# «BOLALARDA TUG'MA RIVOJLANISH NUQSONLARI»

O'ZBEKISTON RESPUBLIKASI OLIY VA O`RTA MAXSUS
TA`LIM VAZIRLIGI

Atakulov Jamshed Ostonoqulovich

# "Bolalar xirurgiyasi"
# «BOLALARDA TUG'MA RIVOJLANISH NUQSONLARI»

**O`quv qo'llanma**

Mutaxassislik sohasi: 500 000 - "Sog`liqni saqlash va ijtimoiy ta`minot"

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Tibbiyot oliy o`quv yurtlarining: davolash ishi (5510100) va tibbiy pedagogika (5511100) 5-bosqich talabalari uchun o`quv qo`llanma

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O'quv qo'llanma tibbiyot oliy ta'lim muassalari talabalari uchun mo'ljallangan bo'lib, bolalar jarrohligi fanidan o'rganilagan barcha mavzularni o'z ichiga oladi. Har bir mavzudan so'ng amaliy ko'nikmalar, yaxshi o'zlashtirish uchun o'quv topshiriqlari, interaktiv o'yinlar va o'zini o'zi nazorat qilish uchun testlar taqdim etiladi. Kasallik belgilarini (subyektiv, obyektiv, paraklinik), sindromlarni (oddiy va murakkab), tashxislarni (to'g'ridan-to'g'ri va differentsial) tasniflashning o'ziga xos usuli taklif qilingan. Tavsif bilan parallel ravishda simptomlar, sindromlar, diagnostika xususiyatlarini tahlil qilinib, ularni guruhlarga bo'lish metodologiyasini asoslab berilgan. O'quv qo'llanmada zamonaviy tadqiqot usullaridan foydalangan holdan talabalar uchun moslashtirilgan klinik tashxisni shakllantirish usullari muhokama qilingan.

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## Mundarija:

**Qisqartmalar ro'yxati:**

AB - antirefluks baryer

UASH- umumiy amaliyot shifokori

KQVD - ko`krak qafasining voronkasimon deformatsiyasi

OIT- oshqozon- ichak trakti

GI- Gijitskiy indeksi

PQS- pastki qizilo'ngach sfinkteri

PG - portal gipertenziya

UTT - ultratovush tekshirish

EKG - elektrokardiografiya

ExoKG - exokardiografiya

SWOT- Kuchli tomonlar (kuchli tomoni), zaif tomonlari (zaif tomoni); Imkoniyatlar (imkoniyatlar); tahdidlar (kasallikning bezovta qiluvchi tomonlari)

## KIRISH

Bemor bolalar kontingentining o'ziga xos xususiyatlarini bilish bolalar jarrohlik muassasalari xodimlari faoliyatida muhim o'rin tutadi. Bu jihat xodimlarning umumiy pediatrik tayyorgarligiga, bemor bola bilan munosabatlariga, deontologik va boshqa ba'zi masalalarga taalluqlidir.

Bolalar jarrohi jarrohlik kasalliklarini turli yuqumli kasalliklardan farqlashi, nuqsonli bolalarni kuzatishi, yangi tug'ilgan chaqaloqlarni va hatto erta tug'ilgan chaqaloqlarni davolashi kerak, shuning uchun u yuqumli kasalliklarni yaxshi bilishi, genetika, embriologiya va akusherlik asoslaridan xabardor bo'lishi kerak. Ba'zi jarrohlik kasalliklarini tashxislashning qiyinligi va ularning o'zgaruvchanligi ko'p jihatdan kasallikning qaysi fonda kechayotganligiga, yoshi, rivojlanishi, bolaning umumiy holatiga bog'liq. Shuning uchun bolalar jarrohiga pediatriya bo'yicha fundamental bilim kerak.

Xodimlarning bemor bolalar bilan munosabatlariga katta e'tibor berilishi kerak. Ruhiyat o'zgaruvchanligi va kuchli iroda kabi fazilatlarning yo'qligi, bolaning negativligi, g'ayrioddiy sharoitlarda ota-onasiz qolishdan qo'rqishini hisobga olgan holda, bolalar jarrohligi bo'limi xodimlari o'z bemorlariga maksimal darajada sezgirlik va e'tibor ko'rsatishlari kerak. Pediatr, xususan, bolalar jarrohi ham psixologdir, shuning uchun uning kichkina bemor bilan gaplashish ohangi va uslubi katta ahamiyatga ega. Bolaning ishonchini qozonish juda muhimdir. Agar ataylab og'riqli va yoqimsiz amaliyot bo'lsa, u zarar ko'rmaydi deb aytmaslik kerak. Bu biroz og'riqli bo'lishi mumkinligi haqida ogohlantirish to'g'riroq, ammo boshqa bolalar bunga osongina chidashadi deb aytilishi lozim. Umuman olganda, u yoki bu amaliyotdan o'tgan bolaning boshqa bolalarga murojaat qilish foydalidir va keyin ular o'zlari palatadagi qo'shnisiga "bu unchalik qo`rqinchli emasligini" tushuntiradilar. Biroq, bolaga ehtiyotkorlik va sezgirlik bilan munosabatda bo'lish bilan birga, shifokor injiq bemoriga ergashmasligi va kerakli tekshiruv va davolanishni qat'iy bajarishi kerak.

Bemorlarning ota-onalari bilan muloqot qilishda jarroh katta xushmuomalalik va sezgirlikka ega bo'lishi kerak. Bolaning taqdiri haqida juda xavotirda bo'lgan ota-

onalar uchun uning ahvoli va davolanishi haqida yetarlicha jiddiy va asosli xulosalarni tinglash og'ir. Suhbat davomida shifokorning erkin va beparvo ohangiga yo'l qo'yib bo'lmaydi, chunki ota-onalar farzandlarini beparvo shifokorlarga olib kelgandek taasurot qoldirishlari mumkin. Bolaning ahvoli va uning keyingi davolanishi haqida turli shifokorlar va hamshiralar tomonidan yetkazilgan qarama-qarshi ma`lumotlar yo'qligiga ishonch hosil qilish kerak.

Yangi tug'ilgan chaqaloqlarning taxminan 1 foizida bir nechta kichik rivojlanish anomaliyalari va tug'ma nuqsonlarning tasodifiy bo'lmagan kombinatsiyasi mavjud bo'lsa, ularning 40 foizida u yoki bu sindromni aniqlash mumkin va 60 foiz hollarda yangi sindromlarni aniqlash kerak. Bu sindromlarni tashxislashning murakkabligini ko'rsatadi, ularning soni hozirgi vaqtda 1500 dan oshadi va davriy adabiyotlarda har yili kamida 10-15 ta yangi nozologik shakllar tavsiflanadi.

Ko`pgina patologik sindromlarning uchrash chastotasi juda past (10 000-10 000 tug'ilishga 1 ta holat), ammo umumiy kasallanish tarkibida sindromli shakllarning hissasi sezilarli. Misol uchun, qizilo'ngach atreziyasi bo'lgan bolalar orasida kasallikning sindromli shakllarining chastotasi 55% ga, anorektal nuqsonlari bo'lgan bolalarda - 60% ga, ko'krak qafasining tug`ma deformatsiyasi bo'lgan bolalarda - 30% ga yetadi.

Alohida sindromlar eng keng tarqalgan bo'lib, ular nafaqat genetik, balki pediatriya va bolalar jarrohlari tomonidan tashxis qo'yish ko'nikmalarini talab qiladi. Masalan, kriptorxizm va tug'ma yurak nuqsonlari bo'lgan bolalar orasida Nunan sindromi mavjud bo'ladi, uning uchrash chastotasi umumiy populyatsiyada 2000 kishiga 1 ta holat; embrional va kindik churrasi bo'lgan yangi tug'ilgan chaqaloqlar orasida Bekvit-Videman sindromi 12000 tug'ilish uchun kamida 1 holat chastotasi bilan aniqlanadi.

Ba'zi sindromlar jarrohlik amaliyotida juda muhim, jiddiy asoratlarni keltirib chiqarishi mumkin. Misol uchun, Elers-Danlos sindromi kamida 500 nashrlarda va bir nechta monografiyalarda tasvirlangan, chunki u umumiy jarrohlik, bolalar jarrohligi va qon tomir jarrohligida muhim rol o'ynaydi.

Ikki tomonlama nuqsoni bo'lgan bolada sindromli patologiyaga shubha qilish. masalan, qo'l yoki oyoqning ikki tomonlama tug'ma nuqsoni (polidaktiliya, tug'ma barmoq qiyshiqligi) holatlarida oqlanadi. Ba'zi tug`ma nuqsonlar yoki kichik rivojlanish anomaliyalari sindromli patologiyani yoki o'ziga xos tug'ma nuqsonni ko'rsatishi mumkin. Shunday qilib, yuqori darajadagi ehtimollik bilan preaksial polidaktiliya (birinchi barmoq yoki oyoqning ikkinchi barmog'i) sindromli patologiyani ko'rsatadi, postaksial polidaktiliya (kichik barmoq yoki oyoqning kichik barmog'i) odatda alohidalangan tug'ma nuqsondir. Rudimentning mavjudligi (qo'shimcha so`rg`ichlar yoki rudimentar sut bezlari) buyraklar va siydik yo'llarining tug`ma patologiyasining yuqori ehtimolini ko'rsatadi.

Jarrohlar uchun eng tez-tez uchraydigani va muhimi biriktiruvchi to'qima kasalliklari bo'lib, ular biologik asosi hujayradan tashqari matritsa oqsillari (kollagen oqsillari, elastin, proteoglikanlar va glyukoproteinlar) patologiyasidir. Bu kasalliklar Marfan, Elers-Danlosning eng keng tarqalgan sindromlari, osteogenezning noto`liqligi, shuningdek, kam uchraydigan displaziyalar va mukopolisaxaridozlar bilan ifodalanadi.

Zamonaviy ma'lumotlar irsiy kasalliklarning bolalar kasalliklari va o'limi tarkibida muhim rol o'ynashini ko'rsatadi, masalan, bolalar klinikalarida bemorlarning 25 foizida irsiy patologiya tashxisi qo'yilgan, vafot etgan bolalar orasida esa bu ko'rsatma 50 foizni tashkil qiladi.

Irsiy kasalliklar orasida eng yuqori foizni tug'ma rivojlanish nuqsonlari egallaydi, ular zamonaviy tasnifga ko'ra 4 toifaga bo'linadi: tug'ma nuqsonlar, buzilishlar, deformatsiyalar va displaziyalar.

**Tug`ma rivojlanish nuqsonlari**- embrion differentsiatsiyasining birlamchi genetik jihatdan aniqlangan buzilishi natijasida kelib chiqadigan organning anatomik nuqsoni (polidaktiliya, agenez yoki buyrakning ikkilanishi , gipospadiya va boshqalar).

**Norasolik**- normal genotip bilan embrion differensiatsiyasining ikkilamchi buzilishi natijasida kelib chiqadigan organning anatomik nuqsoni (embrionga

nisbatan tashqi ta'sirlar natijasida kelib chiqqan teratogen nuqsonlar – homila ichi infektsiyalar, radiatsiya, kimyoviy va tibbiy preparatlar, onaning boshqa kasalliklari).

**Deformatsiya**- homila rivojlanishida mexanik sabablar natijasida embrion differentsiatsiyasi buzilmasdan kelib chiqadigan tana a'zolarining tabiiy bo'lmagan shakli yoki tabiiy bo'lmagan holati (tug'ma maymoqoyoq, tortikollis, tug'ma pektus ekskavatum va boshqalar).

**Displaziya**- bu to'qimalarning differentsiatsiyasining genetik jihatdan aniqlangan birlamchi buzilishi natijasida kelib chiqadigan morfologik to'qima nuqsoni (gemangioma, pigmentli nevus, neoplaziya va boshqalar).

Yuqorida sanab o'tilgan tug'ma rivojlanish nuqsonlarining uchrash chastotasi yangi tug'ilgan chaqaloqlar orasida yagona belgi sifatida 3% aniqlangan va 0,7% da ko'p sonli tug'ma nuqsonlar sifatida paydo bo'lishi mumkin.

Ko'p tug'ma rivojlanish nuqsonlari bo'lgan bolalarda sindromlarni, ya'ni bemorni ko'pincha maxsus terapevtik va jarrohlik davolashni talab qiladigan ayrim kasalliklarni aniqlash juda muhimdir.

**Sindrom**- bitta sabab tufayli kelib chiqqan ikki yoki undan ortiq tug'ma nuqsonlarning tasodifiy bo'lmagan birikmasi bilan tavsiflanadigan kasallik.

Bu sabab gen yoki xromosoma mutatsiyasi bo'lishi mumkin (Marfan sindromi, Daun sindromi); homila ichi infektsiyasi (qizilcha sindromi); onaning boshqa kasalligi (diabetik embriopatiya sindromi); Spirtli ichimliklarning teratogen ta'siri, biologik turdagi sindromlar.

Klinik amaliyotda sindromlarning diagnostikasi kasal bolaning fenotipining o'zgarishi bilan ma'lum tug`ma rivojlanish nuqsonlari haqidagi bilimlarga asoslanadi. Fenotip yoki tashqi ko'rinishdagi bu o'zgarishlar kichik rivojlanish anomaliyalari (disembriogenez stigmalari) majmuasi bilan tavsiflanadi, ularning diagnostikasi va talqini shifokorning ma'lum tajribasi va malakasini talab qiladi.

**Kichik rivojlanish anomaliyasi**- tana tuzilishining kam uchraydigan varianti yoki tibbiy ahamiyatga ega bo'lmagan, ya'ni davolashni talab qilmaydigan tug'ma anomaliya (epikant, mongoloid yoki antimongoloid ko'z kesmasi, rangdor parda kolobomasi, ya'ni rangdor pardoning radial nuqsoni, teri qo'shimchalari) quloq

oldingi chig`anog`ining ortiqchasi, kaftning bitta burmasi, mikrogipospadiyalar, gipertelorizm, ya'ni keng tarqalgan orbitalar.

Yangi tug'ilgan chaqaloqlarda kichik rivojlanish anomaliyalari 14% da uchrashi yoki (bolada ikki yoki undan ortiq kichik rivojlanish anomaliyalari) 11% gacha bo'lgan chastotali bitta yoki yagona belgi bo'lishi mumkin. Uch yoki undan ortiq kichik rivojlanish anomaliyalari bo'lgan yangi tug'ilgan chaqaloqning tug'ma rivojlanish nuqsoni uchrash ehtimoli 90% ni tashkil qiladi va bu nuqsonni aniqlashni talab qiladi. Uch yoki undan ortiq kichik rivojlanish anomaliyalari bo'lgan bolaga 40% ehtimollik bilan ma'lum bir sindrom tashxisi qo'yilishi mumkin - o'z vaqtida tashxis qo'yish kerak. Psixomotor rivojlanishning kechikishi va uchta kichik rivojlanish anomaliyalari mavjudligi bilan 20% hollarda aqliy zaiflashuv ehtimoli mavjud va oldindan bilish katta ahamiyatga ega.

Yangi tug'ilgan chaqaloqda uch va undan ortiq kichik rivojlanish anomaliyalarini aniqlash, bu yoshda hali klinik ko'rinishga ega bo'lmagan tug'ma nuqsonlarni o'z vaqtida aniqlash uchun yurak, miya, buyraklar va qorin bo'shlig'i organlarini to'liq ultratovush tekshiruvidan o'tkazishni talab qiladi. Bundan tashqari, keyinchalik dispanser kuzatuvi bilan ma'lum sindromlarni o'z vaqtida tashxislash maqsadida genetik mutaxassisga murojaat qilish kerak.

## 1-BOB. Qizilo'ngach rivojlanishining nuqsonlari va anomaliyalari (atreziya, qizilo`ngach-traxeal oqmasi, tug`ma kistalar, qizilo'ngach xalaziyasi, qizilo'ngach axalaziyasi), klinikasi, diagnostika, davolash, operatsiyadan keyingi reabilitatsiya

Bolalar xirurgiyasi xirurgiya kursining bir qismi bo'lib, jarrohlik davolashni talab qiladigan tug'ma nuqsonlar va rivojlanish anomaliyalarining kelib chiqishi, diagnostikasi va davolashini tavsiflaydi.

Bolalar xirurgiyasini o'qitishning asosiy prinsipi - tashxislash, nozologik diagnostika va standartni ta'minlash ko'nikmalarini o'rgatish, tug'ma nuqsonlari va rivojlanish anomaliyalari bo'lgan bolalarni umumiy tibbiy yordam va operatsiyadan keyin reabilitatsiya qilishdir.

Fakultetning bolalar xirurgiyasi kursining o‘quv rejasida fundamental va boshlang‘ich klinik fanlar, jumladan, filo-, onto- va embriogenez, inson o‘sishi va rivojlanishi fiziologiyasi va patologiyasi, semiotika va zamonaviy usullar bo‘yicha oldingi kurslarda olingan bilim va ko‘nikmalarni birlashtirish, laboratoriya va instrumental diagnostika, davolash va reabilitatsiyaning klassik standartlari asoslari ko`zda tutilgan.

**Mashg`ulot vazifalari:** tug'ma nuqsonlari va jarrohlik yo'li bilan davolashni talab qiladigan rivojlanish anomaliyalari bo'lgan bolalarni klinik diagnostika qilish, davolash va reabilitatsiya qilish ko'nikmalarini rivojlantirish.

**Mashg`ulot maqsadi:**

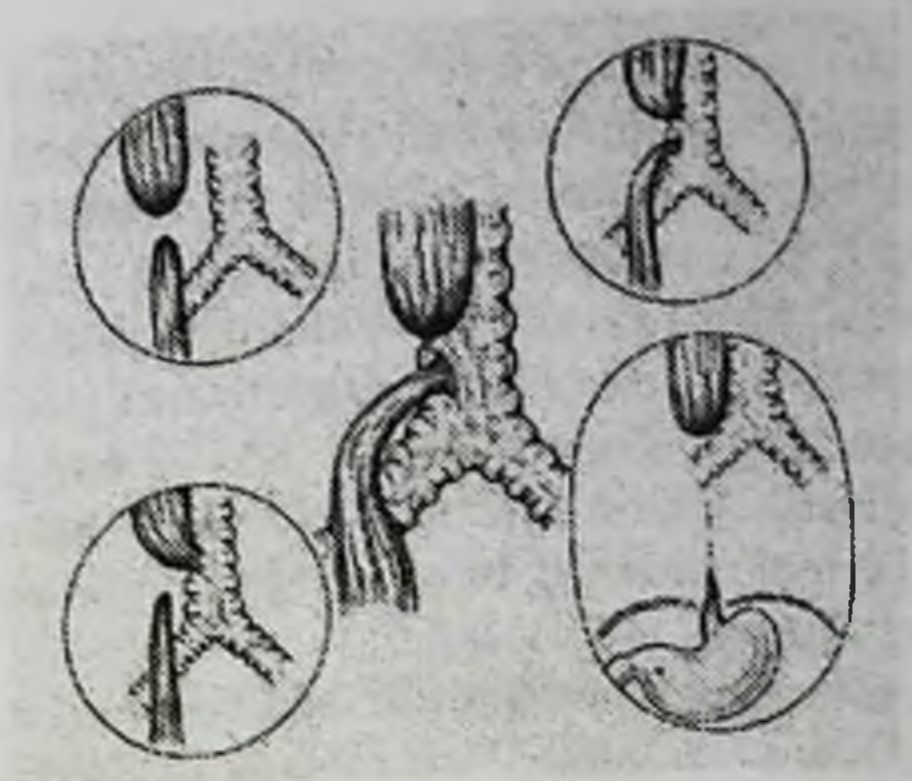
- Bolalarda keng tarqalgan nuqsonlar va rivojlanish anomaliyalarining etiologiyasi, patogenezi va klinikasi bo'yicha bilimlarni shakllantirish;
- Talabalarda tug'ma nuqsonlari va rivojlanish anomaliyalari bo'lgan bolalarni klinik ko'rikdan o'tkazish va tekshirish, shu jumladan laboratoriya va instrumental tekshirish usullari bo'yicha malaka va ko'nikmalarni rivojlantirish;
- Talabalarga bolaning hayotiga xavf tug'diradigan nuqsonlar va rivojlanish anomaliyalari diagnostikasi algoritmini o'zlashtirishda ko`maklashish;
- Nuqsonlar va rivojlanish anomaliyalari va ularning asoratlarini jarrohlik yo'li bilan davolash tamoyillari bilan tanishish;
- Tug'ma nuqsonlari va rivojlanish anomaliyalari bo'lgan bolalarni operatsiyadan keyingi reabilitatsiya qilish bo'yicha davolash-diagnostika standartlari va yo`riqnomalari asosida umumiy tibbiy yordam ko'rsatish bo`yicha ko'nikma va ko'nikmalarni rivojlantirish.

**Mashg`ulot o`tkazilish joyi:** torakal jarrohlik bo'limi, operatsiya xonasi, kompyuter xonasi, o'quv xonasi

**Kuzatish va baholash:** og'zaki nazorat: nazorat savollari, guruhlarda o'quv topshiriqlarini bajarish.

**Yozma nazorat:** Nazorat savollari.

## QIZILO'NGACH ATREZIYASI

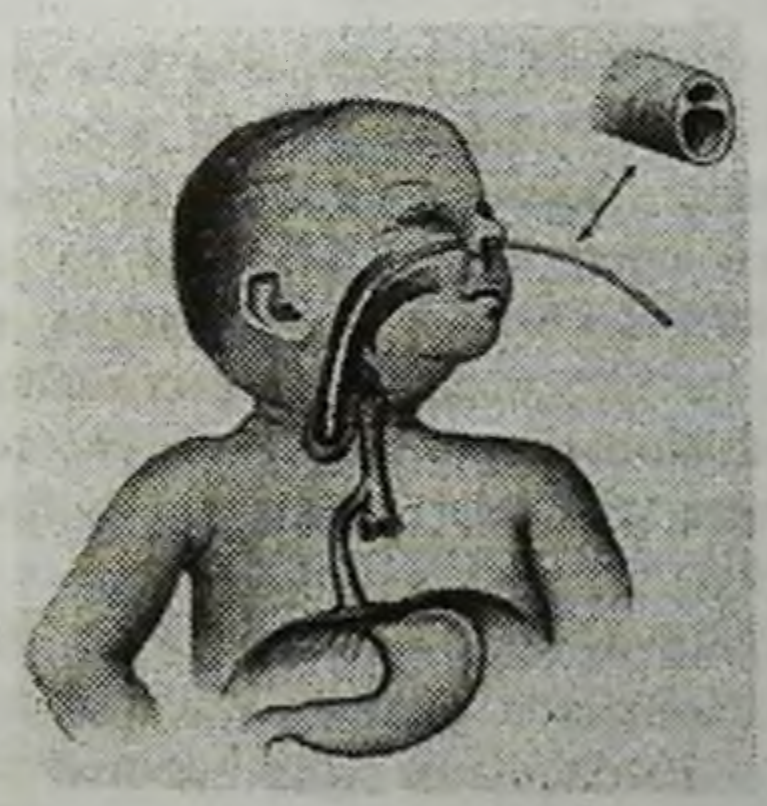


**1-rasm Qizilo'ngach atreziyasi turlari**

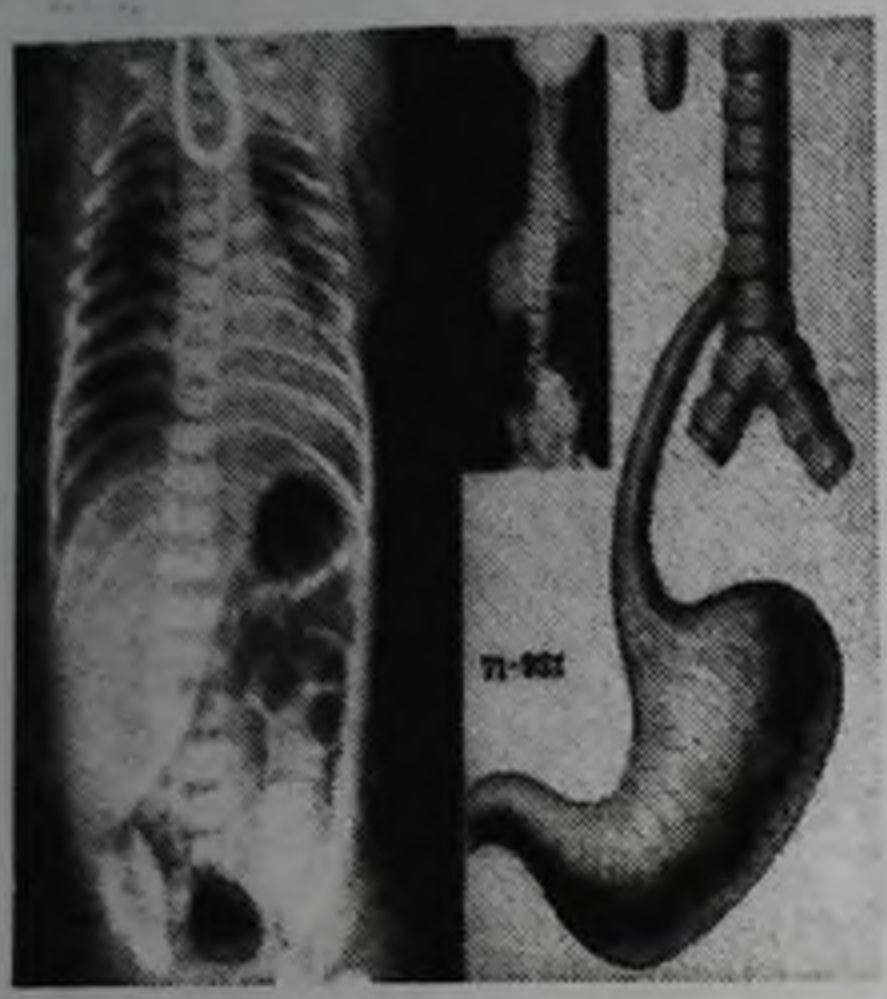
Qizilo'ngach atreziyasi-rivojlanish nuqsoni bo`lib, bunda qizilo'ngachning yuqori qismi ko'r tugaydi, uning pastki qismi esa ko'pincha traxeya bilan aloqa qiladi. Ko'pincha qizilo'ngach atreziyasi boshqa rivojlanish nuqsonlari bilan qo`shilib keladi. Masalan,tug`ma yurak nuqsonlari, oshqozon-ichak trakti,siydik ayirish tizimi nuqsonlari. 5% hollarda qizilo'ngach atreziyasi xromosoma kasalliklari bilan uchraydi. Aholida uchrash chastotasi 0,3 har 1000 tada; erkak va ayollar o`rtasida1:1 nisbatda uchraydi.

Nuqson rivojlanishi embriogenezning dastlabki bosqichlaridagi buzilishlar bilan bog'liq. Ma'lumki, traxeya va qizilo'ngach bitta rudimentdan - oldingi ichakning bosh uchidan paydo bo'ladi. Embriogenez boshida traxeya qizilo'ngach bilan to`liq aloqada bo'ladi. Ularning ajralishi embriogenezning 4-5-haftasida sodir bo'ladi. Traxeya va qizilo'ngachning yo'nalishi va o'sish tezligining mos kelmasligi natijasida, shuningdek, 20 kundan 40 kungacha bo'lgan davrda qizilo'ngach ichak nayining boshqa shakllanishlari bilan birga o'tadigan qattiq to'qimalarda vakuolizatsiya jarayonlari mos kelmasa, qizilo'ngach atreziyasi rivojlanishi mumkin (1-rasm). Homiladorlik anamneziga ko'ra, birinchi uch oylikda ko`p suvlilik va bola tushish xavfi aniqlanadi.

**Klinikasi va diagnostikasi.** Qizilo'ngach atreziyasining belgilari bola tug'ilgandan keyingi dastlabki soatlarda aniqlanadi.Qizilo'ngachning yuqori qismi va halqum shilliq bilan to`ladi, bolaning og'zidan ko'p miqdorda ko'piksimon massa ajrala boshlaydi. Shilliq massaning bir qismi chaqaloq tomonidan nafas yo'llariga o'tib, sianoz va nafas yetishmovchiligi belgilari paydo bo`ladi. Halqum shilliqlardan tozalangandan so`ng aspiratsiya yana takrorlanadi. Qisqa vaqtda o'pkalar auskultatsiyasida hirillashlar eshitila boshlaydi.



**2-rasm. Qizilo'ngachning o'tkazuvchanligini tekshirish.**



Tashxis qizilo'ngachni yumaloq uchli ingichka uretral kateter bilan kateterizatsiya qilish yo'li bilan aniqlanadi. (2-rasm). Kateter burun orqali kiritiladi; 6-8 sm ichkariga kiritilib, kateter qizilo'ngachning ko'r uchiga tiraladi yoki egilib, bolaning og'zidan chiqadi. Shilliq massa so`rib olinadi. Qizilo'ngachga kiritilgan havo halqum orqali shovqin bilan chiqadi (Elefant simptomi musbat).

Atreziyani erta diagnostika qilishda, aspiratsion pnevmoniyani oldini olishda nafas yetishmovchiligi bilan tug`ilgan bolalarni barchasida bola tug`ilishi bilan qizilo`ngachni zondlash muhim ahamiyatga ega.

**3-rasm. Qizilo'ngachni rentgen nazorati ostida tekshirish.**

Atreziya shakliga qarab klinik belgilar o`ziga xos bo`ladi. Eng keng tarqalgan shakli bu distal qismdagi traxeya-qizilo`ngach oqmali atreziya. Bunda oqma qorin bo'shlig'i, ayniqsa epigastral sohada aniqlanadi. Aspiratsiya sindromining kelib chiqishi asosan traxeya-qizilo`ngach oqmaning diametriga bog'liq.

Aniq yakuniy tashxis rentgenologik tekshiruvidan so'ng amalga oshiriladi. Kateter qizilo'ngachning ko`r qismiga taqalguncha kiritiladi, shundan so'ng ko'krak qafasi va qorin bo`shlig`i a'zolarining umumiy rentgenogrammasi o'tkaziladi. Atreziyada qizilo'ngachning ko'r uchida rentgenkontrastli kateter aniq ko'rinadi. Oshqozon va ichakda havo mavjudligi traxeya va qizilo'ngachning qorin segmenti sohasida oqma mavjudligidan dalolat beradi. Oqmasiz shakllarida qorin bo'shlig'ining to'liq qorayishi qayd etiladi. Atreziyaning oqmali shakllari bo'lgan bolalarda qizilo'ngachning uchlari orasidagi diastazning uzunligini yon proeksiyali rentgenogrammada aniqlash mumkin. Diagnostika uchun rentgenokontrast eritmalardan, ayniqsa, bariy eritmalaridan foydalanish aspiratsion pnevmoniya xavfi tufayli man etiladi. Bunda suvda eruvchi contrast moddalar, xususan yodolipol ishlatiladi(3-rasm).

**Davolash.**Faqat erta jarrohlik aralashuvi qizilo'ngach atreziyasi bo'lgan bolaning hayotini saqlab qolishi mumkin. Tug'ruqxonalarda operatsiyaga tayyorlov ishlarini barvaqt olib borish kerak, bunda har 15-20 daqiqada og`iz burun orqali aspiratsion massalarni so`rib olish va tozalab turish kerak va og`iz orqali ovqatlantirishni to`xtatish kerak. Tashxish imkon qadar tezroq ixtisoslashgan guruh tomonidan amalga oshirilishi kerak. Operatsiyadan oldingi tayyorgarlikning davomiyligi gomeostaz va gemodinamik buzilishlarning og'irligi, nafas yetishmovchiligi va suvsizlanish darajasi bilan belgilanadi. Aspiratsiyaning belgilari ya`ni nafas olish buzilishi yaqqol ifodalangan bo`lsa, pnevmoniya va atelektazda darhol laringoskopiya va traxeya kateterizatsiyasi o`tkazilishi kerak. Agar yuqoridagi

usullar samarasiz bo`lsa, umumiy og`riqsizlantirish ostida bronxoskopiya yoki traxeya intubatsiyasi o`tkaziladi. Bemor kyuvezga joylashtiriladi, kislorod bilan uzluksiz ta'minlanadi, halqumdan aspiratsion massa chiqariladi va bemor isitiladi. Bemorga infuzion, antibakterial va simptomatik terapiya tayinlanadi.

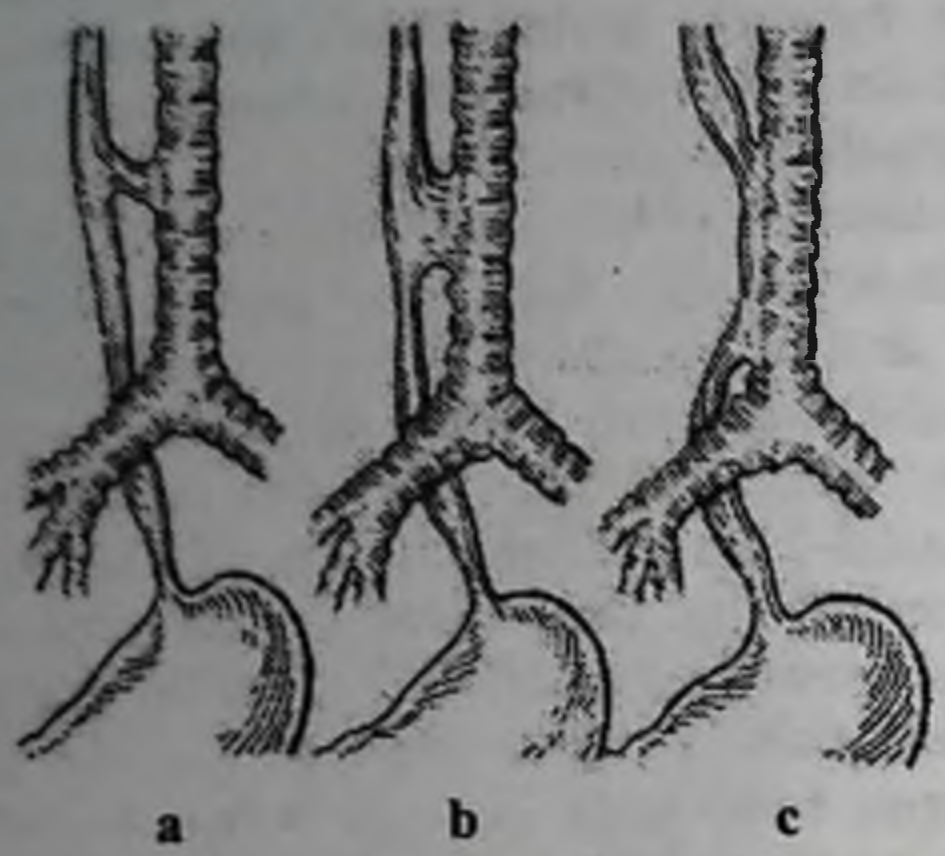
Jarrohlik aralashuvi usulini tanlash atreziya shakli va bemorning ahvoli bilan belgilanadi. Operatsiya xavfi past bo'lgan bemorlarda distal traxeoezofagial oqma bilan atreziyaning eng keng tarqalgan shaklida (muddati, hayotiy organlarning birgalikdagi nuqsonlari va intrakranial tug'ilish travmasi belgilarisiz) torakotomiya, traxeoezofagial oqmani bartaraf qilish bilan boshlash maqsadga muofiqdir. Qizilo'ngachning uchlari orasidagi diastaz 1,5-2 sm dan oshmasa , to'g'ridan-to'g'ri anastomoz qo'yiladi. Qizilo'ngach segmentlarining katta diastazi bilan servikal ezofagostomiya va Kader usuliga ko'ra gastrostomiya qo'llaniladi. Fistuloz bo'lmagan shakllarda sezilarli diastaz tufayli gastrostomiya va ezofagostomiya amalga oshiriladi. Operatsiya xavfi yuqori bo'lgan bemorlarda jarrohlik ko'pincha ikki tomonlama gastrostomiya qo'yish bilan boshlanadi (birinchi o'n ikki barmoqli ichakka kiritilgan naycha orqali oziqlantirish uchun, ikkinchisi oshqozonni dekompressiyalash va aspiratsiyani kamaytirish uchun). Operatsiyaning ikkinchi bosqichi 2-4 kundan keyin holat yaxshilanganidan keyin amalga oshiriladi.

Operatsiyadan keyingi davrda boshlangan intensiv terapiya davom ettiriladi. Bolada ichak orqali o'tish tiklangandan so'ng, operatsiya vaqtida anastomoz yoki gastrostomiyaga kiritilgan zond orqali oziqlanadi. 6-7-kuni anastomozning mustahkamligi tekshiriladi. Rentgenoskopiya nazorati ostida bolaning og'ziga 1-2 ml suvda eriydigan kontrast modda yuboriladi. Anastomoz zonasining ochiqligi baholanadi, kontrast moddaning chiziqlari chiqarib tashlanadi. Asorat bo'lmasa, bola og'iz orqali ovqatlana boshlaydi. Operatsiyadan 2-3 hafta o'tgach, anastomoz zonasining ochiqlik darajasini, kardial qismning holatini va ezofagit belgilarini baholash bilan nazorat fibroezofagogastroskopiya o'tkaziladi. 30-40% hollarda yuzaga keladigan anastomozning torayishi bujlashni talab qiladi. Bujlashning davomiyligi ezofagoskopiya bilan nazorat qilinadi.

Operatsiyadan keyingi davrda bolaning hayotining birinchi yilida doimiy dispanser kuzatuvi zarur. Shoshilinch hollarda anastomoz sohasidagi obstruktsiya bilan asoratlangan disfagiyada ezofagoskopiya qilish mumkin. Shu munosabat bilan, hayotning birinchi yilidagi bolalarga bir xil oziq-ovqat massasini berish tavsiya etiladi. Operatsiyadan keyingi davrni tez-tez murakkablashtiradigan kardial yetishmovchilik va gastroezofagial reflyuks klinik jihatdan tungi regurgitatsiya, takroriy pnevmoniya bilan namoyon bo'ladi va o'z vaqtida tashxis qo'yishni talab qiladi. Bolalarda nervning jarrohlik jarohati bilan bog'liq holda, keyingi 6-12 oy ichida ovozning xirillashi mumkin.

Qizilo'ngach va gastrostomiya qo'yilgan bolalarda 2-3 oylikdan 3 yoshgacha bo'lgan davrda operatsiyaning ikkinchi bosqichi - yo'g'on ichak bir qismi bilan ezofagoplastika amalga oshiriladi.

## TUG'MA TRAXEYA QIZILO`NGACH OQMASI



a b c

**4-rasm. Traxeoezofagial oqmaning variantlari**

Izolyatsiyalangan konginental traxeoezofagial oqma kam uchraydigan malformatsiyadir: uning uchrashi barcha qizilo'ngach anomaliyalarining 3-4% ni tashkil qiladi. Fistula, qoida tariqasida, yuqori, VII bo'yin yoki I ko'krak umurtqasi darajasida joylashgan.

Traxeoezofagial oqmalarning uch turi mavjud: torva uzun(4-rasm a), qisqa va keng(4-rasm b) hamda qizilo'ngach traxeyadagi juda katta oqma (4-rasm c).

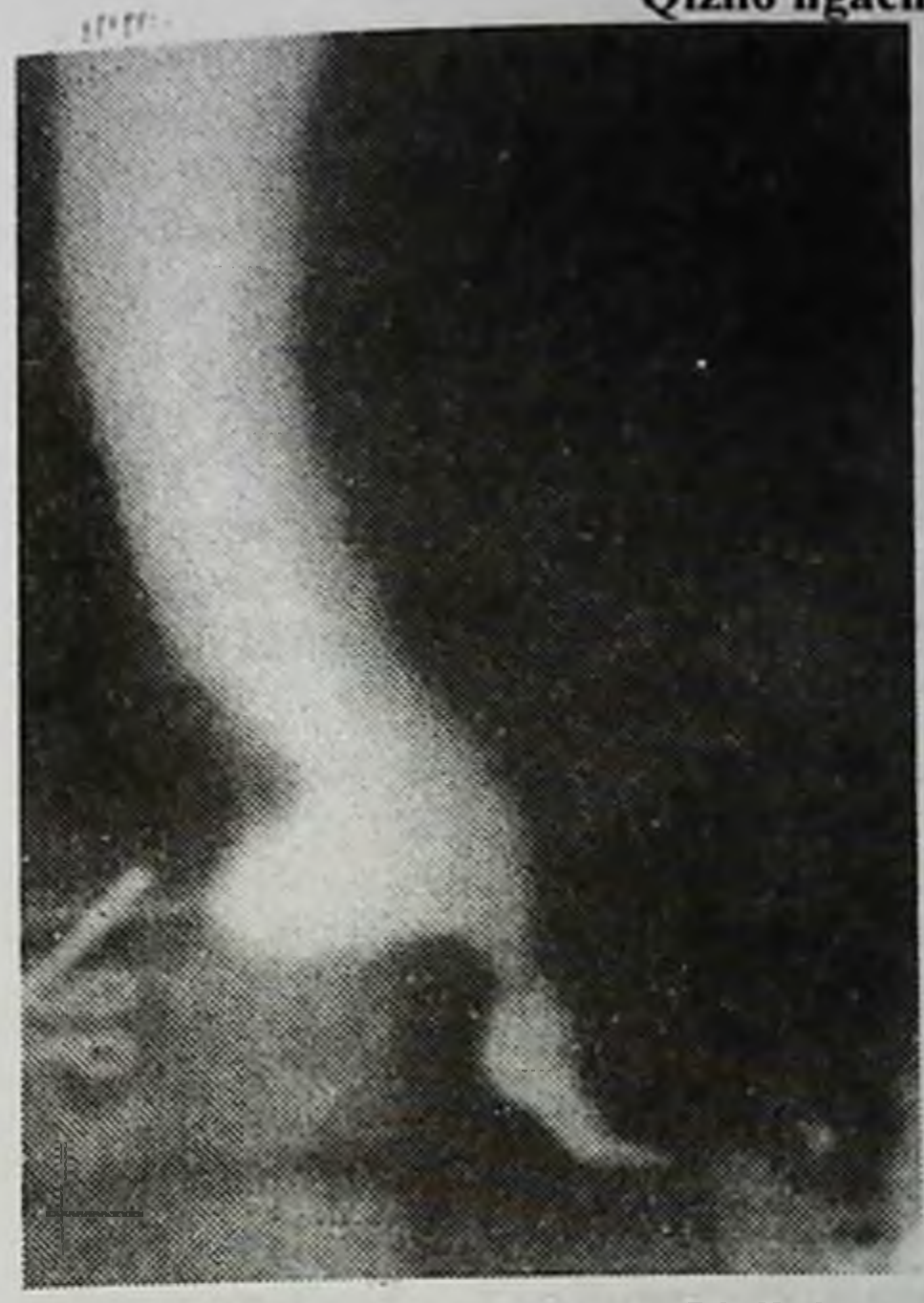
**Klinikasi va diagnostikasi.** Simptomlarning og'irligi fistula diametriga va traxeyaga kirish burchagiga bog'liq. Xarakterli alomatlar: oziqlantirish paytida yuzaga keladigan yo'tal va sianoz xurujlari, bolaning gorizontal holatida yanada aniqroq. Tor va uzun oqma bilan faqat ovqatlanish paytida bolaning yo'talishi mumkin. Holat o'zgarganda, alomatlar kamayadi. Bolada ko'pincha, pnevmoniya rivojlanadi. Eng asosiy klinik ko'rinish keng oqmalarda kuzatiladi, oziqlantirishning boshida sut traxeobronxial daraxtga osongina kirib boradi. Atelektaz bilan o'pkada o'tkir yallig'lanish jarayoni tez rivojlanadi.

Traxeoezofagial oqma diagnostikasi qiyin, ayniqsa tor oqmalarda. Tadqiqotlar majmuasi rentgen va instrumental usullarni o'z ichiga oladi. Radiografiya bolaning gorizontal holatida amalga oshiriladi. Ekran nazorati ostida qizilo'ngachning boshlang'ich qismiga kiritilgan zond orqali suvda eriydigan kontrast moddaning eritmasi yuboriladi. Uning traxeyaga oqishi fistula mavjudligini ko'rsatadi. Ushbu usulning mazmuni past. Traxeoskopiya katta diagnostik ahamiyatga ega. Traxeya boshidan to bifurkatsiyagacha tekshiriladi. Yoriqsimon oqma traxeyaning orqa yuzasi bo'ylab joylashgan. Fistulaning to'g'ridan-to'g'ri belgisi shilimshiq bilan havo pufakchalari paydo bo'lishidir.

**Differensial diagnostika.** Qizilo'ngachning atreziyasi, kardial axalaziyasi, gastroezofagial reflyuks, qizilo'ngachning torayishi, tug'ruq paytida, reanimatsiya paytida ovoz boylamlarining shikastlanishi bilan bog'liq disfagiyalar bilan farqlash kerak.

**Davolash**. Faqat operatsion usulda qilinadi. Operatsiyadan oldingi tayyorgarlik traxeobronxial daraxtni sanatsiya qilish , aspiratsion pnevmoniyani davolashdan iborat. Shu maqsadda sanitar bronxoskopiya amalga oshiriladi, UVCh, antibakterial, infuzion terapiya buyuriladi. Og'iz orqali ovqatlantirishni butunlay to'xtatiladi. Mobilizatsiya, bog'lash va anastomozni kesish operatsiyasi o'ng tomonlama servikal kirish orqali amalga oshiriladi, kamroq tez-tez posterolateral torakotomiya qilinadi. O'z vaqtida tashxis qo'yilsa, prognoz ijobiy.

## Qizilo'ngach axalaziyasi



Qizilo'ngach axalaziyasi - qizilo'ngachning kardial qismining o'tkazuvchanligining funksional buzilishi bilan tavsiflangan patologik holat. Kasallikning rivojlanishi bilan qizilo'ngach motor faolligini yo'qotadi, bu uning kengayishiga olib keladi. Bolalikda kasallik kattalarnikiga qaraganda ancha kam uchraydi. Bolalarda kasallikning boshlanishi o'rtacha 8-9 yoshga to'g'ri keladi, garchi u chaqaloqlarda paydo bo'lishi mumkin bo'lsada.

Bir vaqtlar bu kasallik gangliya hujayralarida buzilishlar bilan bog'liq deb hisoblangan. Ammo, elektron mikroskopda olib borilgan tadqiqotlar keying yillarda bemorlarda vagus nervlarning yadrolarida degenerativ o'zgarishlarni aniqlashga yordam beradi.

**5-rasm. Kontrastli tadqiqot . Qizilo'ngach axalaziyasi**

**Klinika.** Kasallikning asosiy belgilari disfagiya va regurgitatsiyadir. Ovqatning qizilo'ngach orqali o'tishiga to'sqinlik qiladigan bu alomatlar va o'zgarmagan ovqatni qusish suyuq oziq-ovqatga qaraganda ko'proq qattiq ovqatda uchraydi. Noqulaylik hissi, to'sh orqasida biroz bosim, epigastral sohada yoki ko'krak orqasidagi mo'tadil og'riq kabi belgilarni pediatrik bemorlarda tasvirlash qiyin, bu ma'lum diagnostika qiyinchiliklarini keltirib chiqaradi. Yosh bolalarda disfagiya bir qator bilvosita belgilar bilan namoyon bo'ladi: ular sekin ovqatlanadilar, ovqatni yaxshilab chaynashadi, ovqatni to'liq iste'mol qilmaydilar, ovqat paytida bo'g'ilib qoladilar. Katta yoshdagi bolalar ovqatning o'tishini osonlashtirish uchun yutinishning kuchayishi (bo'sh yutish harakatlari), ichimlik suvi ichish va boshqalar kabi usullarga murojaat qilishadi. Bolalikda kasallik juda kam uchraganligi sababli, bu alomatlar ko'pincha psixologik muammolar bilan bog'liq bo'lib, bu ham tashxisni biroz kechiktiradi. Bu o'z navbatida bolalarda vazn yo'qotishiga olib keladi va qizilo'ngachning tungi aspiratsiyasi takroriy pnevmoniyaga olib kelishi mumkin. Kasallik ba'zi hollarda intervalli xarakterga ega, ya'ni yomonlashuv davrlari klinik sog'lik bilan almashinishi mumkin.

**Diagnostika.** Ushbu kasallikni tashxislashning asosiy usullari qizilo'ngachni kontrast modda bilan rentgenologik tekshirish (ko'pincha bariy bilan) va ezofagoskopiya (5-rasm). Vertikal holatda o'tkazilgan obzor rentgenoskopiya bilan kengaygan qizilo'ngachdagi suyuqlik darajasini aniqlash mumkin, bu esa o'tkazuvchanlikning buzilganligini ko'rsatadi. Keyin bo'tqasimon bariy suspenziyasi bilan to'ldiriladi. Bunday holda, bariy suspenziyasi oshqozonga umuman kirmaydi

yoki unga ingichka oqim bilan o'tadi. Tadqiqot davomida kardial qismning bo'shashishi va kontrast moddaning muhim qismining oshqozonga tushishi mumkin - bu kardial qismning funktsional buzilishining ishonchli belgisidir. Bemorga aralashmani suv bilan ichish uchun berilsa, bu alomatni rag'batlantirish mumkin.

Ezofagoskopiya majburiy tadqiqotdir, chunki u ezofagit belgilarini aniqlash va uning darajasini aniqlash imkonini beradi va fibroezofagoskopning oshqozonga erkin o'tishi reflyuks ezofagiti yoki boshqa sabablarga ko'ra tug'ma stenoz yoki ikkilamchi stenozning yo'qligini ko'rsatadi.

Hozirgi vaqtda bolalarda ushbu kasallikning tashxisida manometriyadan foydalanish cheklangan. Biroq, kelajakda ushbu diagnostika usulini takomillashtirish axalaziya va kardiospazmni farqlash imkonini beradi, bu esa o'z navbatida davolash taktikasini tanlashga differentsial yondashish imkonini beradi.

Qizilo'ngach axalaziyasini qizilo'ngachning tug'ma stenozi, peptik va kuyishdan keyingi stenoz, qizilo'ngach divertikullari, shuningdek, oshqozon va qizilo'ngachning yaxshi va yomon sifatli o'smalaridan farqlash kerak.

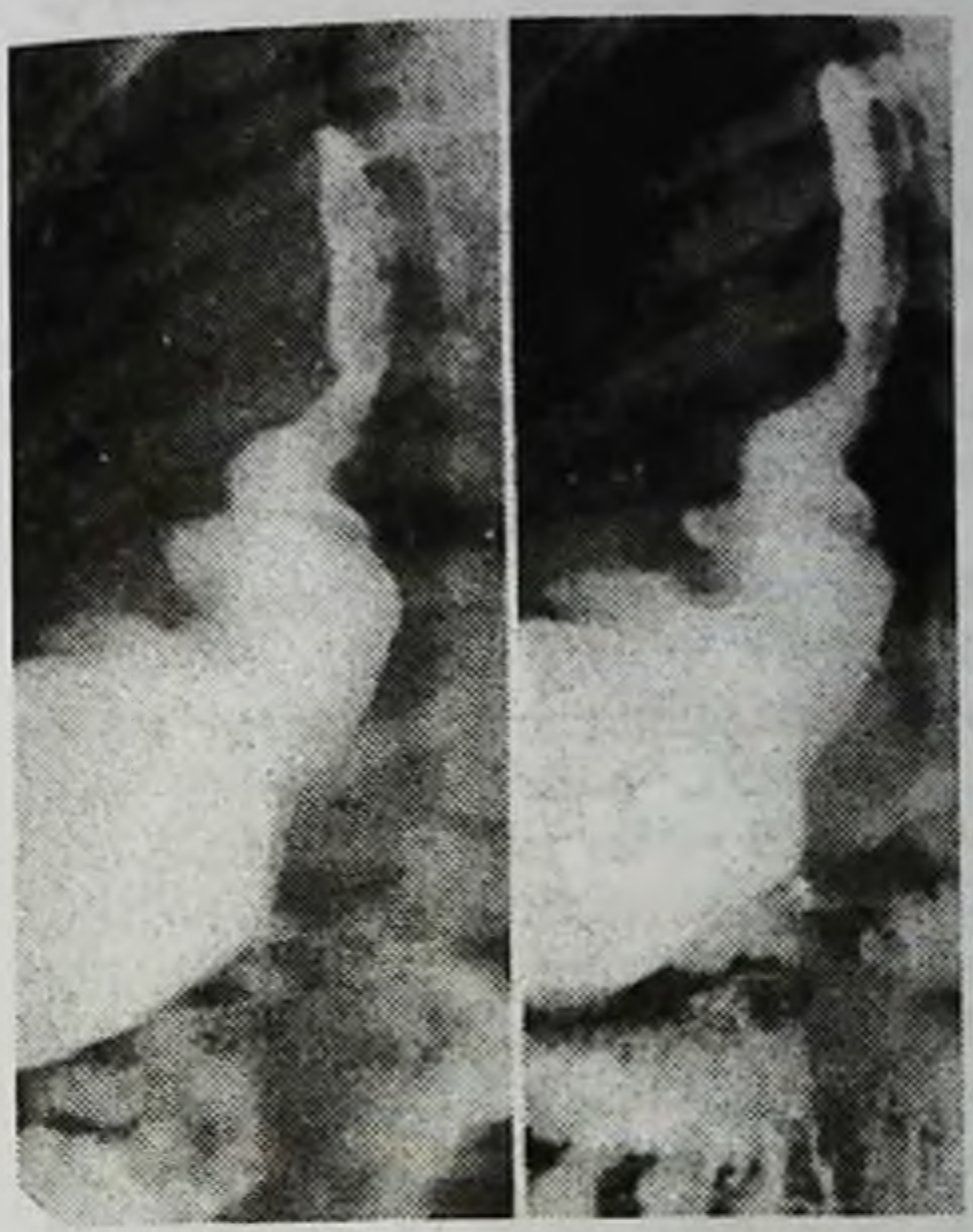
**Davolash.** Axalaziya uchun konservativ va jarrohlik davolash usullari mavjud. Konservativlarga dori terapiyasi, majburiy bujlash va kardiodilatatsiya kiradi (pediatrik amaliyotda pnevmo va gidrodilatatorlar bilan balondilatsiya qo'llaniladi). Ular qo'llanilganda, darhol yaxshilanish bo'ladi, ammo davolanishning ta'siri beqaror bo'ladi.

Bolalarda qizilo'ngach axalaziyasini davolashning eng keng tarqalgan usuli jarrohlik usulidir. Keng qo'llaniladigan ekstramukozal kardiomiotomiya ezofagokardiofundoplikatsiya bilan birgalikda bajariladi.

Qizilo'ngach axalaziyasi bilan og'rigan bemorlar, ayniqsa operatsiyadan keyingi davrda dispanser kuzatuvida bo'lishi kerak. Radikal (jarrohlik) davolashdan so'ng ular 6-12 oydan keyin tekshiriladi; radikal davolash olmagan bemorlar yiliga 3-4 marta .

Axalaziyani davolash kasallikning asosiy belgilarini bartaraf etishga qaratilganligi sababli, bemorlar ma'lum mehnat va dam olish sharoitlariga rioya qilishlari va kasallikning qaytalanishining klinik ko'rinishi bo'lmagan taqdirda ham vaqti-vaqti bilan tekshiruvdan o'tishlari kerak.

# QIZILO'NGACH XALAZIYASI



**Qizilo'ngachning xalaziyasi**- qizilo'ngach va oshqozon birikkan zonasining funksional yetishmovchiligi tufayli oshqozon tarkibini qizilo'ngachga tashlash natijasida kelib chiqqan qizilo'ngach kasalligi.

Yevropa va Shimoliy Amerikadagi ko'pchilik olimlar tomonidan qabul qilingan "reflyuks kasalligi" atamasi kardial disfunktsiya bilan bog'liq bo'lgan juda keng simptomlarni aks ettiradi, bu esa ezofagit, aspiratsiya va boshqa organlarga bog'liq ko'rinishlar bo'lishi mumkin. Shunday qilib, qizilo'ngachning xalaziyasi bu reflyuks kasalligining bir turi bo'lib, ammo bunda qizilo'ngachning boshqa neyropatofiziologik jihatlariga qisqacha to'xtalib o'tish kerak deb hisoblaymiz.

**6-rasm. Qizilo'ngach xalaziyasini tekshirish**

Endi reflyuks kasalligi ko'p etiologik kasallik bo'lib ko'rinadi, garchi asosiy omil kislota yoki boshqa zararli moddalarning oshqozondan qizilo'ngachga o'tishi bo'lsada.

Oddiy fiziologik sharoitda oshqozon tarkibining qizilo'ngachga harakatlanishi qizilo'ngach-oshqozon o'tish hududidagi anatomik tuzilmalar majmuasi tomonidan amalga oshiriladigan antirefluks to'siq (AB) tomonidan oldi olinadi. So'nggi yillardagi adabiyotlarda qizilo'ngachning pastki sfinkteri (LES), Gissning o'tkir burchagi, qizilo'ngach bog'lami (Laymer membranasi), diafragmaning churrasi, qizilo'ngachning qorin qismi va boshqalar kabi tarkibiy qismlarning ahamiyati aytib o'tilmoqda.

Shuning uchun patologik gastroezofagial reflyuksining paydo bo'lishida xalaziya yoki kardiyaning funksional yetishmovchiligi, to'g'rirog'i, antirefluks to'siqning yetishmovchiligi hal qiluvchi rol o'ynaydi. Antireflyuks to'sig'ining ma'lum tarkibiy qismlarida turli xil buzilishlarning kombinatsiyasi xalaziyani keltirib chiqarishi yoki reflyuksning boshlanishi uchun zarur shart-sharoitlarni yaratishi mumkin. Bu pastki qizilo'ngach sfinkteridagi asosiy bosimning pasayishi yoki pastki qizilo'ngach sfinkteri funktsiyasi ustidan nazoratni yo'qotish, shu jumladan uning vaqtinchalik bo'shashishi natijasi bo'lishi mumkin. Bunday xalaziya nafas olish vaqtida antirefluks to'sig'ida rol o'ynaydigan diafragma churrasining yopilish funktsiyasining buzilishi natijasi bo'lishi mumkin. Taqdim etilgan tushunchalar nuqtai nazaridan xalaziyaning sabablari sirpanuvchi yoki fiksatsiyalangan churra mavjudligida yanada yaxshi ko'rinadi.

Yuqorida sanab o'tilganlarga qo'shimcha ravishda, qizilo'ngachning kimyoviy kuyishi natijasida, shuningdek qizilo'ngach va oshqozonning tegishli bo'limlariga jarrohlik aralashuvlar natijasida qizilo'ngach devori va qizilo'ngach atrofi to'qimalaridagi o'zgarishlar funksional yetishmovchilikka olib kelishi mumkin.

Qizilo'ngachda himoya ta'sir qilish mexanizmlarining mavjudligi organizmda reflyuks ezofagit rivojlanishining oldini olish uchun undan himoya qilish mexanizmini ishlab chiqqanligi aniqlangan. Bularga qizilo'ngachni reflyuksentdan tozalash mexanizmlari (qizilo'ngach peristaltikasining kuchayishi, so'lakning ko'payishi), shuningdek, qizilo'ngach shilliq qavati hujayralarining qarshiligi, ularning roli hali aniqlanmagan va boshqa mexanizmlar kiradi. Hozirgacha bu yetarli darajada o'rganilgan.

Shunday qilib, zararli va himoya kuchlari o'rtasidagi reflyuks foydasiga o'tishi ezofagit reflyuksining paydo bo'lishiga olib keladi.

**Klinika.** Kichkina bolalarda reflyuks ezofagitining eng xarakterli klinik belgilari tez-tez qusish va regurgitatsiya, bezovtalik, ishtahani yo'qolishi, tana vaznining kamayishi va anemiya, uyqu paytida "ho'l yostiq" alomati, qusishda qon izlari mavjudligi va kamdan-kam hollarda qon ketishi kiradi. 50% dan ortiq hollarda takroriy pnevmoniya, bronxit mavjud. Kattaroq bolalar yurak urishi, epigastral sohada yoki ko'krak orqasida og'riqdan shikoyat qilishlari mumkin, shuningdek, og'izda yoqimsiz ta'm yoki achchiqlikni qayd etishlari mumkin.

Yarali ezofagit asosida chandiqlanish jarayon tufayli uning stenozi natijasida qizilo'ngachning ochiqligini buzish disfagiya, qizilo'ngach qusish va tana vaznining tezroq yo'qolishi bilan birga keladi. Ushbu alomatlarning mavjudligi bolada gastroezofagial reflyuksiyaga shubha qilish va tashxisni aniqlashtirish uchun qo'shimcha tadqiqotlar o'tkazish uchun jiddiy asoslar beradi.

**Diagnostika.** Pediatriya amaliyotida ko'pincha gastroezofagial reflyuks mavjudligini tasdiqlashga va ba'zi hollarda uning sababini aniqlashga imkon beradigan eng keng tarqalgan va informatsion tadqiqot usullari rentgen va endoskopik hisoblanadi. Kontrastli vosita (bariy sulfat) bilan rentgen tekshiruvi bemor yotgan holda amalga oshiriladi(6-rasm). Bunday holda, yurak yetishmovchiligining quyidagi rentgenologik belgilari aniqlanishi mumkin: bariy suspenziyasining oshqozondan qizilo'ngachga qaytarilishi, giss burchagining oshishi, oshqozonning diafragma ustida joylashgan qismining kolba shaklidagi kengayishi, terminal qizilo'ngachda oshqozon shilliq qavatining uzunasiga burmalari mavjudligi. Ananaviy tekshiruv bu belgilarni aniqlamagan hollarda, provokatsion usullar (Trendelenburg pozitsiyasi, tekshiruv vaqtida ichimlik suvi va oshqozonga yengil bosim berish) qo'llanilishi mumkin , bu esa ba'zi hollarda reflyuksni aniqlashga yordam beradi. Peptik stenoz mavjud bo'lganda, qizilo'ngachning kontrastli vosita bilan rentgenologik tekshiruvi uning darajasini aniqlash imkonini beradi. Yumshoq endoskoplar bilan endoskopik ezofagitni aniqlash va uning tabiatini aniqlash, shuningdek, kardiyaning bo'shlig'ini yoki diafragmaning qizilo'ngach teshigidan yuqorida Z-chiziqning siljishini aniqlash imkonini beradi. Shuni ta'kidlash kerakki, qizilo'ngachning shilliq qavatini vizual baholash har doim ham ob'ektiv emas. Shunday qilib, ko'rinadigan yallig'lanish o'zgarishlari bo'lmasa, biopsiya va keyingi gistologik tekshiruv qizilo'ngachning shilliq qavatida yallig'lanish o'zgarishlarining

mavjudligini tasdiqlashi, shuningdek metaplaziyaning tabiatini aniqlashi mumkin. Tashxisda juda yaxshi usul- uzaygan pH-metriya, bu kun davomida oshqozon tarkibini qizilo'ngachga o'tish chastotasini aniq ko'rsatadi. Qizilo'ngachning shilliq qavatini vizual baholash har doim ham obyektiv emas. Shunday qilib, ko'rinadigan yallig'lanish o'zgarishlari bo'lmasa, biopsiya va keyingi gistologik tekshiruv qizilo'ngachning shilliq qavatida yallig'lanish o'zgarishlarining mavjudligini tasdiqlashi, shuningdek metaplaziyaning tabiatini aniqlashi mumkin.

**Davolash.** Gastroezofagial reflyuksda konservativ terapiya tamoyili barcha yosh guruhlari uchun bir xil bo'lib, kardial yetishmovchilik sabablariga bog'liq emas. Davolash, asosan, oshqozon tarkibini qizilo'ngach va traxeyaga qaytarilishining oldini olish, shuningdek, qizilo'ngachdagi yallig'lanish o'zgarishlarini bartaraf etish yoki kamaytirish uchun qulay shart-sharoitlarni yaratishga qaratilgan.

Konservativ terapiyada nomedikamentoz va dori-darmonlar bilan davolash usullari ajralib turadi. Birinchisi postural terapiya va dietterapiya variantlarini o'z ichiga oladi. Umumiy amaliyot shifokorini bilimlarini mustahkamlash, belgilangan kasbiy sohada standart ko'nikmalarni o'rgatish, bemor, uning oilasi va do'stlari bilan ishlash ko'nikmalarini o'rgatish, tibbiy muammolarni hal qilishda oqilona taktikani o'rgatish va ijtimoiy muammolarni faqat noan'anaviy, faol, muammoli ta'lim orqali hal qilish mumkin. Shu maqsadda interaktiv o'yinlarini o'tkazish, vaziyatli muammolarni hal qilish taklif etiladi.

1. **Mavzu bo'yicha bemorlarni kuratsiya qilish - 15 daqiqa**
2. **Muolaja va operatsiyada ishtirok etish - 20 daqiqa;**
3. **Amaliy ko'nikmalarni amalga oshirish - 15 daqiqa:**

## AMALIY KO'NIKMALAR

**Elefant sinamasi**

-ko'rsatmalar: qizilo'ngach atreziyasiga shubha;

- zarur vositalar va dori vositalarining tayyorligini tekshirish: steril salfetkalar, shariklar, spirt, dumaloq uchli ingichka uretral kateter, 20,0 ml shprits;

- qo'llar sovun bilan oqar suv ostida yuviladi, sochiq bilan quritiladi, spirt bilan ishlov beriladi;

- bemorni tekshirish stoliga chalqancha yotqizish;

- bolaning boshi chap qo'l bilan mahkamlanadi, o'ng qo'l bilan burun orqali kateter kiritiladi;

- nazofarenks, orofarenks orqali 6-8 sm chuqurlikda o'tiladi. Kateter qizilo'ngachning ko'r uchiga suyanadi;

- shilimshiqning so'rilishini hosil qiladi;

- shprits yordamida kateter orqali qizilo'ngachning ko'r uchiga kiritilgan havo burun-halqumdandan shovqin bilan chiqariladi, bu "Elefant sinamasi" ning ijobiy alomatini ko'rsatadi;

- kateter burundan asta-sekin chiqariladi.

**OSHQOZONNI ZONDLASH**

- zarur vositalar va dori vositalarining tayyorligini tekshirish - steril salfetkalar, shariklar, spirt, oshqozon naychasi;
- qo'llar sovun bilan oqadigan suv ostida yuviladi, sochiq bilan quritiladi, spirt bilan ishlov beriladi;
- bemorni chalqancha yotgan holda tekshirish stoliga qo'yadi;
- oshqozon naychasining kerakli uzunligi o'lchanadi ;
- chap qo'l bilan bolaning boshini mahkam ushlanib, o'ng qo'l bilan kateter asta-sekin burun orqali, yaxshisi chap burun teshigi orqali kiritiladi;
- nazofarenks, orofarenks, qizilo'ngach orqali oldindan belgilangan uzunlikdan o'tib, kateterning oxiri oshqozonga kiradi;
- oshqozon tarkibi kateter orqali oqib chiqa boshlaydi;
- kateter burundan asta-sekin chiqariladi.

**Oshqozonni yuvish(7-rasm)**

**Ko'rsatmalar:**

1. davolash maqsadida;
2. diagnostik maqsadlarda;
3. bolaning tanasiga kirgan sifatsiz oziq-ovqat, pestitsidlar, dori-darmonlar, bakterial va o'simlik kelib chiqadigan toksinlarni oshqozondan olib tashlash.

**Tayyorlanishi:**

Bolaning ota-onasiga yaqinlashib kelayotgan manipulyatsiya haqida xabar bering.

**Kerakli shartlar, vositalar va dorilar:**

1. manipulyatsiya xonasi;
2. yangi tug'ilgan chaqaloqlarni yotqizish uchun divan yoki stol;
3. yuvish uchun eritma (suv, 2% natriy gidrokarbonat eritmasi yoki xona haroratida kaliy permanganatning och pushti eritmasi, agar ko'rsatilsa, antiseptik eritmalari);
4. 70-100 sm uzunlikdagi va 10-12 mm diametrli qalin zond (kattaroq bolalar uchun), 3-5 mm diametrli ingichka zond (yosh bolalar uchun);
5. shisha shprits (20 gr.);
6. voronka;
7. kateter;
8. vazelin moyi;
9. Oshqozonga kiritilgan zondning uzunligini aniqlash uchun siz burun uchidan kindikgacha bo'lgan masofani o'lchash orqali foydalanishingiz mumkin.

Aniqroq aytganda, tishlardan oshqozonga kirishgacha bo'lgan masofani quyidagi formula yordamida hisoblash mumkin: 20 + n, bu erda n - bolaning yoshi.

*Bajarish texnikasi (aseptika qoidalariga rioya qilinadi):*

1. Oshqozonni yuvish paytida bolalarning holati (kichik yoki go'dak yoshdagi bolalar ko'pincha yuzlari bir oz pastga qaragan holda yon tomonga yotqiziladi, hamshira yoki uning yordamchisi maktabgacha yoshdagi bolani ko'taradi, uni

choyshab yoki taglikka o'raydi, bolaning qo'llari oyoqlar orasiga mahkam bog'langan , boshini yelkasiga bosing).

2. Zondning o'tkazuvchanligini eritma bilan tekshiring.

3. Kateterning uchini vazelin moyi bilan yog'lang.

4. Zondni o'ng qo'lingizga oling, boladan og'zini ochishini yoki shpatel bilan oching va zondni tezda tilning ildiziga (maktabgacha va maktab yoshidagi bola uchun) kiriting.

5. Boladan bir nechta yutish harakatlarini qilishni so'rang, bunda hamshira zondni qizilo'ngach bo'ylab zo'ravon harakatlarsiz ilgari qilingan belgiga olib boradi.

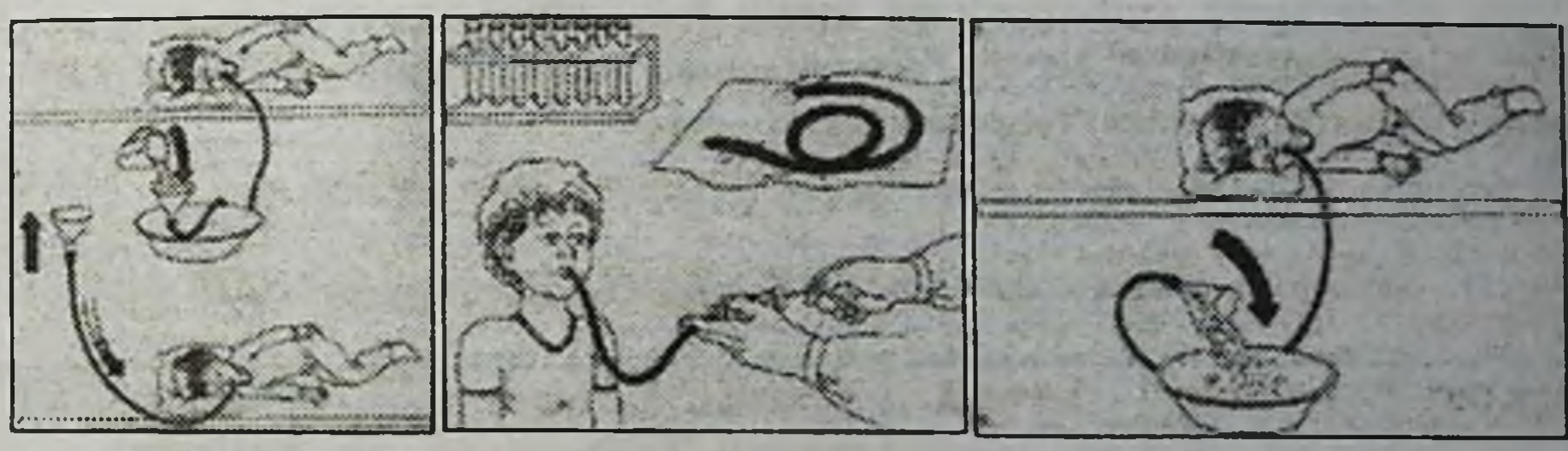
6. Zondning oshqozonda ekanligini tasdiqlash - qusishni to'xtatish, shuningdek, shprits bilan havo kiritish va havoni puflash uchun oshqozon ustida fonendoskop bilan tinglash.

7. Katta yoshdagi bolalar me'dani yuvish uchun stulga o'tiriladi, ko'krak qafasi sellofan fartuk yoki choyshab bilan o'raladi.

8. Zondni oshqozonga kiritgandan so'ng, uning tashqi uchiga hajmi taxminan 500 ml bo'lgan shisha voronka biriktiriladi va yuvish uchun tayyorlangan suyuqlik bilan to'ldiriladi. Sifon printsipi yordamida voronka yuqoriga ko'tariladi va suyuqlik oshqozonga yuboriladi.

9. Yosh bolalar uchun 20 grammli shprits yordamida oshqozonni yuvish mumkin.

10. Jarayon tugagandan so'ng, varonkani olib tashlang va zondni tez harakat bilan olib tashlang.



**7-rasm Oshqozonni yuvish sxemasi**

## O'QUV TOPSHIRIQLARI

**1-ilova**

### Guruh qoidalari

Har bir guruh a'zosi

- O'rtoqlarining fikrlarini hurmat qilish;
- Vazifalarni bajarishda faol va birgalikda ishtirok etish, topshiriq uchun masuliyatni ko'rsatish;
- Agar kerak bo'lsa, o'rtoqlardan yordam so'rashi mumkin;
- Guruhdagi o'rtoqlaringizga yordam bering;

- Guruhni baholashda ishtirok etish;
- "Bir qaviqda umumiy taqdir - natija topish voki cho'kish" qoidalarini bilish kerak.

Savollarga javoblarning tuzilishi.

1. Subyektiv tadqiqotga nimalar kiradi?
2. Laboratoriya va instrumental tadqiqotlar.

Quvidagi ta'riflarni bering: Gipertrofiya, qusish, sianoz, nafas qisilishi, regurgitatsiya, og'riq, qon ketish.

**2-ilova**

**Guruhlar uchun vazifalar**

1. Qizilo'ngach atreziyasining 5 turini ko'rsating? Klaster, SWOT jadvali, qusish so'zi uchun Venn diagrammasi va jadval nima uchun? Ierarxik diagramma qanday qizilo'ngach atreziyasida.

2. Qizilo'ngach atreziyasining klinik belgilari.Klaster, SWOT jadvali, sianoz so'zi uchun Venn diagrammasi va jadval nima uchun? va Ierarxik diagramma qanday qizilo'ngach axalaziyasida.

3. Qizilo'ngach axalaziyasining klinik belgilarini ko'rsating. Disfagiya so'zi uchun klaster, SWOT jadvali, Venn diagrammasini tuzing va jadvallarni tuzing. Nima uchun? Ierarxik diagramma qanday qilib? qizilo'ngachning xalaziyasida.

4. Tug'ma qisqa qizilo'ngachda qanday jarrohlik aralashuv usuli qo'llaniladi? "Habitus" so'zi uchun klaster, SWOT jadvali, Venn diagrammasini tuzing va diagrammalarni chizing nega? Ierarxik diagramma qanday tug'ma qisqa qizilo'ngachda.

5. Qizilo'ngach axalaziyasining asosiy belgilarini ko'rsating? Regurgitatsiya so'zi uchun klaster, SWOT jadvali, Venn diagrammasini yarating va nima uchun? va Ierarxik diagramma qanday Traxeoezofagial oqma

Sinfda o'qitish texnologiyasining diagnostik xaritasi

*Baholash ko'rsatmalari - mezon mashg'ulotda namoyon bo'ldi:*

| Guruh | 1- vazifa | 2 -vazifa | 3- vazifa: (har bir savol uchun 0,2ball) | | | Ballar yig'indisi |
|---|---|---|---|---|---|---|
| | (1,0) | (1.4) | 1 -savol | 2-savol | 3-savol | (3,0) |
| 1 | | | | | | |
| 2 | | | | | | |

TABLE / X / Y - Talabalar "Siz ushbu mavzu bo'yicha nimani bilasiz?" Degan savollarga javob berishadi. va "nimani bilishni xohlaysiz?"; Matn, mavzu, bo'lim bo'yicha tadqiqot ishlarini olib borish imkonini beradi

| **Tushuncha** | **Bilaman + bilmayman"-"** | **o'rgandim "+", "-"ni taniy olmadi** |
|---|---|---|
| Ikkilik nomenklatura: | | |
| Etiologiya | | |

| | | |
|---|---|---|
| Patogenez | | |
| Klinika | | |
| Deontologiya | | |
| Alomat | | |
| Sindrom | | |
| Kasallik | | |
| Kasallik tarixi | | |
| Ambulatoriya kartasi | | |
| Genetika | | |
| Infektsiya | | |
| Diagnostika | | |
| Bemorlarni instrumental tekshirish: | | |
| Termometr | | |
| Fonendoskop | | |
| Tanometr | | |
| Yodolipol, bariy sulfat | | |
| Nazogastral naycha | | |
| Palpatsiya | | |
| Perkussiya | | |
| Auskultatsiya | | |
| Anamnez | | |
| Tekshirish | | |
| To'liq qon ro'yxati, qon biokimyosi | | |
| Umumiy siydik tahlili | | |
| EKG | | |
| FKG | | |
| Exokardiyografiya | | |
| Ko'krak qafasi rentgenogrammasi | | |

**JADVAL KO'RISH**

Insert jadvali: a) mustaqil o'qish, ma'ruza tinglash jarayonida olingan ma'lumotlarni tizimlashtirishni ta'minlaydi; olingan ma'lumotlarni tasdiqlash, tushuntirish, rad etish, tushunishni kuzatish b) ilgari o'zlashtirilgan ma'lumotlarni yangi ma'lumotlar bilan bog'lash qobiliyatini shakllantirishga yordam beradi.
INSERT jadvalini tuzish qoidalari:

| Tushunchalar | V | + | - | ? |
|---|---|---|---|---|
| Qizilo'ngachning malformatsiyasi va anomaliyalari (atreziya, traxeo-qizilo'ngach oqmalari, tug'ma qisqa qizilo'ngach, xalaziya, qizilo'ngach axalaziyasi) klinikasi, diagnostikasi, davolash, asoratlari, operatsiyadan keyingi reabilitatsiya. | | | | |
| Tibbiyotdagi o'rni | | | | |
| Mavzuning asosiy maqsadi | | | | |
| Kasallik turlari | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Mavzuni o'rganish ketma-ketligi | | | | | |
| O'quv qo'llanmalari | | | | | |

Bu yerda: V - ... haqidagi mavjud bilimlarga (ma'lumotlarga) mos keladi.

- Ma'lum bo'lgan narsalarga zid ...

+ - yangi ma'lumot

? - tushunarsiz yoki tushuntirish, qo'shimcha ma'lumot talab qiladigan

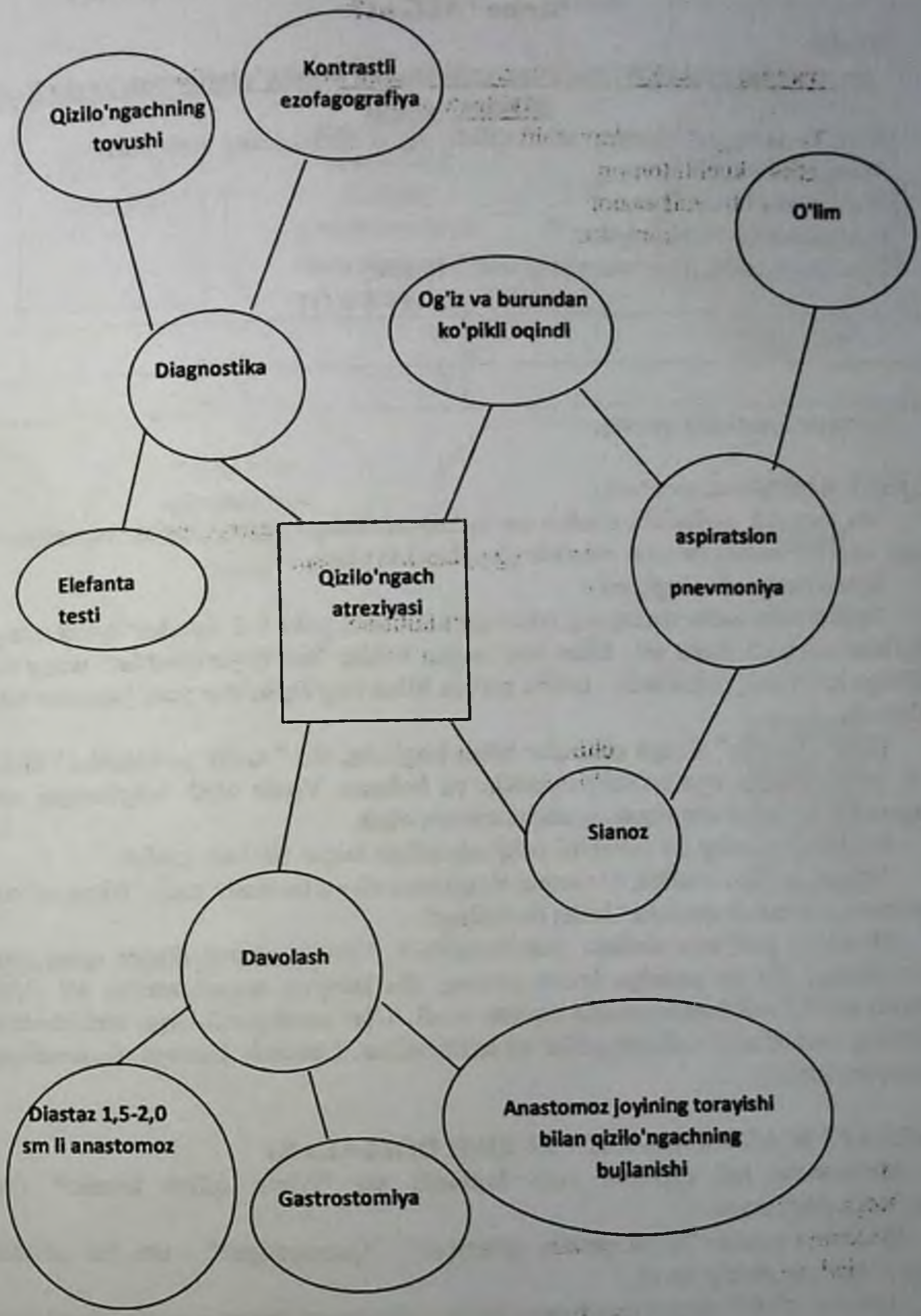
**KONSEPTIYA JADVALI**

-o'rganilaytaqagan hodisalar, tushunchalar, qarashlar, mavzularni qiyoslashni ta'minlaydi.

- vertikal ravishda solishtirish kerak bo'lgan narsa (ko'rinishlar, nazariyalar)

-gorizontal - taqqoslash amalga oshiriladigan turli xil xususiyatlar

| Kasalliklar | Kasallikning turli belgilari yoki simptomlari (tavsiyalar, toifalar, turli belgilar va boshqalar) | | | | | | |
|---|---|---|---|---|---|---|---|
| | Kusish | Sianoz | Nafas qisilishi | yo'tal | Auskultatsiya | perkussiya | Gipotrofiya |
| Atreziya | Ko'pikli | Aspiratsiya paytida | Pnevmoniya natijasida | Aspiratsiya paytida | Nam xirillashlar | To'mtoqlashgan | Uchraydi |
| Axalaziya | Regurgitatsiya | Ko'rinmas | Ko'rinmas | Ko'rinmas | Ko'rinmas | Yo'q | Uchraydi |
| Xalaziya | Hazm qilingan ovqat | Balki | Balki | Balki | Nam xirillashlar | To'mtoqlashgan | Uchramaydi |
| Qisqa tog'ma qizilo'ngach | Hazm qilingan ovqat | - | - | - | O'zgarishsiz | Vezikulyar | Uchramaydi |
| Traxeoezofagial oqma | - | Uchraydi | Uchraydi | Uchraydi | Nam xirillashlar | To'mtoqlashgan | Uchramaydi |




Eslatma: 2-ilovaga qarang.

**Rasm. 8 Qizilo'ngach atreziyasini tashxislash va davolash algoritmi**

**Sxema "NEGA?"**

**SWOT**

**(uy vazifasi yoki SIW: ma'ruza yoki amaliy mashg'ulotlardan keyin ijodiy fikrlash uchun)**

SWOT - olingan bilimlarni tahlil qilish, ingliz alifbosining bosh harflari:
Strengths - kuchli tomon;
Weakness - bu zaif tomon;
Opportunities- imkoniyatlar;
Threats - kasallikning bezovta qiluvchi tomoni

Analitik jadval - SWOT

| | |
|---|---|
| S | W |
| O | T |

Eslatma: 2-ilovaga qarang.

**KLASTER (to‘plam, to‘plam)**

Ma’lumotni xaritalash usuli - bu butun tuzilishga e'tibor berish va tushunish uchun ba'zi bir asosiy omillar atrofida g'oyalarni to'plash.

Klasterlash texnologiyasi:

Doska yoki katta varaqning o'rtasiga kalit so'z yoki 1-2 so'zdan iborat mavzu sarlavhasi yoziladi. Kalit so'z bilan bog'langan holda, "sun'iy yo'ldoshlar" uning yon tomoniga kichikroq doiralarda - ushbu mavzu bilan bog'liq so'zlar yoki jumlalar bilan bog'lanadi.

Ularni "asosiy" so'zga chiziqlar bilan bog'lang. Bu "sun'iy yo'ldoshlar" kichik sun'iy yo'ldoshlarga ega bo'lishi mumkin va hokazo. Yozib olish belgilangan vaqt tugaguncha yoki g'oyalar tugamaguncha davom etadi.

Bu muammoning asl sababini aniqlash uchun butun fikrlash zanjiri.

Tizimli, ijodiy, analitik fikrlashni rivojlantiradi va faollashtiradi. “Nima uchun” diagrammasini tuzish qoidalari bilan tanishing?

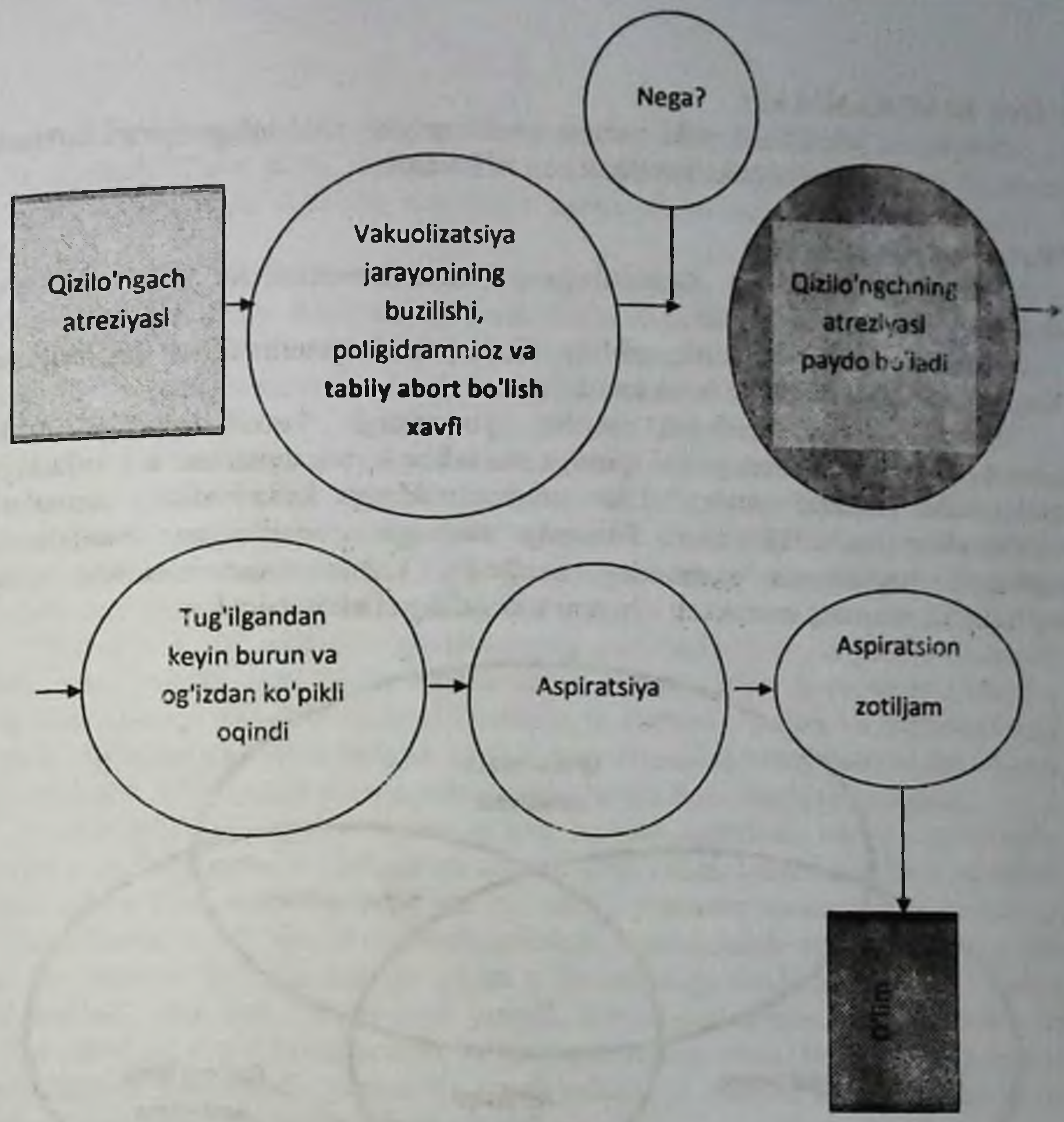
Muammo juftlikda alohida shakllantiriladi. "Nima uchun" degan savol bilan o'qni chizing? Va bu savolga javob yozing. Bu jarayon muammoning asl (lekin yashirin) sababi aniqlanmaguncha davom etadi. Ular mini-guruhlarga birlashadilar, o'zlarining sxemalarini solishtiradilar va to'ldiradilar. Umumiy holatga qisqartirilgan natijalar taqdimoti.

**"QANDAY" DIAGRAMMASINI TUZISH QOIDALARI**

Muammoni hal qilishda ko'p hollarda siz "Nima qilish kerak?" Deb o'ylashingiz shart emas.

Muammo odatda "Buni qanday qilaman?". "Qanaqasiga?" - uni hal qilishda yuzaga keladigan asosiy savol.

“Qanday qilib?” degan izchil savollar quyidagilarga imkon beradi: Muammoni hal qilishning barcha mavjud variantlarini emas, balki ularni amalga oshirish usullarini ham o'rganish;




**Eslatma: 2-ilovaga qarang**

**VENN DIAGRAMMASI**

2-3 jihatni solishtirish yoki qarama-qarshi qo'yish yoki ularga qarshi ko'rsatish va ularning xususiyatlarini ko'rsatish uchun ishlatiladi

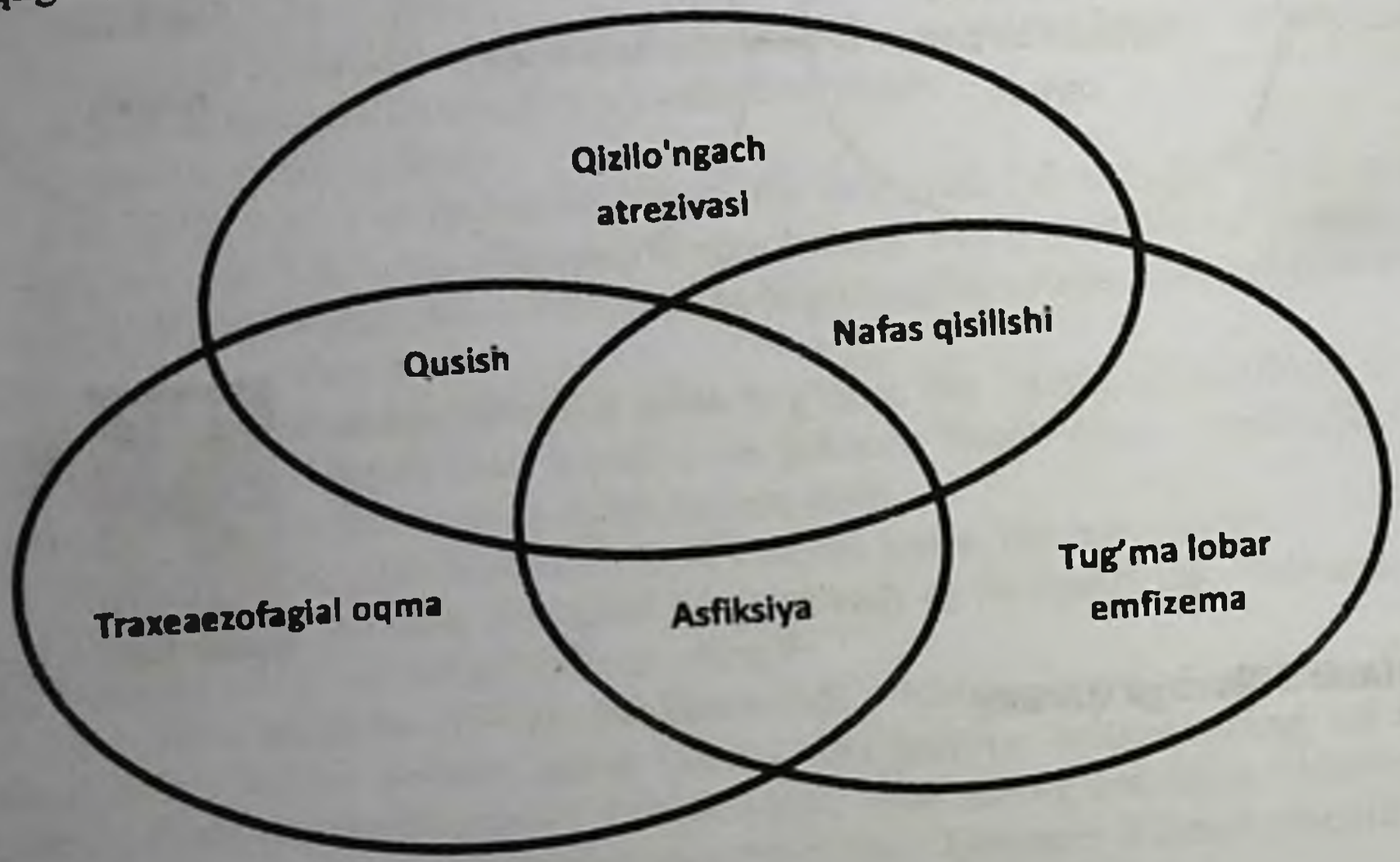
**"Baliq skeleti" sxemasi**

Muammoning butun doirasini (maydonini) tasvirlash va uni hal qilishga harakat qilish imkonini beradi.

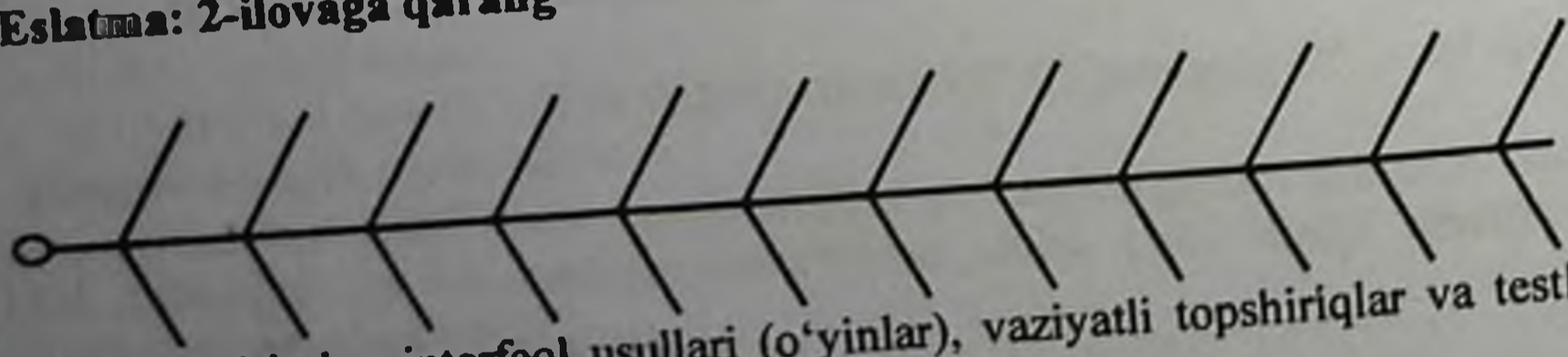
Tizimli, ijodiy, analitik, tahliliy fikrlashni rivojlantiradi va faollashtiradi.

Diagramma tuzish qoidalari bilan tanishing.

Alohida-alohida juft-juft bo‘lib, yuqoridagi “asos” qismiga kichik muammolarning so‘zlarini, pastki qismiga esa ushbu kichik muammolar mavjudligini tasdiqlovchi faktlarni yozing. Ular mini guruhlarga birlashadilar, sxemalarini solishtiradilar va to'ldiradilar. Umumiy sxemaga qisqartirilgan. Natijalarning taqdimoti: tugallangan sxemaning taqdimoti kichik muammolarning o'zaro bog'liqligini, ularning murakkab tabiatini ko'rsatishga imkon beradi.




**Eslatma: 2-ilovaga qarang**



3. O‘qitishning interfaol usullari (o‘yinlar), vaziyatli topshiriqlar va testlar bilan mashg’ulotlar – 20 daqiqa;

Bolalar xirurgiyasi fanida interfaol shakllar ko‘rinishida o‘qitishning yangi texnologiyalarini joriy etish, ulardan biri “XALTADA MUSHUK” o’yini mavzuli materialni o‘zlashtirish, talabalar tomonidan maxsus bilimlarni egallashning zaruriy shartidir.

Bu usul fikrlash doirasini kengaytirishga, mavjud cheklovlardan mavhumlashishga, aqliy faoliyatning dinamikada rivojlantirishga, o'quv faoliyatini faollashtirishga yordam beradi. Uning ahamiyati yangi ta'lim ma’lumotlarini ishlab chiqish va mustahkamlashda, ba'zi bir tugallangan bo'lim bo'yicha bilimlarni umumlashtirishda yoki oraliq nazorat bosqichlaridan birini o'tkazish usuli sifatidadir.

O'qituvchi oldindan maxsus vazifalar variantlari bilan kartalarni tayyorlaydi. Ushbu tanlov ishtirokchilari tasodifiy kartalarni chizishadi. Savollarga yozma javob beriladi. Talabalarning ishi maslahatchilar tomonidan tekshiriladi. Mashg’ulot oxirida maslahatchilar talabalar tomonidan to'plangan ballar sonini e'lon qiladilar va eng ko'p ball olgan eng yaxshi talabalarni nomlashadi.

“Davra suhbati” metodi o’quvchilarning guruhlarda faol o’rganish usullarini nazarda tutadi. Ushbu usul ustida ishlash uchun guruhda ishonch muhitini o'rnatish, ochiq muhokamaga to'sqinlik qiluvchi psixologik stressni yengish va o'qituvchining diqqatini chalg'itishga olib keladigan uzoq davom etmasligi kerak bo'lgan ish vaqtini belgilash kerak. Ushbu usul yozma yoki og'zaki ravishda qo'llanilishi mumkin.

Vazifa yozilgan qog'oz varaq aylana bo'ylab uzatiladi, har bir talaba o'z javobini yozadi va varaqni boshqasiga uzatadi yoki butun guruhga og'zaki ravishda hamma uchun bitta savol beriladi, har bir talaba yozma ravishda javob beradi va savollarga javob beradi. har 30 soniyada so'raladi, buning uchun talabalar boshqarishi kerak. Bu sxema bo`yicha har bir guruh o`quvchilariga navbatma-navbat 5 tadan savol beriladi. Har kim o'z javobini yozadi, keyin muhokama qilinadi: noto’g’ri javoblar chiziladi, to'g'ri javoblar soni bo'yicha talabaning bilimi baholanadi. Javoblar 3 ballli tizimda baholanadi, ya'ni to‘liq javob uchun – 3 ball, to‘liq bo‘lmagan javob uchun – 1 ball, noto‘g‘ri javob uchun – 0 ball.

“Uch bosqichli suhbat” usuli talabalarning kichik guruhlarda faol o'rganish usullarini nazarda tutadi. Ushbu usul ustida ishlash uchun 3 kishidan iborat guruhlarni shakllantirish, ishonch muhitini o'rnatish, ochiq muhokamaga to'siq bo'lgan psixologik stressni engib o'tish va uzoq davom etmaslik kerak bo'lgan ish vaqtini belgilash kerak, bu esa diqqatni chalg'itishga olib keladi. talabaning diqqatini.

Har bir guruhda rollar taqsimlanadi: "shifokor", "bemor", "mutaxassis - GP". "Mutaxassis - GP" rolini nima bo'laytaqaganini baholovchi talaba yoki o'qituvchi o'ynashi mumkin. "Bemorlarga" anonim ravishda jarrohlik kasallikning nomi beriladi, ularning belgilari ochiq hikoyada yoki yozma ravishda tasvirlanishi kerak. Taqdim etilgan ma’lumotlarga ko'ra (bemorning shikoyatlari, kasallik belgilari, anamnezdagi ba'zi ma’lumotlar) "shifokor" uni qisqacha asoslab, to'g'ri tashxis qo'yishi kerak, "mutaxassis - GP" tashxisning to'g'riligini baholashi kerak. ularning harakatlari. Guruh a'zolarining harakatlarini baholash uchta bo'limda qayd etiladi:

1) Nima to'g'ri qilingan;
2) Nima noto’g’ri qilingan;
3)Qanday qilish kerak edi.

Har bir guruh mavzuning barcha ishtirokchilari tomonidan baholanadigan ekspert mulohazalari bilan maslahatlashuvni namoyish etadi. Yana bir variant - talabalar klinikada shifokor va bemor o'rtasidagi haqiqiy maslahatlashuvda ekspert sifatida ishlaydi, munozara butun guruh va o'qituvchi tomonidan o'tkaziladi.

Bu usul fikrlash doirasini kengaytirish, mavjud cheklovlardan mavhumlik qilish, aqliy faoliyatning dinamizmini rivojlantirish va o'quv faoliyatini faollashtirish qobiliyatini birlashtiradi. Uning ahamiyati yangi ta'lim ma'lumotlarini ishlab chiqish va mustahkamlashdadir.

**"QOR"** Ikki guruh talabalar birgalikda eng ko'p to'g'ri javob olish uchun bitta muammo yoki vaziyatni muhokama qiladilar. Har bir to‘g‘ri javob o‘sha guruh uchun ball sifatida "qor to‘plari" ko‘rinishida qayd etiladi. Eng ko'p ball to'plagan guruh a'lo baholarga ega bo'ladi.

"QISQA SAVOLLAR" interaktiv o'yini quyidagicha o'ynaladi. Mas'ul o'yin yordamchisi har bir mavzu bo'yicha 30-50 ta savol tayyorlaydi. Savollar qisqa, aniq bo'lishi va 5-15 soniya ichida javob berishi kerak. Bir guruh o‘quvchilari ro‘yxat bo‘yicha yarim doira ichida ketma-ket quriladi, ro‘yxatli guruh yordamchisi ballarni ro'yxatga olish uchun ularning yoniga o‘tiradi. O'yinga mas'ul yordamchi ishtirokchilarni uning shartlari bilan tanishtiradi, unga ko'ra talaba 3 soniya ichida savolga javob berishni boshlashi kerak, to'liq javob to'g'ri javob bo'lsa, 10 soniyagacha beriladi. Agar javob yo'q yoki noto’g’ri bo'lsa, yordamchi keyingi savolni boshqa ishtirokchiga so'raydi, shuning uchun barcha talabalar navbat bilan so'raladi - bu birinchi tur deb ataladi. Har bir to'garak uchun bitta mavzu bo'yicha savollar tayyorlash tavsiya etiladi, keyin doiralar soni so'rovnoma o'tkazmoqchi bo'lgan mavzular soniga bog'liq bo'ladi. Masalan, birinchi tur savollari "O‘tkir appenditsit", ikkinchisi "Yopiq qorin travmasi" mavzusida va hokazo. Har bir savolga berilgan javob 3 ballli tizim bo‘yicha baholanadi, to‘g‘ri to‘liq – 3 ball, to‘g‘ri to‘liqsiz – 2 ball, noto’g’ri – 0 ball. Yakunida ballar umumlashtiriladi, o‘rtacha ball ko‘rsatiladi va talabalarga e’lon qilinadi.

## INTERAKTIV O'YIN SAVOLLARI:

1. Bolalarda qizilo'ngach atreziyasining 5 turini ko'rsating ?

JAVOB: Yuqori segment ko'r tugaydi va pastki qismi traxeya bilan, yuqori segment traxeya bilan va pastki qismi ko'r tugaydi, ikkala segment ham ko'r tugaydi, ikkala segment ham traxeya bilan aloqasi mavjud.

2. Qizilo'ngach atreziyasining yetakchi klinik belgisini ko'rsating?

JAVOB: Og'iz va burundan ko'pikli ajralma to’planishi

3. Qizilo'ngach atreziyasining diagnostik choralarini sanab o'ting?

JAVOB: Qizilo'ngachni zond bilan tekshirish, rentgen tekshiruvi.

4.Qizilo'ngachga havoni kateter orqali kiritish usuli qanday nomlanadi, bunda havo shovqin bilan burun yoki og'izdan chiqadi?

JAVOB: Elefant belgisi.

5. Qizilo'ngach atreziyasida to'g'ridan-to'g'ri anastomoz diastazning qaysi o'lchamida qo'llaniladi?

JAVOB: 1,5-2,0 sm dan kam.
6. Distal qizilo'ngach me'da shilliq pardasi bilan ko'p yoki kichik darajada xaltalanib turadigan malformatsiya qanday nomlanadi?
JAVOB. Tug'ma qisqa qizilo'ngach
7. Tug'ma qisqa qizilo'ngachda o'tkaziladigan asosiy tekshiruvlarni ko'rsating.
JAVOB. Kontrastli rentgenografiya, ezofagoskopiya.
8. Qizilo'ngachning kardial qismining bu sohada organik to'siq mavjudligi bilan bog'liq bo'lmagan o'tkazuvchanligining buzilishi qanday nomlanadi?
JAVOB. Qizilo'ngachning axalaziyasi.
9. Qizilo'ngach axalaziyasining 2 ta asosiy klinik belgilarini ko'rsating?
JAVOB. Regurgitatsiya va disfagiya.
10. Qaysi kasallikda qusish kuzatiladi, u hayotning birinchi kunlaridan boshlab paydo bo'ladi va ovqatdan keyin tez orada paydo bo'ladi, ko'pincha yotgan holatda. qichqirganda, yig'laganda.
JAVOB. Qizilo'ngachning xalaziyasi.

## O'Z-O'ZI TEKSHIRISH UCHUN TESTLAR:

1. Qizilo'ngachning ikkala uchi ham ko'r bo'lsa, oddiy rentgenografiyada qanday belgilar aniqlanadi?

1. Ko'p sonli kichik Kloyber kosachalari
2. Ikkita katta Kloyber kosachalari
3. Qorin bo'shlig'i hududida soyali zonaning mavjudligi
4. Ichak pnevmatozi
5. Oshqozonda katta gazlar mavjudligi

2. Qizilo'ngach atreziyasining yuqori qizilo'ngach-traxeya oqmasidagi rentgen tasviri?

1. Ko'p sonli kichik Kloyber kosalari
2. Ikkita katta Kloyber kosasi
3. Qorin bo'shlig'i hududida soyali zonaning mavjudligi
4. Ichak pnevmatozi
5. Oshqozonda katta gazlar mavjudligi

3. Qizilo'ngach atreziyasining past qizilo'ngach-traxeal oqma bilan rentgen tasviri?

1. Ko'p sonli kichik Kloyber kosalari
2. Ikkita katta Kloyber kosasi
3. Qorin bo'shlig'i hududida soyali zonaning mavjudligi
4. Ichak pnevmatozi
5. Oshqozonda katta gazlar mavjudligi

4. Yangi tug'ilgan chaqaloqlarda qizilo'ngach atreziyasi uchun qaysi tadqiqot usuli eng ishonchli hisoblanadi?

1. Ob'ektiv tadqiqot
2. Rentgen - kontrastli tadqiqot
3. Laboratoriya tadqiqotlari

4. Ultratovush
5. Ko'krak qafasining oddiy rentgenogrammasi

5. Qaysi kasallik qusishda oshqozon mahsuloti chiqaradi?
1. Qizilo'ngachning axalaziyasi
2. Qizilo'ngachning xalaziyasi
3. Tug'ma ichak tutilishining pastligi
4. Qizilo'ngachning tug'ma stenozi
5. Qizilo'ngachning sikatrisial stenozi

6. Qizilo'ngach atreziyasida qaysi simptom eng muhim va erta belgi hisoblanadi?
1. Yo'tal
2. Sianoz
3. Tug'ilgandan beri qusish
4. Og'iz va burundan ko'pikli oqmalar
5. Tana haroratining oshishi

7. Qizilo'ngach xalaziyasining belgilari qanday?
1. Favvorali qusish
2. Epigastral sohada doimiy og'riq va shishning mavjudligi
3. Yig'laganda qusish, gorizontal holatda bezovtalik
4. O'zgarmagan oziq-ovqatning regurgitatsiyasi
5. Qon qusish

8. Trendelenburg holatida kontrastli rentgen tekshiruvi shuni ko'rsatadiki, kontrast moddaning qizilo'ngachga qaytishi qanday kasallikni isbotlaydi?
1. Tug'ma qisqa qizilo'ngach
2. Qizilo'ngachning axalaziyasi
3. Qizilo'ngachning xalaziyasi
4. Pilorik stenoz
5. Qizilo'ngachning konginental stenozi

9. Qizilo'ngach axalaziyasida qusishning xususiyatlari?
1. Safro aralashmasi bilan takroriy qusish
2. Qon aralashmasi bilan takroriy qusish
3. Yig'laganda qusish va bezovtalanish
4. O'zgarmagan oziq-ovqatning regurgitatsiyasi
5. Favvorali qusish

10. Qizilo'ngachning konginenital stenozida belgilarining namoyon bo'lishini qanday omil aniqlaydi?
1. Toraygan joyning anatomik joylashuvi
2. Toraygan joyning uzunligi
3. Torayib ketish darajasi
4. Birgalikda kechadigan kasalliklar

5. Bolaning yoshi

11. Qizilo'ngachning xalaziyasini rentgen-kontrastli tekshirishda qaysi pozitsiya to'g'ri deb hisoblanadi?
1. Tik turish holati
2. O'tirish holati
3. Orqa tarafdagi holat
4. Trendelenburg pozitsiyasi
5. Yon pozitsiya

12. Yangi tug'ilgan chaqaloqlarda qizilo'ngach atreziyasi bilan qorin bo'shlig'ining oddiy rentgenogrammasida ichakdagi havo mavjudligi nimani anglatadi?
1. Qizilo'ngach atreziyasining fistuloz shakli
2. Yuqori qizilo'ngach-traxeya oqmasining mavjudligi
3. Pastki qizilo'ngach-traxeya oqmasining mavjudligi
4. Qizilo'ngachning agneziyasi
5. Qizilo'ngachning aplaziyasi

13. Pastki qizilo'ngach oqmasi bo'lgan yangi tug'ilgan chaqaloqlarni tashishda qaysi pozitsiya to'g'ri hisoblanadi?
1. O'ng tomon
2. Chap tomon
3. Tik
4. Gorizontal
5. Bemorning pozitsiyasi muhim emas

14. Qizilo'ngach atreziyasida segmentlar orasidagi qancha masofagacha operatsiya qilish mumkin?
1, 0,5 sm gacha
2. 1,0 sm gacha
3. 1,5 sm gacha
4. 2,0 sm gacha
5. 2,5 sm gacha

15. Qizilo'ngach atreziyasining eng og'ir asoratlari qanday?
1. Destruktiv pnevmoniya
2. Ichak tutilishi
3. Yurak-qon tomir yetishmovchiligi
4. Aspiratsion pnevmoniya
5. Oshqozon-ichak traktidan qon ketish

16. Tug'ma qizilo'ngach stenozi uchun eng yaxshi davolash nima?
1. Spazmolitiklardan foydalanish
2. Operativ

3. Bujlash
4. Vagotomiya
5. Lazer terapiyasi

17. Qizilo'ngach atreziyasida ochiqlik qayerda buziladi?
1. Kardiyada
2. 1-fiziologik torayma
3. 2-fiziologik torayma
4. 1 va 2 fiziologik torayma
5. Qizilo'ngachning barcha qismlarida

18. Qizilo'ngachning qanday tug'ma malformatsiyasi tez-tez uchraydi?
1. Alohida qizilo'ngach-traxeya oqma
2. Qizilo‘ngachning aplaziyasi
3. Qizilo'ngach atreziyasining fistuloz shakli
4. Pastki qizilo'ngach-trakeal oqma
5. Yuqori qizilo'ngach-traxeya oqmasi

19. Qizilo'ngach atreziyasida qanday tadqiqot usulini o'tkazish mumkin emas?
1. Kontrastli rentgenografiya
2. Ezofagoskopiya
3. Qizilo'ngachga kauchuk kateter kiritilganda rentgenografiya
4. Traxeobronkoskopiya
5. Kauchuk kateterni qo'llash, havo kiritish

20. Qizilo'ngach atreziyasidan yuqori kontrast modda kiritilsa, biz nimani topamiz?
1. Qizilo'ngachning uzun atreziyasi
2. Qizilo'ngach atreziyasining turlari
3. O'pkada yallig'lanish belgilari
4. Qizilo'ngach-traxeya oqmasining kengligi
5. Pastki qizilo'ngach-traxeya oqmasi bo'lgan ichakdagi havoni aniqlash

21. Qizilo'ngach atreziyasi bo'lgan bemorlarda jarrohlik shifoxonasini tayinlashda qanday choralar ixtiyoriy hisoblanadi?
1. Vikosol tavsiyasi
2. Antibiotiklarni yuborish
3. Yangi tug'ilgan chaqaloqni inkubatorga qo'yish
4. Najasni yig'ish
5. So'lak aspiratsiyasini oldini olish uchun yuqori segmentga rezina naycha qo'yish

22. Qizilo'ngach atreziyasiga shubha qilingan bo'lsa, qaysi diagnpstik usul eng ishonchli va sodda hisoblanadi?
1. Qizilo'ngachning kontrastli rentgenografiyasi
2.Zondni oshqozonga kiritish
3. Qorin bo'shlig'ining rentgenologik ko'rinishi

4. Ezofagoskopiya
5. Ko'krak qafasining ultratovush tekshiruvi

23. Elefant testini tekshirish uchun trubka orqali nima yuboriladi?
1. Havo
2. Suv
3. Kontrastli vosita
4. Antiseptik eritma
5. Vodorod peroksid

24. Qizilo'ngach atreziyasining sababi nima?
1. Embrion davrida qizilo'ngachni qon bilan ta'minlashning buzilishi
2. Qizilo'ngachning asosiy trubasini aniqlashning buzilishi
3. Vakuolizatsiya jarayonining buzilishi
4. Qo'shni organning namoyon bo'lishining buzilishi
5. G'ayritabiiyy etkazib berish

25. Kontrastni tekshirish uchun qanday kontrast modda ishlatiladi?
1. Bariy sulfat
2. Stodomepol
3. Yodolipol
4. Brillyant yashili
5. Metilen ko'k

26. Qizilo'ngachning kimyoviy kuyishida klinik belgilar paydo bo'lishi uchun qaysi omil muhim emas?
1. Kimyoviy moddaning turi
2. Kimyoviy konsentratsiya
3. Kun vaqti
4. Yaroqlilik
5. Moddaning miqdori

27. Qizilo'ngach atreziyasining eng keng tarqalgan turi qaysi?
1. Ikkala uchi ham ko‘r tugaydi
2. Yuqori uchi ko'r tugaydi, pastki uchi esa traxeya oqmasiga ega
3. Ikkala uchi traxeyaga ochiladi
4. Qizilo'ngach traxeyaga ochiladi va ikkalasi ham bitta devor hosil qiladi
5. Yuqori uchi traxeyaga ochiq, pastki uchi esa ko'r

28. Embrion davrida qizilo'ngach nimadan hosil bo'ladi?
1. O‘pka to‘qimasidan
2. To‘g‘ri ichakning kranial qismidan
3. O‘rta ichakdan
4. Yuqori nafas yo'llarining to'qimalaridan
5. Mediastinal tomirlardan

29. Qizilo'ngachning kuyishiga shubha bo'lsa, diagnostik ezofagoskopiyani necha kundan keyin o'tkazishga ruxsat beriladi?

1. 1-2 kun
2. 3-4 kun
3. 5-6 kun
4. 10 kun
5. 12 kun

30. Agar yangi tug'ilgan chaqaloq birinchi oziqlantirishdan keyin qayt qilsa, qizilo'ngach atreziyasini istisno qilish uchun nima qilishimiz kerak?

1.Ichakning kontrastli tekshiruvi
2. Qorin bo'shlig'ining auskultatsiyasi
3. CHaqaloqni tik holatda qayta ovqatlantirish
4. Ko'krak qafasining oddiy rentgenogrammasi
5. Zondni oshqozonga kiritish

**O'z-o'zini nazorat qilish uchun testlarga javoblar**

1-3, 2-5, 3-4, 4-2, 5-3, 6-4, 7-4, 8-3, 9-2, 10-3, 11-4, 12-3, 13-5 , 14-4, 15-4, 16-2, 17-4. 18-4, 19-4, 20-1, 21-4, 22-1, 23-1, 24-3, 25-3, 26 -3, 27-2, 28-1, 29-3, 30-5.

## 2-BOB. Ko'krak qafasi va o'pkaning tug'ma anomaliyalari va malformatsiyasi (voronka shaklidagi va qayiq shaklidagi ko'krak qafasi, diafragma churralari, bo'lakli emfizema, o'pkaning tug'ma kistalari, o'pka sekvestratsiyasi, tug'ma bronxoektazlar) klinikasi, diagnostikasi, davolash, operatsiyadan keyingi reabilitatsiya.

**Mavzuning maqsadi:** tug'ma nuqsonlari va rivojlanish anomaliyalari bo'lgan bolalarni klinik diagnostika qilish, davolash, jarrohlik turlari va reabilitatsiya qilish ko'nikmalarini rivojlantirish.

**O'quv maqsadlari:**

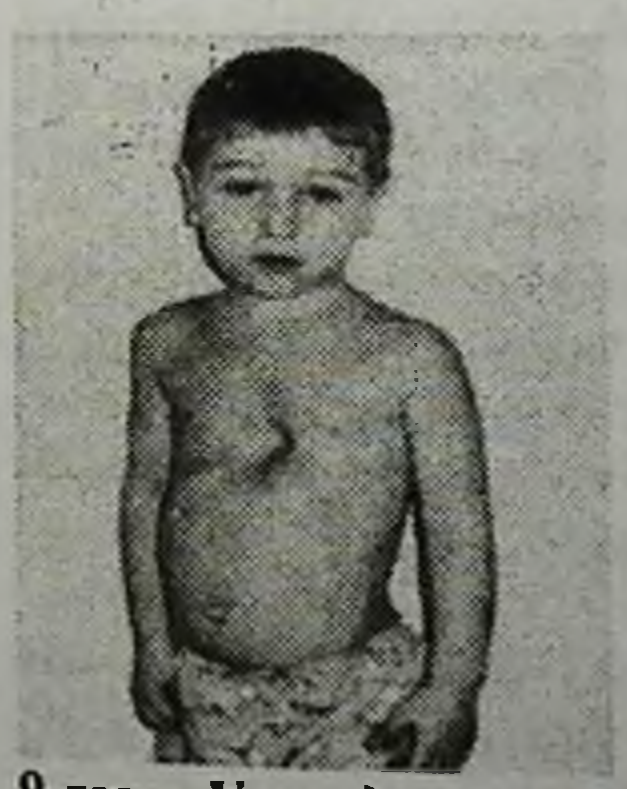
1. Bolalarda keng tarqalgan nuqsonlar va rivojlanish anomaliyalarining etiologiyasi, patogenezi va klinikasi bo'yicha bilimlarni shakllantirish;
2. Talabalarning tug'ma nuqsonlari va rivojlanish anomaliyalari bo'lgan bolani klinik ko'rikdan o'tkazish va tekshirish, shu jumladan laboratoriya, radiatsion va instrumental tadqiqot usullari bo'yicha malaka va ko'nikmalarini rivojlantirish;
3. Talabalar bolaning hayotiga xavf tug'diradigan nuqsonlar va rivojlanish anomaliyalari diagnostikasi algoritmini o'zlashtirish;
4. Malformatsiyalar va rivojlanish anomaliyalari va ularning asoratlarini jarrohlik yo'li bilan davolash tamoyillari bilan tanishish;
5. Umumiy tibbiy yordam ko'rsatish ko'nikmalari va ko'nikmalarini rivojlantirish: tug'ma nuqsonlari va rivojlanish anomaliyalari bo'lgan bolalarni operatsiyadan keyingi reabilitatsiya qilish bo'yicha tibbiy-diagnostik standartlar va protokollar asosida ish olib borish.

**Darsning joylashuvi:** torakal jarrohlik bo'limi, operatsiya xonasi, kompyuter xonasi, o'quv xonasi

**Monitoring va baholash:** og'zaki nazorat, nazorat savollari, guruhlarda o'quv vazifalarini bajarish.

**Yozma nazorat:** Nazorat savollari

### KO'KRAK QAFASINING TUG'MA DEFORMATSIYALARI



**9-rasm. Voronkasimon ko'krak qafasi bilan og'rigan bemor ko'krak qafasining deformatsiyasi.**

Ko'krak qafasi deformatsiyasining tashqi belgilari to'sh suyagi va qovurg'alarning birikish qismining orqaga tortilishi bilan tavsiflanadi. Qovurg'a yoylari biroz ichkariga qarab joylashadi, epigastral soha esa bo'rtib chiqadi.

**Klinikasi va diagnostikasi.** Qoida tariqasida, deformatsiya tug'ilgandan so'ng darhol aniqlanadi, voronka paradoksining xarakterli alomati . Bemorlarning taxminan yarmida, ular o'sishi bilan, deformatsiya o'sib boradi va 3-5 yoshga kelib mustahkamlanadi. Deformatsiya keyinchalik paydo bo'lishi mumkin - odatda bolaning jadal o'sishi davrida

deformatsiya shakllari erta paydo bo'ladi.

Balog'at yoshida sodir bo'lgan eng chuqur deformatsiyalar kamdan-kam holatlarda aniqlanadi. (9-rasm).

Bolani tekshirganda, ma'lum bir sindromga xos bo'lgan stigmalarni aniqlash mumkin (bo'g'imlarning harakatchanligi, tekis umurtqa, to'qimalar turgorining pasayishi, yomon ko'rish va boshqalar).

Tekshiruv ma`lumotlari bilan bir qatorda rentgenografik va funktsional tadqiqot usullari muhim ahamiyatga ega. To'g'ridan-to'g'ri proeksiyadagi rentgenografiya yurakning siljish darajasini (odatda chapga) ochib beradi, bu bilvosita deformatsiyaning yurak faoliyatiga ta'sirini baholashga imkon beradi. Yana rentgenogramma yordamida to'sh suyagining chuqurligi aniqlanadi, torakovertebral indeks yoki I. Gijinskiy (IG) indeksi o'lchanadi (1962 yil.). To'sh suyagining orqa uchi bilan umurtqa pog'onasining oldingi uchi orasidagi eng kichik masofaning eng kattasiga nisbati. Bu ko'krak qafasi deformatsiyasini tasniflash uchun quyidagilar asosdir:

a) daraja bo'yicha - I daraja IG - 1-0,7; II darajali IG - 0,7-0,5; III darajali IG 0,5 dan kam;

b) shaklda - simmetrik, assimetrik, tekis.

Tashqi nafas olish va gemodinamikada funktsional o'zgarishlar jiddiy deformatsiyalar bilan aniqlanadi va bevosita uning darajasiga bog'liq. Tashqi nafas olishning buzilishi o'pkaning maksimal ventilyatsiyasining pasayishi, nafas olishning daqiqalik hajmining oshishi va daqiqalik kislorod ko'rsatmai bilan namoyon bo'ladi. Kislorod kirish koeffitsienti kamayadi. EKGdagi o'zgarishlar kuzatiladi. Biroq, yurakdagi morfologik o'zgarishlarni aniqlashga imkon beruvchi informativ usul exokardiografiyadir.

**Davolash.** Pektus ekskavatum uchun konservativ davo yo'q. Jarrohlik uchun ko'rsatmalar VDKK darajasi va shakli asosida aniqlanadi. Torakoplastika III darajali CHD uchun shartsiz ko'rsatiladi va II darajali CHD uchun ko'rsatiladi. VDGK I darajasida (tekis shakllar bundan mustasno) torakoplastika, qoida tariqasida, amalga oshirilmaydi [Urmonas V.K., Kondrashin N.I., 1983]. Operatsiya uchun optimal yosh - 5 yosh . Deformatsiyaning sindromli shakllari bo'lgan bolalarda jarrohlik davolashga juda ehtiyotkorlik bilan yondashish kerak. Faqat keng qamrovli tekshiruvdan so'ng va ko'rsatmalar bo'lmasa, jarrohlik tavsiya etilishi mumkin.

**10-rasm NASSA usuli.**

So'nggi paytlarda NASSA operatsiyausuli eng ko'p qo'llanilmoqda.

Operatsiya retrosternal bo'shlig'iga titan plitasining o'rnatilishidan iborat. To'g'ri bajarilgan operatsiya bilan asoratlar mavjud emas (10-rasm).

Ko'pincha nuqsonning irsiy belgisi sindromlardan birining ajralmas tarkibiy qismi bo'lishi mumkin.

**Klinikasi va diagnostikasi.** Deformatsiya odatda tug'ilish vaqtida aniqlanadi va yosh bilan ortadi.

To'sh suyagi oldinga chiqib turadi va uning qirralari bo'ylab cho'kaytaqagan qovurg'alar ko'krakka o'ziga xos egilgan shaklni beradi.

Deformatsiya nosimmetrik yoki assimetrik bo'lishi mumkin. Asimmetrik shaklga ega bo'lgan qovurg'alarning xaltaga tushadigan qismlari bir tomondan sternumni ko'taradi va u yelka bo'ylab egiladi. To'sh suyagining yuqori uchdan bir qismi ko'tarilganda va xanjarsimon qismi bilan pastki qismi keskin tushib ketganda birlashtirilgan shakllar mavjud. Shu bilan birga, IV va V qovurg'alarning juftlashishi seziladi va IV qovurg'a to'sh suyagi bilan bo'g'im joyida V qovurg'a ustida joylashgan. Funksional buzilishlar, qoida tariqasida, aniqlanmaydi. Sindromik shakllarda va ko'krak qafasi hajmining sezilarli darajada pasayishi bilan jismoniy mashqlar paytida charchoq, nafas qisilishi va yurak urishi shikoyatlari bo'lishi mumkin.

**Davolash.** Jarrohlik uchun ko'rsatmalar asosan aniq kosmetik nuqsoni bo'lgan 5 yoshdan oshgan bolalarda uchraydi. Qovurg'alarning parasternal qismini subperixondral rezektsiya qilish, ko'ndalang sternotomiya va xanjarsimon o'simtani kesishga asoslangan jarrohlik aralashuvning bir necha usullari taklif qilingan. Ko'krak suyagini to'g'ri holatda mahkamlash sternumni perixondrium va qovurg'alarning qolgan uchlari bilan tikish orqali amalga oshiriladi. Qayiqsimon deformatsiyani jarrohlik yo'li bilan davolash natijalari yaxshi samara beradi.

**Qovurg'a anomaliyalari** alohida qovurg'a yoylarining deformatsiyasi yoki yo'qligi, qovurg'alarning bifurkatsiyasi va sinostozi, qovurg'a yoylari guruhlari deformatsiyasi, qovurg'alarning yo'qligi yoki keng tarqalishidan iborat bo'lishi mumkin.

**Ko'krak qafasining bifurkatsiyasi** qovurg'alar (Luschko qovurg'alari) odatda sternum yonida zich, chiqadigan massa ko'rinadi. Kamdan kam hollarda o'sma jarayoni bilan differentsial tashxis qo'yish kerak. Davolash faqat kosmetik maqsadlar uchun sezilarli deformatsiyalar uchun talab qilinadi. Bu deformatsiyalangan yoy subxondral olib tashlashdan iborat.

**Serebro-kosto-mandibular sindromi.** Qovurg'a nuqsonlari (yo'qligi, bifurkatsiyasi, psevdoartroz va boshqalar) yuqori tanglay yoki yumshoq tanglayning yopilmasligi, pastki jag'ning gipoplaziyasi, mikrognatiya, glossoptoz va mikrosefaliya bilan birlashtiriladi. Paradoksal nafas olish bilan ko'krak qafasi devorining sezilarli nuqsoni bo'lgan ekstremal holatlarda jarrohlik davolash ko'rsatiladi.

**Poland sindromi** U har doim bir tomonlama kechish bilan tavsiflanadi, shu jumladan ko'krak qafasidagi katta mushakning aplaziyasi yoki gipoplaziyasi, ko'krak qafasidagi kichik mushaklarning gipoplaziyasi. Ko'pincha bu ko'krak qafasidagi bo'g'im va qovurg'alarning bir qismining yo'qligi, ko'krak qafasining aplaziyasi yoki gipoplaziyasi, qizlarda sut bezining aplaziyasi, qo'lning deformatsiyasi bilan birga keladi. Tashxis tashqi tekshiruvga asoslanadi. Qovurg'alarning holatini aniqlash uchun rentgen nurlari qo'llaniladi. O'pka churrasi shakllanishi bilan sezilarli nuqson bo'lsa, qovurg'a nuqsoni sog'lom tomondan qovurg'alarning autotransplantatsiyasi yordamida tuzatiladi. Yuqorida va pastda qovurg'alarning bo'linishi bilan foydalanish mumkin va nuqson tomon siljitiladi. Ba'zi jarrohlar sintetik materiallardan muvaffaqiyatli foydalanadilar. Yo'qolgan mushaklarni almashtirish uchun m. latissimus dorsi harakatga keltiriladi. Paradoksal nafas olish bilan keng nuqsonlar bo'yicha operatsiyalar erta yoshda amalga oshiriladi.

**Sternumning yorilishi-** o'rta chiziqda joylashgan uzunlamasiga yoriq mavjudligidan iborat bo'lgan noyob malformatsiya. Yoriq uzunligi va kengligida sternumning to'liq bo'linishigacha olib kelishi mumkin.

Shu bilan birga, mediastinal organlarning paradoksal harakati qayd etiladi, nuqson joyida faqat yumshoq to'qimalar va terining yupqalashtirilgan qatlami bilan yopiladi. Yurak va katta tomirlarning pulsatsiyasi ko'rinadi. Bu nuqson erta chaqaloqlik davrida aniqlanadi va bolaning o'sishi bilan ortadi. Anatomik ko'rinishlar bilan bir qatorda, funktsional buzilishlar ham qayd etilgan. Sianoz xurujlarigacha boradigan nafas olish buzilishi mumkin. Bolalar odatda jismoniy rivojlanishdan orqada qoladilar.

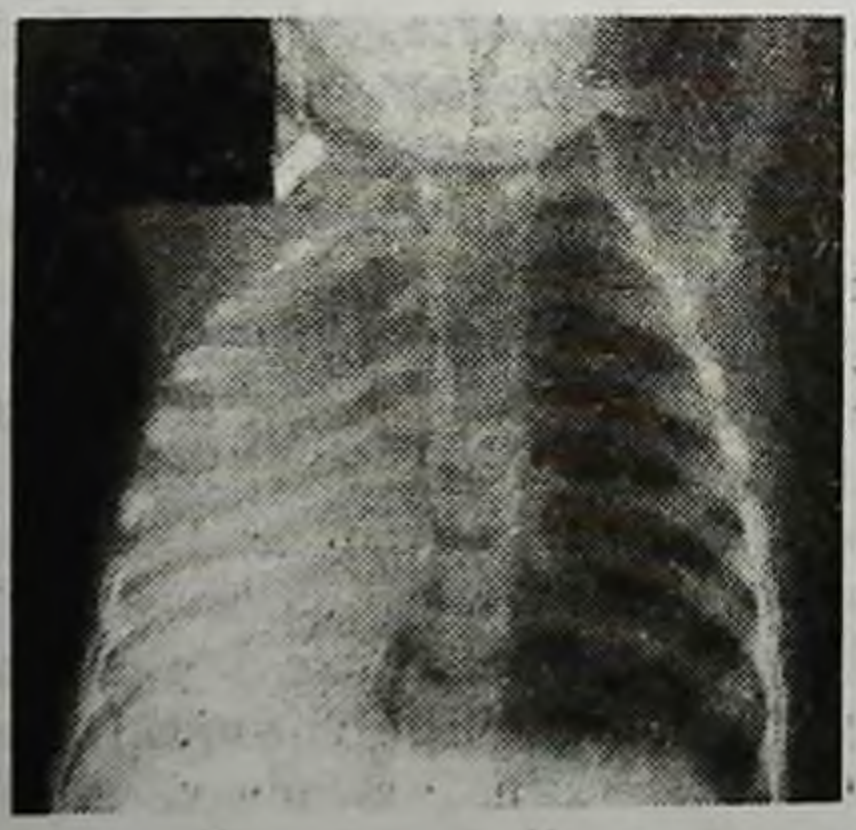
Operatsiya erta yoshda amalga oshiriladi. Ko'krak qafasidagi nuqsonlari bo'lgan bolalarni tekshirganda, disembriogenezning stigmalarini aniqlashga e'tibor qaratish lozim, masalan, barmoq naqshidagi anomaliyalar, barmoqlarning qisqarishi va boshqalar. Sindromning sporadik holatlari uchun tibbiy genetik maslahat bilan, tug'ilish prognozlari bilan sog'lom bolaning tug'ilishi qulaydir.

## O'pka anomaliyalari

Turli xil teratogen omillarning homilaga ta'siri natijasida o'pka embriogenezi jarayonining buzilishi o'pkada turli xil malformatsiyalarning paydo bo'lishiga olib keladi.

Ma'lumki, erta bosqichlarda (4-hafta) bronxopulmonar bo'laklarning o'sishini to'xtatish bir yoki ikkala o'pkaning ageneziyasiga olib keladi; 5-haftada bronxopulmonar bo'laklar rivojlanishining kechikishi o'pkaning aplaziyasi yoki chuqur gipoplaziyasining paydo bo'lishiga olib keladi, 5-6 xaftada – bo'laklarning agenezi, aplaziyasi yoki gipoplaziyasining paydo bo'lishi uchraydi. Shunday qilib, aniq aytish mumkinki, o'pka rivojlanishining buzilishi darajasi homilaning teratogen omillar ta'siriga bog'liqdir.

O'pkaning anatomik, strukturaviy va to'qima elementlarining rivojlanishi bilan bog'liq eng keng tarqalgan malformatsiyalarga o'pkaning ageneziya va aplaziyasi, gipoplaziya, tug'ma lobar emfizema kiradi; haddan tashqari disembriogentik shakllanishlar mavjudligi bilan bog'liq malformatsiyalarga - qo'shimcha o'pka bilan
anormal qon ta'minlanishi (ekstralobar sekvestr), o'pka kistasi. Klinik ahamiyatga ega bo'lgan o'pka tomirlari malformatsiyalari orasida ko'proq pulmonologiya bilan bog'liq bo'lganlarni arteriovenoz oqmalar deb atash kerak.



**11-rasm. O'ng o'pka ageneziyasi**

Ageneziyani asosiy bronxning yo'qligi bilan bir vaqtda o'pkaning yo'qligi deb tushunish kerak.

Aplaziya - shakllangan yoki qo'shimcha bronx mavjudligida o'pkaning yoki uning bir qismining yo'qligi. O'pkaning ikki tomonlama agenezi yoki aplaziyasi bilan bolalar yashamaydi, bir tomonlama nuqsoni bilan ular normal yashashi va rivojlanishi mumkin (11-rasm).

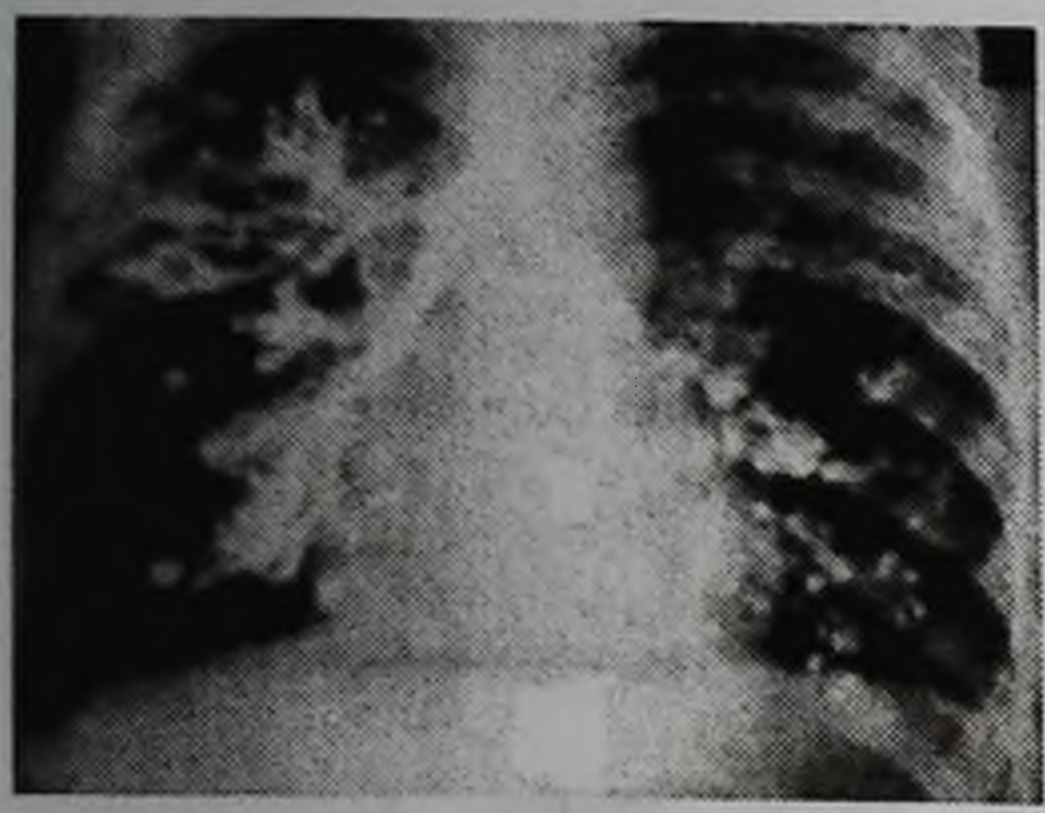
**Klinikasi.** Ushbu nuqsonlar juda o'xshash va nafas olishning assimetriyasi, perkussiya tovushining to'mtoqlashishi, shuningdek, shikastlangan tomonda auskultatsiyada nafas olishning yo'qligi yoki sezilarli darajada zaiflashishi, kasallik mediastinal siljishning klinik va rentgenologik belgilari bilan namoyon bo'ladi. Oddiy ko'krak qafasi rentgenogrammasida ko'krak bo'shlig'i yarmining to'liq qorayishi mumkin. Biroq, vaqt o'tishi bilan o'pkaning bir qismining qarama-qarshi tomonga harakatlanishi tufayli mediastinal churraning alomati qo'shilishi mumkin. Bunday klinik va rentgenologik belgi neonatal atelektazga o'xshaydi, uning differensial tashxisida bronxoskopiya, bronxografiya va angiopulmonografiya kabi qo'shimcha tadqiqot usullaridan foydalanish mumkin. Jarrohlik bilan davolash bu nuqsonlar uchun talab qilinmaydi.

**O'pkaning gipoplaziyasi-** uning barcha tarkibiy elementlarining rivojlanmaganligi. Rivojlanmaganlik ikkala o'pkaga, butun bir o'pkaga yoki uning bir qismiga (lob, segment) ta'sir qilishi mumkin. Shu munosabat bilan, "gipoplaziya" atamasi bir qator nuqsonlarni o'zida mujassam etganligi aniq bo'ladi, ularning shakli embriogenez bosqichiga bog'liq bo'lib, o'pkaning strukturaviy elementlarining differensiatsiyasi to'xtagan yoki uzoq davom etgan bo'lishi mumkin. Ko'pgina olimlar o'pka gipoplaziyasining eng keng tarqalgan ikkita shaklini tavsiflaydi, oddiy va kistali.

**Gipoplaziyaning oddiy shakli** o'pka yoki o'pka bo'laklari hajmining bir xil pasayishi, bronxlar va qon tomirlarining torayishi bilan tavsiflanadi. Ushbu nuqsonning klinik ko'rinishi, boshqa ko'plab shakllarda bo'lgani kabi, o'pkaning hajmiga va o'pkaning yuzasiga yoki qo'shni bo'limlarida yallig'lanish o'zgarishlarining mavjudligiga (yo'qligiga) bog'liq. Bunday holda, nafas yetishmovchiligi belgilari, ko'krak qafasining assimetriyasi va nafas olish assimetriyasi, mediastinal organlarning qisqargan o'pka tomon siljishining klinik va rentgenologik belgilari bo'lishi mumkin. Har xil darajada bronxlarning ventilyatsiya, sekretsiya va drenaj funktsiyalarining buzilishi tegishli klinik va rentgenologik belgilar bilan birga bo'lishi mumkin: nafas olishning zaiflashishi bilan perkussiya tovushining to'mtoqlashishi, turli o'lchamdagi quruq va nam tirnashlarning mavjudligi va o'pka to'qimalarining shaffofligi o'zgarishi. Biroq, asosiy omil klinik ko'rinishni keltirib chiqaradigan o'pkaning gipoplastik qismida yiringli-yallig'lanish jarayoni bo'lib, u ko'pincha o'pkaning malformatsiyasi bilan birga keladi. Bu ko'pincha nuqson mavjudligiga shubha qilish uchun sabab bo'lgan tegishli lokalizatsiya o'pkasining takroriy yallig'lanish kasalliklari ko'rinishida aniqlanadi.

Bunday hollarda qo'shimcha va maxsus tadqiqotlar (bronxoskopiya, bronxografiya, angiopulmonografiya, o'pkani skanerlash) o'tkazish, qoida tariqasida, tashxisni aniqlashtirishga imkon beradi. Bronxoskopiya paytida yallig'lanish o'zgarishlarining kuchayishi va lokalizatsiyasi, bronxlarni ventilatsiyasi va ularning bo'shlig'ining torayishi darajasi va boshqalar aniqlanadi.Qoida tariqasida,

bronxogrammada bronxial daraxtning deformatsiyasi qayd etiladi. Angiopulmonografiya qon oqimining sezilarli darajada kamayishini ko'rsatadi. Radiologik usullar nuqsonning lokalizatsiyasiga mos keladigan joylarda funktsional buzilishlar darajasini (ventilyatsiya va qon oqimi) aniqlash imkonini beradi.



**12-rasm. Kontrastli bronxografiya ikkala o'pkaning polikistoz kasalligi**

**O'pkaning kistoz gipoplaziyasi** (tug'ma polikistoz) - bronxial daraxtning terminal bo'limlari subsegmental bronxlar yoki bronxiolalar darajasida turli o'lchamdagi kista shaklining kengayishi bo'lgan malformatsiya.

**Klinik ko'rinishi** gipoplaziyaning kistozli shakli oddiydan kam farq qiladi. Rentgenogrammada, bir nechta yupqa devorli havo bo'shliqlari aniqlanishi mumkin ular odatda suyuqlikni o'z ichiga olmaydi.

Bunday bo'shliqlarning uzoq vaqt mavjudligi, ularda bronxial sekretsiyalar to'planishi, uning turg'unligi va infeksiyasi, yiringli yallig'lanish jarayoni kuztiladi. Bu holatda eng xarakterli belgisi , yiringli balg'am bilan ho'l yo'tal, nafas olish yetishmovchiligi, shuningdek, o'pka to'qimalarining kam rivojlanganligi va undagi yallig'lanish tufayli hajmining o'zgarishi bilan bog'liq alomatlar bo'lishi mumkin. Ushbu davrda radiologik jihatdan, kistoz bo'shliqlarida ko'p darajadagi suyuqlik paydo bo'lishi mumkin. Yallig'lanish jarayonining uzoq muddatli mavjudligi bilan ko'pincha kistoz gipoplaziyasi va bronxoektaziya differensial tashxisida qiyinchiliklar paydo bo'ladi. (12-rasm).

**Davolash.**Gipoplaziya davo operativ - o'pkaning zararlangan qismini olib tashlash. Operatsiyadan oldin o'tkir yallig'lanish jarayonini maksimal darajada yengillashtirishga e'tibor qaratish lozim, bu esa operatsiyadan keyingi asoratlar foizini kamaytirish va jarrohlik davolash natijalarini yaxshilash imkonini beradi.

O'pka gipoplaziyasi tashxisini morfologik tasdiqlash operatsiyadan keyingi davrda bunday bemorlarni doimiy kuzatish uchun asos bo'lishi kerak, chunki ular o'pkaning qolgan qismlarining strukturaviy elementlarida kamroq buzilishlar mavjudligini istisno qila olmaydi. o'z navbatida, ulardagi yallig'lanish o'zgarishlarining qo'shilishiga olib kelishi mumkin.

Ushbu malformatsiya o'pkaning bir qismini (odatda bitta bo'lak) cho'zilishi bilan tavsiflanadi. Uning nomlanishi uchun "tug'ma lobar emfizema", "mahalliy emfizema", "obstruktiv emfizema", "gipertrofik emfizema" atamalari ham qo'llaniladi. Nuqsonning asl sabablari noma'lumligicha qolmoqda. Biroq, ba'zi mualliflar uning paydo bo'lishini bronxlar elementlarining aplaziyasi, elastik tolalar gipoplaziyasi, terminal va nafas olish bronxiolalarining silliq mushaklarining gipoplaziyasi va o'pka to'qimalarining tarkibiy bo'linmalaridagi boshqa buzilishlar

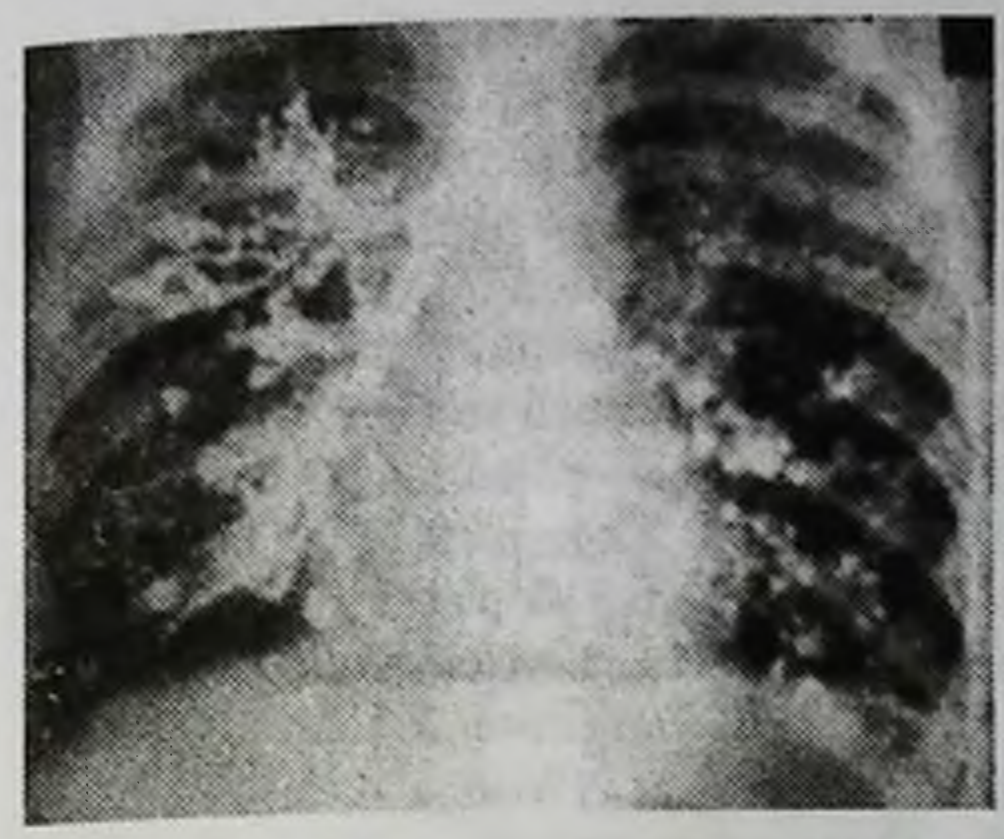


**Figure 12. On contrast bronchography, polycystic disease of both lungs**

**Cystic hypoplasia of the lung** (congenital polycystic) is a malformation in which the terminal sections of the bronchial tree at the level of subsegmental bronchi or bronchioles are an expansion of a cystic form of various sizes.

**The clinical picture** of the cystic form of hypoplasia differs little from a simple one, however

on the radiograph in the zone corresponding to the defect, multiple thin-walled air cavities, which usually

do not contain liquid, can be determined. The prolonged existence of such cavities, the accumulation of bronchial secretions in them, its stagnation and infection, as a rule, cause a purulent-inflammatory process. The most characteristic in this case may be intoxication, a wet cough with purulent sputum, respiratory failure, as well as symptoms caused by a change in the volume of lung tissue due to its underdevelopment and inflammation in it. Radiologically during this period, multiple levels of fluid may appear in the cystic cavities. With the long-term existence of the inflammatory process, difficulties often arise in the differential diagnosis of cystic hypoplasia and bronchiectasis (with saccular bronchiectasis) (Fig. 12).

**Treatment** of hypoplasia is surgical - removal of the affected part of the lung. Attention should be paid to the maximum relief of the acute inflammatory process before surgery, which allows to reduce the percentage of postoperative complications and improve the results of surgical treatment.

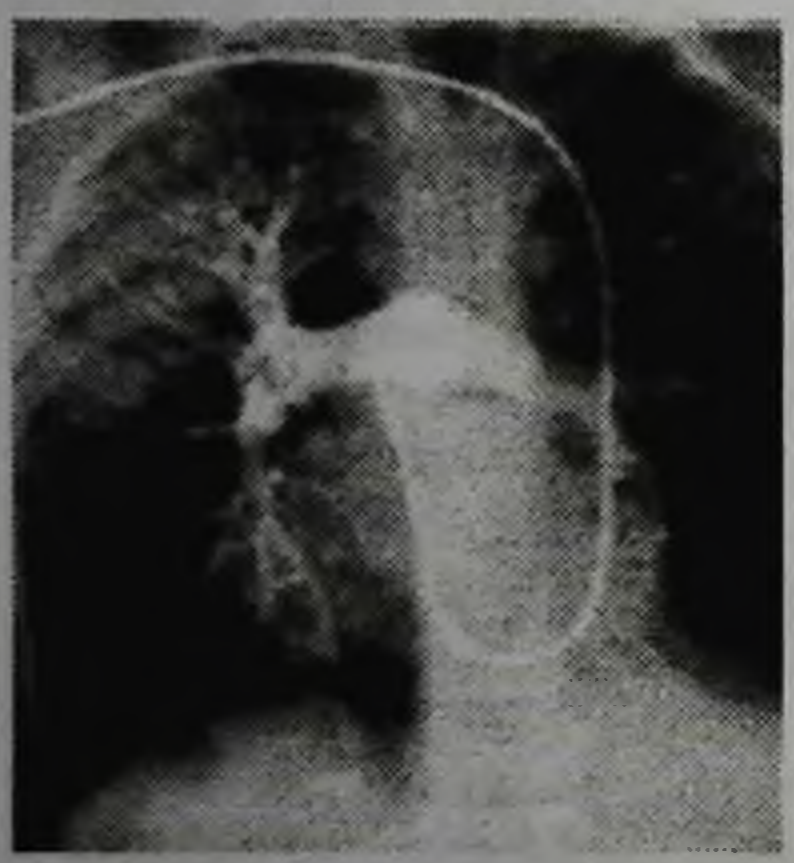
Morphological confirmation of the diagnosis of lung hypoplasia should be the basis for continuous follow-up of such patients in the postoperative period, since they cannot exclude the presence of less pronounced disorders in the structural elements of the remaining parts of the lungs, which, in turn, can lead to the addition of inflammatory changes in them.

This malformation is characterized by stretching of a part of the lung (usually one lobe). For its designation, the terms **"congenital lobar emphysema"**, **"localized emphysema"**, **"obstructive emphysema"**, **"hypertrophic emphysema"** are also used. The true causes of the defect remain unclear. However, some authors associate its occurrence with aplasia of the cartilaginous elements of the bronchi, hypoplasia of elastic fibers, hypoplasia of the smooth muscles of the terminal and respiratory bronchioles, and other disorders in the structural units of the lung tissue. These factors create the prerequisites for the emergence of a valvular mechanism that

contributes to excessive swelling of the corresponding part of the lung and the development of respiratory disorders.

**Clinic and diagnostics.** Clinical disorders are due to the presence and severity of symptoms of respiratory and cardiovascular insufficiency. The following factors play a role in the pathogenesis of respiratory failure: exclusion of a large volume of lung tissue from the respiratory function (lack of respiratory function in the malformed section of the lung and collapse of normally formed sections as a result of compression by their overly stretched sections of the malformed lung), as well as a significant percentage of blood shunting in the collapsed lung. parts of the lung.

An increase in intrathoracic pressure and mediastinal displacement, which are often found in this malformation, are another pathogenetic mechanism that causes cardiovascular disorders in such patients. There are decompensated, subcompensated and compensated forms of congenital lobar emphysema. With **a decompensated form**, the defect manifests itself from birth. Quite often, general cyanosis, shortness of breath, respiratory asymmetry (lag in the act of breathing of the swollen half of the chest), anxiety of the child, frequent dry cough, attacks of asphyxia during feeding are noted. X-ray examination is decisive in the diagnosis, in which an increase in the transparency of the lung tissue can be detected up to the complete disappearance of the lung pattern, mediastinal displacement, sometimes with the presence of a mediastinal hernia, compression of healthy parts of the lung in the form of a triangular shadow of atelectasis. The latter sign is extremely important in the differential diagnosis with pneumothorax.



The most convincing signs of localization of emphysema are found with angiopulmonography, which can be performed only in cases where the patient's condition allows, i.e., with subcompensated and compensated forms. At the same time, in the zone of increased transparency is determined by depleted vascular network and contiguous vessels in the compressed parts of the lung (Fig. 13).

**Figure 13. Angiopulmonography shows congenital lobar emphysema on the left**

With **a compensated form** of congenital lobar emphysema, the listed symptoms can be extremely mild, intermittent, noticeable only to an experienced clinician. Often only the occurrence of inflammatory changes in the malformed section of the lung or collapse in other sections is the reason for an x-ray examination, which allows an accurate diagnosis.

**Treatment.** The only correct method of treating this malformation is operative - removal of the viciously developed lobe.

This malformation is characterized by the presence of a cystic formation located centrally, i.e., in the root zone or closer to the periphery. Other names can be found in the literature: **"bronchogenic cyst", "bronchial cyst".** These names are justified, since microscopic examination of the walls of cystic formations in most cases makes it possible to identify elements of the bronchial walls in them: cartilaginous plates, cylindrical epithelium, elastic and muscle fibers and etc. Embryogenesis of such cysts, apparently, is associated with the formation of an additional hypoplastic lobe (segment, subsegment), which is completely separated from the bronchial tree or retains communication with it.

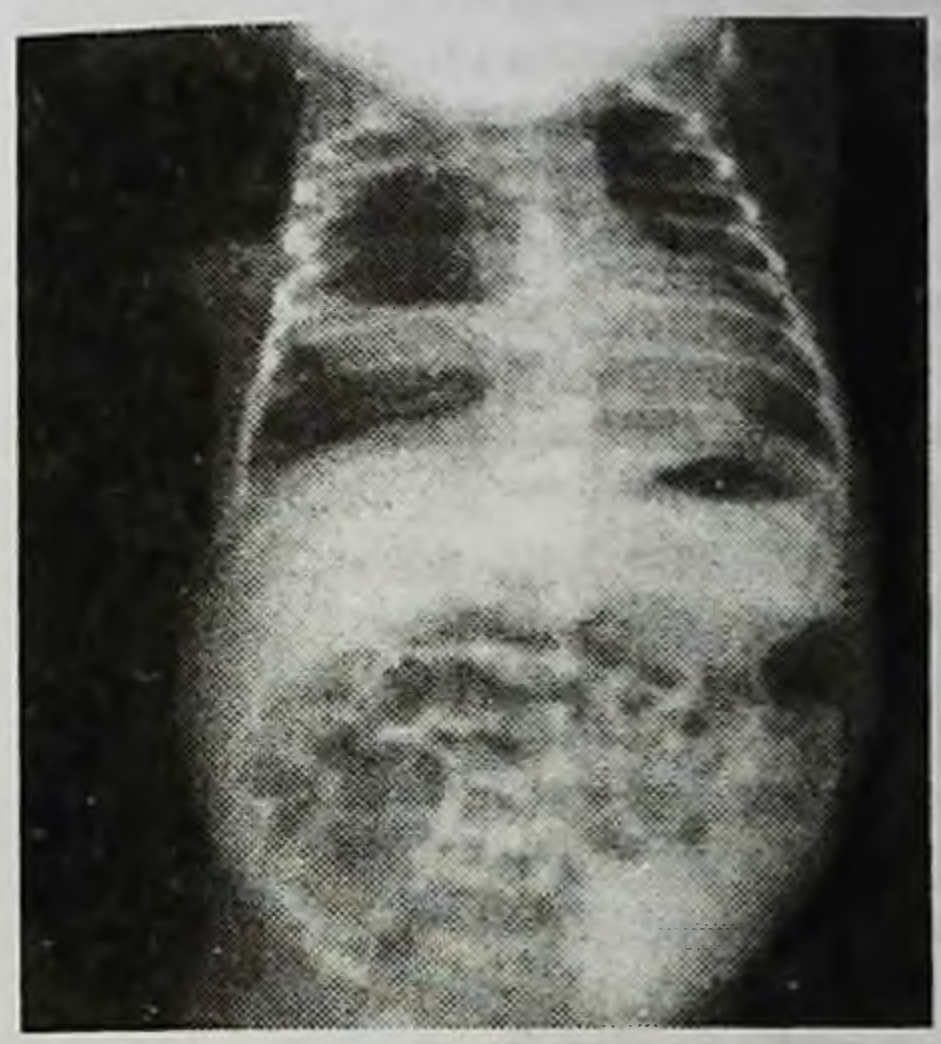


**Figure 14. On the radiograph, a bronchogenic cyst on the right**

**Clinic and diagnostics.** With small sizes of cysts that do not communicate with the bronchial tree, clinical manifestations of the defect may be absent, and often these formations are an accidental x-ray finding. If there are reports of a cyst with a bronchial tree, symptoms may appear due to partial drainage of the contents of the cyst into the bronchial tree (wet cough, the presence of dry rales during auscultation). X-ray examination in such cases makes it possible to detect the level of fluid in the cyst cavity (Fig. 14). When the cyst becomes infected, symptoms of inflammation and intoxication may appear (fever, anxiety, loss of appetite, etc.).

The presence of large centrally located solitary cysts of the lung, more often communicating with the bronchial tree, may be accompanied by a syndrome of respiratory disorders caused by compression of large lung areas. The occurrence of a valvular mechanism in such a cyst causes the appearance of respiratory and cardiovascular insufficiency, similar to how it happens with tension pneumothorax. The nature of the physical data depends on the size of the cyst, the contents, the degree of tension.

Significant volume or tense air cysts are more characterized by weakening of breathing on the side of the lesion, the presence of a pulmonary sound with a box shade during percussion, and a shift of the mediastinum in the opposite direction. In

the absence of mediastinal displacement, tension syndrome can be manifested by anxiety, refusal to eat, reflex vomiting, etc.

The presence of cysts, even of considerable size, filled with liquid contents, is rarely accompanied by tension syndrome, and the characteristic physical data are weakening of breathing and dullness of lung sound on the side of the lesion.

The diagnosis is clarified with the help of X-ray methods of investigation. At the same time, an air cystic formation with clear contours can already be detected on a plain radiograph. The presence of a fluid level in the cavity indicates partial drainage of the contents of the cavity through the bronchial tree. Homogeneous darkening with clear contours makes it reasonable to conduct a differential diagnosis with a parasitic cyst (usually echinococcus), as well as a lung tumor. Radiography in two projections, polypositional fluoroscopy, as well as tomography can clarify the localization of the formation.

Angiopulmonography and bronchography are of considerable informative value in these cases. However, it should be remembered that bronchography in conditions of severe respiratory failure is more dangerous than angiography.

A characteristic endemic history, the presence of positive serological reactions and other symptoms serve as a rationale for an ultrasound examination of the liver in a patient with suspected echinococcosis of the lung due to frequent concomitant lesions of these organs.

**Treatment.** The complexity of the differential diagnosis between a cyst and a tumor, as well as the inability to predict the course of the disease (enlargement, suppuration, rupture) give grounds for surgical treatment in a planned manner, which often consists in removing a cyst or a section of the lung along with a cyst (segment or lobectomy).

**Lung sequestration** is understood as a malformation in which an additional hypoplastic lobe, sometimes communicating with the bronchial tree of the main lung, has an autonomous blood supply by an abnormal artery extending from the aorta or its branches. Venous drainage of such a site, as a rule, is carried out into the system of a small circle and much less often into the system of the superior vena cava. The hypoplastic part of the lung with abnormal blood supply may be a single cyst or polycystic formation located outside the tissue of the main lung and having its own pleural sheet or located inside the lung tissue, which gives reason to isolate extrapulmonary and intrapulmonary sequestration.

The most common localization of the defect is the lower medial lung. There are reports in the literature about the localization of the sequestered area of the lung in the abdominal cavity.

**Clinic and diagnostics.** Signs of pathology occur during infection and the attachment of the inflammatory process in the viciously developed and adjacent normal sections of the lung. At the same time, certain symptoms are due not only to the degree of inflammatory changes, but also to the sequestration variant: the presence of simple or cystic hypoplasia, the presence or absence of communication between the sequestered area and the common bronchial system, extrapulmonary or intrapulmonary localization of the malformed area.

So, in the absence of communication with the bronchus and inflammation, a defect in the form of a darkening area of greater or lesser intensity in certain parts of the lungs can be detected by chance - during an X-ray examination performed for other reasons. The accession of the inflammatory process is accompanied by the corresponding symptoms: fever, physical data characteristic of lobar pneumonia or localized bronchiectasis.

Diagnosis of lung sequestration is difficult, since the clinical and radiographic symptoms of other diseases and malformations (polycystic and bronchiectasis, solitary cyst and lung abscess, etc.) are very similar. Only the identification of an abnormal vessel, the shadow of which can sometimes be detected by tomography and in most cases by aortography, makes it possible to make a diagnosis before surgery.

The importance of preoperative diagnosis of this malformation should be emphasized due to the fact that the presence of an abnormal, very large arterial branch located in an atypical place and extending directly from the aorta poses a certain danger during surgery.

**Surgical treatment.**

**Bronchiectasis** (bronchodilation) is a chronic lung disease, accompanied by a pathological expansion of the bronchi, in which a purulent process is localized. Pneumosclerosis develops in the lung parenchyma.

The prevalence of bronchiectasis in children ranges from 0.5 to 1.7%. Currently, bronchiectasis is much less common.

Bronchiectasis can develop under the influence of many reasons, which are divided into the following groups:

- congenital bronchiectasis;
- inflammatory diseases of the respiratory system;
- foreign bodies of the bronchi.

The theory of congenital bronchiectasis was proposed in the last century, but there is still no consensus. It is more correct to consider that bronchiectasis can exist both at the birth of a child and form in the first years of life as a result of embryonic disorders, delays in the formation of bronchial walls and cartilaginous plates with hypoplasia.

Inflammatory lung diseases, especially recurrent ones, play an important role in the development of bronchiectasis. The first is bronchitis. The peribronchitis and interstitial inflammation that develops in this case cause a violation of the drainage function, which leads to the formation of bronchiectasis. Protracted and often recurrent pneumonia, especially in young children, contribute to the development of significant changes in the interstitial tissue.

Foreign bodies of the tracheobronchial tree. The development of destruction in the bronchi is affected not so much by the location of the foreign body as by the degree of obstruction of the bronchus. Organic and plant objects, while in the bronchi, cause bronchiectasis faster than plastic, metal and glass. Obturation leads to atelectasis, and subsequent infection leads to the development of bronchiectasis.

The pathogenesis of the development of bronchiectasis has not yet been unambiguously interpreted, however, the main points leading to the development of

bronchiectasis are morphological inferiority of the congenital order, an inflammatory agent in the postnatal period, a violation of the drainage function with or without the development of atelectasis, endobronchitis, turning into panbronchitis, peribronchitis with transition of inflammation to the lung parenchyma. There comes a deformation of the bronchus of a cylindrical or saccular type, the bronchi do not pass into the bronchioles and end blindly with the formation of atelectasis or, conversely, emphysema. This site does not take part in ventilation and gas exchange does not occur in it. Such a destructive-purulent area of the lung is only a source of intoxication. According to histological studies, it is often not possible to differentiate congenital bronchiectasis from those acquired as a result of changes in tissues that occur as a result of a suppurative process.

The following classification of bronchiectasis has been adopted.

By genesis: congenital, acquired.

In shape: cylindrical, saccular, cystic.

By distribution: one-sided, two-sided.

**Clinic and diagnostics.** Complaints of the child or parents of lethargy, weakness, fatigue. The main symptom is a loose cough, more in the morning, with sputum that may be mucous, mucopurulent, and purulent. The amount of sputum depends on the extent of the lesion. Hemoptysis in children with bronchiectasis is rare, more often it occurs during a process caused by a foreign body, and is due to the presence of granulations above the aspirated object.

Complaints are more pronounced in processes of considerable length (a share or more) and during an exacerbation. Children under 5 years of age usually swallow sputum, so even parents may not notice the fact of its discharge.

With percussion, a shortening of the percussion sound is detected above the affected lobe in cases of atelectatic bronchiectasis, especially with extensive atelectasis. The borders of the heart in these children are also displaced to the affected side.

Auscultation is more informative. According to the affected area, wheezing is heard, often moist, of various sizes, even large bubbling. With a limited process, wheezing disappears after coughing. Loud wheezing can be heard as wired and over a healthy part of the lung, even on the other side, especially in children under 5 years of age. Auscultation also noted a weakening of breathing or its bronchial shade over the affected area. Auscultatory examination is carried out repeatedly, including in the morning immediately after sleep.

Diagnosis of bronchiectasis is based on anamnestic data, especially the first year of life, and symptoms, which may vary depending on the length of the process. The final diagnosis is made only after a complete clinical bronchial examination: bronchoscopy, radiography, bronchography and radioisotope studies.

One of the main symptoms that parents always note is a cough. It is a consequence of bronchitis - a constant companion of the bronchiectasis process, and it is cough that is an indication for bronchoscopy.

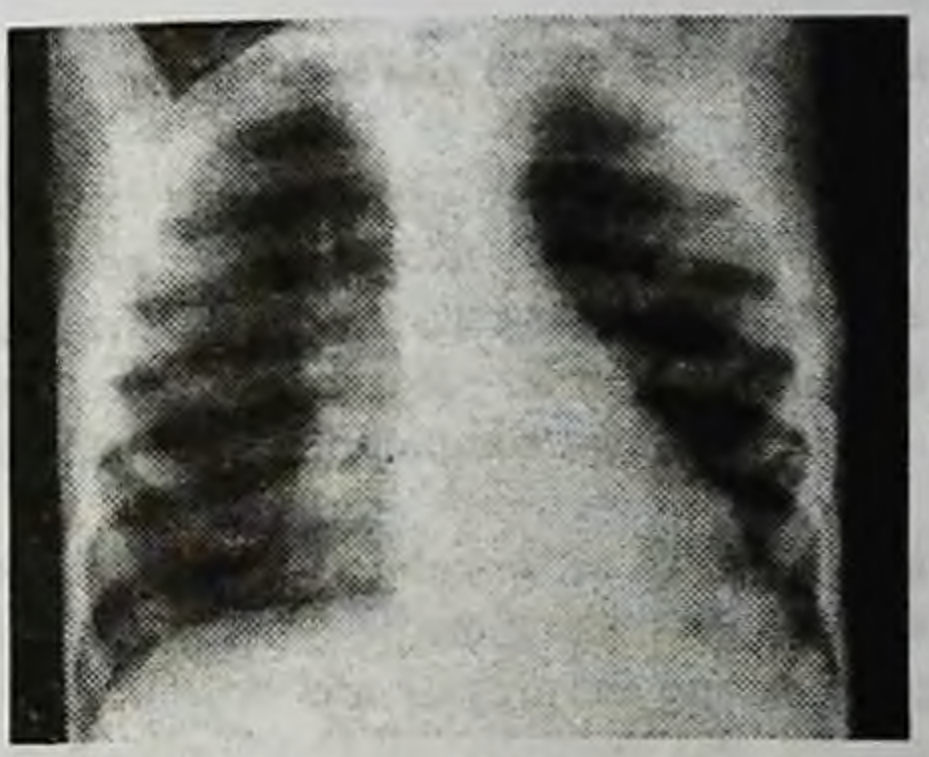
Endoscopic diagnosis is based on a visual assessment of the state of the mucous membrane of the tracheobronchial tree, and bronchitis can be catarrhal or purulent, depending on the nature of the process. With formed bronchiectasis, even

during remission, purulent sputum is found in the bronchi of the affected area. With catarrhal bronchitis, the discharge is mucous in nature.

With bronchiectasis, purulent or catarrhal-purulent bronchitis is determined, corresponding to the affected area.

Local endobronchitis, spreading within the lobe of the lung, indirectly indicates a lobar bronchiectasis process. With bilateral bronchiectasis, especially wide, diffuse purulent endobronchitis is found. Sputum is examined to establish the microflora, in some cases - to detect tuberculosis.

**X-ray diagnostics** consists of survey methods, bronchography and radioisotope studies. Angiography is used for limited indications, mainly when pulmonary hypertension is suspected.



Plain radiography may reveal an increase in the bronchovascular pattern, more in the root zone, infiltration, fibrosis, elements of emphysema, atelectasis from a segment to the entire lung, but the absence of changes on a chest x-ray does not deny the presence of bronchiectasis, especially a local form.

Bronchiectasis of the lower lobe of the left lung. Plain radiograph.

**Figure 15. On the radiograph, signs of bronchiectasis in the lower lobe of the left lung**

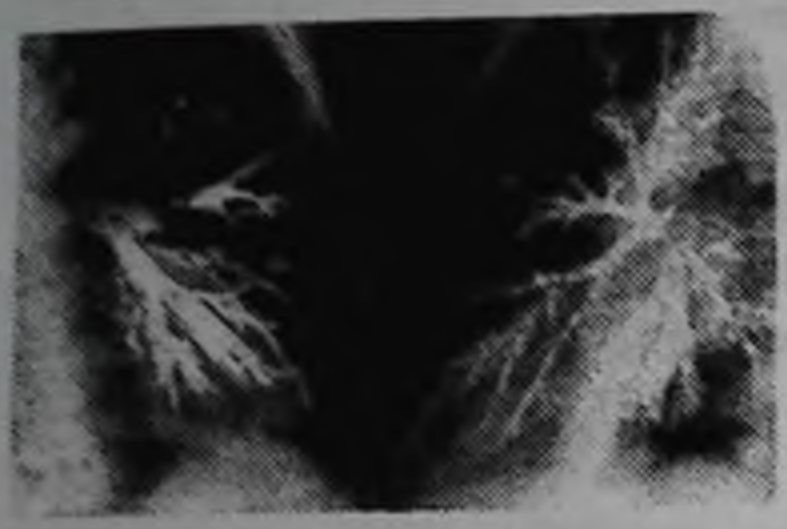
Atelectasis of the lower lobe of the left lung is determined. The transparency of the left lung field is increased. The shadow of the mediastinum is shifted to the left. The most informative X-ray method is bronchography, which allows you to identify the presence of bronchiectasis, their nature - cylindrical or saccular, the extent of the lesion and establish the state of healthy parts of the lung (Fig. 15).

In childhood, combined lesions are often found, when there are, for example, bronchiectasis of one lobe and segments of another.

Angiopneumography reveals a depletion of blood flow in accordance with the affected area, and in the absence of blood flow, "silent" contrast zones are determined.

A radionuclide study for bronchiectasis in children makes it possible to judge the functional state of all parts of the lung (this is evidenced by the degree of decrease in the accumulation of a radioactive substance) and serves as an additional diagnostic method in combination with the results of other studies. Differential diagnosis of bronchiectasis in the early stages in outpatient settings is carried out with asthmatic bronchitis.

In contrast to bronchiectasis, in these cases, there is a more pronounced paroxysmal respiratory failure, wheezing is heard over the surface of both lungs and quickly disappears at the end of the attack.



With recurrent prolonged pneumonia, the process, unlike bronchiectasis, is localized in the interstitial tissue, so the manifestations of bronchitis fade into the background. Radiography is of great help (Fig. 16).

**Figure 16. Bronchography shows bronchiectasis of the right and left lung**

Many patients with bronchiectasis have previously been unreasonably treated for tuberculosis. In differential diagnosis, it is necessary to take into account the anamnesis. Contact with a patient with tuberculosis, unclear causes of fever without an x-ray picture of pneumonia require tuberculosis tests. If an outpatient diagnosis is not possible, the child should be placed in a hospital for a complete bronchological examination.

In clinical conditions, bronchiectasis has to be differentiated from various malformations of the bronchopulmonary system with associated suppuration. In some cases, plain radiographs of the lungs (festering lung cyst) are sufficient, in others, it is necessary to conduct bronchography and angiography (intrapulmonary sequestration).

A number of systemic diseases, especially in children of the first years of life, also require a complete bronchological examination for the purpose of differential diagnosis. These include cystic fibrosis, immunodeficiency states, Hamman-Rich syndrome, in which, in addition to the expansion and deformation of the bronchi, small shadows are detected, diffuse emphysema, and increased bronchovascular pattern.

**Treatment** of bronchiectasis in children is carried out by radical transthoracic surgery with the removal of the affected part of the lung.

**Figure 17. Scheme of resection and extirpation of the bronchi of the lower lobe according to E.A. Stepanov**

With the defeat of individual segments, an operation can be applied - resection and extirpation of the bronchi of this segment according to E.A. Stepanov (Fig. 17).

The advantage of this operation is the fact that healthy nearby parts of the lung are not injured, there is no wound surface, and the left area of the parenchyma without bronchi is very quickly pneumatized due to the penetration of air into it through the pores of Kohn and is a good biological prosthesis.

Conservative treatment is indicated for deforming bronchitis, exacerbation of the process, with temporary or final contraindications to surgery in cases of widespread bilateral bronchiectasis and to prepare the patient for a planned operation.

Sanitation of the tracheobronchial tree is carried out by physical therapy, active coughing, postural drainage, inhalations aimed at reducing the viscosity of sputum and repeated bronchoscopy.

It is mandatory to carry out detoxification, desensitizing and restorative therapy. A good effect is also given by sanatorium-and-spa treatment.

The prognosis after surgery depends on the volume of the removed part of the lung and the severity of bronchitis in the so-called healthy areas of the lung. When bronchitis is stopped and no more than two lobes of the lung are removed, the prognosis is favorable, often even pulmonectomy, in the absence of a lesion on the other side, leads the child to recovery. More extensive resections are fraught with the development of hypertension in the pulmonary circulation with the formation of cor pulmonale.

**Dispensary supervision** is aimed at organizing a rehabilitation system in the coming years. Mandatory control studies of the bronchial tree (bronchoscopy, bronchography), spa treatment, sanitation of all foci of chronic inflammation, exercise therapy.

In the future, it is important to choose a profession that is not related to chemical production, dust.

**Diaphragmatic hernia** is understood as the movement of the abdominal organs into the chest through a defect in the abdominal barrier (diaphragm). Unlike other hernias, they do not always have a hernial sac.

In children, congenital hernias are mainly noted, which are a malformation of the diaphragm. The frequency of occurrence of diaphragmatic hernia varies, according to different authors, over a wide range - from 1:2000 to 1:4000 newborns, while a large group of stillborns with malformations of the diaphragm is not taken into account.

The defect begins to form in the embryo at the 4th week of pregnancy, when a septum is formed between the pericardial cavity and the body of the embryo. The underdevelopment of muscles in certain areas of the abdominal obstruction leads to the appearance of hernias with a bag, the walls of which consist of serous integuments - the abdominal and pleural sheets. Such hernias are true. With false hernias, there is a through hole in the diaphragm, which is formed either as a result of underdevelopment of the pleuroperitoneal membrane, or due to its rupture due to overstretching.

By origin and localization, diaphragmatic hernias should be divided as follows (Fig. 18).

Congenital diaphragmatic hernias:

- diaphragmatic-pleural (false and true);

- parasternal (true);
- frenopericardial (true);
- hiatal hernia (true).

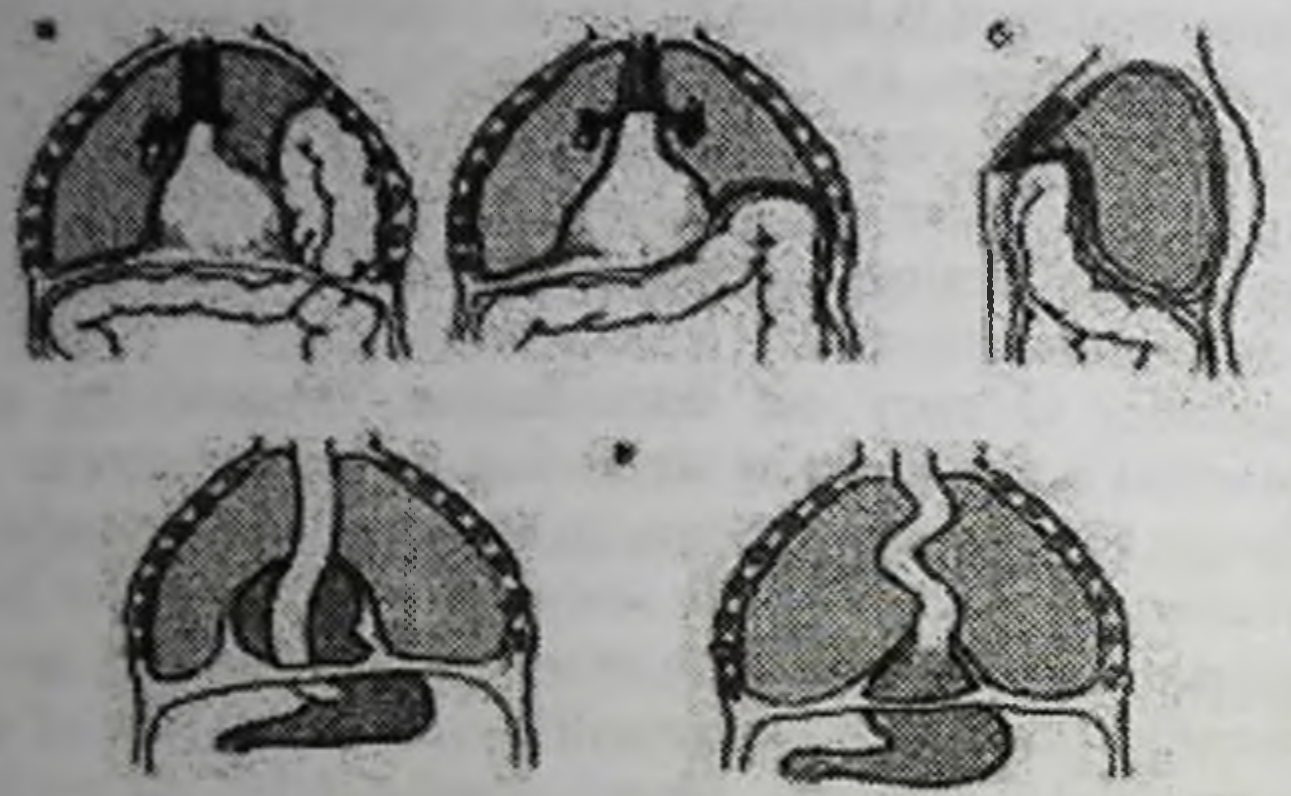


**Figure 18. Types of diaphragmatic hernias**

**II. Acquired hernias - traumatic (false).**

Most often in children there are diaphragmatic-pleural hernias, hernias of the esophageal opening of the diaphragm. Parasternal hernias are much less common; frenocardial hernias are essentially casuistry.

Diaphragmatic paresis is a separate nosological form of the disease and therefore is not included in this classification.

Diaphragmatic - pleural hernias can be both true and false. Often they are left-handed. False hernias on the right are very rare. True hernias can occupy a limited part of the diaphragm, but are of considerable size and complete. In the latter cases, when there is a high standing of the entire dome of the diaphragm with the absence of a muscular layer, this type of diaphragmatic hernia is called relaxation of the diaphragm. With false hernias, the defect in the diaphragm is most often slit-like and located in the costal-vertebral region (Bogdalek's hernia). Due to the absence of a hernial sac in these types of diaphragmatic hernias, the abdominal organs move into the chest cavity without restriction, which often leads to chest tension syndrome. A similar situation, of course, is also observed in true hernias, when there is a complete protrusion of the diaphragm.

Parasternal hernias usually have a hernial sac and are divided into retrosternal and retrosternal costal. These hernias penetrate into the chest cavity through a section of the diaphragm thinned in the anterior section (Larrey's fissure). A hernia, located more to the right of the sternum, is called Morgagni's hernia by some authors.

A phrenopericardial hernia is a false hernia with a defect located in the tendon of the diaphragm and the pericardium adjacent to it. Through this defect, the intestinal loops can move into the pericardial cavity, sometimes there can be the opposite effect - dislocation of the heart into the abdominal cavity.

Hernias of the esophageal opening of the diaphragm are always true and are divided into two large groups - paraesophageal and esophageal. Paraesophageal is characterized by the displacement of the stomach up next to the esophagus. With esophageal esophageal-gastric junction located above the level of the diaphragm. In this case, the degree of displacement of the stomach can be different and even change depending on the position of the child and the volume of filling of the stomach.

The severity of the condition and the severity of clinical manifestations are determined not only by the degree and volume of the displaced organs into the chest cavity, but also by the combined malformations. With diaphragmatic-pleural hernias, underdevelopment of the lungs, heart defects, central nervous system and gastrointestinal tract are often noted. Particular severity is determined by the degree of underdevelopment of the lungs and those morphological and functional disorders in them that lead to circulatory disorders in the pulmonary circulation with the development of hypertension and the occurrence of a right-hand shunt with blood shunting at the level of the arterial duct or intracardiac. Shunting of blood in the lungs due to functioning fetal communications is not excluded. Children with such severe malformations are often stillborn or die shortly after birth.

**Clinic.** Each type of diaphragmatic hernia has a rather specific symptomatology, although two leading symptom complexes can be distinguished: cardiopulmonary disorders observed in diaphragmatic-pleural hernias accompanied by intrathoracic tension, and gastroesophageal reflux in hiatal hernias.

With false diaphragmatic-pleural hernias or true ones with a significant bulging of the sac into the pleural cavity, when almost the entire intestine moves there, clinical signs of respiratory failure are detected early. Shortness of breath, cyanosis develop immediately after birth or after a few hours. The skin and mucous membranes are dark blue and even cast-iron in color. Acute respiratory failure progresses very quickly. On examination, in addition to cyanosis, attention is drawn to the asymmetry of the chest with swelling on the side of the lesion (usually on the left) and the absence of excursion of this half of the chest. A very characteristic symptom is a sunken navicular abdomen. Percussion over the corresponding area of the chest is determined by tympanitis, with auscultation - a sharp weakening of breathing. Heart tones (with a left-sided hernia) are almost not defined on the left, loud on the right, which indicates a shift of the heart to the healthy side. Sometimes through the chest wall it is possible to listen to the peristalsis of the displaced loops of the intestines and the splashing noise.

With smaller hernias, clinical manifestations are less pronounced, respiratory disorders in the form of cyanosis and shortness of breath are more often observed with anxiety, screaming, feeding, or changing the position of the child. Sometimes deterioration in the condition occurs in children of toddler and even school age among seemingly complete health, when the stomach wall is infringed in the hernial orifice or its volvulus. At the same time, the child complains of indefinite pain in the abdomen, nausea, vomiting appear, anxiety gradually increases.

With true small diaphragmatic hernias, especially with a protrusion of a limited part of the diaphragm on the right, when the content is an intruding area of the liver, there are no clinical symptoms. Children are no different from healthy ones,

they develop well, keeping up with their peers. With such hernias localized on the left, despite the absence of visible clinical manifestations, there is some displacement of the heart with its rotation, which can cause hidden cardiovascular disorders. To identify them, functional loads and additional research methods should be carried out.

With parasternal hernias, the symptoms are not pronounced and unstable, they are more often detected in children of toddler and school age, when they begin to complain of painful, unpleasant sensations in the epigastrium. Sometimes there is nausea and even vomiting. Respiratory and cardiovascular disorders in this type of hernia are not typical. In almost half of all cases, children do not complain. By the method of percussion and auscultation, it is possible to determine tympanitis and weakening of heart tones in this zone.

With hiatal hernia, especially in the esophageal form, the clinical manifestations are associated with the presence of gastroesophageal reflux resulting from dysfunction of the cardiac esophagus. There is a syndrome called reflux esophagitis. In the paraesophageal form, the symptoms of the disease are often associated with the presence of gastroesophageal reflux, and depend on a violation of the evacuation of food from the stomach, its inflection, volvulus, trauma; possible cardiovascular disorders due to displacement and compression of the heart. Sometimes paraesophageal hernias are detected by chance during x-ray examination.

**Diagnosis** of diaphragmatic hernia is not always easy. The leading importance should be given to X-ray examination. Diaphragmatic-pleural hernias are characterized by ring-shaped enlightenments over the entire left half of the chest, which usually have a spotted pattern; the transparency of these cavities is more pronounced towards the periphery. The variability of the position and shape of the areas of enlightenment and darkening is characteristic, which can be seen when comparing two radiographs obtained at different times.

The displacement of the organs of the mediastinum and the heart depends on the number of intestinal loops prolapsing into the chest cavity. In newborns and children in the first months of life, the displacement is so significant that it is not even possible to determine the shadow of the collapsed lung.

It is difficult to distinguish a false diaphragmatic hernia from a true one, especially if the pleural cavity is filled with intruding intestinal loops. Usually, with true hernias, it is possible to radiographically trace the upper contour of the hernial sac, which delimits prolapsed intestinal loops in the chest cavity.

If the patient's condition allows and there are difficulties in differential diagnosis with diseases such as polycystic lung or limited pneumothorax, the gastrointestinal tract should be contrasted with a barium suspension. At the same time, it is clearly established which part of the intestine is located in the chest cavity. Sometimes gastric catheterization is sufficient. Such manipulation can to some extent alleviate the patient's condition, since decompression of the stomach occurs.

When a true hernia is located on the right, its contents are usually part of the liver, therefore, radiographically, the shadow of the hernial protrusion will have a dense intensity, merging in the lower sections with the main shadow of the liver, and the upper contour of the hernia will be spherical, i.e., it gives the impression of having a dense rounded lung tumor, adjacent to the diaphragm. For **differential**

**diagnosis**, computed tomography and diagnostic pneumoperitoneum can be used, in which air accumulates in the hernial sac, which makes it possible to distinguish a hernia from other formations.

With parasternal hernia of the diaphragm, a semi-oval or pear-shaped shadow is revealed with large-mesh annular enlightenments projected onto the shadow of the heart in direct projection. In the lateral projection, the shadow of the hernia seems to be wedged between the shadow of the heart and the anterior chest wall. Radiologically, it is not possible to distinguish parasternal hernia from phrenopericardial hernia. To establish the contents of parasternal hernias, an X-ray contrast study of the gastrointestinal tract with a barium suspension is performed. It is better to start with an irrigography, since the contents of a hernia are most often the transverse colon.

The radiographic picture of hernias of the esophageal opening of the diaphragm depends on their shape. With paraesophageal hernias in the chest cavity to the right or left of the midline, a cavity with a liquid level is detected, while the gas bubble of the stomach located in the abdominal cavity is reduced or absent. Contrast study with located in the abdominal cavity, reduced or absent. A contrast study with a barium suspension reveals an hourglass-type stomach, the upper part of which is located in the chest cavity, and the lower part is in the abdominal cavity, and the barium suspension can overflow from one part of the stomach to another. Esophageal hernia, as a rule, can only be detected by contrasting the gastrointestinal tract.

**Treatment** of congenital diaphragmatic hernias is operative. The exception is asymptomatic small hernias, localized on the right, when the contents are part of the liver. The urgency of treatment is determined by the severity of symptoms of respiratory failure and cardiovascular disorders.

Usually, with false diaphragmatic-pleural or true large hernias, respiratory and cardiovascular disorders are so pronounced (even in newborns) that a rather lengthy preoperative preparation is required, which consists in decompression of the stomach with a catheter, nasopharyngeal intubation, transferring the child to artificial ventilation of the lungs with the creation of positive pressure on exhalation, which should be minimal - no more than 20 cm of water column; otherwise, pneumothorax may develop. Eliminate metabolic disorders. Infusion and drug therapy should be adequate and aimed at improving the rheological properties of blood and restoring homeostasis. It is very important to use drugs that reduce pressure in the pulmonary circulation (galazolin, dopamine). It should be emphasized that children with such disorders do not tolerate transportation very well, so this therapy should be started in the maternity hospital and continued in special vehicles. Only after improvement of homeostasis, elimination of cardiovascular disorders and hypoxia, the child can be operated on.

The principle of surgical intervention is to bring organs down into the abdominal cavity, suturing the diaphragm defect in case of false diaphragmatic hernias and plastic surgery of the diaphragm in case of true hernias. Sometimes, with aplasia of the diaphragmatic muscles and the presence of only a pleural abdominal sheet, plastic material is used. The operation can be performed both through the

abdomen and through the chest cavity, but it is extremely important that there is no significant intra-abdominal pressure in the postoperative period, so decompression of the gastrointestinal tract is performed during the operation. In the postoperative period, a rather long nasopharyngeal intubation with artificial lung ventilation is carried out until hemodynamics and homeostasis improve.

The results of the operation are mainly related to the severity of the patient's condition at admission and the degree of underdevelopment of the lung. In addition, the quality of transportation and preparation of the newborn for surgery is of great importance. If, due to the severity of cardiovascular and respiratory disorders, children are forced to be delivered to clinics on the first day after birth, then the prognosis is unfavorable in more than 50% of cases.

**I. Curation of patients on the topic - 15 minutes**
**II. Participation in the dressing room and operating room - 20 minutes;**
**III. Implementation of practical skills - 15 minutes:**

## PRACTICAL SKILLS

### TRACHEOSTOMY

(in children, the lower tracheostomy is predominantly used)

- indications: 1) Violation of the patency of the upper respiratory tract (trauma of the larynx, pharynx, trachea, tumors, inflammatory processes that stenose the upper respiratory tract), 2) increasing tracheobronchial obstruction, 3) paralysis of the respiratory muscles, 4) the need for prolonged mechanical ventilation;
- check the readiness of the necessary instruments and medicines: a tracheostomy tube, 2 scalpels - one for cutting the skin, the other (narrow) for cutting the trachea, 2 Farabef hooks, 2 single-pronged hooks, Trousseau dilator, a sufficient number of silk ligatures, Billroth clamps, sterile balls, napkins, 2% iodine solution, 70 gr. alcohol;
- explain to the patient's parents about the upcoming operation;
- check the availability and readiness of tools and materials;
- mucus is carefully aspirated from the upper respiratory tract and oxygen inhalation is adjusted;
- hand treatment (hand washing under running warm water with soap and a brush for 10 minutes, wiped with a sterile cloth and treated with 96% alcohol, nail beds with tincture of iodine), sterile gloves are put on;
- the patient is laid on his back with his head thrown back strictly along the middle axis of the body, a roller 12-15 cm high is placed under the shoulders;
- the surgeon stands on the right side of the patient;
- anesthesia: in children, endotracheal anesthesia is preferable;
- the surgical field is treated with tincture of 2% iodine and alcohol;
- the larynx is fixed with the thumb and middle fingers of the left hand;
- skin incision strictly along the midline of the neck from the level of the cricoid cartilage to the bottom to the jugular notch of the sternum;

- subcutaneous tissue and superficial fascia of the neck are dissected, hemostasis is performed, the edges of the wound are bred to the sides with blunt hooks;
- strictly along the midline, focusing on the trachea, the 2nd and 3rd fascia of the neck are stratified in layers, the exposed sternohyoid muscles are bluntly separated and parted to the sides and the fiber of the pretracheal space is opened;
- the isthmus of the thyroid gland in the upper corner of the wound is slightly pulled up (Fig. 1a);
- stupidly shifts and exfoliates the 4th fascia of the neck and the tracheal rings become visible;
- the trachea is fixed with a sharp single-toothed hook, slightly pulled up and strictly along the midline with a pointed scalpel 2 adjacent tracheal rings (4th and 5th) are pierced to a depth of no more than 0.5-0.6 cm in order to avoid puncture of the posterior wall of the trachea (Fig. 1b) );
- two long silk handles (silk No. 3) are applied to the edges of the wound of the trachea in its membranous part;
- by pulling the handles to the sides, the edges of the wound of the trachea diverge and a tracheostomy tube is inserted into its lumen, the size of which should correspond to the diameter of the trachea (Fig. 21 c);
- snap holders are circled around the neck and tied;
- between the shield of the tube and the wound, a napkin and a tube are laid, fixed with the help of previously threaded ribbons, which are tied on the posterolateral surface of the neck;
- 1-2 silk sutures are applied to the skin wound in the upper corner of the wound;
- periodic suction of mucus, exudate from the trachea and bronchi is recommended.

**Figure 19 (a, b, c). Stages of the lower tracheostomy.**

- complications: damage to the esophagus, bleeding, asphyxia, subcutaneous emphysema, air embolism, insertion of a tube into the submucosal space, tracheoesophageal fistulas due to injury to the posterior wall of the trachea or pressure sore of the trachea.

**IV. Big break - 40 minutes (11.50-12.30).**

**V. Practical lesson (part 2) - 1 hour 35 minutes (12.30-14.05):**

**1. During classes, the use of electronic textbooks, video and photographic materials - 20 minutes;**

**2. UMM - 45 minutes**

## LEARNING ASSIGNMENTS

Group rules

Member of each group

- Respect for the thoughts of their comrades;
- Active and joint participation in tasks, manifestation of responsibility for the task;
- Can ask for help if necessary from comrades;
- Help your comrades in the group;
- Participate in the evaluation of the group;
- Must know the rules "In the same boat, a common fate - to be saved or drown"

Structure responses to questions.

1. What is included in subjective research?
2. Laboratory and instrumental research.

Give the following concepts: Hypotrophy, vomiting, cyanosis, shortness of breath, regurgitation, pain, bleeding.

**Tasks for groups**

1. Is the funnel-shaped chest divided by shape? Cluster, SWOT table, Venn diagram for dyspnea and chart Why? and hierarchical diagram How?
2. What degrees are the funnel chest divided into? Compile a cluster, SWOT table, Venn diagram for the word strain and chart Why? and hierarchical diagram How?
3. What are the clinical signs of a funnel cell? Cluster, SWOT table, Venn diagram for the word pain and chart Why? and hierarchical diagram How?
4. Keeled ore cell is divided into: make a cluster, SWOT table, Venn diagram for the word "habitus" and make diagrams Why? and hierarchical diagram How?
5. Specify research methods for congenital anomalies of the chest organs. Cluster, SWOT table, Venn diagram for the word bronchoscopy and chart Why? and hierarchical diagram How?
6. According to the origin, bronchiectasis is divided into: make a cluster, SWOT table, Venn diagram for the word bronchography and make diagrams Why? and hierarchical diagram How?
7. Specify the causes of diaphragmatic hernia? Cluster, SWOT table, Venn diagram for the word hernia and chart Why? and hierarchical diagram How?
8. What complications are observed in pulmonary sequestration? Make a cluster, SWOT table, Venn diagram for the word bleeding and draw diagrams Why? and a hierarchical diagram How?
9. Specify the main causes of lobar emphysema. Make a cluster, SWOT table, Venn diagram for the word pneumothorax make diagrams Why? and hierarchical diagram How?
10. Will indicate the clinical signs of asphyxia infringement? Make a cluster, a SWOT table, a Venn diagram for the word cyanosis make diagrams Why? and hierarchical diagram How?

**Diagnostic map of learning technology in the classroom**

***Evaluation indicators - the criterion was manifested in the training session:***

| Group | Task 1 | Task 2 | Task 3: (for each question 0.2 points) | | | Sum of points |
|---|---|---|---|---|---|---|
| | (1,0) | (1,4) | Question 1 | Question 2 | Question 3 | (3,0) |
| 1 | | | | | | |
| 2 | | | | | | |

TABLE / X / Y - Students answer the questions "what do you already know about this topic?" and "what do you want to know?"; Allows you to conduct research work on the text, topic, section

| Concept | know "+", don't know "-" | learned "+", could not find out "-" |
|---|---|---|
| Binary nomenclature: | | |
| Etiology | | |
| Pathogenesis | | |
| Clinic | | |
| Deontology | | |
| Symptom | | |
| Syndrome | | |
| Disease | | |
| Disease history | | |
| Outpatient card | | |
| Genetics | | |
| Infection | | |
| Diagnosis | | |
| Instrumental examination of patients: | | |
| Thermometer | | |
| Phonendoscope | | |
| Tonometer | | |
| Iodolipol, barium sulfate | | |
| Nasogastric tube | | |
| Palpation | | |
| Percussion | | |
| Auscultation | | |
| Anamnesis | | |
| Examination | | |
| General blood analysis, blood biochemistry | | |
| General urine analysis | | |
| ECG | | |
| FCG | | |
| EchoCG | | |
| Chest X-ray | | |

## INSERT TABLE

Insert table: a) provides systematization of information obtained during independent reading, listening to a lecture; confirmation, clarification, rejection, tracking the understanding of the information received;

b) contributes to the formation of the ability to link previously mastered information with new information.

Rules for compiling an INSERT table:

| Concept | V | + | - | ? |
|---|---|---|---|---|
| Congenital anomalies and malformations of the chest and lungs (funnel-shaped and keeled chest, diaphragmatic hernias, lobar emphysema, congenital lung cysts, pulmonary sequestration, congenital bronchiectasis) clinic, diagnosis, treatment, complications, postoperative rehabilitation | | | | |
| Place in medicine | | | | |
| The main objective of the subject | | | | |
| Types of disease | | | | |
| The sequence of studying the subject | | | | |
| Learning aids | | | | |

Where: V - corresponds to significant knowledge (information) about ...

- Exceptional knowledge of...

+ - is new information

? - incomprehensible or requiring clarification, additional information

## CONCEPT TABLE

| Vertically - comparisons with diseases (theories) are located | Horizontally - various signs or symptoms of the disease are located (recommendations, categories, various signs, etc.) | | | | | | |
|---|---|---|---|---|---|---|---|
| | Dyspnea | Cyanosis | Cough | Deformity | Auscultation | Percussion | Chest X-ray |
| Pectus excavatum | | | | | | | |
| Keeled chest | | | | | | | |
| Diaphragmatic hernia | | | | | | | |
| Lobar emphysema | | | | | | | |
| Congenital cyst of the lung | | | | | | | |
| Pulmonary sequestration | | | | | | | |
| Congenital bronchiectasis | | | | | | | |

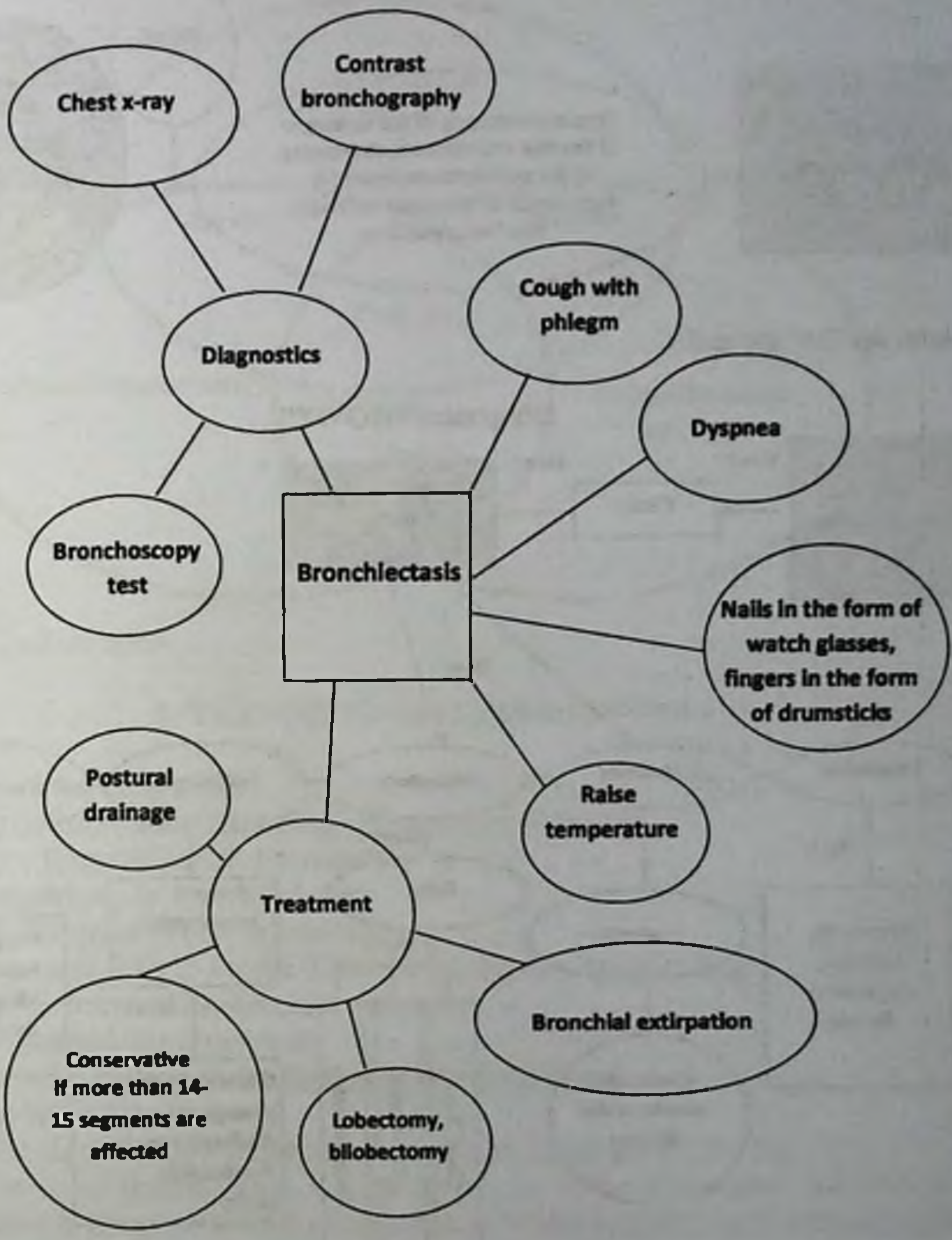
## SWOT

Analytical table - SWOT

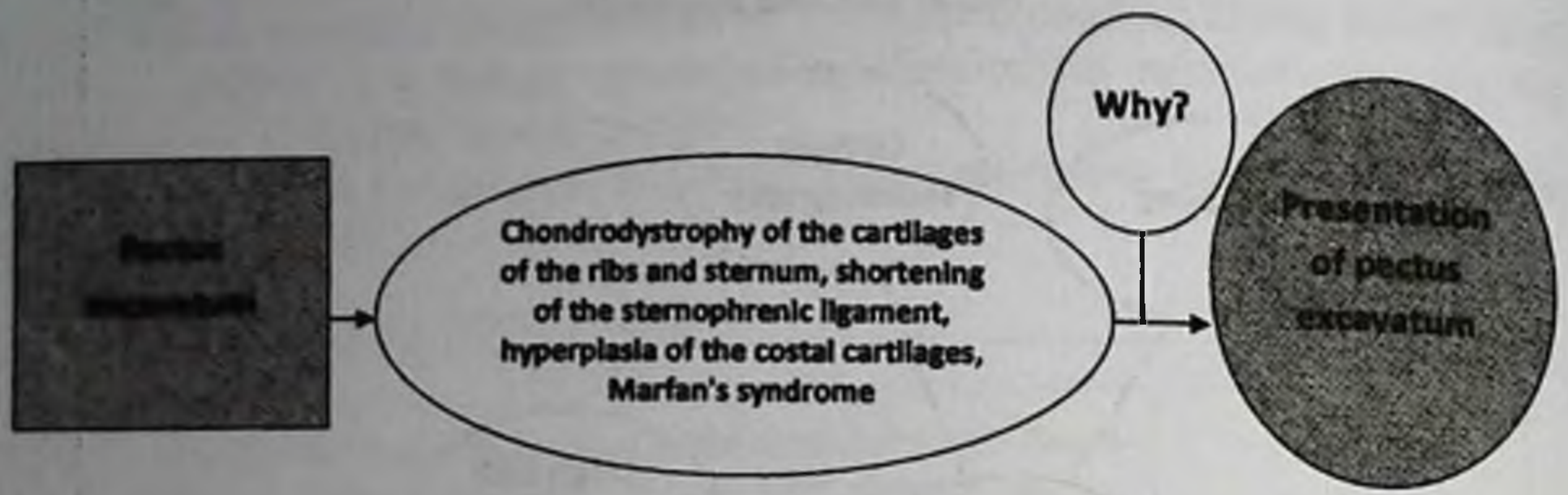
| | |
|---|---|
| S | W |
| O | T |

Note: see 2nd appendix.

## CLUSTER (Bunch, bundle).
## Note: see 2nd appendix.

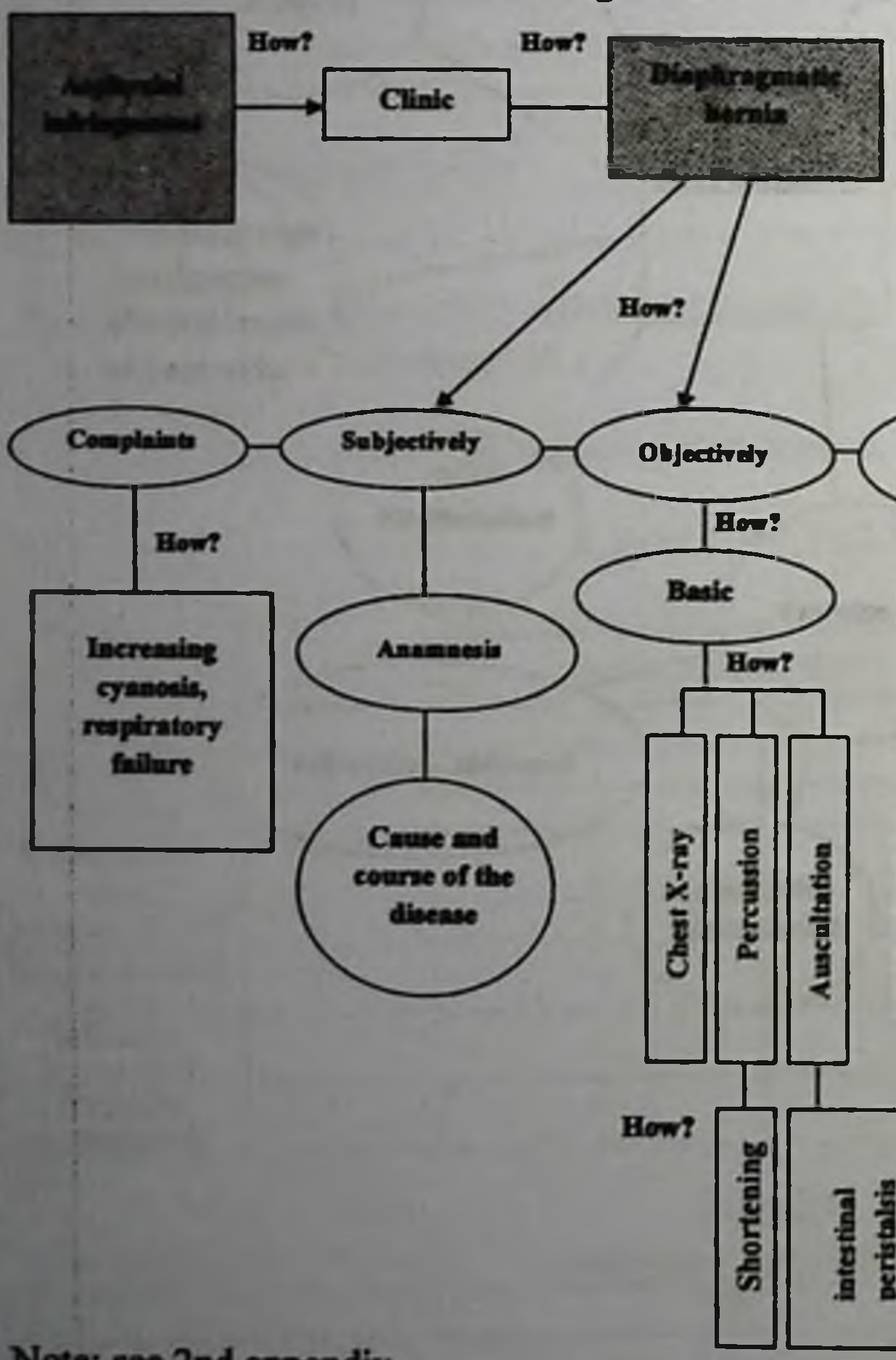


## SCHEME "WHY?"




Note: see 2nd appendix.

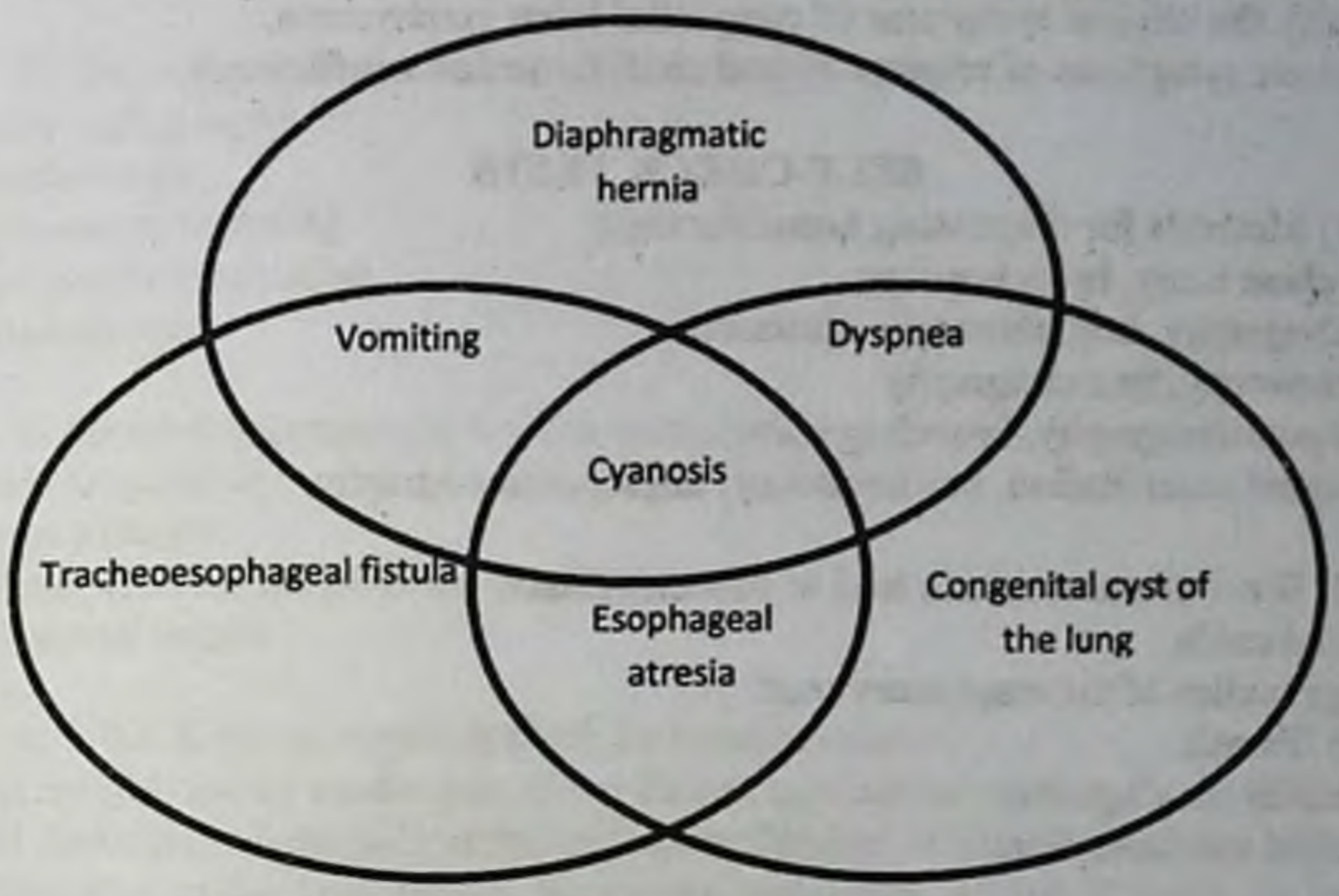
## Diagrams "HOW?"




Note: see 2nd appendix.

## VENN DIAGRAM

Used to compare or contrast or contraindicate 2-3 aspects and show their features




Note: see 2nd appendix.

## INTERACTIVE GAME QUESTIONS:

1. Define pectus excavatum.
Rep. Retraction of the sternum and adjacent part of the ribs
2. Specify 3 forms of pectus excavatum.
Rep. symmetrical, asymmetrical, flat
3. Specify 3 degrees of pectus excavatum.
Rep. I-degree (1-0.7), II-degree (0.7-0.5), III-degree (less than 0.5)
4. Specify the forms of keeled chest deformity.
Rep. symmetrical and asymmetric
5. Indicate what hernias of the diaphragm itself are found.
Rep. True and false
6. Describe the difference between false and true diaphragmatic hernias.
Rep. With false hernias, there is a through hole in the diaphragm, and with true hernias, there is always a hernial sac, the role of which is played by a thinned section of the diaphragm.
7. Specify the clinical signs in newborns with false diaphragmatic hernia.
Rep. Periodic bouts of cyanosis and shortness of breath (asphyxial infringement), sunken abdomen, asymmetry of the chest.
8. What research is decisive in the diagnosis of all types of congenital diaphragmatic hernias?
Rep. X-ray examination

9. What explains the appearance of symptoms of previously undiagnosed lung cysts?
Rep. Small cysts that do not communicate with the bronchial tree.
10. Specify the clinical symptoms of congenital lobar emphysema.
Rep. Severe symptoms of respiratory and cardiovascular insufficiency.

## SELF-CHECK TESTS

1) Methods for diagnosing bronchiectasis
1.plain chest x-ray, bronchoscopy
2.bronchography, bronchoscopy, ultrasound
3.bronchoscopy, bronchography
4. angiopulmonography, bronchography
5.ultrasound examination, bronchoscopy, angiopulmonography

2) What diseases do not lead to bronchiectasis?
1.repeated colds
2.foreign bodies of the respiratory tract
3.cystic fibrosis
4.congenital lung agenesis
5.bronchial malformations

3) Cause of false diaphragmatic hernia:
1. defects in the development of the diaphragm
2. through hole in the diaphragm
3. relaxation diaphragm
4. increased intra-abdominal pressure
5. the presence of a thinned section of the diaphragm

4) With what diseases is bronchiectasis differentiated?
1. chronic bronchitis, pleural empyema, pleurisy
2. lung abscess, lung atelectasis, chronic bronchitis
3. lung atelectasis, mediastinal emphesema, lung abscess
4. lung abscess, lung atelectasis, pleurisy
5. chronic bronchitis, mediastinal emphysema

5) Changes in the bronchi in bronchiectasis?
1. constriction of the bronchi
2. underdevelopment of the bronchi
3. cystic dilatation of the bronchi
4. limited gas bubble in the lungs
5. bronchial dilatation and pneumosclerosis

6) Type of bronchial changes not found in bronchiectasis:
1. cylindrical
2. baggy
3. cystic

4. conical
5. all of the above

7) The main method for diagnosing bronchiectasis?
1. survey radiography
2. bronchoscopy
3. radioisotope scanning
4. ultrasound examination
5. bronchography

8) Which diaphragmatic hernias are true
1. hernia Bogdaleko
2. Larrey's hernia
3. protrusion of the dome of the diaphragm
4. parasternal hernia

9) What X-ray picture is typical for bronchiectasis?
1. total enlightenment on the side of the lesion, mediastinal shift to the healthy side
2. total darkening on the side of the lesion, mediastinal shift to the healthy side
3. deformation of the lung pattern, heaviness, cellularity. Offset towards the lesion
4. the lung is collapsed, the intercostal spaces are sharply narrowed, the mediastinum is displaced to the healthy side
5. round formation with clear edges, the mediastinum is not displaced

10) What auscultatory findings are typical for bronchiectasis?
1. hard breathing, single wet and dry rales
2. creping, crackling rales (in the form of a "machine-gun burst")
3. pleural friction noise
4. weakened breathing
5. amphoric breathing

11) X-ray signs in false hernias proper aperture?
1. ring-shaped enlightenments in the form of cellular cavities against the background of the cardiac shadow
2. homogeneous darkening of the pleural cavity, shift of the mediastinum to the healthy side
3. ring-shaped enlightenments in the form of cellular cavities, mediastinal shift to the healthy side
4. total enlightenment of the pleural cavity, shift of the mediastinum to the healthy side
5. multiple cavities with liquid level

12) The diagnosis of lung agenesis is specified on the basis of
1. clinical picture
2. spirometry

3. bronchoscopy, bronchography
4. cytological examination
5. puncture of the pleural cavity

13) Specify the optimal method of treatment of the lobar cyst of the lung
1. conservative treatment
2. thoracocentesis according to Bulau
3. puncture and drainage of the cyst
4. resection of the area of the lung containing the cyst
5. pulmonectomy

14) The leading symptom of the decompensated form of lobar emphysema is
1. cough
2. cyanosis
3. hyperthermia
4. sputum discharge
5. vomit

15) The optimal treatment option for congenital lobar emphesema is
1. conservative treatment
2. puncture of the emphesematous lobe of the lung
3. pulmonectomy
4. removal of the affected lobe of the lung
5. thoracentesis according to Bulau

16) To the complication of pulmonary sequestration from-Xia
1. lung tissue atrophy
2. bleeding (pulmonary)
3. gap with the development of spontaneous pneumothorax
4. displacement of the mediastinal organs to one side
5. lung atelectasis

17) In case of pulmonary sequestration, in order to identify an additional vessel, it is necessary to perform
1. Plain X-ray of the chest
2.bronchography
3.aortography
4. ultrasound examination of the lung
5. bronchoscopy

18) Choose the most optimal treatment for bilateral bronchiectomy
1.conservative
2. pulmonectomy
3. bronchial resection
4. thoracocentesis with Bulau drainage
5.lobectomy

19) Percussion sound in bronchiectasis
1.lung sound
2.boxed
3.blunt
4.tympanic

20) With bronchiectasis, breathing that is not auscultated
1.vesicular
2.weak breathing
3. breathing "machine-gun fire"
4.wet and dry rales

21) The diagnosis of congenital lobar emphysema is made when
1. when puncturing the pleural cavity
2. when draining the pleural cavity
3. bronchoscopy, bronchography
4. tomography
5. inspection

22) Name the most rational approach for strangulated diaphragmatic hernia in a newborn
1.wide lateral thoracotomy
2. thoracotomy with vertical skin incision
3. thoracolaparotomy
4. laparotomy
5. laparotomy with transection of the left rectus muscle

23) What should be done after diaphragm repair for false diaphragmatic hernia
1. insert the decompression probe into the intestine
2. drain the pleural cavity followed by active aspiration
3. drain the pleural cavity followed by passive aspiration
4. prescribe a remedy that stimulates intestinal motility
5. carry out artificial ventilation of the lungs on the first day after surgery

24) The leading symptom of congenital diaphragmatic hernia is
1. respiratory disorder
2. indigestion
3. urinary disorder
4. disorder of the cardiovascular system
5. deformation of the chest

25) In the diagnosis of congenital diaphragmatic hernia, the most informative method is
1. Chest ultrasound

2.bronchoscopy
3. Plain X-ray of the chest
4. Plain X-ray of the abdominal cavity
5.contrast x-ray examination of the gastrointestinal tract

26) A characteristic sign of a hernia of the esophageal opening of the diaphragm
1. shortness of breath
2. vomiting with blood
3. vomiting with an admixture of bile
4.cough
5. heart failure

27) A characteristic sign of a false diaphragmatic hernia
1. convulsive syndrome
2.hyperthermic syndrome
3.respiratory failure
4. signs of intestinal obstruction
5. kidney failure

28) What form of diaphragmatic hernia requires emergency surgery
1.True diaphragmatic hernia
2. hiatal hernia
3.large true diaphragmatic hernia
4. False diaphragmatic hernia
5.Aperture relaxation

29) Diaphragmatic hernia is
1. movement of the lungs into the abdominal cavity
2. moving the mediastinal organs to the affected side
3. movement of the mediastinal organs to the healthy side
4. movement of the abdominal organs into the chest cavity
5. movement of the mediastinal organs into the abdominal cavity

30) In a newborn child with percussion, dullness over the right half of the chest, lack of breathing on the right, complete displacement of the mediastinal organs to the right are determined. Bronchoscopy reveals the absence of a bronchus. Make a diagnosis
1. lung hypoplasia
2. lung aplasia
3. lung agenesis
4.atelectasis
5. bulls

31) In a child aged 1 month. there is a lack of breathing on the right, a complete displacement of the mediastinal organs to the right. With bronchoscopy, the right main bronchus ends blindly. Make a diagnosis
1. lung hypoplasia
2. lung aplasia
3. lung agenesis
4.atelectasis
5.cystic hypoplasia

32) The examination revealed the absence of breathing on the right, dullness during percussion, displacement of the mediastinal organs to the right. On the P-gram, total darkening on the right with a shift of the mediastinal organs to the diseased side. Bronchoscopy shows narrowed, blindly ending lobar bronchi on the right. Make a diagnosis
1.bronchiectasis
2.agenesis
3. aplasia
4. lung hypoplasia
5.atelectasis

33) Urebenka aged 6 months. P-logical examination revealed cystic formation in the lung. The condition is satisfactory, there is no respiratory failure. Your tactics
1.wait and see
2.drainage of the cyst
3.surgical treatment
4.conservative treatment
5.sanatorium treatment

34) A patient with bronchiectasis of the lower lobe on the right has an exacerbation of the process in the lung. Prescribe a treatment
1.surgical treatment is indicated
2. surgical treatment is temporarily contraindicated
3.Surgical treatment is not indicated
4. Surgical treatment is contraindicated
5.sanatorium treatment

35) A long-lying foreign body was removed from the patient's respiratory tract. Bronchographic examination revealed bronchiectasis. Prescribe a treatment
1. surgery is temporarily not indicated
2.surgical treatment is indicated
3. Surgical treatment is contraindicated
4.Surgical treatment is not indicated
5.conservative therapy

36) The diagnosis of lung agenesis is specified on the basis of

1.clinical picture
2.spirometry
3.bronchoscopy, bronchography
4.Cytological examination
5.puncture of the pleural cavity

37) Specify the optimal method of treatment of the lobar cyst of the lung
1.conservative treatment
2. thoracentesis according to Bulau
3.Puncture and drainage of the cyst
4. resection of the area of the lung containing the cyst
5.pulmonectomy

38) With lobar emphesema, percussion is determined
1.dull sound
2. shortening of percussion sound
3.box sound
4.blunting
5. clear lung sound

39) The leading symptom of decompensated form of lobar emphysema is
1.cough
2.cyanosis
3.hyperthermia
4. sputum discharge
5.vomit

40) The best treatment option for congenital lobar emphesema is
1.conservative treatment
2. puncture of the emphysematous lobe of the lung
3.pulmonectomy
4. removal of the affected lobe of the lung
5. thoracentesis according to Bulau

**Answers to tests for self-control**

**1-3, 2-4, 3-2, 4-5, 5-3, 6-5, 7-5, 8-3, 9-3, 10-1, 11-2, 12-3, 13-4, 14-2, 15-4, 16-2, 17-3, 18-1, 19-1, 20-1, 21-4, 22-1, 23-3, 24-1, 25-5, 26-2, 27-3, 28-4, 29-4, 30-3, 31-2, 32-4, 33-1, 34-2, 35-2, 36-3, 37-4, 38-3, 39-2, 40-4.**

## CHAPTER 3. CONGENITAL HIGH INTESTINAL OBSTRUCTION (PYLORIC STENOSIS, INTESTINAL ATRESIA, LEDD'S SYNDROME, INTERNAL ABDOMINAL HERNIAS, UMBILICAL AND EMBRYONIC HERNIAS), CLINIC, DIAGNOSIS, TREATMENT, COMPLICATIONS, POSTOPERATIVE REHABILITATION

**The purpose of the training:** to develop the skills and abilities of clinical diagnosis, treatment and rehabilitation of children with congenital malformations and developmental anomalies: requiring surgical correction.

**Learning objectives:**

• Formation of knowledge on the etiology, pathogenesis and clinic of the most common malformations and developmental anomalies in children;

• Developing students' skills and abilities of clinical examination and examination of a child with congenital malformations and developmental anomalies, including laboratory, radiation and instrumental research methods;

• Students mastering the diagnostic algorithm for malformations and developmental anomalies that pose a threat to a child's life;

• Acquaintance with the principles of surgical treatment of malformations and developmental anomalies and their complications;

• Development of skills and abilities of general medical care: based on treatment and diagnostic standards and protocols for postoperative rehabilitation of children with congenital malformations and developmental anomalies.

**Location of the lesson:** Department of Thoracic Surgery, Operating Room, Computer Room, Training Room

**Monitoring and evaluation:** oral control: control questions,
performance of educational tasks in groups.

**Written control:** control questions.

### HERNIA OF THE UMBILICAL CORD

**A hernia of the umbilical cord,** umbilical hernia or embryonic hernia (omphacele) is a malformation in which, by the time the child is born, part of the abdominal organs is located extraperitoneally - in the umbilical membranes, consisting of amnion, Wharton's jelly and primary undifferentiated peritoneum.

In early embryogenesis, as a result of the mismatch of the "critical periods of development" of the intestine in the abdominal cavity, the latter cannot accommodate the rapidly increasing intestinal loops. Located extraperitoneally, in the umbilical membranes, they go through a temporary stage of "physiological embryonic hernia", and then, having completed the "rotation process", return to the growing abdominal cavity. If, as a result of a violation of the process of intestinal rotation, underdevelopment of the abdominal cavity or a violation of the closure of the abdominal wall, part of the organs remains in the umbilical membranes, the child is born with a hernia of the umbilical cord.

Depending on the time of stopping the development of the anterior abdominal wall, two main types of umbilical hernias are distinguished - embryonic and fetal.

With embryonic hernias, the liver does not have a fibrous membrane (glisson capsule) and fuses with the membranes of the umbilical cord.

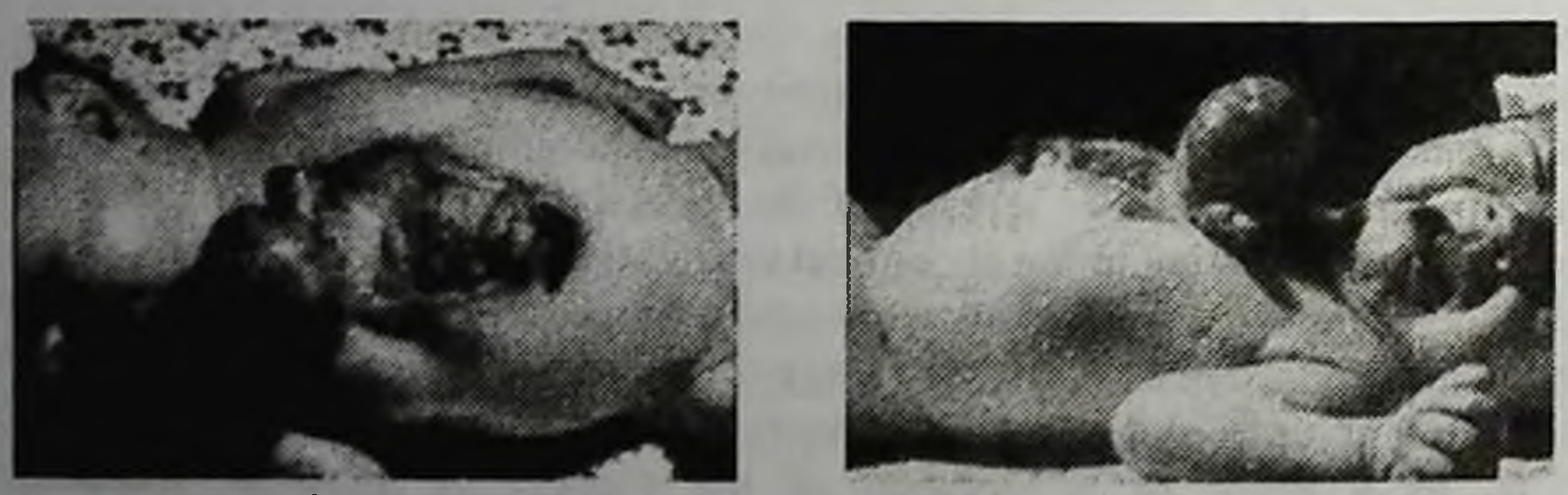
The population frequency is 1:6000 newborns. The pattern of inheritance is presumably autosomal dominant and X-linked. Approximately 65% of children with embryonic hernias have combined malformations of the heart (tetralogy of Fallot), gastrointestinal tract, genitourinary system, Beckwith-Wiedemann syndrome.

**Clinic and diagnostics.** When examining a child, it is found that part of the abdominal organs is located in the umbilical membranes. The size of the hernial sac varies from small (2-5 cm) to gigantic - 15-20 cm (Fig. 20-21).

A B

**Figure 20(a). Embryonic hernia of the umbilical cord of small sizes**
**Figure 21(b). Embryonic hernia of the umbilical cord of large sizes**

The hernial orifice is an enlarged umbilical ring, the size of the defect of which ranges from 1-2 cm to a significant one. Depending on the size of the defect in the umbilical ring, the hernia can be elongated with a narrow gate or hemispherical. The umbilical cord passes into the top of the hernial sac, in which three umbilical vessels pass before entering the abdominal cavity. The contents of the hernial sac can be the intestines, stomach, liver. With a diaphragm defect, ectopia of the heart is observed (Fig. 22).



A B

**Figure 22 (a, b). Diaphragmatic defect, ectopic heart**

In the first hours after birth, the umbilical membranes that form the hernial sac are shiny, transparent, whitish in color. However, by the end of the first day, they dry out, become cloudy, then become infected and covered with fibrin deposits.

If measures are not taken to prevent and treat infected membranes, peritonitis and sepsis may develop. With thinning and rupture of the membranes, eventration of the internal organs occurs, peritonitis develops (Fig. 23).

According to the classification of the hernia of the umbilical cord are divided as follows: in size: small (up to 5 cm); medium (up to 10 cm); large (more than 10 cm); according to the condition of the hernial membranes: uncomplicated (unchanged hernial membranes); complicated (rupture of the membranes, their purulent fusion, intestinal fistulas).

Diagnosis of hernia of the umbilical cord is not difficult.

**Figure 23. Rupture of membranes of embryonic hernia with eventration of internal organs**

**Treatment** of children with hernias of the umbilical cord begins immediately upon diagnosis. Two methods of treatment are used: operative and conservative. Newborns with small and medium hernias with a well-formed abdominal cavity and the absence of aggravating factors (deep prematurity, birth trauma, sepsis) are subject to radical surgical intervention. The operation is reduced to excision of the umbilical membranes, reduction of the viscera and plastic surgery of the anterior abdominal wall.

Conservative treatment is indicated for children with large hernias, underdevelopment of the abdominal cavity, aggravated premorbid background. Immediately after birth, the shells are treated with 2% tincture of iodine, alcohol, 5% potassium permanganate solution, followed by the application of sterile dressings.

As a result of daily dressings, the membranes turn into a black scab, impervious to infection. As granulations appear, the coagulation scab is shed and marginal epithelialization begins.

During this period, dressings with drugs that stimulate regeneration are shown (iruksol, Shostakovsky's balm, solcoseryl, etc.). The hernial sac is gradually covered with epithelium, shrinks, decreases, the contents are partially immersed in the abdominal cavity. Complete epithelialization is observed after 2-2.5 months.

To reduce the time of conservative treatment, the method of gradual immersion of the internal organs into the abdominal cavity with gradual ligation from the bottom of the hernial sac is currently widely used, as shown in Figure 24. After conservative treatment, a ventral hernia is formed. It is eliminated surgically at the age of 2-5 years.

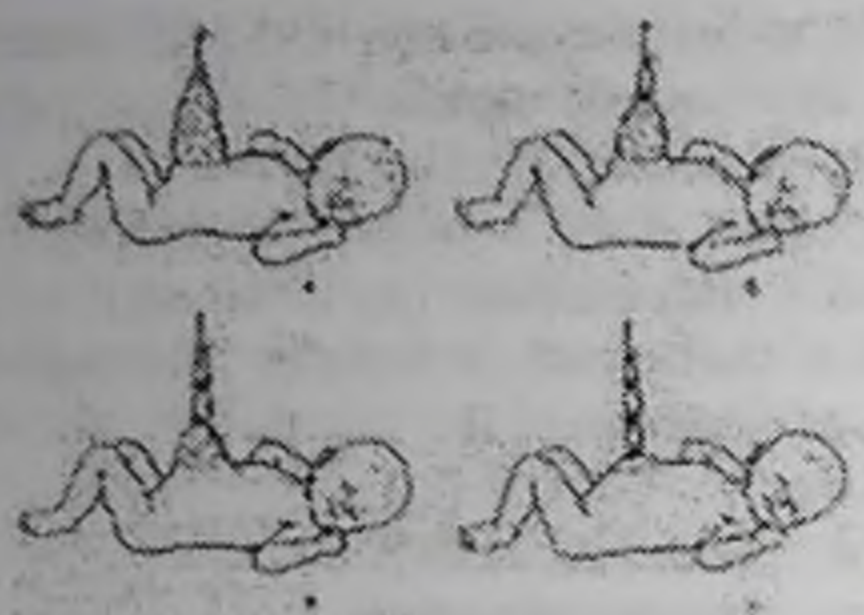


**Figure 24. Conservative treatment**

A functional test is preliminarily performed to determine the degree of compensation for the increase in intra-abdominal pressure when the hernia is reduced. If the pulse and respiration rate, blood gas parameters remain within the normal range, the hernia can be eliminated. With increased heart rate and shortness of breath, the operation is postponed until the abdominal cavity reaches a sufficient size. In the preoperative period, it is mandatory to massage the muscles of the abdominal wall, therapeutic exercises and use a bandage that prevents protrusion of internal organs.

**The prognosis** for hernias of the umbilical cord is always serious, especially in immature children with associated malformations.

**Children successfully operated on in the neonatal period grow and develop normally in the future.**

## UMBILICAL HERNIA

**An umbilical hernia** - a defect in the development of the anterior abdominal wall - is quite common in children, especially in girls. The conditions conducive to its formation are the anatomical features of this area.

After the umbilical cord falls off, the umbilical ring closes. However, it closes tightly only in the lower part, where two umbilical arteries and the urinary duct pass in the embryo, which, together with the surrounding embryonic tissue, form dense connective, and then fibrous tissue. This gives the lower part of the scar tissue greater density. The upper section of the umbilical ring, through which only the umbilical vein passes, which does not have a sheath, is much weaker than the lower one. In addition, in some cases, the underdeveloped abdominal fascia closes it only partially. With underdevelopment of the fascia, as well as in areas where it is not dense enough, small defects are formed that contribute to the development of a hernia.

Under such anatomical conditions, the navel is a weak point of the anterior abdominal wall, predisposing to the formation of a hernia. In this case, various moments that increase intra-abdominal pressure are of great importance. Long-term diseases that cause a violation of muscle tone and tissue turgor also create favorable conditions for the formation of an umbilical hernia.

**Clinic and diagnostics.** An umbilical hernia is manifested by a protrusion of a rounded shape of different sizes. In a calm state and in the position of the child lying down, the hernial protrusion is easily reduced into the abdominal cavity, and then the umbilical ring is well palpated.

With large hernias, the skin over it is stretched and thinned, the child is restless, and parents often believe that the hernia causes pain to the child. The subjective sensations of the child depend on the form of the hernia. With a wide umbilical ring, when a hernial protrusion appears at the slightest disturbance of the child, but is also quickly and easily reduced, there is no reason to think that the contents of the hernia are injured and cause pain. With a small hole with rigid edges, there is every reason to worry the child.

**Treatment** for an umbilical hernia depends on its shape and the age of the child. In a significant number of cases in children in the process of growth, self-healing is observed, which usually occurs by 2-3 years. The closure of the expanded umbilical ring is promoted by massage and gymnastics, aimed at developing and strengthening the muscles of the anterior abdominal wall. Treatment begins at the age of 1 month with the child lying on his stomach for 1-3 minutes 5-6 times a day 15-20 minutes before meals. In this position, children strain their back muscles, trying to raise their heads, move their arms and legs, which helps to strengthen the overall tone and develop muscles, including the abdominals. In the future, it is advisable to use massage and a set of exercises prescribed by a methodologist for physiotherapy exercises. The mother can conduct massage and gymnastics.

After three years, the umbilical ring, as a rule, does not close on its own and one cannot count on self-healing. Surgical intervention - plastic closure of the umbilical ring is performed after the age of 5 years.

**A hernia of the white line of the abdomen** occurs due to small defects in the aponeurosis, located near the midline, between the navel and the xiphoid process. Often there are hernias located directly above the navel - paraumbilical. The umbilical ring is completely closed. With an external examination of a child, a paraumbilical hernia is difficult to distinguish from an umbilical one, but palpation of the hernial ring easily makes it possible to determine that it is located above the navel.

**Clinic and diagnostics.** Unlike an umbilical hernia, a hernia of the white line of the abdomen occurs mainly in older children. Hernial protrusion comes in different sizes. Often, only the preperitoneal tissue protrudes into the defect of the aponeurosis. In some cases, pain may occur, which is associated with the involvement of the parietal peritoneum, which forms the hernial sac, into the defect of the aponeurosis. Infringement of a hernia of the white line of the abdomen in children is an extremely rare occurrence.

**Treatment.** Hernias of the white line of the abdomen, including paraumbilical ones, do not show a tendency to spontaneous closure, so their treatment is only surgical. The operation is performed after the diagnosis is established.

## CONGENITAL PYLORIC STENOSIS

The disease is based on a violation of the patency of the pyloric part of the stomach, due to a malformation of the pyloric sphincter in the form of a violation of its morphological structures (muscle fibers at the level of caveolae and myofibrils, their histochemical disorders and nerve elements). The disease is genetically heterogeneous. Sex-linked recessive and autosomal dominant inheritance has been described. Population frequency 0.5 - 3:1000. Male to female ratio 4:1.

**Clinic and diagnostics.** The first symptoms of the disease usually appear from the end of the 2nd - the beginning of the 3rd week. Initially, they notice vomiting with a fountain that occurs between feedings. The vomit is stagnant in nature, their volume exceeds the dose of a single feeding, they contain curdled milk with a sour smell. The child begins to lose weight, signs of dehydration appear, accompanied by a decrease in urination and scanty stools. In the acute form of the disease, symptoms develop rapidly - within a week. The symptoms of acute dehydration II-III degree and decompensated metabolic alkalosis predominate. In the subacute form, the symptoms develop gradually: regurgitation, single or double vomiting, which, becoming more frequent, leads to malnutrition. This form is not accompanied by severe water and electrolyte disturbances.

The diagnosis is confirmed by clinical, laboratory, instrumental and x-ray studies.

When examining a patient, attention is paid to the degree of development of malnutrition, exsicosis, when examining the abdomen - to swelling of the epigastric region, increased peristalsis of the stomach in the form of an hourglass (Fig. 25).

**Figure 25. Hourglass symptom in pyloric stenosis**

In some cases, it is possible to determine a hypertrophied pylorus by palpation. Laboratory data indicate blood clotting (decrease in BCC, BCP; increase in BCC, hemoglobin, hematocrit), hypochloremia, hypokalemia, metallic alkalosis.

An x-ray examination pays attention to an increase in the size of the stomach, the presence of a large level of liquid on an empty stomach, reduced gas filling of the intestinal loops (a - plain radiograph).

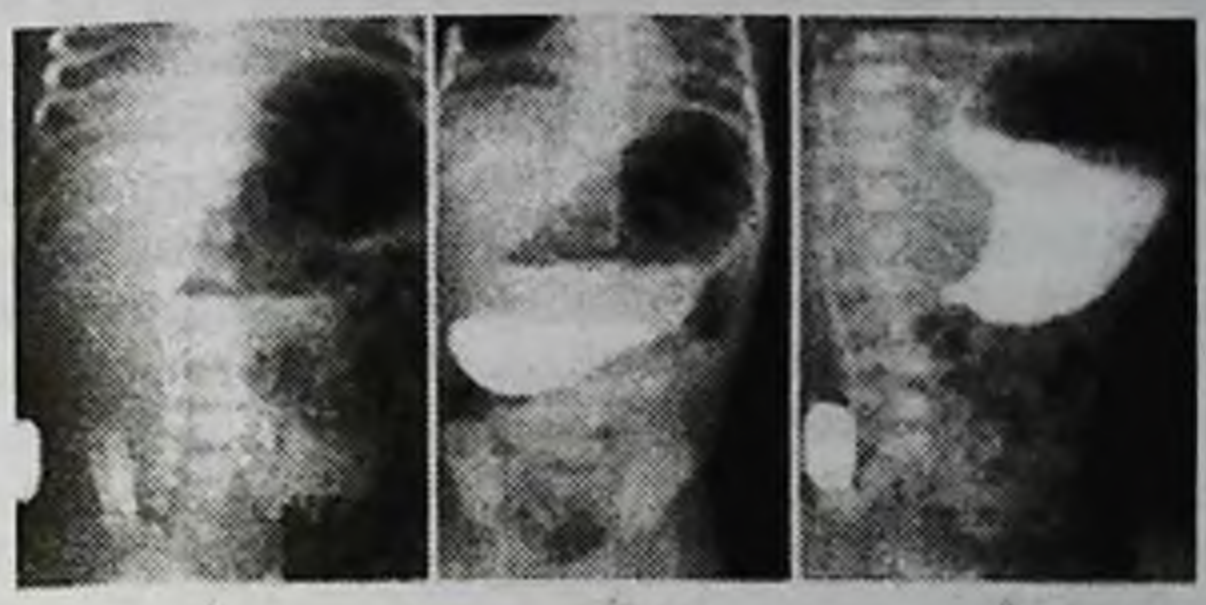


**Figure 26 (a, b, c). X-ray contrast study of the stomach.**

An X-ray contrast study is performed in a vertical position 30-40 minutes after the administration of a contrast agent (5% aqueous suspension of barium in breast milk in the volume of a single feeding). The segmenting peristalsis of the stomach and the absence of primary evacuation into the duodenum are visible (b). On the radiograph in the lateral projection, a narrowed pyloric canal is determined - a symptom of the "beak" (c) (Fig. 26).

All radiographs should be taken with the child upright. As a rule, no further examination is required.

Recently, **fibroesophagogastroscopy** has been used to diagnose pyloric stenosis.

At the same time, the expanded folded antrum of the stomach is visible, the lumen of the pyloric canal is sharply narrowed to the size of a pinhead, does not open when inflated with air (unlike pylorospasm).

**Figure 27. Ultrasound picture of pyloric stenosis**

In addition, fibroscopy makes it possible to examine the esophagus, to determine the severity of reflux esophagitis, which often accompanies pyloric stenosis. Ultrasound diagnostics is also possible (Fig. 27).

Differential diagnosis is carried out with pylorospasm, pseudopyloric stenosis (adrenogenital syndrome, salt-losing form - Debre-Fibiger syndrome), gastroesophageal reflux, duodenal stenosis above the major duodenal papilla.

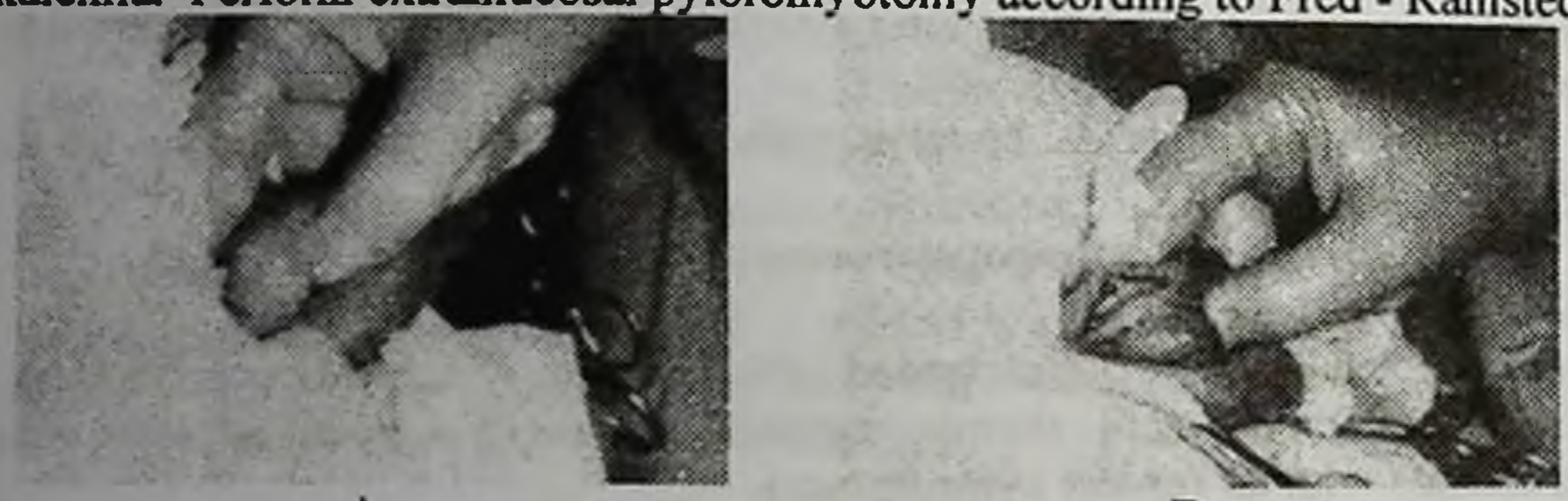
**Differential diagnosis** is based on the difference in time and the nature of clinical manifestations, laboratory data, X-ray and endoscopic picture.

With pylorospasm as a result of vegetative dystonia of the sympathetic type, the disease begins at birth; anti-spasmodic therapy and NMC treatment give a good effect. Endoscopically, the pylorus is well passable. The adrenogenital syndrome is characterized by an admixture of bile in the vomit, polyuria, periodically liquefied stools, hyperkalemia, hyponatremia, and metabolic acidosis. Endoscopically and radiographically, the pylorus is well passable.

Children with gastroesophageal reflux typically present with onset at birth, vomiting, and regurgitation when lying down. Endoscopically determined fibrinous-ulcerative esophagitis, gaping cardia, x-ray - the presence of gastroesophageal reflux.

For high partial intestinal obstruction of the duodenum, the appearance of symptoms from the first days of life is specific; x-ray revealed the presence of two levels of fluid in the stomach and duodenum, its expansion.

**Treatment.** Pyloric stenosis requires surgical treatment. The intervention is preceded by preoperative preparation aimed at correcting hypovolemia, alkalosis, and hypokalemia. Perform extramucosal pyloromyotomy according to Fred - Ramstedt.



A B

**Figure 28 (a, b). Stages of pyloromyotomy according to Fred-Ramstedt**

During the operation, the anatomical obstruction is removed and the pyloric patency is restored (Fig. 28).

3-6 hours after the operation, the child begins to drink 5% glucose solution, then 5-10 ml of milk after 2 hours. On the following day, the amount of milk is increased daily by 100 ml (10 ml per feeding). By the 6th day, the volume of feeding is increased to 60-70 ml with an interval of 3 hours, after which the child is transferred to normal feeding. In the first days after surgery, the deficiency of fluid, electrolytes, protein and other ingredients is replenished through infusion therapy and auxiliary parenteral nutrition, as well as the appointment of microclysters (5% glucose solution and Ringer-Locke solution in equal amounts of 30 ml, 4 times a day in warm form).

**The prognosis** is favorable. Children require dispensary observation for the purpose of further treatment of malnutrition, anemia, hypovitaminosis.

The second period lasts from the 10th to the 12th week of embryogenesis and consists in the return of the "middle" intestine to a sufficiently grown abdominal cavity, the intestine continues to rotate counterclockwise by another 90 °. If rotation is delayed at this stage, the baby is born with incomplete intestinal rotation. In this

case, the "middle" intestine remains fixed at one point at the place of origin of the superior mesenteric artery. The loops of the small intestine are located in the right half of the abdominal cavity, the blind - in the epigastric region, and the large intestine - on the left. With such fixation, there are conditions for the development of volvulus around the root of the mesentery and for the development of acute strangulation intestinal obstruction. The caecum, located in the epigastric region, is fixed by embryonic strands that compress the duodenum and cause its obstruction. The combination of compression of the duodenum with a volvulus of the "middle intestine" is regarded as **Ledd's syndrome** (Fig. 29).

**Figure 29 (a, b, c, d, e). Variants of incomplete bowel rotation.**

Surgical treatment – Ledd`s operation.

**I. Curation of patients on the topic - 15 minutes**
**II. Participation in the dressing room and operating room - 20 minutes;**
**III. Implementation of practical skills - 15 minutes:**

## PRACTICAL SKILLS

**Probing and gastric lavage (see chapter 1)**
**Performing a cleansing enema**

- indications: for the release of the intestine from feces, constipation, food poisoning, preparing the patient for operations, rectoscopy, colonoscopy, X-ray examination of the intestine, kidneys, ultrasound, before the introduction of drugs;
- explain to the patient's parents about the upcoming manipulation;
- check the readiness of the necessary tools and medicines: water at room temperature, a can with a soft tip, Esmarch's mug, vaseline oil;
- take the balloon in the right hand, release air from it and fill it with water (temperature 20-22 ° C), remove the air, slightly squeezing the balloon until liquid appears from the tip turned upwards. Lubricate the tip with Vaseline;

**Figure 30. Stages of a cleansing enema.**
Note: Required amount of water:

Newborn - 25-30 ml; For a baby - 50-150 ml; 1-3 years - 150-250 ml.
- lay the child on the left side, with the lower limbs pulled up to the stomach:
Note: lay the child under 6 months on his back and lift his legs up.
- spreading the buttocks of the child with 1 and 2 fingers of the left hand, placing the can with the tip up, carefully move it into the anus, directing it first to the navel, and then, having overcome the sphincters, parallel to the coccyx;
- slowly press the canister from below, inject water and, without opening it, remove the tip from the rectum (place the canister in the waste material tray);
- to hold the injected fluid in the intestines with the left hand, squeeze the buttocks of the child for a few minutes;
- lay the child on his back, covering the perineum with a diaper (until stool appears or the urge to defecate).

## ANTI-SPASTIC THERAPY FOR SUSPECTED PYLOROSTENOSIS

**Indications:**
- differential diagnosis of pyloric stenosis from pylorospasm.

**Necessary conditions and tools:**
1. atropine or other neuroplegic agents (pipolphen, suprastin, etc.);
2. syringe;
3. pipette;
4. alcohol;
5. sterile cotton.

**Technique:**
1. We give a solution of atropine through the mouth, 2-3 drops (at the rate of 1-1.5 mg / kg) 3 times a day for 5-7 days (intramuscular administration of the drug is most rational);
2. Against the background of neuroplegic agents in patients with pylorospasm, there is a clear tendency to the disappearance of symptoms, while in patients with pyloric stenosis, signs characteristic of pyloric stenosis remain.

Below is a diagram showing the changes in symptoms during the use of neuroplegic agents.

*Scheme*

| *Piloric stenosis* | *Pylorospasm* |
|---|---|
| **The nature of vomiting** | |
| Permanent, does not disappear with the use of neuroplegics | Unstable, against the background of the use of neuroplegics tends to disappear |
| Large portions, fountain | Small portions of regurgitation |
| **Visible peristalsis of the stomach** | |
| It is observed often, in the form of an hourglass. Does not disappear after treatment with neuroplegics | It is observed very rarely. After treatment with neuroplegics, it disappears. |
| **Palpation data** | |
| The gatekeeper is palpated | The gatekeeper is never palpable |

| Child's body weight | |
|---|---|
| Stable or slowly increasing | Increases, often rapidly |

## CONSERVATIVE TREATMENT OF UMBILICAL HERNIA

- explain to parents the essence of the treatment of umbilical hernia;
- elimination of the causes associated with the release of a hernia;
- recommendations for general treatment (rickets, malnutrition, etc.);
- swaddling the baby;

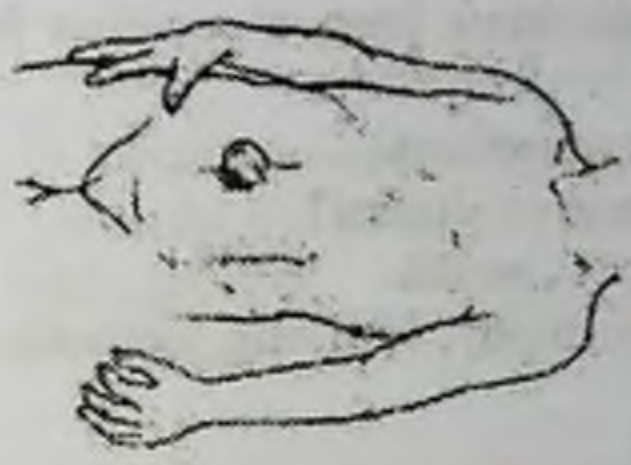


**Figure 31. Appearance of a patient with an umbilical hernia.**

- put the child on the stomach for 2-3 minutes (this achieves regular abdominal exercises, which contributes to the narrowing of the umbilical ring);
- carry out a light massage of the anterior abdominal wall with careful stroking along the rectus muscles and around the navel clockwise;
- application of an adhesive bandage;
- the hernia is reduced on both sides of the navel;
- the skin is collected in folds;
- fix it in this position with a wide strip of adhesive tape;
- the patch is changed no more than once every 7-10 days;
- in parallel, therapeutic exercises are carried out;
- the child is bathed daily.

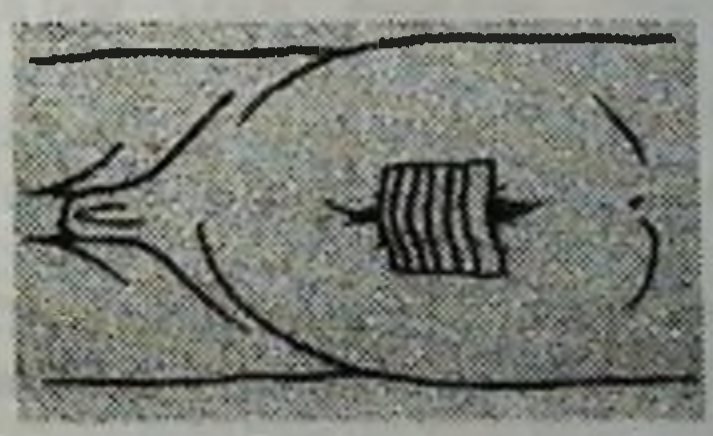


**Figure 32. Applying an adhesive bandage for an umbilical hernia**

**IV. Big break - 40 minutes (11.50-12.30).**

**V. Practical lesson (part 2) - 1 hour 35 minutes (12.30-14.05):**

**1. During classes, the use of electronic textbooks, video and photographic materials - 20 minutes;**

**2. UMM - 45 minutes**

## LEARNING ASSIGNMENTS

**Appendix 1**

### Group rules

**Member of each group**

- Respect for the thoughts of their comrades;
- Active and frequent participation in assignments, description of assignments;
- Can ask for help if necessary from comrades;
- Help your comrades in the group;
- Participate in group evaluation;
- Must know the rules "In the same boat, a common fate - to be saved or drown"

**Structure your responses to questions.**

1. What is included in the observed studies?
2. Laboratory and instrumental research.

**Give possible concepts:** Hypotrophy, vomiting, cyanosis, shortness of breath, regurgitation, pain, bleeding.

**Appendix 2**

### Tasks for groups

1. Specify the radiographic sign of congenital pyloric stenosis? Compile a cluster, SWOT table, Venn diagram for the word vomiting and draw up "Why?" diagrams. and a hierarchical "How?"

2. Specify tactics in case of damage to the mucosa of the pyloric part of the stomach during the operation of pyloromyotomy? Compile a cluster, SWOT table, Venn diagram for the word "hypotrophy" and draw up diagrams of "Why?" and a hierarchical "How?"

3. Specify the types of congenital intestinal obstruction. Compile a cluster, SWOT table, Venn diagram for the word "peristalsis" and draw "Why?" and a hierarchical "How?"

4. Specify the signs of high intestinal obstruction? Compile a cluster, SWOT table, Venn diagram for the word "dyspnea" and draw "Why?" and a hierarchical "How?"

5. What type of surgery is performed for congenital pyloric stenosis? Compile a cluster, SWOT table, Venn diagram for the word "stenosis" and draw "Why?" and a hierarchical "How?"

6. Specify the types of embryonic hernia of the umbilical cord? Compile a cluster, SWOT table, Venn diagram for the word "peritonitis" and draw "Why?" and a hierarchical "How?"

7. Specify the signs of congenital pyloric stenosis? Compile a cluster, SWOT table, Venn diagram for the word "habitus" and draw "Why?" and a hierarchical "How?"

8. Specify complications after pyloromyotomy? Compile a cluster, SWOT table, Venn diagram for the word "pain" and draw diagrams of "Why?" and a hierarchical "How?"

**Diagnostic map of learning technology in the classroom**

***Evaluation indicators - the criterion was manifested in the training session:***

| Group | Task 1 | Task 2 | Task 3: (for each question 0.2 points) | | | Sum of points |
|---|---|---|---|---|---|---|
| | (1,0) | (1,4) | Question 1 | Question 2 | Question 3 | (3,0) |
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |

**TABLE / X / Y** - Students answer the questions "what do you already know about this topic?" and "what do you want to know?"; Allows you to conduct research work on the text, topic, section

| Concept | know "+", don't know "-" | learned "+", could not find out "-" |
|---|---|---|
| Binary nomenclature: | | |
| Etiology | | |
| Pathogenesis | | |
| Clinic | | |
| Deontology | | |
| Symptom | | |
| Syndrome | | |
| Disease | | |
| Disease history | | |
| Outpatient card | | |
| Genetics | | |
| Infection | | |
| Diagnosis | | |
| Instrumental examination of patients: | | |
| Thermometer | | |
| Phonendoscope | | |
| Tonometer | | |
| Iodolipol, barium sulfate | | |
| Nasogastric tube | | |
| Palpation | | |
| Percussion | | |
| Auscultation | | |
| Anamnesis | | |
| Examination | | |
| General blood analysis, blood biochemistry | | |
| General urine analysis | | |
| ECG | | |
| FCG | | |
| EchoCG | | |
| Chest X-ray | | |

## INSERT TABLE

Insert table: a) provides systematization of information obtained during independent reading, listening to a lecture; confirmation, clarification, rejection, tracking the understanding of the information received b) contributes to the formation of the ability to link previously mastered information with new

Rules for compiling an INSERT table:

| Concepts | V | + | - | ? |
|---|---|---|---|---|
| Congenital high intestinal obstruction (pyloric stenosis, intestinal atresia, Ledd's syndrome, internal abdominal hernias, umbilical and embryonic hernias), clinic, diagnosis, treatment, complications, postoperative rehabilitation | | | | |
| Place in medicine | | | | |
| The main objective of the subject | | | | |
| Types of disease | | | | |
| The sequence of studying the subject | | | | |
| Learning aids | | | | |

**Where: V - corresponds to the existing knowledge (information) about ...**

**-contradicts existing knowledge about...**

**+ - is new information**

**? -incomprehensible or requiring clarification, addition information**

## CONCEPT TABLE

| Vertically - comparisons with diseases (theories) are located | Horizontally - various signs are located or symptoms of a disease. (recommendations, categories, various signs, etc.) | | | | | | |
|---|---|---|---|---|---|---|---|
| | Vomiting | Bloating | Lack of stool | Temperature increase | Intestinal peristalsis | Hypotrophy | R-graphy picture |
| Pyloric stenosis | | | | | | | |
| Intestinal atresia | | | | | | | |
| Ledd`s syndrome | | | | | | | |
| Intra-abdominal hernias | | | | | | | |
| Embryonic hernia of the umbilical cord | | | | | | | |

## SWOT

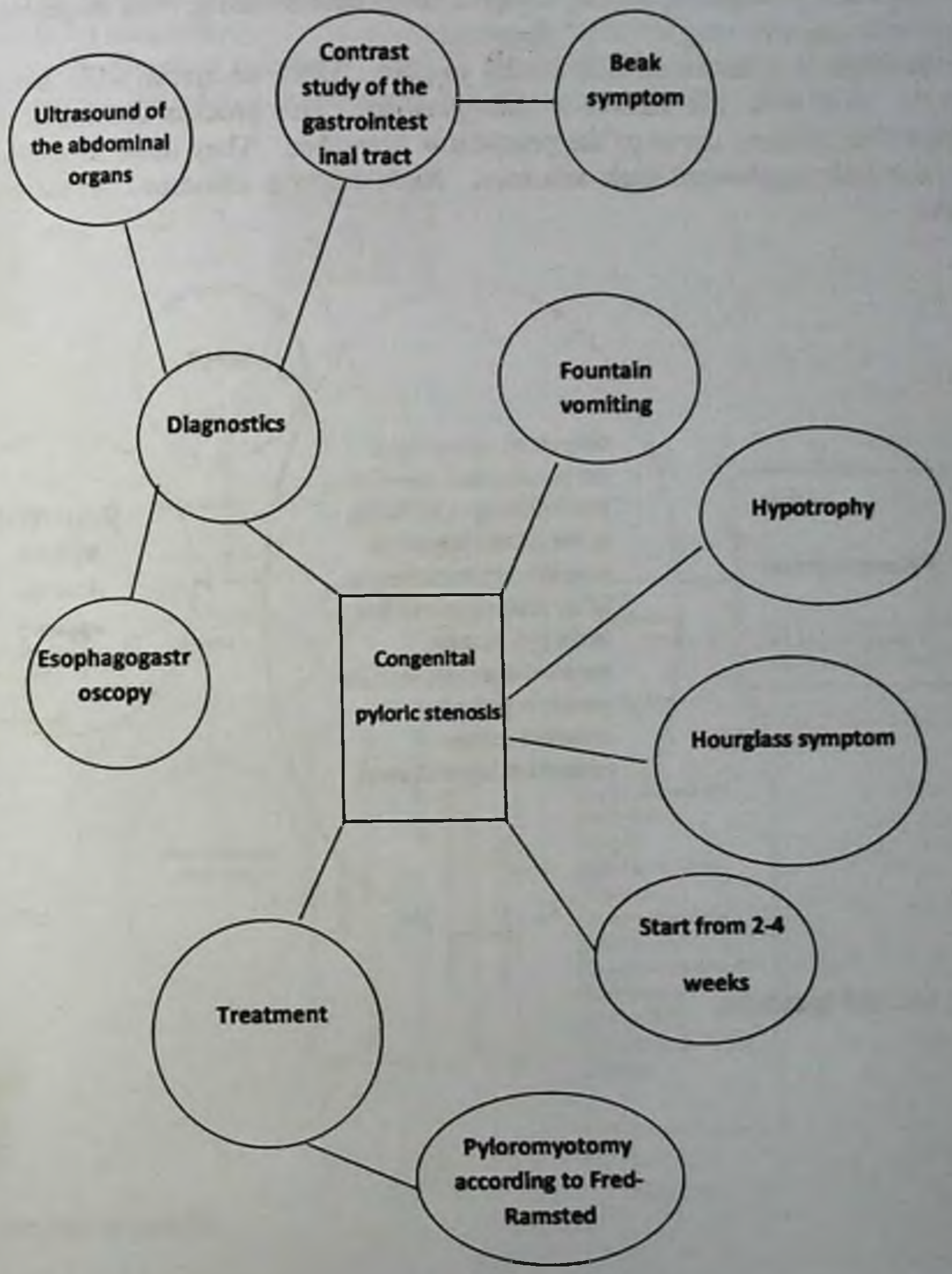
**(homework or SIW: for creative thinking after lectures or practical exercises)**

Analytical table - SWOT

| | |
|---|---|
| S | W |
| O | T |

Note: see 2nd appendix.

**CLUSTER (Bunch, bundle)**

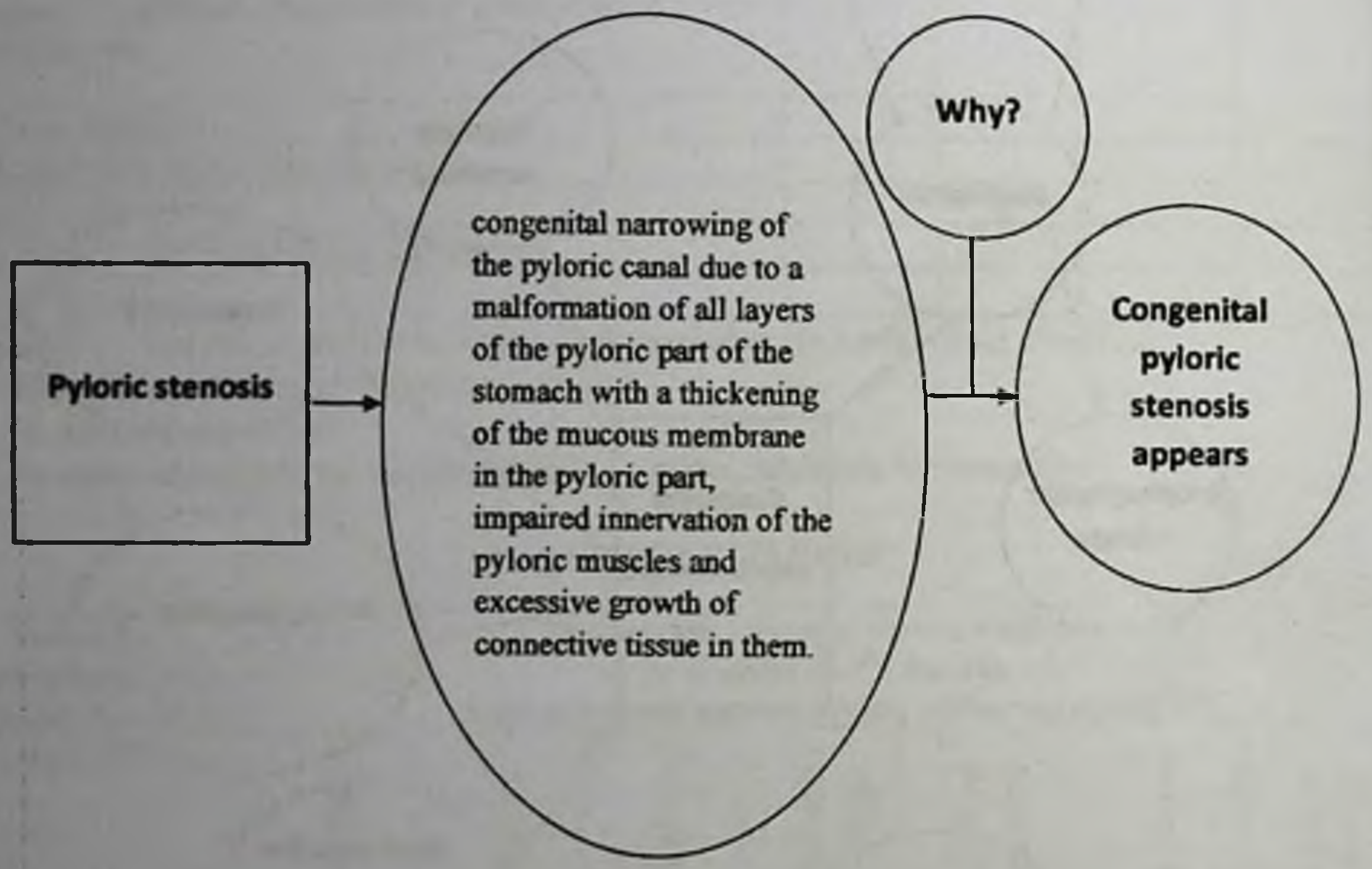



Note: see 2nd appendix.

## SCHEME "WHY?"

This is a whole chain of reasoning to identify the root cause of the problem. Develops and activates systemic, creative, analytical thinking. Get acquainted with the rules for constructing a "Why" diagram?

The problem is formulated individually in pairs. Draw an arrow with the question "Why"? And write the answer to this question. This process continues until the original (but hidden) cause of the problem is identified. They unite in mini-groups, compare and supplement their schemes. Reduced to a common. Presentation of results

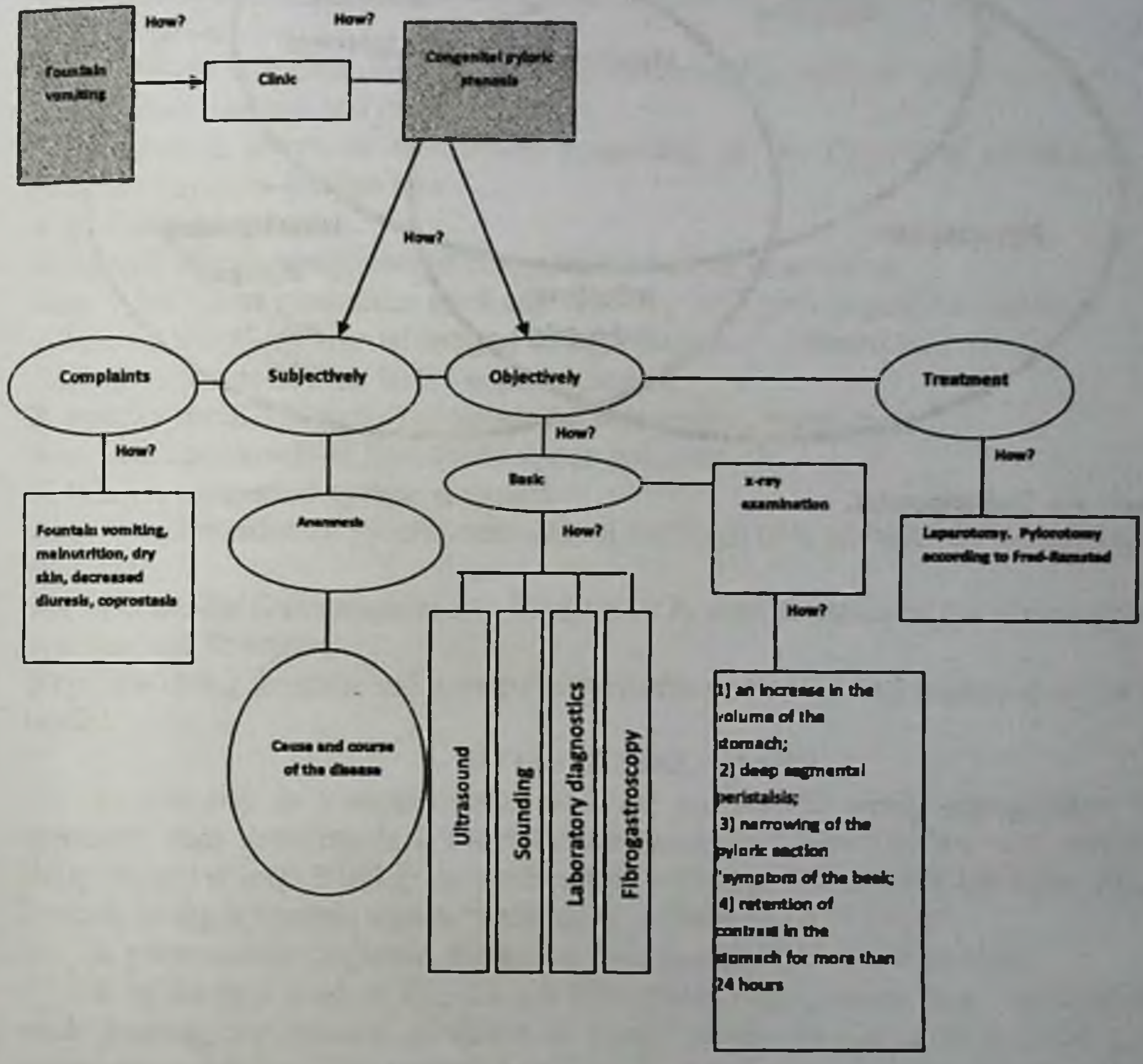



Note: see 2nd appendix.

## RULES FOR CONSTRUCTING THE "HOW" DIAGRAM

When solving a problem, in most cases you do not need to think about "What to do?". The problem is usually "How do I do this?". "How?" - the main question that arises in its solution.

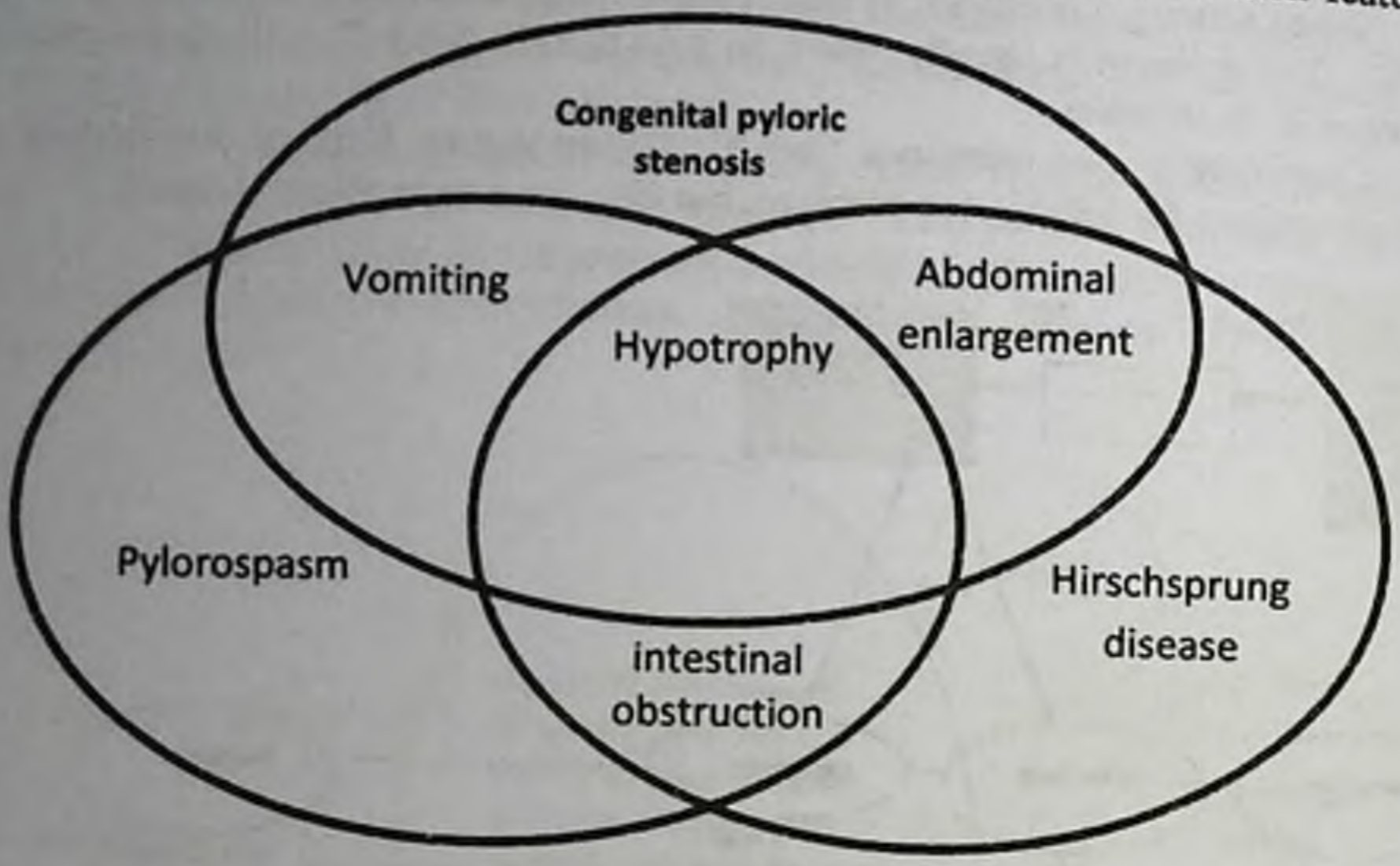
Consistent posing questions "how?" allows you to: Explore not only all the available options for solving the problem, but also ways to implement them;




Note: see 2nd appendix.

## VENN DIAGRAM

Used to compare or contrast or contraindicate 2-3 aspects and show their features




Note: see 2nd appendix.

## INTERACTIVE GAME QUESTIONS:

1. Name 4 groups of causes that are the causes of congenital intestinal obstruction.

Rep. Malformations of the intestinal tube, malformations of the intestinal wall, intestinal rotation disorders, malformations of other abdominal organs.

2. What is Ledd's syndrome?

Rep. The combination of compression of the duodenum with a volvulus of the "middle intestine".

3. Congenital intestinal obstruction by the level of the obstacle is - ....

Rep. High and low.

4. Congenital intestinal obstruction downstream will be divided into -....

Rep. Acute, chronic and recurrent

5. Congenital intestinal obstruction according to the degree of closure of the intestinal lumen is divided into - ....

Rep. Full and partial.

6. Specify 2 main symptoms of congenital intestinal obstruction.

Rep. Absence of meconium stool and vomiting with pathological impurities

7. Specify the X-ray sign of congenital high intestinal obstruction.

Rep. Two levels of fluid in the upper abdomen.

8. Specify the X-ray sign of congenital low intestinal obstruction.

Rep. Multiple levels of fluid in the upper abdomen.

9. What is congenital pyloric stenosis?

Rep. Malformation of pyloric sphincter in the form of a violation of morphological structures.

10. Indicate the first symptom and the time of its manifestation of congenital pyloric stenosis, and its nature.

Rep. Vomiting fountain and appears towards the end of the 2nd beginning of the 3rd week.

## SITUATIONAL TASKS

1. The boy is 1 month old. Sick for the second week, regurgitation first appeared, then vomiting in a fountain that occurs 4-5 times a day, rare urination. Body weight at birth 3400 g, on examination - 3500 g. The child is lethargic, the cry is weak, in the epigastric region "peristalsis" is determined "by eye".

A presumptive diagnosis, a plan for their examination and treatment?

2. In the first week of life, the girl first started regurgitation, then vomiting after each feeding, the amount of vomit is small. Body weight at birth 3100 g, on examination 3400 g. The general condition is satisfactory, but the child is restless, noisy. Skin integuments of physiological color, during physical examination from the organs of the chest and abdomen without pathological changes, with X-ray contrast examination - evacuation of the contrast agent from the stomach occurs after 15 minutes. and ends within 3 hours.

Presumptive diagnosis, examination plan and treatment?

3. A newborn 4 hours after birth developed vomiting with an admixture of bile. After feeding, vomiting intensified and became indomitable. You are a micropediatrician, when examining a child, you found adynamia, a weak cry, dry skin, retraction of the fontanel and eyeballs: the abdomen is involved in breathing,

soft, sunken in the lower sections and somewhat swollen in the epigastrium, grayish meconium came out only twice in small portions. The drop in body weight per day was 200 g.

Presumptive diagnosis. What is your tactic?

4. A 1.5-month-old girl was transferred from the district hospital. diagnosed with pyloric stenosis. From the anamnesis 2 weeks ago, intermittent vomiting with a fountain mixed with bile, diarrhea, adynamia, refusal to eat, weight loss appeared. The condition of the girl is moderate, lethargic, pale, the skin is dry, the abdomen is swollen in the epigatrium, there is swelling of the mammary glands, pubic hairiness.

Do you agree with the diagnosis? If you do not agree, then your assumptions and a further plan for examining the child.

5. Counseling patients in the children's department of the district hospital, you found a boy at the age of 6 weeks, who, with an established clinical and radiological diagnosis of congenital hypertrophic pyloric stenosis for 10 days, receives antispasmodic, infusion and restorative therapy. According to the pediatrician, the child's condition improved somewhat.

What are your recommendations?

6. A 2-month-old child was admitted to the emergency room with complaints of stool and gas retention, abdominal distention, and vomiting twice. Difficulties in passing gases and stools are noted from birth. Currently, cleansing enemas and the introduction of a gas outlet tube do not provide relief.

Presumptive diagnosis, additional research methods, treatment tactics?

7. Parents with a 10-month-old child, who has had difficulty passing stool since birth, applied for a consultation. Appetite is reduced. The child is pale, capricious, body weight is 8000 g. The chest is short, the abdomen is enlarged in diameter, flattened. The wall of the abdomen is flabby, loops of intestines filled with feces are palpable.

Your assumptions, the plan of examination of the child?

8. A 5-year-old child was delivered to the emergency room of the hospital with complaints of abdominal pain and stool retention for 3 days. Physical examination of the chest revealed no pathology. The abdomen is soft, painful on palpation, there are no symptoms of peritoneal irritation.

Preliminary diagnosis with your activities?

9. In a 6-year-old child with chronic constipation, during a preventive examination in the abdominal cavity above the womb, you found a round, mobile, painless tumor of test consistency, 8x6x5 cm in size.

Your assumptions, tactics?

10. Describe the basic principles of conservative therapy for Hirschsprung's disease.

## SELF-CHECK TESTS

1) Surgical treatment for pyloric stenosis is provided by the method:

1. Duhamel-Bairov
2. Wangensten
3. Frede-Ramstedt
4. Wankelman

5. Petrivalsky

2) A characteristic symptom for pyloric stenosis in a contrast study research institutes of the gastrointestinal tract:
1.after 20 min. contrast in the stomach
2. after 1 hour in the stomach and intestines
3.after 12 hours in the stomach and small intestine
4. after 6 hours in the stomach
5.after 24 hours in the stomach

3) Symptom characteristic of pyloric stenosis:
1. vomiting from birth
2. frequent vomiting
3.fantastic vomiting
4.presence of bile in vomit
5. change in the nature of vomiting within a week

4) X-ray symptom characteristic of pyloric stenosis:
1.uniform darkening of the abdominal cavity
2. Kloiber bowls 2 pieces
3.Multiple Cloiber bowls
4. increase in the size of the stomach
5.presence of fluid in the stomach on an empty stomach

5) In a contrast study, non-characteristic X-ray a sign of pyloric stenosis is:
1. Symptom of communicating vessels
2.constasta depot in the stomach and duodenum 12
3.contrast retention in the stomach
4.narrowing of the pyloric canal (in an oblique position)
5.enlargement of the stomach

6) With giant hernias of the umbilical cord, treatment is carried out:
1.conservative
2. radical plate of the anterior abdominal wall
3.ventral hernia creation
4. alloplasty of anterior abdominal wall defect
5.treatment is not carried out

7) Causes of a hernia of the umbilical cord:
1. violation of the normal growth of intestinal loops
2. violation of the development of embryogenesis in the first weeks of intrauterine life
3. Violations of embryogenesis in the last months of intrauterine life
4.excessive enlargement of the liver

5.increased intra-abdominal pressure

8) How are hernias of the umbilical cord classified according to the condition of the membrane

1.compensated, decompensated
2.acute, chronic
3. uncomplicated, complicated
4. not infected, infected
5. with eventration and without eventration of organs

9) When does vomiting begin in pyloric stenosis

1.from birth
2. one year after birth
3. one month after birth
4.2-3 weeks after birth
5.after 6 months

10) Operation used for pyloric stenosis

1.pyloroplasty
2.pyloromyotomy
3.gastro-duodenal anastomosis
4.gastrostomy
5. gastrojejunostomy

11) The main clinical symptoms of congenital intestinal obstruction

1.vomiting blood, absence of meconium, bloating, hyperthermia, intoxication
2. vomiting, lack of meconium, bloating, exsicosis, toxicosis
3.vomiting, bloody stools, bloating, intoxication
4.abdominal pain, diarrhea, vomiting
5. no stool, vomiting with blood, bloating

12) The main causes of congenital intestinal obstruction

1.malformation of the intestinal wall, violation of the rotation of the intestine, compression of the intestines by other organs
2.malformation of the intestinal tube, malformation in the intestinal wall, violation of the rotation of the intestine, compression of the intestine by other organs
3.violation of intestinal rotation, violation of the development of the abdominal wall
4. violation of the rotation of the intestine, compression of the intestine by other organs
5. malformation of the intestinal wall, violation of the rotation of the intestine

13) Diagnosis of congenital intestinal obstruction includes:

1.analysis, palpation, percussion, gastric probing, rectal examination, abdominal radiography
2. palpation, percussion, gastric probing, passage of the gastrointestinal tract
3.blood biochemistry, palpation, percussion, auscultation, stool analysis

4. palpation, recursion, gastric probing, rectal examination, abdominal radiography, passage of the gastrointestinal tract
5.analysis, ultrasound, rectal examination, percussion

14) X-ray sign of congenital intestinal obstruction
1.free gas in the abdomen
2. Kloiber bowl
3. intestinal pneumatosis
4.mute belly
5.Sickle symptom

15) Clinic of pyloric stenosis:
1.Fountain vomiting, hourglass symptom, weight loss
2. constipation, fever, gushing vomiting, weight gain
3.anemia, dehydration, regurgitation, oliguria
4. vomiting with bile, diarrhea, loss of weight
5. polyuria, fountain vomiting, hourglass symptom

16) With contrast radiography of the gastrointestinal tract, pyloric stenosis is characterized by
1. Kloiber bowls
2.contrast retention in the stomach for more than 24 hours
3.contrast delay in duodenum 12
4.fast evacuation of contrast from the stomach
5.reducing the size of the stomach, rapid evacuation of the contrast from the stomach

17) Anatomical border between congenital high and low intestinal obstruction
1.between the stomach and duodenum
2. middle part of the duodenum
3. initial section of the jejunum
4.ileocecal angle
5. transverse colon

18) Val's symptom with intestinal obstruction is characterized by
1. the presence of an empty ampoule of the rectum when viewed with a finger
2. auscultatory determination of the symptom of "falling drop"
3.visible intestinal peristalsis through the abdominal wall
4. the presence of local flatulence in the abdomen
5. the presence of fluid levels on the survey P-gram of the abdominal cavity

19) Symptoms of intestinal obstruction in newborns may consist of the following except:
1.stool retention
2. visible peristalsis of the intestine
3.bloating

4.melena
5.no vomiting

20) What do the 2 levels on the plain radiograph indicate?
1.jejunal atresia
2. acute form of Hirschsprung's disease
3. atresia of the pyloric canal
4.complete congenital obstruction of the duodenum
5. arterio-mesenteric obstruction

21) X-ray sign of acute congenital low intestinal obstruction
1. the presence of two gas bubbles and two levels of liquid, darkening of the lower half of the abdominal cavity
2.free gas under diaphragm dome
3. intestinal pneumatosis
4.presence of multiple liquid levels
5.distended stomach, no gas in bowel loops

22) An operative method for the treatment of duodenal atresia
1.imposition of a T-shaped anastomosis
2.duodeno-duodenoanastomosis
3.duodenostomy
4. gastrojejunostomy
5. Operation Mikulich

23) In which case, with congenital intestinal obstruction, the preoperative period should be short in order to avoid complications (rupture of the intestinal wall)
1.membrane of the pyloric stomach
2.atresia of the distal duodenum
3.atresia of the proximal duodenum
4. annular head of the pancreas
5. atresia of the distal part of the small intestine

24) A characteristic sign of congenital low intestinal obstruction
1. vomiting from birth
2.vomiting bile and intestinal contents
3. sunken belly
4. swelling of the anterior abdominal wall
5. copious discharge of flatus and meconium

25) High congenital intestinal obstruction includes
1. ileal atresia, annular pancreas, embryonic adhesions
2.duodenal atresia, meconium ileus, coprostasis
3.atresia of the distal jejunum, volvulus of the "midgut", intussusception of the intestine
4. atresia of the proximal end of the jejunum, aberrant vessel, Ledd's syndrome

5. atresia of the duodenum, valve of the pyloric part of the stomach, disease Irasek-Sulzer-Wilson

26) The leading link in the etiology of pyloric stenosis:
1.intrauterine infection and subsequent scarring of the pyloric channel
2.congenital deficiency of parasympathetic nerve formations and congenital pyloric stenosis
3. Hyperplasia of the pylorus circular muscle and malformation of the parasympathetic ganglia
4.hyperplasia of the longitudinal muscle of the pylorus and hypertrophy of the mucosa of the pyloric canal
5. hypertrophy of all muscle layers and abnormal innervation of the pylorus parasympathetic nerves

27) Time of onset of clinical symptoms of pyloric stenosis
1. the first day after birth
2. second week of life
3. third week of life
4. fourth week of life
5.after 1 month life

28) Leading clinical symptom of pyloric stenosis
1. shortness of breath
2.anxiety
3.vomit
4.convulsions
5. cyanosis

29) What is the characteristic of stool in pyloric stenosis
1.sparse, regular dark greenish color
2.constant constipation, scanty
3. plentiful, undigested
4.frequent, liquid, offensive
5.watery

30) Quantitative characteristics of vomiting in pyloric stenosis
1. poor regurgitation
2.regurgitation profusely
3.vomiting a fountain, more drunk milk
4. Vomiting is smaller in volume than the child sucked out for 1 time
5. indomitable vomiting

**Answers to tests for self-control**

**1-3, 2-3, 3-3, 4-4, 5-1, 6-1, 7-3, 8-4, 9-4, 10-2, 11-2, 12-2, 13-4, 14-2, 15-1, 16-2, 17-3, 18-3, 19-4, 20-4, 21-4, 22-2, 23-3, 24-2, 25-5, 26-5, 27-2, 28-3, 29-1, 30-3.**

# CHAPTER 4. LOW CONGENITAL INTESTINAL OBSTRUCTION (MECONIUM ILEUS, HIRSCHSPRUNG DISEASE, DOLICHOSIGMA, ANORECTAL MALFORMATIONS, UMBILICAL FISTULAS, DOUBLE INTESTINES) CLINIC, DIAGNOSIS, TREATMENT, COMPLICATIONS, POSTOPERATIVE REHABILITATION

**The purpose of the training:** to develop the skills and abilities of clinical diagnosis, treatment and rehabilitation of children with congenital malformations and developmental anomalies requiring surgical correction.

**Learning objectives:**

• Formation of knowledge on the etiology, pathogenesis and clinic of the most common malformations and developmental anomalies in children;

• Development of students' skills and abilities of clinical examination and examination of a child with congenital malformations and developmental anomalies, including laboratory, radiation and instrumental research methods;

• Students mastering the diagnostic algorithm for malformations and developmental anomalies that pose a threat to a child's life;

• Acquaintance with the principles of surgical treatment of malformations and developmental anomalies and their complications;

• Development of skills and abilities of general medical care: based on treatment and diagnostic standards and protocols for postoperative rehabilitation of children with congenital malformations and developmental anomalies.

**Location of the lesson:** department of emergency and purulent surgery, operating room, computer room, training room

**Monitoring and evaluation:** oral control, control questions, performance of educational tasks in groups.

**Written control:** control questions.

## ANORECTAL MALFORMATIONS

**Malformations of the anorectal region** occur with a frequency of 0.25 - 0.66:1000. The most common variants of the defect are shown in the figure.

Combined malformations (heart, urinary system, gastrointestinal tract, musculoskeletal system, central nervous system) occur in almost 30% of cases.

Anorectal defects are often observed in the following syndromes: caudal regression, VACTER, Opitz, Opitz - Fries, with chromosomal abnormalities 4p, 13q, etc. They occur in the ratio of male and female sexes 1:2.

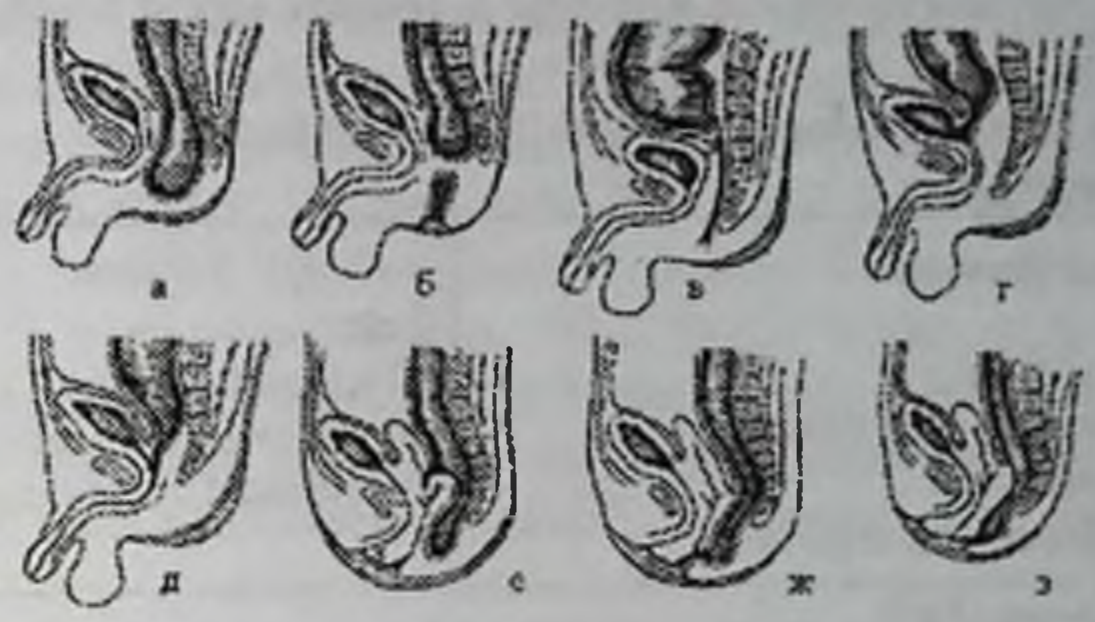


**Figure 33. Scheme of variants of anorectal defects**

In the first weeks of intrauterine life in an embryo, the anus (final) intestine opens along with the canal of the primary kidney into one common cavity - the cloaca, which is closed by a cloacal membrane. At the 4th week, the cloaca is divided by a descending septum from the mesoblast into two tubes. The anterior forms the bladder and ureters, and from the posterior, which is the continuation of the final intestine, the rectum with the anus is formed. From the 5th week, the ectoderm approaches the outer surface of the anal membrane and an anal fossa is formed, deepening towards the intestine. The process of perforation of the anal membrane ends by the 8th week of embryogenesis.

The occurrence of anorectal malformations depends on the stage at which there was a violation of normal embryogenesis. Violations of the formation and division of the internal cloaca cause the following types of defects: a) preservation of the cloaca; b) rectovesical fistula; c) rectovaginal fistula; d) rectovestibular fistula; e) atresia of the anus without a fistula; f) rectourethral fistula (Fig. 33).

Stopping development at the next stage leads to the birth of a child with an imperforated anal membrane or anal stenosis. Underdevelopment of the perineum causes ectopia of the anus and the formation of a covered anal opening with a perineal fistula.

In embryogenesis, the external sphincter of the anus develops independently. However, if we take into account that by the time the urorectal septum is formed, the fibers of the sphincter of the cloaca intersect at the height of the central core of the perineum, then in the absence or severe insufficiency of the rudiment of the primary perineum, the bundles of the external sphincter are incorrectly laid. With the most pronounced anorectal malformations, there is an absence or a sharp underdevelopment of the external sphincter.

In 1970, at the International Congress of Pediatric Surgeons in Melbourne, a classification was adopted, which was based on the relationship of the rectum to the muscles of the pelvic floor, in particular the puborrectal muscle. There are three groups of anomalies: high, medium, low. In the first case, agenesis and atresia of the rectum with or without a fistula are implied; the blind end of the intestine is located above the muscles of the pelvic floor. The second group includes defects in which the blind end of the intestine is located at the level of the pelvic floor. The third

group consists of variants when the intestine is located in the center of the loop of the pubic-rectal muscle.

**Melbourne classification of anorectal anomalies**

***High (supralevator)***

| | |
|---|---|
| *1. Anorectal agenesis*<br>*Boys:*<br>*a) without a fistula;*<br>*b) with a fistula - rectovesical, rectourethral.*<br>*2. Rectal atresia (boys, girls).* | Girls:<br>a) without a fistula;<br>b) with a fistula - rectovesical, rectocloacal, rectovaginal. |

***Middle (intramedial)***

| | |
|---|---|
| *1. Anal agenesis*<br>*Boys:*<br>*a) without a fistula;*<br>*b) with a fistula - rectobulbar.*<br>*2. Anorectal stenosis (boys, girls).* | Girls:<br>a) without a fistula;<br>b) with a fistula - rectovestibular. |

***Low (translator)***

| | |
|---|---|
| 1. Boys and girls:<br>a) covered anus - simple;<br>b) anal stenosis | |
| 2. Boys:<br>a) anterior perineal anus;<br>b) recto-perineal fistula | Girls:<br>a) anterior perineal anus;<br>b) rectovestibular fistula;<br>c) vulvar anus;<br>d) anovulvar fistula;<br>e) rectovestibular fistula |

Each anatomical form has its own characteristics.

**Atresia of one opening** is easily recognized during the initial examination: the anus is absent.

**Figure 34. Appearance of patients with anal atresia**

In all cases, it becomes necessary to determine the height of atresia, i.e., the ratio of the intestine to the levator muscles, which in newborns lie at a depth of 2 cm from the skin of the anal region. Low atresia means options when the blind end of

the intestine is located at a depth of up to 2 cm from the skin, and under medium and high atresia - when the blind end is located at a great depth. Clinically, from the side of the perineum, some features can be noted that make it possible to assess the height of atresia. With high atresia, the perineum is reduced in size, underdeveloped, the ischial tubercles are brought together, and the coccyx is often absent. At the site of the anus, the skin is most often smooth. The "push" symptom is negative (a jerky movement is applied with the index finger in the projection of the external sphincter; if the intestine filled with meconium is located near the perineum, then the researcher's finger feels a counterblow, while the symptom is considered positive) (Fig. 34).

If for some reason the examination of the child after birth was not carried out, then by the end of the day the newborn begins to worry, profuse regurgitation and vomiting of gastric contents, then bile and intestinal contents appear. The abdomen becomes sharply swollen, stretched bowel loops are visible. Meconium and gases do not depart. A picture of low intestinal obstruction develops.

In order to determine the height of atresia, an invertogram according to Wangensteen is performed (Fig. 35-36).

A radiopaque object (for example, a coin) is glued onto the projection area of the anus, after which a survey image is taken in a lateral projection in the position of the child upside down.

The height of the atresia is judged by the distance between the gas bubble in the atrezirovanny intestine and the mark on the perineum. This study should be performed 16 - 18 hours after birth, otherwise the gas does not have time to reach the atrezed intestine and you can get a false result.

**Figure 35. X-ray method according to Vangistin**

In doubtful cases, X-ray contrast studies are used. In the projection of the anus, the perineum is punctured by immersing the needle to a depth of 2 cm and, under the control of the x-ray screen, a 10-15% solution of verografin is injected. If the needle enters the intestinal lumen, then the latter is clearly contrasted.

With high atresia, the contrast agent infiltrates the tissue.

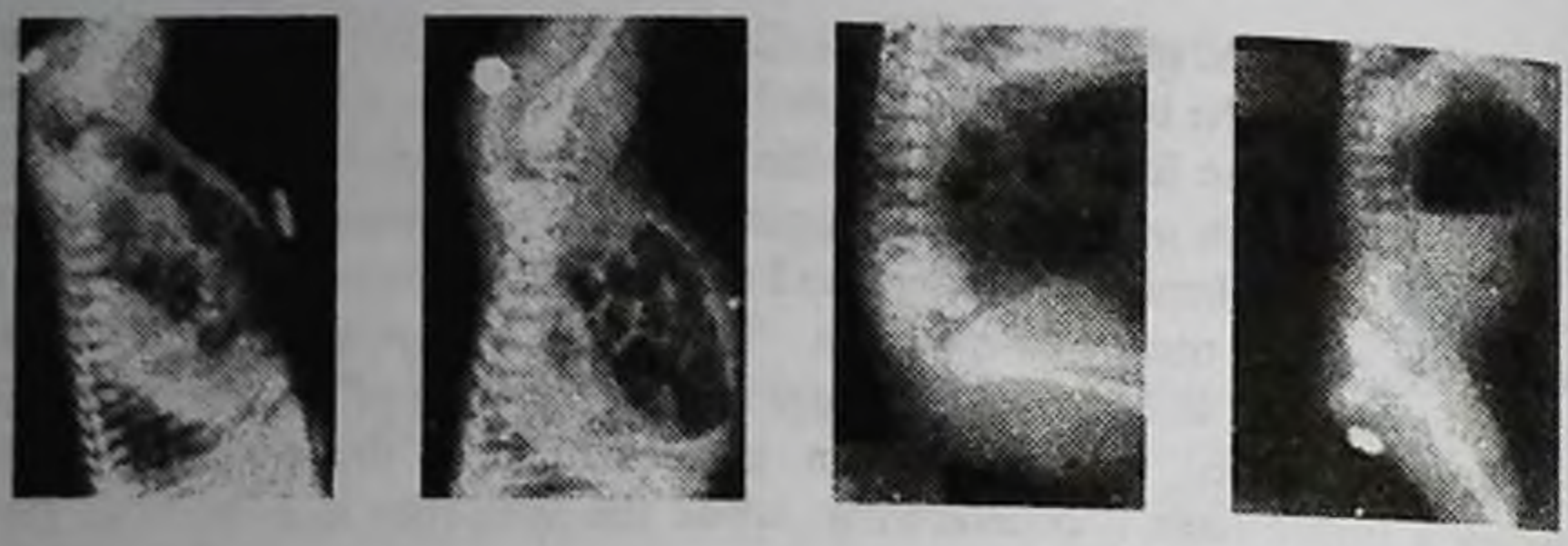


**Figure 36. Invertograms according to Vangistin in the lateral projection.**

Low and high forms of atresia

Currently, in order to determine the level of atresia, ultrasound scanning of the perineum has been widely used (Fig. 37).

**Figure 37. Ultrasound picture of anal atresia**

**Figure 38. Electromyography of the external sphincter**

The presence, location and usefulness of the external sphincter is determined using electromyography performed with needle electrodes from four points (Fig. 38).

The high frequency of combined malformations requires an ultrasound examination of the kidneys and heart, checking the patency of the esophagus and stomach.

**Atresia of the anus and rectum with a fistula into the urinary system** is the most severe form of the defect. It occurs almost exclusively in boys and, as a rule, with high forms of atresia. In the first day of life, the defect in the clinical course does not differ from the fistulous forms. By the end of 2 days, the child develops a picture of low intestinal obstruction, since fistulas with the bladder and urethra are more often narrow and impassable for meconium.

When examining a child, in some cases it is possible to detect the release of meconium from the external opening of the urethra. It is difficult to judge the location of the fistula. Most often, in almost 94% of cases, there is a rectourethral fistula with a membranous or prostatic part of the urethra. In these cases, the discharge of meconium from the urethra is insignificant and may not be associated with urination. Meconium is ejected at the beginning of the act of urination almost unchanged, and the last portions of urine, as a rule, are transparent. Passage of gases through the urethra is observed outside of urination.

In cases where the fistula opens into the bladder, meconium constantly mixes with urine and stains it green. When urinating, urine is intensely colored green, especially its last portions.

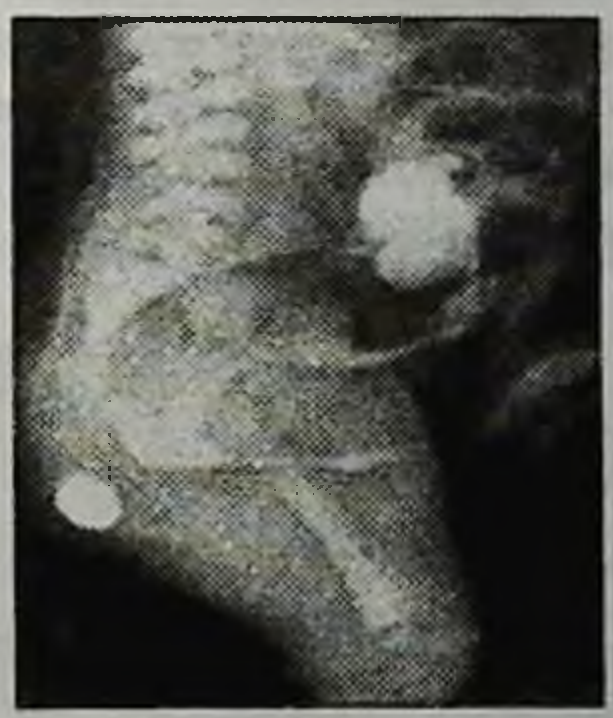


**Figure 39. Contrast urethrocystography in lateral projection**

The listed signs can be expressed to varying degrees and even be absent, since the diameter of the fistulous opening varies. According to B. V. Parin, wide fistulas with severe symptoms account for 18%, fistulas of medium width with variable clinical manifestations - 41%, narrow, "asymptomatic" fistulas - 41%

**The diagnosis** is clarified radiographically using urethrocystography. Under the control of the screen, a catheter is immersed into the initial section of the urethra to a depth of 1–2 cm, through which a 10–15% solution of verografin is injected. The picture in the lateral projection shows the flow of the contrast agent into the rectum (Fig. 39).

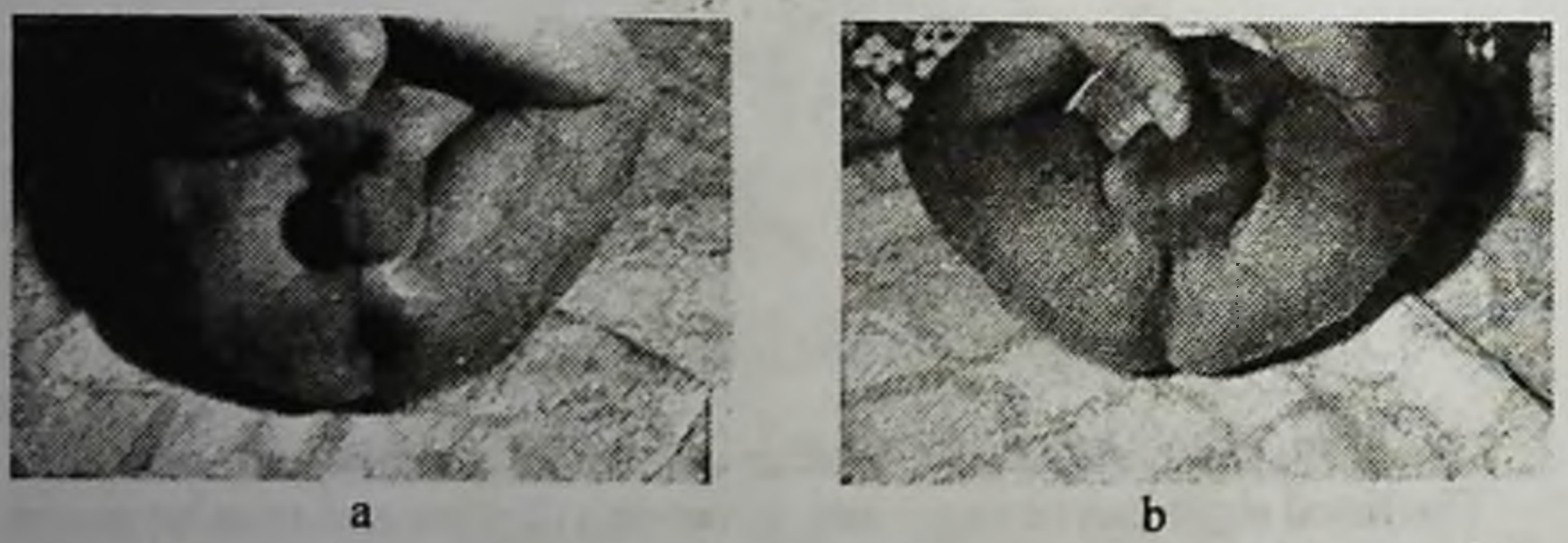
**A fistula into the reproductive system** is characteristic mainly for girls. It usually opens on the eve of the vagina in the region of the posterior commissure, less often in the vagina.

The clinical picture of atresia with a fistula into the reproductive system largely depends on the location and diameter of the fistula. The main sign of an anastomosis is the release of meconium, and then feces and gases through the genital slit from the first days of life, the anus is absent. If the fistula is short and wide enough, more or less regular independent stools are noted in the first months of life. When switching to artificial feeding, the stool becomes less frequent, constipation increases.

With atresia with a fistula into the vagina, the fistulous opening, as a rule, is narrow, located above the hymen. In girls with a vaginal fistula, intestinal contents are constantly excreted through the opening, which creates the conditions for ascending infection. Insufficient self-emptying of the intestine and the impossibility of conducting enemas due to the high location of the fistula lead to the early appearance of fecal obstruction, chronic intoxication with progressive deterioration.

In rectovestibular fistulas, atresia is usually classified as low, in cases of rectovaginal fistula, atresia is always high and is usually accompanied by infantilism of the external genital organs.

**Fistula of the perineum** is observed in boys more often than in girls. In girls, the perineal fistula is short and wide. In boys, the length and width of the fistula vary greatly; the external opening can open in the immediate vicinity of the anus, in the anterior portion of the external sphincter, at the root of the scrotum, and even in the penis. Depending on the anatomical variant, a clinical picture of complete or partial intestinal obstruction is possible (Fig. 40).



a b

**Figure 40 (a, b). Appearance of a patient with an atresia of the anus with a fistula on the perineum**

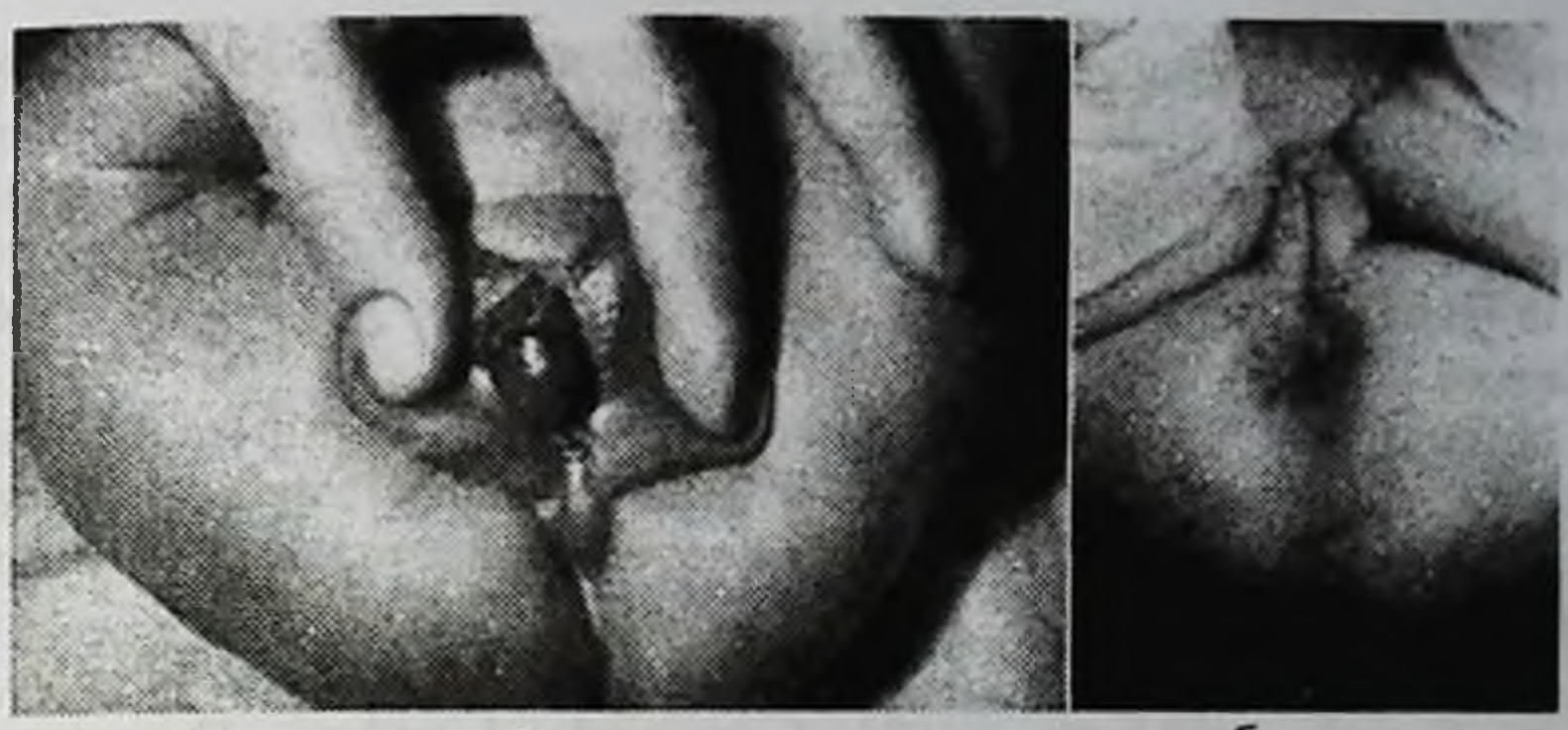


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**Figure 41 (a, b). Appearance of a child with perineal ectopia of the anus**

**An ectopia of the anus** is a condition when the anus, which has all the signs of a normal one (opens well, contracts and functions normally), is located in an unusual place - close to the genitals (Fig. 41).

There are perineal and vestibular ectopia. True ectopia must be **differentiated** from fistulous forms of atresia, since the latter are unable to provide full function and require surgical correction. Differences lie in the visual detection of contractions of the external sphincter or using electromyography. With ectopia, it contracts around the anus, and with fistulas, the contraction of the fibers of the external sphincter is observed outside it. With ectopia of the anus, functional abnormalities are not detected.

**Congenital narrowing of the anus and rectum** are most often localized at the site of transition of the endodermal part of the intestine to the ectodermal, i.e. in the region of the scallop line of the anal ring. The shape and extent of the stricture is variable. Sometimes it is a thin membrane, in other cases it is a dense fibrous ring. The length of the narrowing ranges from a few millimeters to 2 - 4 cm.

In the neonatal period and the first months of life, congenital strictures are usually not clinically manifested, since liquid feces freely pass through the constriction. With sharp degrees of stenosis, a child has constipation from the first days, feces are excreted in the form of a narrow ribbon. With the introduction of complementary foods, constipation becomes more pronounced. The child is restless, bloating progresses, poor appetite, lag in body weight; secondary megacolon is formed.

**Diagnosis** of congenital narrowing of the anal canal is not difficult. A rectal digital examination reveals a pliable elastic ring in the constriction zone; sometimes with a sharp stenosis it is not possible to hold the tip of the finger. Clarify the diagnosis with the help of radiopaque examination of the rectum, colonoscopy.

**Treatment.** All types of atresia of the anus and rectum are subject to surgical treatment in a specialized department. Emergency surgery in the first 2 days of life is required for all types of complete atresia, as well as fistulous forms: rectourethral, rectovesical and, with small diameters, rectovaginal, recto-perineal. At the age of 1-3 months to 1-3 years, defects with fistulas in the reproductive system and perineum

are corrected, which do not cause symptoms of intestinal obstruction. Recently, there has been a desire for an earlier correction of congenital malformations, so that by the time of formation and fixation of the neuro-reflex cortico-visceral connections, an anatomical variant as close as possible to the norm can be achieved.

In low forms of atresia of the anus and rectum, one-stage perineal proctoplasty is performed.

In cases of moderate forms of atresia (height 1.5 - 2 cm from the skin of the perineum), sacro-perineal proctoplasty has proven itself well, allowing good mobilization, passing through the pubococcygeal ligament and the external sphincter of the intestine.

High forms of atresia require significant mobilization of the intestine, which can be performed only by the abdominal-sacroperineal method. The extensiveness and invasiveness of such an operation in a newborn require its division into two stages. In the first days of life in the left iliac region, an unnatural anus is applied along Mikulich to the sigmoid colon as close as possible to the atresia zone to eliminate intestinal obstruction. At the age of 2 months - 1 year, the second stage of the radical operation is performed. Such tactics allow not only to achieve the recovery of children, but also to obtain better functional results. After the operation, starting from the 10th - 14th day, prophylactic bougienage of the newly created anal canal is carried out with Hegar's bougie, gradually increasing from No. 8 to No. 11-12. Prophylactic bougienage for 2-2.5 months allows you to create a gentle scar at the junction of the intestine into the skin and avoid stenosis of the rectum. Bougienage is carried out daily for the first 1-2 weeks - in a hospital, and then at home by parents under weekly dispensary control.

All children with multiple malformations need medical genetic counseling and constant follow-up. Other concomitant defects are corrected in stages - kidneys, genital organs, heart, musculoskeletal system).

**The prognosis** of the disease, the functional result depends both on the severity of the defect and associated anomalies, and on the correctness of the chosen tactics of surgical intervention.

## VITELLINE DUCT ANOMALIES

In the first weeks of intrauterine development of a person, the embryonic ducts function - vitelline and urinary, which are part of the umbilical cord. The first serves to nourish the embryo, connecting the intestines with the yolk sac, the second is the outflow of urine into the amniotic fluid.

At the 3-5th month of intrauterine life, reverse development of the ducts is observed. The urinary duct, in particular, completely atrophies and turns into a median ligament located on the inner surface of the anterior abdominal wall.

Various violations of the obliteration of the vitelline duct are possible. Depending on the extent and at what level the non-obliterated duct is preserved, they distinguish: 1) umbilical fistulas are complete and incomplete; 2) diverticulum of the ileum; 3) enterocystoma. Anatomical variants of this anomaly are shown in Figure 42.

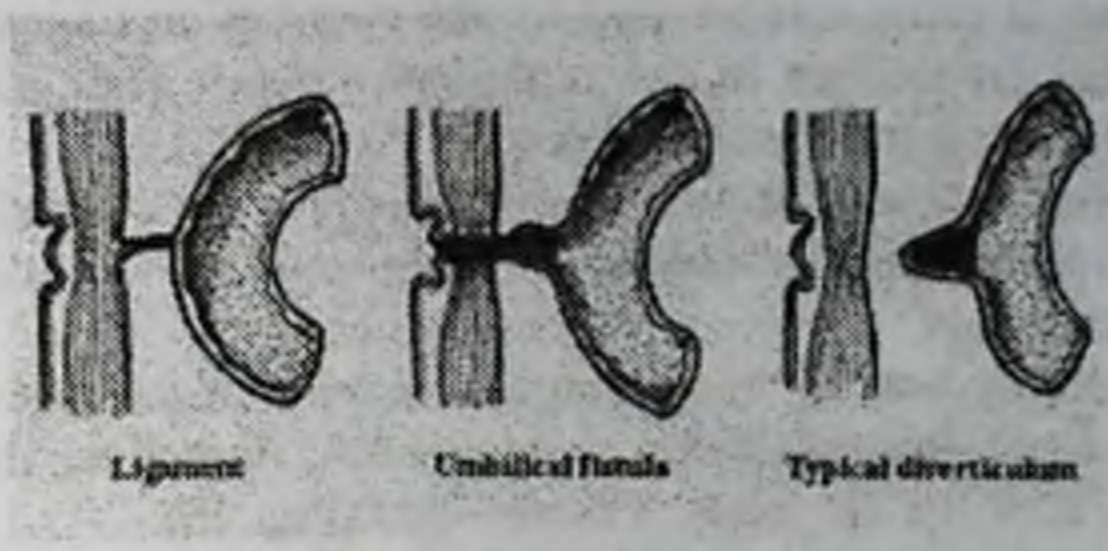



**Figure 42. Variants of vitelline duct obliteration disorder**

**Complete fistulas of the navel** occur when the vitelline duct remains open throughout. In this condition, the contents of the ileum are excreted through the umbilical wound.

**Clinic and diagnostics.** In the case of a non-obliterated vitelline duct, at the birth of a child, attention is paid to an abnormally thickened umbilical cord and a somewhat dilated umbilical ring. The falling off of the umbilical cord is often delayed, and after this has happened, a fistulous opening with a bright mucous membrane and intestinal discharge is found in the center of the umbilical fossa.

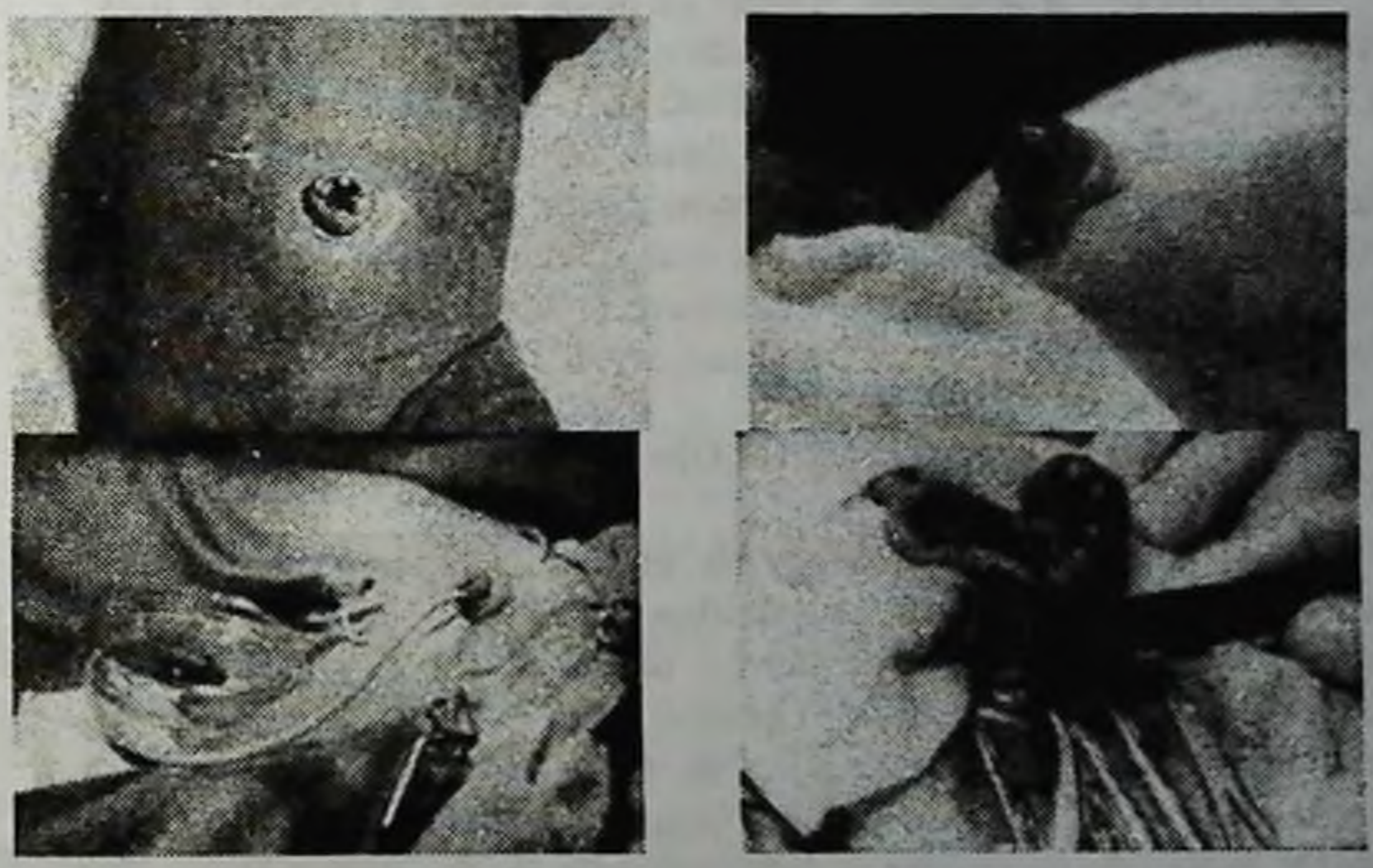


**Figure 43. Stages of the operation to eliminate a complete fistula of the navel**

In cases where the fistula is wide and long enough, when the child is anxious, evagination of the intestine may occur, accompanied by intestinal obstruction. Early cutting off of the umbilical cord on the 2-3rd day of life in the case of a non-

obliterated vitelline duct is often complicated by the eventration of intestinal loops through a defect in the peritoneum in the umbilical fossa. The intestinal loop, restrained in the umbilical ring, may become necrotic.

The diagnosis of a complete fistula of the umbilicus is not difficult and, with a wide fistula, is made on the basis of characteristic secretions. Fistulography is a valuable diagnostic technique.

**Treatment.** The only way to treat complete fistulas of the navel is surgery, which, in order to avoid complications (evagination, infection, bleeding), is performed immediately after the diagnosis is established (Fig. 43).

The operation consists in excision of the fistulous tract all the way from the navel to the ileum by laparotomic access.

**Incomplete fistulas of the navel** are formed in violation of the obliteration of the distal vitelline duct and are observed much more often than complete ones.

**Clinic and diagnostics.** Scanty discharge from the umbilical fossa is characteristic, as a result of which children are treated for a long time about the "weeping navel". When an infection is attached, the discharge becomes purulent. Examination of the umbilical fossa reveals a punctate fistulous opening with scanty discharge among the non-abundant granulations. To confirm the diagnosis, a fistulous tract is probed. If the bellied probe can be carried out to a depth of 1-2 cm, the fistula diagnosis becomes undeniable.

**A differential diagnosis** should be made with the umbilical fungus, which is characterized by the growth of granulation tissue at the bottom of the umbilical fossa due to infection and delayed epithelialization.

**Treatment** of an incomplete fistula of the navel always begins with such conservative measures as daily baths with a weak solution of potassium permanganate, treatment of the fistula with a solution of hydrogen peroxide and 3% tincture of iodine; dressings with antiseptics (1% solution of chlorophyllipt). In case of ineffective conservative treatment, surgery is indicated.

## ILEAL DIVERTICULUM (MECKEL DIVERTICULUM)

Under this name, pathology is known when the proximal part of the vitelline duct remains non-obliterated. The forms of the diverticulum are different. Usually, **the diverticulum** is located on the side of the ileum opposite the mesentery, 20-70 cm from the ileocecal angle and resembles a short appendix in shape. The diverticulum often has a conical (b) or cylindrical (a) shape. It can be soldered with a connective tissue cord (the remainder of the vitelline duct -c) to the mesentery, anterior abdominal wall or intestinal loops (Fig. 44).

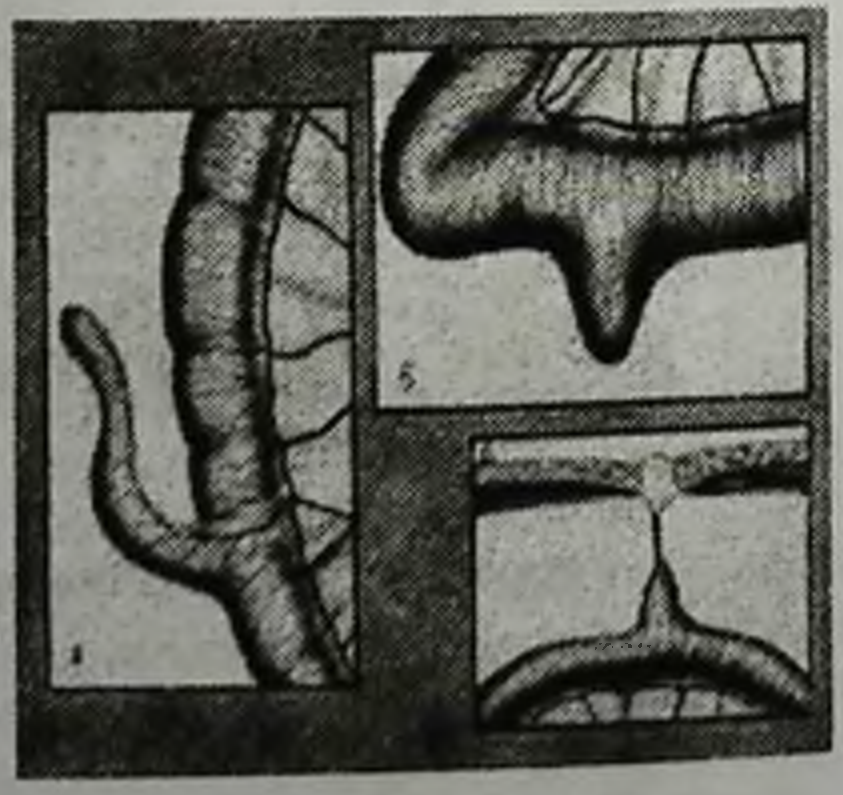


**Figure 44. Variants of Meckel's diverticulum**

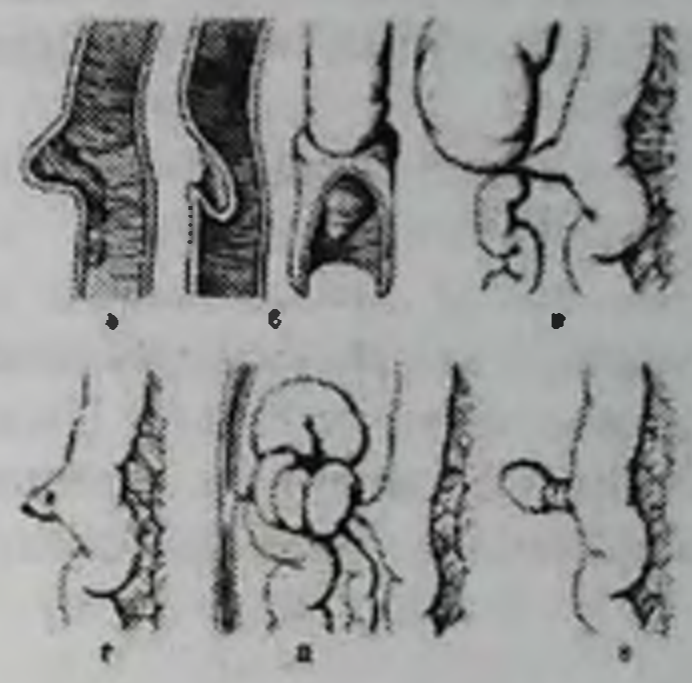


**Figure 45. Complications of Meckel's diverticulum**

Histological examination of the wall of the diverticulum in some cases reveals a dystopian mucosa of the stomach or duodenum. Less common is pancreatic tissue. Dystopia of atypical glandular tissue in the diverticulum is the cause of one of the complications - erosion of its wall and intestinal bleeding.

**Clinic and diagnostics.** An ileal diverticulum is most often discovered incidentally during a laparotomy undertaken for another reason or in connection with the development of complications, among which the most important are bleeding, inflammation (diverticulitis), intussusception and other types of intestinal obstruction (strangulation, volvulus).

Bleeding can occur acutely and be profuse, but chronic bleeding in small portions is also observed. Blood is found in the stool, which is dark brown in color. With massive bleeding, anemia quickly develops; bleeding can be repeated repeatedly. Diverticulitis occurs with symptoms similar to acute appendicitis (nausea, abdominal pain, fever, leukocytosis). It is almost impossible to distinguish between these diseases, therefore, in the absence of changes in the appendix during laparoscopy, it is necessary to revise the small intestine for about 70 cm from the ileocecal angle. In cases of belated diagnosis of diverticulitis, perforation occurs and peritonitis develops.

Intestinal intussusception, starting with a diverticulum, proceeds with typical symptoms (sudden onset, paroxysmal abdominal pain, vomiting, intestinal bleeding). The diverticulum is found on operation after disinvagination.

Intestinal obstruction can also be caused by torsion of the intestinal loops around the diverticulum, soldered to the anterior abdominal wall, or by their incarceration during fixation of the diverticulum to the mesentery or intestinal loops. The clinical picture is typical for intestinal obstruction. In a number of cases, the symptoms increase slowly and are accompanied by first partial and then complete intestinal obstruction.

Diagnosis of a diverticulum of an ileum causes great difficulties. It is most often thought of in cases of recurrent intestinal bleeding (Fig. 45). In a number of cases, a radioisotope study based on the local accumulation of a radiopharmaceutical.

which reveals the gastric mucosa ectopic in the diverticulum, allows a correct diagnosis to be made. For the final exclusion of the diagnosis, laparoscopy or trial laparotomy is used.

Bleeding diverticulum must be **differentiated** from intestinal angiomatosis.

Surgical **treatment** - removal of the diverticulum.

With obliteration of both ends of the duct and the remaining non-obliterated middle part, a closed cavity arises, which gradually stretches and fills with the secretion of the mucous membrane; **a cyst** is formed. Usually it is asymptomatic or children complain of an indefinite abdominal pain. In some cases, cysts lead to the development of serious complications (intestinal obstruction, infection of the contents).

**Treatment** is operative.

## DOUBLING OF THE DIGESTIVE TRACT (ENTEROKISTOMS)

Enterocystomas are congenital hollow formations of a spherical or cylindrical shape of various sizes. They often have a joint wall with the intestine and common feeding vessels. The wall of such a cyst is formed by smooth muscles and has a mucous membrane of the gastric or intestinal type. In the case of the gastric mucosa, the fluid in the cyst is watery, clear, acidic, and when ulcerated, it is hemorrhagic. Cysts lined with intestinal epithelium contain mucus. Communication cysts with the digestive tract is rare. These cysts can form anywhere, but most often occur in the area of the ileo-jecal angle.

These malformations are often combined with other developmental anomalies, primarily with splitting of the vertebrae, spinal hernia and doubling of the genitourinary system.

**Clinical picture**

Enterocystomas in newborns or infants are manifested by symptoms of acute intestinal obstruction, associated either with volvulus of the intestinal loop, or with compression from the outside of the main lumen of the intestinal tube. Less commonly, enterocystoma can be detected by ultrasound of the fetus and newborn with the so-called palpable tumor syndrome of the abdominal cavity and retroperitoneal space.

**Figure 46. Appearance of enterocystoma during surgery**

**Diagnostics**
The diagnosis is established on the basis of x-ray examination and ultrasound.
**Surgical treatment.** As a rule, resection of the intestinal loop with enterocystoma is performed with the imposition of enteroenteroanastomosis (Fig. 46).
**The prognosis** is favorable.

## MEGACOLON (HIRSCHPRUNG'S DISEASE)

Congenital enlargement of all or part of the colon (usually the sigmoid). According to modern views, based on microscopic examination data, the main changes are concentrated in the distal part of the sigmoid colon. Here, a deficiency or complete absence of cells of the Auebach plexus is found, the intestine does not peristaltize.

**Figure 47. View of the abdomen in Hirschsprung disease**

The clinical picture of the disease often manifests itself from the first days of life, but not later than two years of age. The main symptoms are constipation and an enlarged abdomen (Fig. 47). At first, when the baby receives mostly liquid food, with the help of cleansing enemas, it is possible to achieve regular bowel movements. Gradually, as the transition to solid food, constipation becomes more and more persistent, and the cleansing enema does not bring success. In these cases, the feces become dense and accumulate in the form of fecal stones.

A fecal stone clogs the intestinal lumen, resulting in symptoms of intestinal obstruction. Constipation is sometimes replaced by diarrhea.

Gradually, as the stool is delayed, the sigmoid colon expands greatly, the stomach swells, sharply increases in volume. When it is felt, an increased sigma and a characteristic sensation of doughy stool masses are determined, on which depressions remain from pressure with fingers.

Constant constipation leads to the development of fecal intoxication, which adversely affects the physical development of the child. He becomes pale, lags behind in weight and height, his appetite goes down.

Recognition of Hirschsprung's disease is based on the presence of underlying symptoms; the diagnosis is specified with the help of an X-ray examination, which can be performed in an outpatient clinic. After complete emptying of the intestines with a cleansing enema, 100-500 ml of barium suspension is injected through the

rectum. Instead of water, 1% sodium chloride solution is used to avoid a shock-like reaction associated with the absorption of toxic products contained in the intestine.

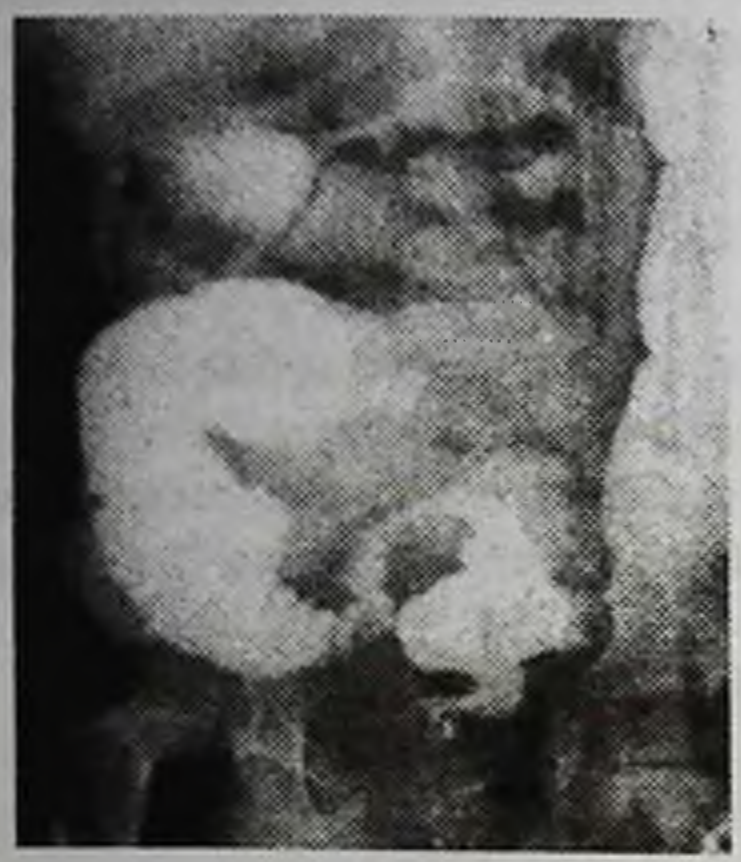


**Figure 48. Irrigogram in Hirschsprung's disease**

The X-ray picture is characterized by the presence of a narrowed part of the sigmoid colon, turning into a sharply expanded part (Fig. 48).

Treatment of Hirschsprung's disease is complex and requires perseverance and patience of the doctor and parents. In principle, surgical intervention is shown, which consists in resection of the aganglionic zone. The operation is performed at the age of 1 - 2 years, because small children find it difficult to tolerate. Before the operation, a complex of conservative measures aimed at combating constipation is carried out. It is important to achieve daily release of the intestines from feces.

The right diet plays a big role. It is necessary that the child takes coarse, mostly plant foods, which increase peristalsis.

A significant place in the complex of conservative measures is given to physiotherapy exercises. Every day, several times for 5 - 20 minutes, the patient's relatives massage his abdomen with wide circular movements in a clockwise direction. This stimulates peristalsis and pushes the intestinal contents mechanically to some extent. In addition, the abdominal press is strengthened. For older children, exercises that promote squeezing and "massaging" the colon (squats, flexion of the body, etc.) are recommended.

Drug treatment (laxatives) is best avoided. Instead, the child is given liquid vaseline, peach, sunflower oil, 1 teaspoon or 1 dessert spoon, depending on age, 2 to 3 times a day between feedings.

Some patients are better helped by hypertonic enemas from a 10% saline solution. The lack of effect of a conventional enema makes a siphon enema necessary, for which a 1% saline solution is used.

In severe cases, when there was a prolonged stool retention, symptoms of intestinal obstruction appeared, the child must be hospitalized.

Among the radical methods of treatment in children suffering from Hirschsprung's disease, the most common operations are Swenson-Hiatt-Isakov; Duhamel - Bairova; Soave - Lenyushkin; (fig.49).

a b

**Figure 49. The main points of the operation: a) Svenson-Khiat-Isakov b) Duhamel-Bairov i) Soave-Lenyushkin**

In order to be able to expand the stereotype of thinking, develop the dynamism of mental activity and intensify educational activity, the teacher uses new pedagogical technologies in the preparation of a general practitioner.

**I. Curation of patients on the topic - 15 minutes**
**II. Participation in the dressing room and operating room - 20 minutes;**
**III. Implementation of practical skills - 15 minutes:**

## PRACTICAL SKILLS

### CLEANING ENEMAS

- indications: for the release of the intestine from feces, constipation, food poisoning, preparing the patient for operations, rectoscopy, colonoscopy, X-ray examination of the intestine, kidneys, ultrasound, before the introduction of drugs;
- explain to the patient's parents about the upcoming manipulation;
- check the readiness of the necessary tools and medicines: water at room temperature, a can with a soft tip, Esmarch's mug, vaseline oil;
- take the balloon in the right hand, release air from it and fill it with water (temperature 20-22 ° C), remove the air, slightly squeezing the balloon until liquid appears from the tip turned upwards. Lubricate the tip with Vaseline;

**Figure 50. Stages of a cleansing enema**

Note: Required amount of water:
Newborn - 25-30 ml;
For a baby - 50-150 ml;
1-3 years - 150-250 ml
- lay the child on the left side, with the lower limbs pulled up to the stomach;
Note: lay the child under 6 months on his back and lift his legs up.
- spreading the buttocks of the child with 1 and 2 fingers of the left hand, placing the can with the tip up, carefully move it into the anus, directing it first to the navel, and then, having overcome the sphincters, parallel to the coccyx;
- slowly press the canister from below, inject water and, without opening it, remove the tip from the rectum (place the canister in the waste material tray);
- to hold the injected fluid in the intestines with the left hand, squeeze the buttocks of the child for a few minutes;
- lay the child on his back, covering the perineum with a diaper (until stool appears or the urge to defecate).

**CARRYING OUT A SIPHON ENNEMA**

- indications: removal of feces or toxic substances that have entered the intestines as a result of poisoning, the ineffectiveness of a cleansing enema;
- explain to the patient's parents about the upcoming manipulation;
- check the readiness of the necessary tools and medicines: water at room temperature or a weak solution of potassium permanganate or sodium bicarbonate, a can with a soft tip, an Esmarch mug, a rubber tube, vaseline oil;
- check the availability of the necessary tools, soft tip, funnel, rubber tube and sterilize them by boiling;
- lay the child on the left side, with the lower limbs pulled up to the stomach;
- carefully insert the end of the tube lubricated with petroleum jelly through the anus into the intestine to a depth of 20-30 cm;
- fill the funnel with water and raise it to a height of 50-60 cm above the bed, and then lower it to the level of the child's pelvis without removing the rubber tube from the rectum;
- repeat the procedure until clean wash water;
- Carefully remove the rubber tube.

**Figure 51. Stages of a siphon enema**

**IV. Big break - 40 minutes (11.50-12.30).**

**V. Practical lesson (part 2) - 1 hour 35 minutes (12.30-14.05):**

**1. During classes, the use of electronic textbooks, video and photographic materials - 20 minutes;**

**2. UMM - 45 minutes**

## LEARNING ASSIGNMENTS

**Group rules**

Member of each group

- Respect for the thoughts of their comrades;
- Active and joint participation in tasks, manifestation of responsibility for the task;
- Can ask for help if necessary from comrades;
- Help your comrades in the group;
- Participate in the evaluation of the group;
- Must know the rules "In the same boat, a common fate - to be saved or drown"

Structure responses to questions.

1. What is included in subjective research?
2. Laboratory and instrumental research.

Give the following concepts: Hypotrophy, vomiting, cyanosis, shortness of breath, regurgitation, pain, bleeding.

**Tasks for groups**

1. Specify the anatomical forms of Hirschsprung's disease. Cluster, SWOT table, Venn diagram for the word "vomit" and chart Why? and hierarchical diagram How?

2. Specify the clinical signs of Hirschsprung's disease. Make a cluster, SWOT table, Venn diagram for the word "habitus" and draw diagrams Why? and hierarchical diagram How?

3. Specify the main features of the rectal polyp. Make a cluster, SWOT table, Venn diagram for the word "constipation" make diagrams Why? and hierarchical diagram How?

4. Specify the types of surgical intervention for Hirschsprung's disease. Compile a cluster, SWOT table, Venn diagram for the word "flatulence" and draw diagrams Why? and hierarchical diagram How?

5. Specify what complications may occur after surgery for anorectal defects. Make a cluster, a SWOT table, a Venn diagram for the word "fistula" make diagrams Why? and hierarchical diagram How?

Diagnostic map of learning technology in the classroom

*Evaluation indicators - the criterion was manifested in the training session:*

| Group | Task 1 | Task 2 | Task 3: (for each question 0.2 points) | | | Sum of points |
|---|---|---|---|---|---|---|
| | (1,0) | (1,4) | Question 1 | Question 2 | Question 3 | (3,0) |
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |

**TABLE / X / Y** - Students answer the questions "what do you already know about this topic?" and "what do you want to know?"; Allows you to conduct research work on the text, topic, section

| Concept | know "+", don't know "-" | learned "+", could not find out "-" |
|---|---|---|
| Binary nomenclature: | | |
| Etiology | | |
| Pathogenesis | | |
| Clinic | | |
| Deontology | | |
| Symptom | | |
| Syndrome | | |
| Disease | | |
| Disease history | | |
| Outpatient card | | |
| Genetics | | |
| Infection | | |
| Diagnosis | | |
| Instrumental examination of patients: | | |
| Thermometer | | |
| Phonendoscope | | |
| Tonometer | | |
| Iodolipol, barium sulfate | | |
| Nasogastric tube | | |
| Palpation | | |
| Percussion | | |
| Auscultation | | |
| Anamnesis | | |
| Examination | | |
| General blood analysis, blood biochemistry | | |
| General urine analysis | | |
| ECG | | |
| FCG | | |
| EchoCG | | |
| Chest X-ray | | |

## INSERT TABLE

Insert table: a) provides systematization of information obtained during independent reading, listening to a lecture; confirmation, clarification, rejection, tracking the understanding of the information received;

b) contributes to the formation of the ability to link previously mastered information with new information.

Rules for compiling an INSERT table:

| Concepts | V | + | - | ? |
|---|---|---|---|---|
| Congenital low intestinal obstruction (meconium ileus, Hirschsprung disease, dolichosigma, anorectal malformations, umbilical fistulas, duplication of the intestinal tract) clinic, diagnosis, treatment, complications, postoperative rehabilitation | | | | |
| Place in medicine | | | | |
| The main objective of the subject | | | | |
| Types of disease | | | | |
| The sequence of studying the subject | | | | |
| Learning aids | | | | |

Where: V - corresponds to the existing knowledge (information) about ...
-contradicts existing knowledge about...
+ - is new information
? -incomprehensible or requiring clarification, addition information

## CONCEPT TABLE

| Vertically - comparisons with diseases (theories) are located | Horizontally - various signs or symptoms of the disease are located. (recommendations, categories, various signs, etc.) | | | | | | |
|---|---|---|---|---|---|---|---|
| | Vomiting | Flatulence | Dyspnea | Abdominal enlargement | Auscultation | R-graphy of the abdomen | Hypotrophy |
| Meconium ileus | | | | | | | |
| Hirschsprung disease | | | | | | | |
| Dolichosigma | | | | | | | |
| Anorectal malformations | | | | | | | |
| Umbilical fistulas | | | | | | | |
| Duplication of the intestinal tract | | | | | | | |

## SWOT

**(homework or independent work of the student: for creative thinking after lectures or practical classes)**

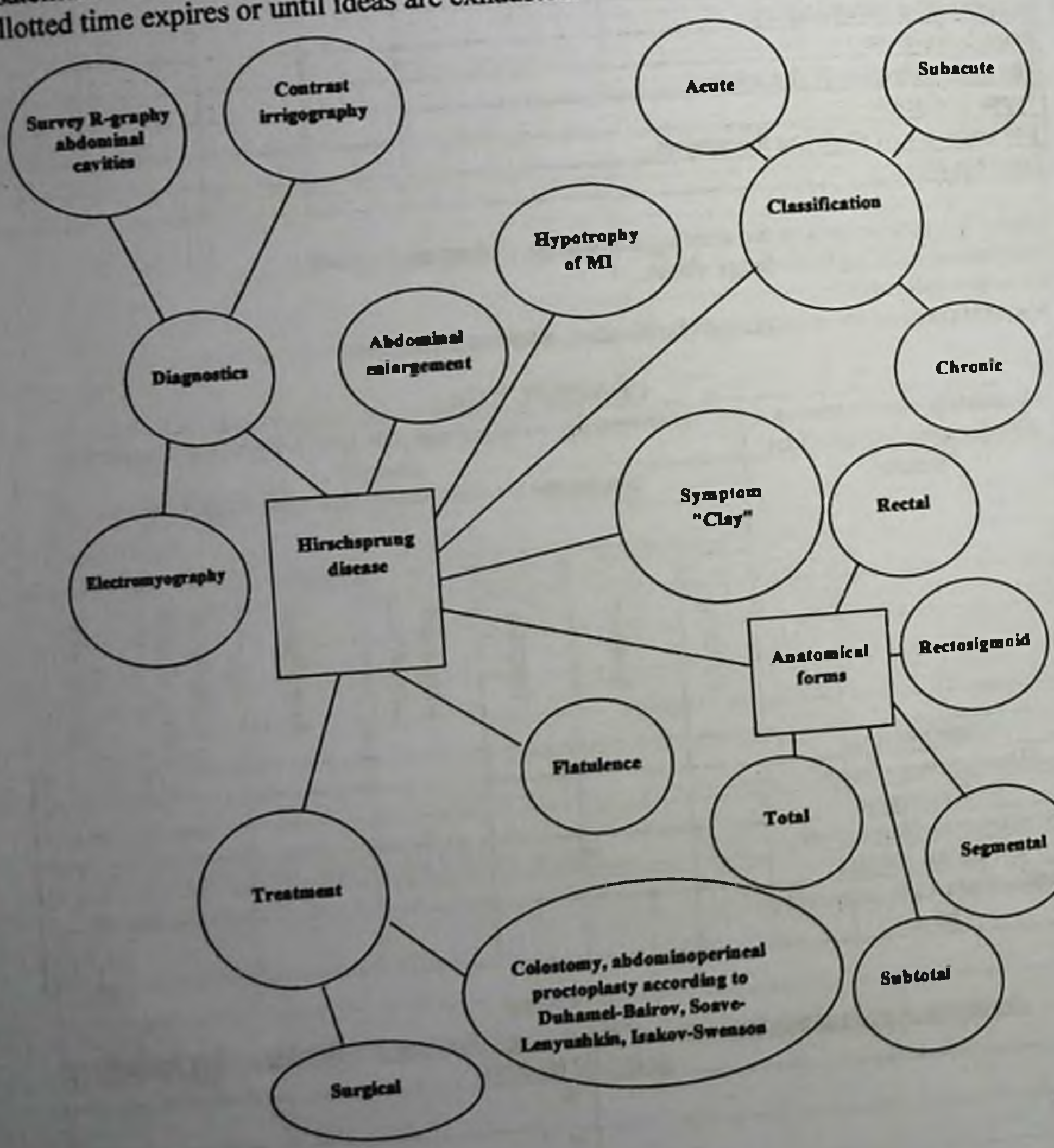
| | |
|---|---|
| S | W |
| O | T |

Note: see 2nd appendix.

## CLUSTER (Bunch, bundle)

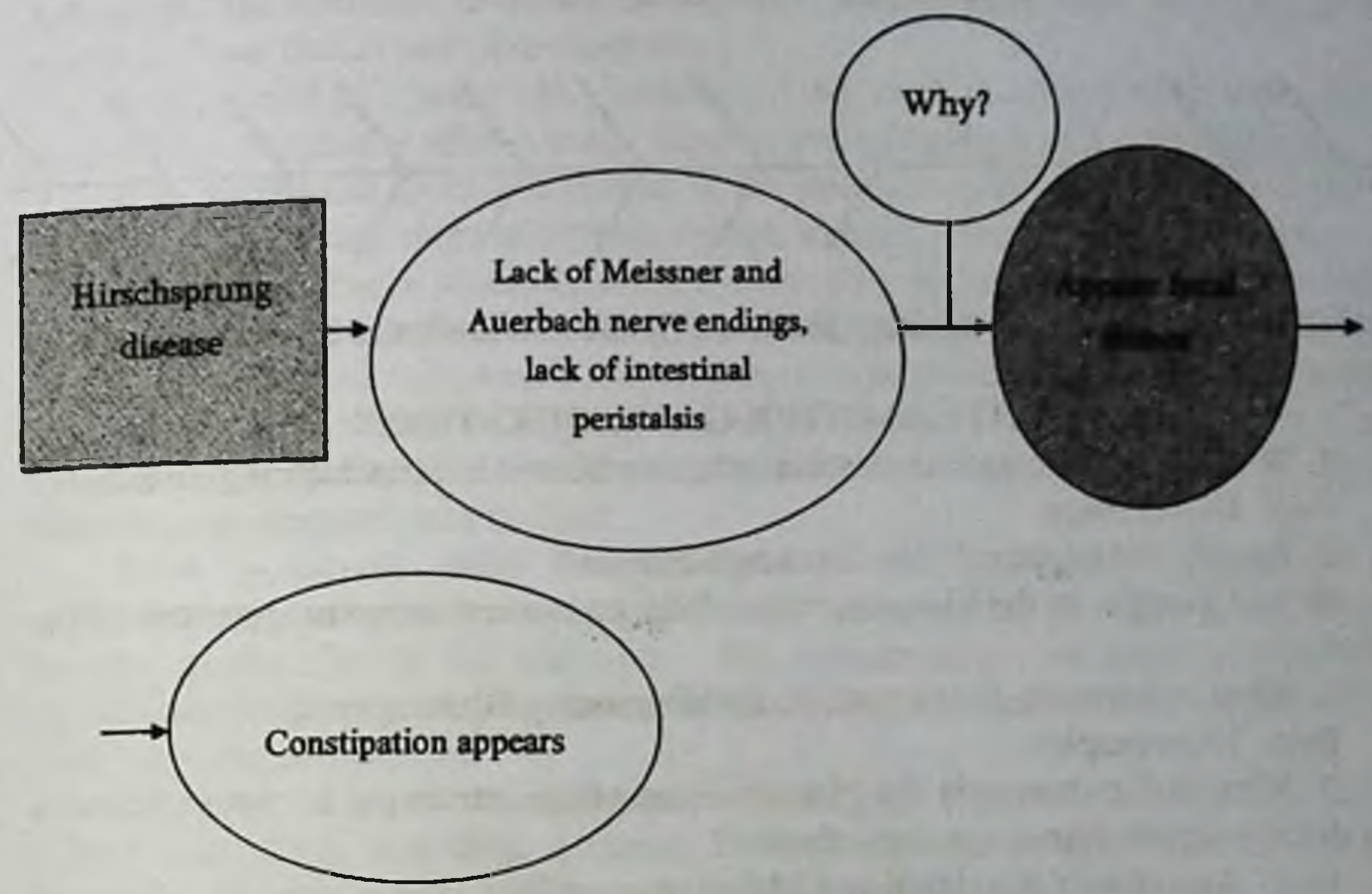
A way of mapping information - gathering ideas around a major factor to focus and make sense of the whole construct

Clustering technology: In the center of a blackboard or a large sheet of paper, a keyword or a topic title of 1-2 words is written. By association with the keyword, "satellites" are attributed to the side of it in smaller circles - words or sentences that are related to this topic. Connect them with lines to the "main" word. These "satellites" may have small satellites, and so on. Recording continues until the allotted time expires or until ideas are exhausted.




Note: see 2nd appendix.

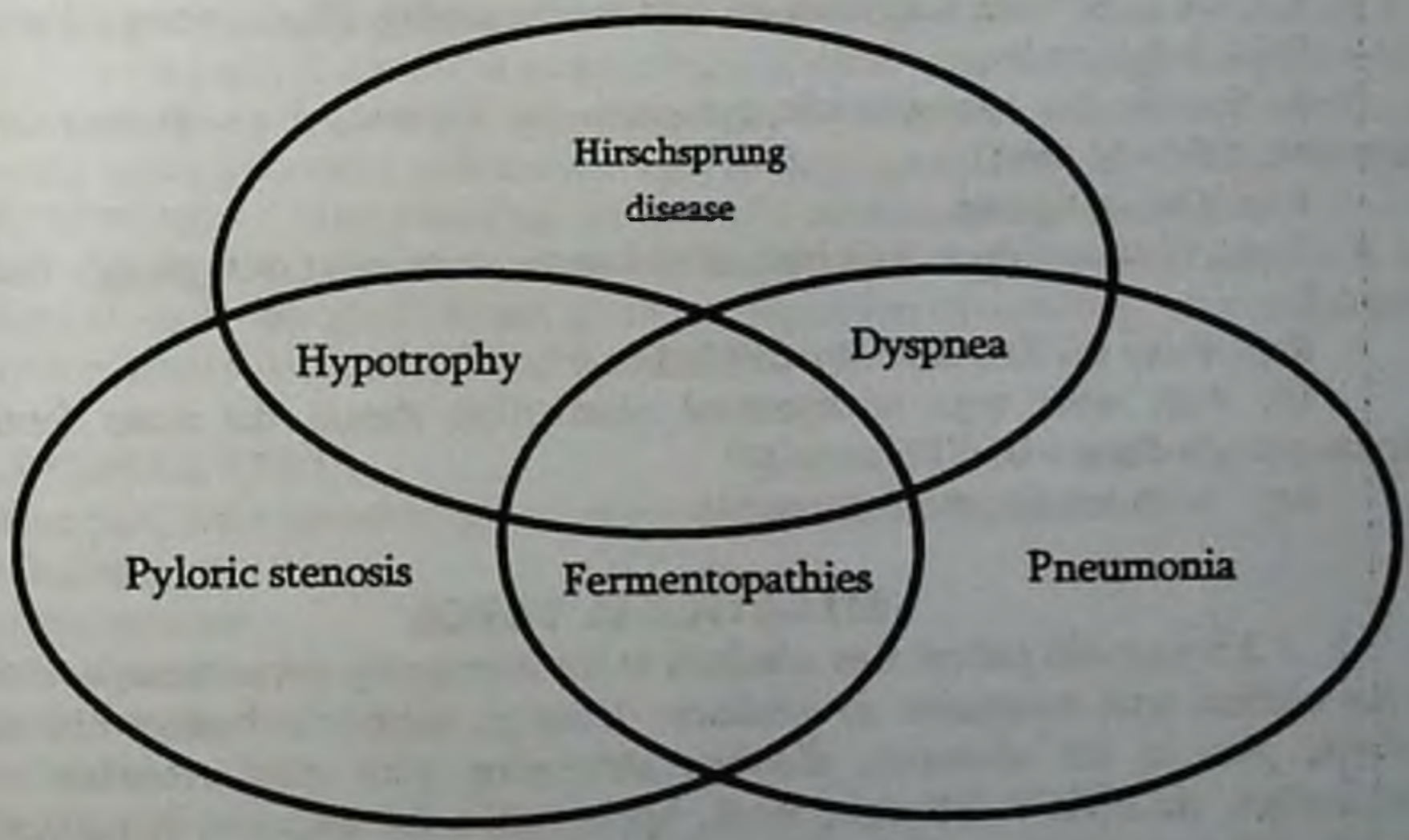
SCHEME "WHY?"




**Note: see 2nd appendix.**

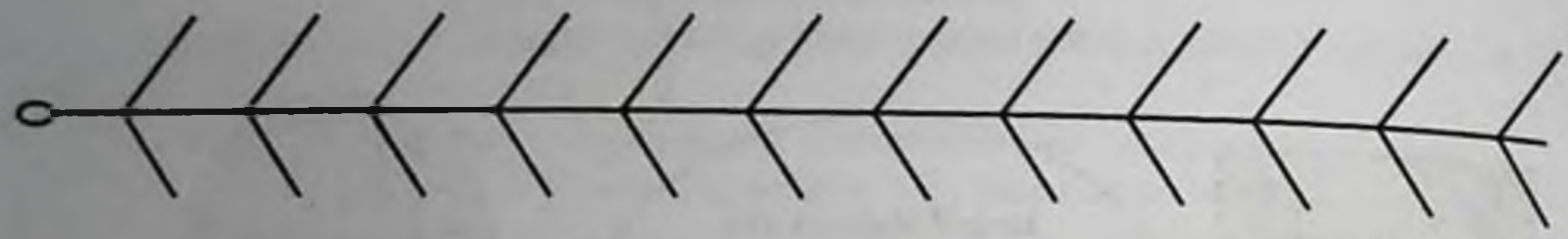
**VENN DIAGRAM**

Used to compare or contrast or contraindicate 2-3 aspects and show their features




Note: see 2nd appendix.

SCHEME "FISH SKELETON"



3. Training with interactive teaching methods (games), situational tasks and tests - 20 minutes;

## INTERACTIVE GAME QUESTIONS:

1. What part of the gastrointestinal tract is affected in Hirschsprung's disease
Rep. Distal colon
2. Specify the cause of Hirschsprung's disease?
Rep. Changes in the histostructure of the intramural nervous apparatus of the distal colon.
3. What is the main X-ray method for diagnosing Hirschsprung's disease?
Rep. Irrigography.
4. What is the change in the histostructure of the intramural nervous apparatus of the distal colon in Hirschsprung's disease?
Rep. Absence of Auerbach and Meissner ganglions.
5. What part of the colon is most often affected in Hirschsprung's disease?
Rep. Recto-sigmoid.
6. In what form of Hirschsprung's disease are symptoms of low intestinal obstruction manifested?
Rep. Severe or acute form of Hirschsprung's disease.
7. What is the main diagnostic method for diagnosing Hirschsprung's disease?
Rep. Irrigography.
8. Specify the characteristic symptom for Hirschsprung's disease during palpation of the abdomen?
Rep. Clay symptom.
9. At what age does the clinic of the acute form of Hirschsprung's disease appear?
Rep. From the first days of a child's life.
10. With what type of intestinal obstruction should the acute form of Hirschsprung's disease be differentiated?
Rep. With low intestinal obstruction.

## SITUATIONAL TASKS.

1. A 3.5-year-old patient was admitted to the emergency department, according to her mother, with complaints of weakness, lethargy, subfebrile body temperature, periodic pain in the abdomen, diarrhea alternating with stool retention. On examination, the child is lethargic, weak, hypotrophic, the abdomen is enlarged, a smooth, painless, dense, mobile formation is palpated on the right side of the abdomen. What is your diagnosis, research methods and treatment tactics?

2. A 4-year-old child complains of bloating, lack of an independent act of defecation, the abdomen is enlarged, physical development lags. Clay symptom is positive. Your tactics and your diagnosis?

3. The child is 2 years old. Suffering from chronic constipation from the first days of life. Stool only after enema. What is your diagnosis and your tactics?

4. A 4-year-old child is admitted to the emergency department with symptoms of the decompensated stage of Hirschsprung's disease. Tactics of his treatment?

5. The child has a prolapse of the rectum only during the act of defecation and its slight spontaneous reduction. What is your diagnosis?

6. A 3-year-old child enters the admission department. Complaints according to the mother about the release of scarlet blood at the end of defecation. After a bowel movement, the mother sometimes notes "rectal prolapse," which is reset on its own. What is your diagnosis and tactics?

7. A 2-year-old child was admitted to the emergency department with complaints, according to the mother, of a delay in the discharge of feces and gases, an increase in the size of the abdomen. On examination: the child lags behind in physical development, the phenomena of intoxication and anemia are noted. What is your diagnosis and tactics?

8.Sick N. 4 years. Complaints, according to the mother, about the lack of independent stool, vomiting, bloating. On examination: the child is lethargic, adynamic, the skin is pale with a cyanotic tinge, the abdomen is swollen, the venous network is expressed on the anterior abdominal wall, the peristalsis of the swollen large intestine is contoured. What is your diagnosis, research methods and treatment tactics?

9. In a child, according to the mother, prolapse of the rectum is repeated often and occurs with every cry and straining of the child. On examination, you can see a sausage-shaped, cylindrical protrusion in the anus. What is your treatment strategy?

10. A 10-year-old patient is undergoing a clinical examination in the admission department. Complaints of paroxysmal pain in the abdomen, nausea and vomiting. Vomiting is not associated with food intake, in large quantities with an admixture of intestinal contents. After vomiting, the patient's condition does not improve. In an objective study, the asymmetry of the abdomen, bloating, intestinal peristalsis is accelerated, gases and stools do not go away. Character of vomiting, your diagnosis, methods of researches and tactics of treatment?

**SELF-CHECK TESTS**

1) What part of the gastrointestinal tract is affected in the disease Hirschsprung

1.pyloric stomach
2.12 duodenum
3.small intestine
4. rectum
5. distal colon

2) The newborn has an acute form of Hirschsprung's disease, what is your tactic?

1.Abdo-perineal proctoplasty
2.Folea catheter placement
3. colostomy on the left
4. colostomy on the right
5.resection of the aganlionic zone, end-to-end anastomosis

3) What is the cause of Hirschsprung's disease?
1.congenital underdevelopment of the muscular layer of the large intestine
2.presence of folds of the colon mucosa
3. long sigmoid colon
4. change in the histostructure of the intramural nervous apparatus of distal colon
5.congenital atony of the large intestine

4) The main X-ray diagnostic method of Hirschsprung's disease?
1. excretory urography
2. irrigography, irrigoscopy
3. survey radiography of the abdominal cavity
4. fistulography
5. retropneumoperitonium

5) At what disease is the Wangensten test performed?
1.pyloric stenosis
2. dolichosigma
3.atresia with fistula
4.ectopia anus
5.atresia of the rectum and anus

6) The newborn has an acute form of Hirschsprung's disease. Your tactics:
1.Abdominal-perineal proctoplasty
2. to carry out an operation on Duhamel-Bairov
3. colostomy on the right
4.conservative treatment
5. intestinal bougienage

7) With complete non-closure of the vitelline duct, there is often complication:
1. peritonitis
2.invagination
3.evagination
4.intestinal obstruction
5. intestinal paresis

8) When doubling the gastrointestinal tract, the passage of J.K.T. information-active is:

1.in the event of peritonitis
2. with cystic form
3. with diverticular form
4.When perforation occurs
5. when bleeding

9) Determine the treatment tactics for a high form of posterior atresia passage and rectum in a premature baby:
1. radical operation
2.conservative treatment
3. palliative, subsequently radical surgery
4.physiotherapy treatment
5. palliative surgical treatment

10) What is the cause of Hirgprung's disease?
1.congenital underdevelopment of the muscular elements of the large intestine
2. the presence of mucosal folds in its distal section
3.bends of the elongated sigmoid colon
4.congenital atony of the colon
5. absence of Auerbach and Meissner ganglions

11) Most often, which part of the colon is aganlionic with Hirschsprung's disease
1. ampoule department
2. perineum
3. initial part of the large intestine
4.recto-sigmoid
5. splenic angle of the large intestine

12) What cannot be the cause of megacolon
1. Hirschsprung's disease
2. hypovitaminosis of vitamin B1
3.anorectal malformations
4. idiopathic megacolon
5.prolapse of the rectum

13) A severe or acute form of Hirschsprung's disease manifests itself symptomatically
mami
1.High intestinal obstruction
2.low intestinal obstruction
3.Acute respiratory failure
4.cardiovascular insufficiency
5. neurotoxicosis

14) The main diagnostic method of research in diagnosing nose in Hirschsprung disease is
1.colonoscopy
2.sigmoidoscopy
3.irrigography
4. survey radiography of the abdominal organs
5.electromyography

15) The severity of the clinical symptoms of Hirschsprung's disease directly proportional
1. the degree of prematurity of the patient
2. the age of the patient
3. the duration of the disease
4.Length of the zone of agangliosis
5.Degree of intestinal expansion

16) What can be revealed during palpation of the abdomen, characteristic of Leznie Hirschsprung?
1. soreness throughout the abdomen
2. soreness along the large intestine
3. soreness in the navel
4. "symptom of clay"
5. Tumor-like formation is determined

17) Acute form of Hirschsprung's disease, at what age does it appear?
1.from the first days of a child's life
2.up to one month old
3. from the third week of life
4.from the age of six months
5. from the age of one

18) An acute form of Hirschsprung's disease, with what type of intestinal obstruction need to be differentiated?
1.with intussusception
2. with obstructive intestinal obstruction
3. with acute high intestinal obstruction
4.Low ileus
5. with strangulation intestinal obstruction

19) Cause of secondary megacolon:
1.hemorrhoids
2.Anus fissures
3.presence of paraproctitis
4.polyps of the rectum
5. congenital or acquired cicatricial narrowing of the rectum

20) Operation not applicable for Hirschsprung's disease
1.by Soave
2.according to Swenson
3.according to Duhamel
4. according to Benson-Stone
5.by Rebake

21) What is not observed in duodenal atresia below the Vater nipple
1. vomiting with bile
2. distention of the epigastrium
3.vomiting blood
4. no vomiting
5. vomiting without bile

22) Clinical picture of intestinal atresia
1. repeated vomiting of bile, absence of meconium, bloating
2.vomiting bile, bloody stools, bloating
3. absence of vomiting, meconium retention, epigastric retraction
4.vomiting curdled milk, scanty stools, bloating in the epigastrium
5. single vomiting, loose stools, retraction of the abdomen

23) At what malformation is the absence of the anus and fecal discharge from the vestibule of the vagina:
1. atresia of the anus and rectum
2. vestibular ectopia of the anus
3. anal atresia with rectovestibular fistula
4. anal atresia with rectovaginal fistula
5.atresia of the rectum

24) A 2-year-old child has discharge from the umbilical fossa.
Causes may be malformations other than
1.fungus
2. non-closure of the urinary duct
3. Meckel's diverticulum
4. non-closure of the vitelline duct
5.intestinal fistula

25) A 3-year-old boy has a complete fistula of the umbilicus. Choose an operational tactic
1. preventive laparotomy, revision of the abdominal cavity, excision of the fistula
2. fistula excision, laparotomy, revision of the abdominal cavity
3.simple fistula excision
4.Diagnostic laparotomy
5. Cryotherapy during laparotomy and revision
26) A complete fistula of the navel was found in a child aged 1.5 years. Your tactics:

1.observation
2. cauterization with lapis
3.surgery
4.Adhesive sticker
5. cryotherapy

27) A sign characteristic of patients with a complete fistula of urachus
1.constant leakage of urine from the umbilical fossa
2. excretion of urine from the umbilical fossa, aggravated by urination
3. communication between the bladder and the umbilical fossa, detected by contrasting the fistula
4. caudal direction of the probe when probing the fistulous tract
5. all of the above

28) What is the reason for emergency surgical treatment for complete fistula of the yolk duct
1.infection of the fistula
2. bowel evagination
3. loss of intestinal contents
4.possible intestinal bleeding
5. none of the above

29) What is the reason for the discharge of urine from the navel
1.bladder exstrophy
2.full fistula of urachus
3.epispadias
4.posterior urethral valve
5.Bladder diverticulum

30) When does the reverse development of the vitelline duct occur in the embryonic period
1.in the first week
2.by the end of the first month
3.on the 2nd month
4.on the 5th month
5.by the time of birth

31) When the reverse development of the urinary duct occurs in the embryonic period
1.by the end of 1 month
2. at 2 months
3.at 3 months
4. at 4 months
5.at 5 months

32) Complete fistulas of the navel occur when:
1. the yolk and urinary ducts are obliterated throughout

2. obliteration of the ducts occurs only in the distal section
3. obliteration of the ducts occurs only in the proximal section
4. there is no obliteration of the ducts throughout
5. obliteration of the ducts occurs at both ends, and is absent in the middle

33) Incomplete fistulas of the navel occur as a result
1.Obliteration of the ducts throughout
2. obliteration of the ducts only in the distal section
3. obliteration of the ducts only in the proximal section
4.Obliteration of the ducts throughout
5. absence of duct obliteration in the middle section

34) The most valuable diagnostic method that allows you to accurately establish the diagnosis of a complete fistula of the navel is
1.visual inspection
2. fistulography
3.analysis of blood, urine and feces
4. Plain X-ray of the abdominal organs
5.ultrasound examination

35) The main method of treatment of complete fistulas of the navel is
1.drug
2. introduction of iodine into the fistulous tract
3.operation
4. cauterization of the fistulous tract with laser beams, followed by the introduction of antibiotics
5. cryodestruction of the fistula

36) Surgical treatment of complete fistulas of the navel should be performed
1.immediately after birth
2.after diagnosis immediately
3.if there are complications
4.Permanently after 5 years of age
5. at the discretion of the parents

37) Treatment is optimal for incomplete umbilical fistulas
1.drug
2.operative after diagnosis
3.laser therapy
4.introduction of cauterizing substances into the fistula
5. first conservative, in the absence of effect, surgical excision of the fistula

**Answers to tests for self-control**

**1-5, 2-3, 3-4, 4-2, 5-5, 6-3, 7-3, 8-3, 9-3, 10-5, 11-4, 12-2, 13-2, 14-3, 15-4, 16-4, 17-2, 18-4, 19-5, 20-5, 21-4, 22-1, 23-3, 24-3, 25-2, 26-3, 27-1, 28-2, 29-2, 30-1, 31-5, 32-4, 33-2, 34-2, 35-3, 36-2, 37-5.**

# CHAPTER 5. CONGENITAL MALFORMATIONS AND ANOMALIES IN THE DEVELOPMENT OF THE KIDNEYS AND URINARY TRACT (AGENESIS, APLASIA, HYPOPLASIA, DEVELOPMENTAL ANOMALY, POSITION, QUANTITY, STRUCTURE AND RELATIONSHIPS, HYDRONEPHROSIS, URETEROHYDRONEPHROSIS) CLINIC, DIAGNOSIS, TREATMENT, COMPLICATIONS, POSTOPERATIVE REHABILITATION

**The purpose of the training:** to develop the skills and abilities of clinical diagnosis, treatment and rehabilitation of children with congenital malformations and developmental anomalies requiring surgical correction.

**Learning objectives:**

• Formation of knowledge on the etiology, pathogenesis and clinic of the most common malformations and developmental anomalies in children;

• Developing students' skills and abilities of clinical examination and examination of a child with congenital malformations and developmental anomalies, including laboratory, radiation and instrumental research methods;

• Students mastering the diagnostic algorithm for malformations and developmental anomalies that pose a threat to a child's life;

• Acquaintance with the principles of surgical treatment of malformations and developmental anomalies and their complications;

• Development of skills and abilities of general medical care: based on treatment and diagnostic standards and protocols for postoperative rehabilitation of children with congenital malformations and developmental anomalies.

**Place of the lesson:** Department of pediatric urology, operating room, computer room, training room

**Monitoring and evaluation:** oral control, control questions,
performance of educational tasks in groups.

**Written control:** control questions.

## KIDNEY AGENESIA

The absence of an organ bookmark occurs with a frequency of 1 per 1000 newborns. Bilateral renal agenesis is observed 4 times less often than unilateral and predominantly in male fetuses (in a ratio of 3:1). Children with agenesis of both kidneys (arenia) are not viable and are usually stillborn. However, casuistic observations of rather long survival are described. This can be explained by a remarkable feature of the child's body, when other organs perform the function of an affected or completely failed organ. In this case, the function of excretion is carried out by the liver, intestines, skin and lungs.

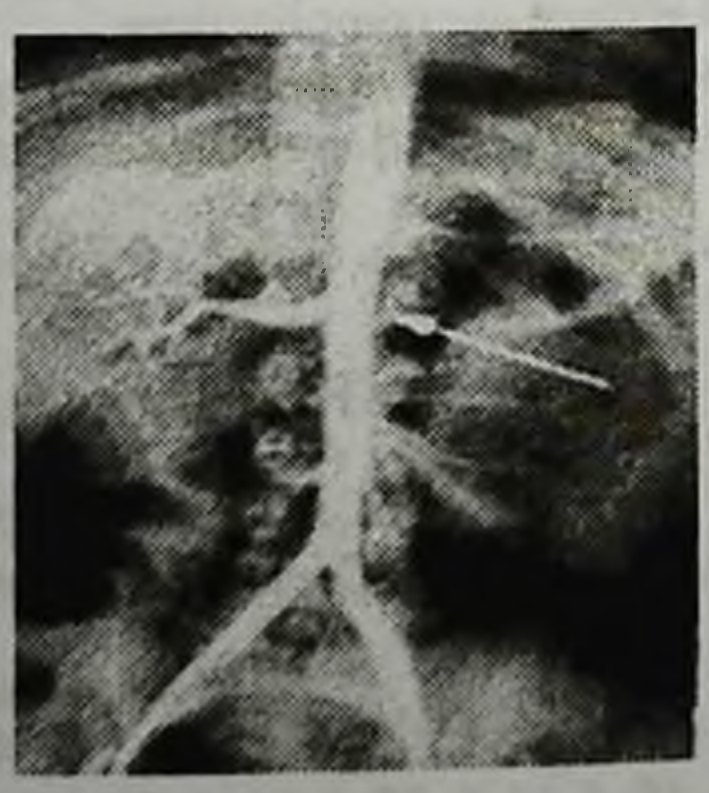


**Figure 52. Renal angiography. Agenesis of the left kidney**

Kidney agenesis is usually combined with the absence of the bladder, genital dysplasia, often with pulmonary hypoplasia, meningocele and other congenital malformations.

**Clinic and diagnostics.** Unilateral renal agenesis is associated with the absence of nephroblastema formation on one side. In this case, as a rule, there is no corresponding ureter, there is an underdevelopment of half of the bladder and often the genital apparatus. The only kidney is usually hypertrophied and fully provides the excretory function. In such cases, the anomaly is asymptomatic.

Suspicion of a solitary kidney arises from palpation of an enlarged painless kidney, however, the diagnosis can be made on the basis of an in-depth X-ray urological examination (excretory urography, cystoscopy, renal angiography) (Fig. 52).

With urography, the appearance of contrast on the side of agenesia is absent. Cystoscopy reveals the absence of a corresponding ureteral orifice and hemiatrophy of the bladder triangle. Angiography indicates the absence of a renal artery.

## ADDITIONAL KIDNEY

The accessory kidney is an extremely rare anomaly. A little over 100 observations have been described to date. The formation of an additional kidney is associated with the budding of a site of a metanephrogenic blastema, and it is more often formed near the main one, located above or below it. The accessory (third) kidney is much smaller than the normal one, but has a normal anatomical structure. It is supplied with blood separately due to the arteries extending from the aorta. The ureter usually flows into the bladder by an independent mouth, but may be ectopic or communicate with the ureter of the main kidney. Cases of the blind termination of an ureter are described.

The accessory kidney should be distinguished from the upper segment of the double kidney. The difference lies in the fact that when doubling, the collecting system of the lower segment of the kidney is represented by two large cups, and the upper one by one. The segments of the doubled kidney are in intimate proximity and form an inextricable contour of the parenchyma. In the case of an additional kidney, its parenchyma is distant from the main kidney, and the collector system contains three cups, like the main one, only in miniature.

**Clinic and diagnostics.** An additional kidney will acquire clinical significance only with ectopia of the ureteral orifice or its damage due to an inflammatory, tumor or other pathological process.

The diagnosis can be made on the basis of excretory urography, retrograde pyelography, aortography.

**Treatment** for disease of the accessory kidney usually consists of nephrectomy due to its low functional value.

**Kidney dystopia.** This name is understood as an unusual location of the kidneys due to a violation in the embryogenesis of the process of their ascent. The frequency of anomalies is on average 1:800. kidney dystopia is more often observed in males.

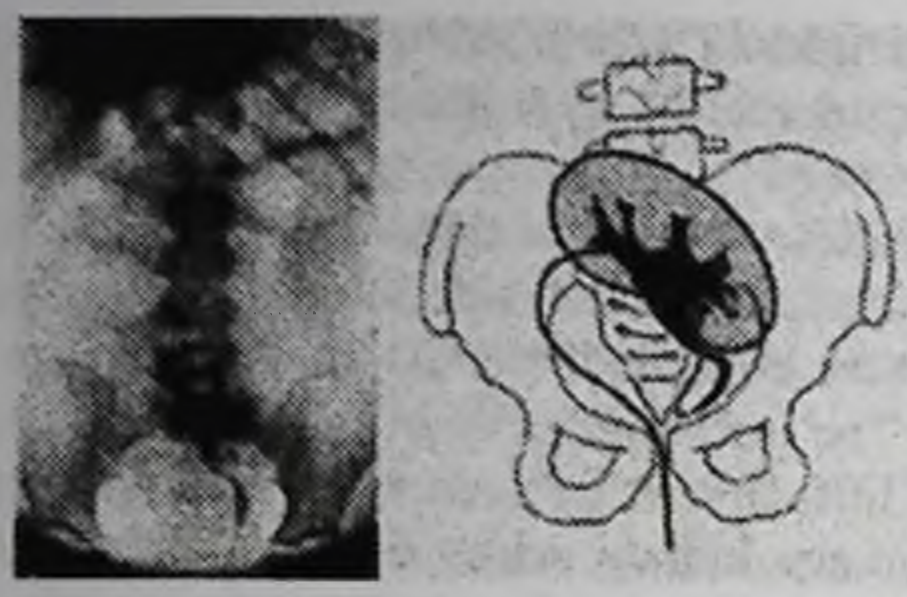


**Figure 53. Excretory urography. Pelvic dystopia of the left kidney**

Since the processes of ascent and rotation are interrelated, the dystopic kidney is turned outward, and the lower the dystopia, the more ventral the renal pelvis is located. A dystopic kidney often has a loose type of blood supply, its vessels are short and limit the displacement of the kidney.

The functional state of a dystopic kidney is usually reduced. The kidney, as a rule, has a lobular structure. Its shape can be very diverse - oval, pear-shaped, flattened and irregular.

There are high dystopia, low and cross.

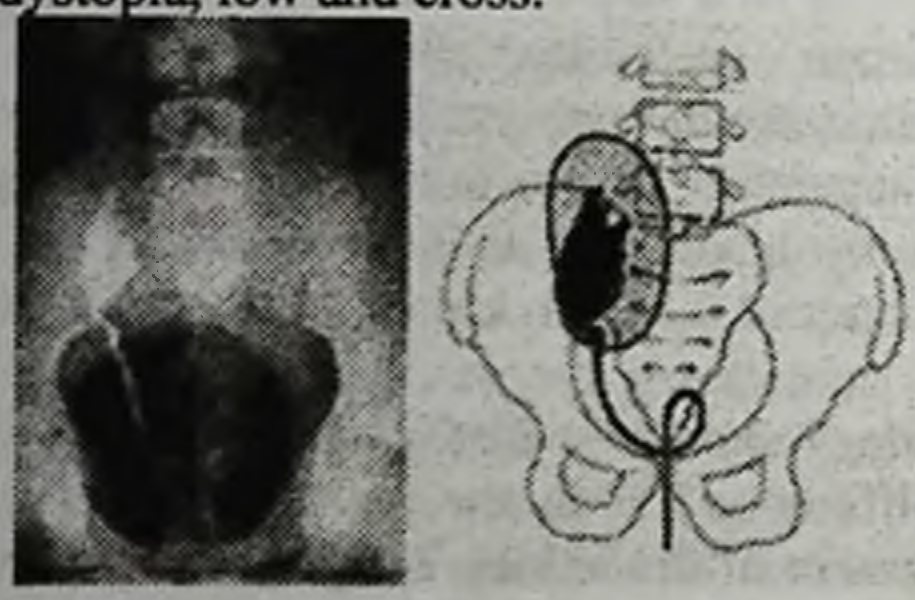


**Figure 54. Retrograde pyelography. Pelvic dystopia of the right kidney**

The intrathoracic kidney belongs to high dystopia. This is a very rare anomaly. To date, in the world literature, the number of its descriptions does not exceed 90. With intrathoracic dystopia, the kidney is usually part of a diaphragmatic hernia. The ureter is elongated, flows into the bladder.

Varieties of low dystopia are lumbar, iliac and pelvic.

With lumbar dystopia, the pelvis slightly turned anteriorly is at the level of the IV lumbar vertebra. The renal artery usually originates above the aortic bifurcation. The kidney moves to a limited extent.

Iliac dystopia is characterized by a more pronounced rotation of the pelvis anteriorly and its location at the level of Lv - SI. Compared with the lumbar-dystopic kidney, its medial displacement is noted. The renal arteries are usually multiple, originating from the common iliac artery or aorta at the bifurcation. There is practically no mobility of the kidney with a change in body position.

The pelvic kidney is located in the midline under the aortic bifurcation, behind and slightly above the bladder. May have the most bizarre shape. As a rule, it is hypoplastic to one degree or another. The vessels of the kidney are usually loose type, they are branches of the common iliac or various pelvic arteries.

A combination of pelvic dystopia with lumbar or iliac dystopia of the contralateral kidney is possible.

**Cross dystopia** is characterized by the displacement of the kidney contralaterally. In this case, as a rule, both kidneys grow together, forming an S- or I-shaped kidney. The vessels that feed the kidneys usually depart lower from the ipsi - or contralateral side. The frequency of cross-dystopia of the kidney is 1:10,000 - 1:12,000.

Bilateral cross-dystopia is described, which is extremely rare.

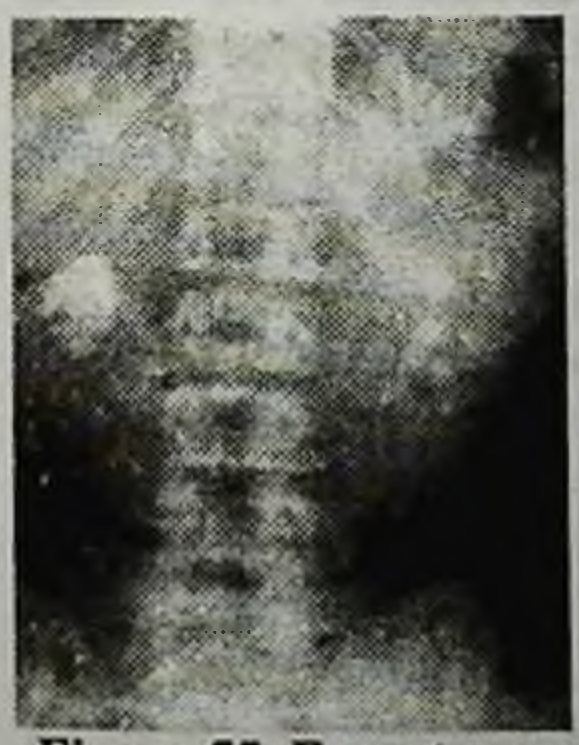
**Clinic and diagnostics.** With kidney dystopia, the clinical picture is due to the abnormal location of the organ. The leading symptom is pain that occurs with a change in body position, physical stress, flatulence.

With cross dystopia, pain is usually localized in the iliac region and radiates to the inguinal region of the opposite side. Since a dystopic kidney is affected by a pathological process (hydronephrotic transformation, calculosis, pyelonephritis) much more often than a normally located one, the symptoms of these diseases are often added. Intrathoracic dystopia with clinical manifestations and survey radiography data can simulate a mediastinal tumor.

With lumbar and iliac dystopia, the kidney is palpated in the form of a slightly painful, inactive formation.

Dystopia is usually detected with excretory urography, and in the case of a sharp decrease in kidney function - with retrograde pyelography (Fig. 53.54).

The characteristic signs of dystopia are noted: rotation and unusual localization of the kidney with limited mobility.



Often there are difficulties in the differential diagnosis of lumbar and iliac dystopia and nephroptosis, especially in cases of the so-called fixed nephroptosis, which. Like a dystopic kidney, it is characterized by low localization and low displacement of the kidney. However, on urograms with fixed nephroptosis, one can note the medial location of the pelvis and a tortuous long ureter (Fig. 55). Sometimes only renal angiography helps to distinguish between this condition, revealing a short vascular pedicle with dystopia and an elongated one with nephroptosis.

**Figure 55. Excretory urography. Cross dystopia of the kidneys**

**Treatment.** The attitude towards kidney dystopia is as conservative as possible. The operation is usually performed with dystopia complicated by hydronephrosis or calculosis. In cases of death of a dystopic kidney, a nephrectomy is performed.

Operational relocation of the kidney is extremely difficult due to the loose type of blood supply and the small caliber of the vessels.

## HORSESHOE KIDNEY

Kidney fusion accounts for about 13% of all renal anomalies. There are symmetrical and asymmetric forms of fusion. The first include horseshoe- and biscuit-shaped, the second - S-, L- and I-shaped kidneys.

**Figure 56. Horseshoe kidney**

With a horseshoe-shaped anomaly of development, the kidneys grow together with the same ends, the renal parenchyma looks like a horseshoe. The occurrence of an anomaly is associated with a violation of the process of ascent and rotation of the kidneys. The horseshoe kidney is located lower than usual, the pelvis of the fused kidneys is directed anteriorly or laterally. Blood supply, as a rule, is carried out by multiple arteries extending from the abdominal aorta or its branches (Fig. 56).

More often (in 98% of cases) the kidneys grow together with the lower ends. At the junction of the kidneys there is an isthmus, represented by connective tissue or a complete renal parenchyma, often having a separate blood circulation. The isthmus is in front of the abdominal aorta and inferior vena cava, but may be located between them or behind them.

The anomaly occurs in newborns with a frequency of 1:400 - 1:500, and in boys it is 2.5 times more common than in girls.

The horseshoe kidney is often combined with other anomalies and malformations. Dystopic location, poor mobility, abnormal ureteral discharge and other factors contribute to the fact that the horseshoe-shaped kidney is easily exposed to traumatic impacts.

**Clinic and diagnostics.** The main clinical sign of a horseshoe kidney is Rovsing's symptom, which consists in the occurrence of pain when the trunk is extended. The appearance of a pain attack is associated with compression of the vessels and aortic plexus by the isthmus of the kidney. Often the pain is of an indefinite nature and is accompanied by dyspeptic symptoms.

A horseshoe-shaped kidney can be identified with deep palpation of the abdomen in the form of a dense sedentary formation. Radiologically, with good bowel preparation, the kidney looks like a horseshoe, convex facing down or up. The

contours of the kidney are most clearly detected during angiography in the phase of the nephrogram.

**Treatment.** Surgery for a horseshoe kidney is usually performed only with the development of complications. In order to identify the nature of the blood supply before the operation, it is advisable to perform renal angiography.

**Galetoform kidney.** Plano-oval formation located at the level of the promontorium or below. It is formed as a result of the fusion of two kidneys at both ends even before the start of their rotation. The blood supply of the gallet-shaped kidney is carried out by multiple vessels extending from the aortic bifurcation and randomly penetrating the renal parenchyma. The pelvis is located anteriorly, the ureters are shortened. The anomaly occurs with a frequency of 1:26,000.

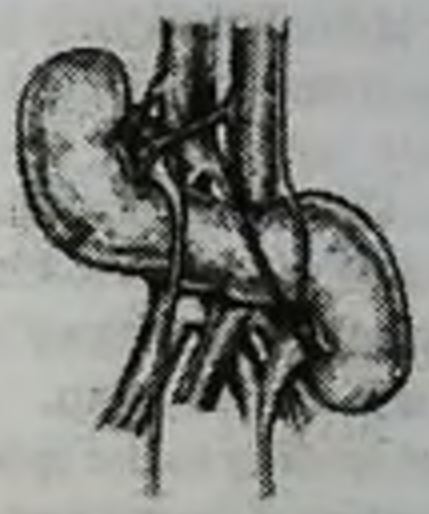


**Figure 57. Galetoform kidney**

Diagnosis is based on the data of palpation of the abdominal wall and rectal finger examination, as well as on the results of excretory urography and renal angiography (Fig. 57).

## ASYMMETRIC FUSIONS.

Such forms account for 4% of all renal anomalies. They are characterized by the connection of the kidneys with opposite ends. In the case of an S-, L-shaped kidney, the longitudinal axes of the fused kidneys are parallel, and the axes of the kidneys forming the L-shaped kidney are perpendicular to each other. The pelvis of the S-shaped kidney is turned in opposite directions.

An L-shaped kidney occurs as a result of dystopia of one kidney, more often the right one, in the opposite direction. In this case, the kidneys grow together, forming a single column of the renal parenchyma with the pelvis located medially.

Adherent ectopic kidneys can compress neighboring organs and large vessels, causing intermittent ischemia and pain.

**Diagnostics.** Anomalies are detected by excretory urography and kidney scanning. If surgery is necessary, renal angiography is indicated. Surgical interventions on fused kidneys are technically difficult due to the complexity of the blood supply.

### Aplasia of the kidney

Kidney aplasia should be understood as a severe degree of underdevelopment of its parenchyma, often combined with the absence of the ureter. The defect is

formed in the early embryonic period, before the formation of nephrons. There are two forms of kidney aplasia - large and small. In the first form, the kidney is represented by a lump of fibrolipomatous tissue and small cysts. Nephrons are not defined, there is no isolateral ureter. The second form of aplasia is characterized by the presence of a fibrocystic mass with few functioning nephrons. The ureter is thinned, has an orifice, but often does not reach the renal parenchyma, ending blindly. The aplastic kidney does not have a pelvis and a well-formed renal pedicle. The frequency of the anomaly ranges from 1:700 to 1:500. it is more common in boys than in girls.

**Clinic and diagnostics.** Usually, an aplastic kidney does not manifest itself clinically and is diagnosed in diseases of the contralateral kidney. Some patients complain of pain in the side or abdomen, which is associated with compression of nerve endings by growing fibrous tissue or enlarged cysts.

The detection of kidney aplasia is based on the data of X-ray and instrumental research methods. On a survey radiograph, in rare cases, cysts with calcified walls are found in place of the aplastic kidney. Against the background of retroperitoneally injected air, an aplastic kidney with good bowel preparation is visible on tomograms in the form of a small lump.

During aortography, the arteries leading to the aplastic kidney are not detected.

Aplasia should be differentiated from a non-functioning kidney, agenesis and hypoplasia of the kidney. To distinguish a kidney that has lost function as a result of pyelonephritis, calculosis, tuberculosis, or another process, retrograde pyelography and aortography allow (Fig. 58).

Agenesia is characterized by the absence of renal parenchyma anlage. In this case, as a rule, the ipsilateral (on the same side) genitourinary apparatus does not develop: the ureter is absent or represented by a fibrous cord or ends blindly, there is hemiatrophy of the vesical triangle, the testicle is absent, or not lowered. Differential diagnosis is helped by cystoscopy, which reveals, with aplasia of the kidney, in half of the cases the mouth of the corresponding ureter.

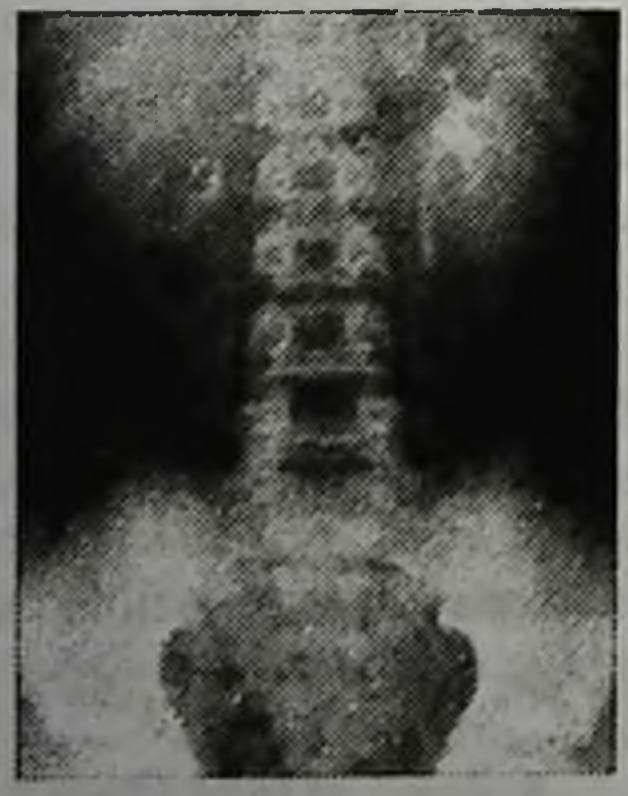


**Figure 58. Excretory urography. Aplasia of the right kidney**

A hypoplastic kidney is distinguished from aplasia by the presence of a functioning parenchyma, a ureter that is passable throughout, and visualization of the vascular pedicle during aortography.

**Treatment.** The need for therapeutic measures for kidney aplasia occurs in three cases: 1) with pronounced pain in the kidney area; 2) with the development of nephrogenic hypertension; 3) with reflux into a hypoplastic ureter. Treatment consists of performing a ureteronephrectomy (removal of the kidney and ureter).

## HYPOPLASIA OF THE KIDNEYS

This is a congenital reduction of the kidney, mainly associated with impaired development of the metanephrogenic blastema as a result of insufficient blood supply. The anomaly occurs with approximately the same frequency as kidney aplasia.

A hypoplastic kidney macroscopically represents a normally formed organ in miniature. On the cut, the cortical and medulla layers are well defined. However, a histological examination reveals changes that make it possible to isolate preforms of hypoplasia:

- Simple hypoplasia;
- Hypoplasia with oligonephronia;
- Hypoplasia with dysplasia.

A simple form of hypoplasia is characterized only by a decrease in the number of calyces and nephrons. In the second form, a decrease in the number of glomeruli is combined with an increase in their diameter, fibrosis of the interstitial tissue, and dilation of the tubules. Hypoplasia with dysplasia is manifested by the development of connective tissue or muscle couplings around the primary tubules. There are glomerular or tubular cysts, as well as inclusions of lymphoid, cartilage and bone tissue. This form of hypoplasia, unlike the first two, is often accompanied by anomalies of the urinary tract.

**Clinic and diagnostics.** Unilateral hypoplasia may not manifest itself in any way throughout life, however, it has been noted that a hypoplastic kidney is often affected by pyelonephritis and often serves as a source of nephrogenic hypertension.

Bilateral renal hypoplasia manifests itself early - in the first years and even weeks of a child's life. Children lag behind in growth and development. Pallor, vomiting, diarrhea, fever, signs of rickets are often observed. There is a pronounced decrease in the concentration function of the kidneys. However, the data of biochemical blood tests remain normal for a long time. Blood pressure is also usually normal and rises only with the development of uremia. The disease is often complicated by severe pyelonephritis. Most children with severe bilateral renal hypoplasia die from uremia in the first years of life.

**Treatment.** In cases of unilateral hypoplasia complicated by pyelonephritis and hypertension, treatment is usually reduced to nephrectomy.

With bilateral renal hypoplasia, complicated by severe renal failure, only bilateral nephrectomy followed by kidney transplantation can save the patient.

# HYDRONEPHROSIS

Hydronephrosis is a progressive expansion of the pelvis and calyces, resulting from a violation of the outflow of urine in the region of the ureteropelvic segment.

Causes of hydronephrosis can be anatomical, including ureteropelvic stenosis, fetal bands and adhesions, fixed kink of the ureter, high ureteral outlet, inferior pole vessel occluding the ureteropelvic segment, ureteral valve, and functional due to muscle dysplasia and nerve elements of the wall of the segment and impaired patency of the peristaltic wave in it.

**Figure 59. Causes of congenital hydronephrosis**

The most common cause of hydronephrosis in childhood is ureteropelvic stenosis. Its occurrence is associated with a violation of the process of recanalization of the ureter in embryogenesis. The consequence of antenatal inflammation are embryonic strands and adhesions, squeezing it from the outside or causing a fixed inflection. In some patients, the difficulty in emptying the pelvis is associated with additional (aberrant) lower polar vessels, the constant pulsation of which can lead to sclerotic changes in the wall of the ureter and impaired patency. High discharge of the ureter is a consequence of a congenital anomaly and leads to a preferential expansion of the lower part of the pelvis. One of the causes of hydronephrosis is the valves of the ureter, localized in the region of the ureteropelvic segment and either representing a fold of the mucous membrane, or they include all layers of the ureter (Fig. 59).

An interesting fact is that even with a pronounced block, the kidney remains functional for a long time. Save the kidney pyelorenal reflux. An increase in pressure in the pelvis leads to the flow of urine from the pelvis into the tubules. With severe obstruction of the ureter, rupture of the fornic zones is possible, while urine penetrates into the interstitial space, from where it is carried away through the venous and lymphatic vessels. But at the same time, pyelorenal refluxes lead to a deterioration in the blood supply to the parenchyma and lead to its replacement with scar tissue.

Urinary stasis and ischemia of the organ contribute to the addition of such a formidable complication of hydronephrosis as pyelonephritis, which occurs in 87% of patients.

**Clinic and diagnostics.** The main clinical manifestations of hydronephrosis are pain, changes in urine tests, and a symptom of a palpable tumor in the abdomen. Pain syndrome is noted in 80% of patients. The pains are varied in nature - from aching dull to bouts of renal colic. The frequency and intensity of pain are associated with the addition of pyelonephritis and / or stretching of the renal capsule against the background of a sharp violation of the outflow of urine. Pain is usually localized in the navel, only older children complain of pain in the lumbar region. Changes in urine tests are characterized by leukocyturia and bacteriuria or hematuria.

Quite often, difficulties arise in the differential diagnosis of hydronephrosis and hydrocalicosis, which is characterized by persistent expansion of the calyces with normal sizes of the pelvis and good patency of the ureteropelvic segment. The disease is the result of medullary dysplasia, accompanied by underdevelopment and thinning of the renal medulla. Diagnosis is assisted by excretory urography with delayed imaging and angiography (Fig. 60). With megacalicosis, the renal arteries retain a segmental structure, the diameter of the based trunks is normal, there is depletion and thinning of the vascular pattern in the areas where the cups are located.

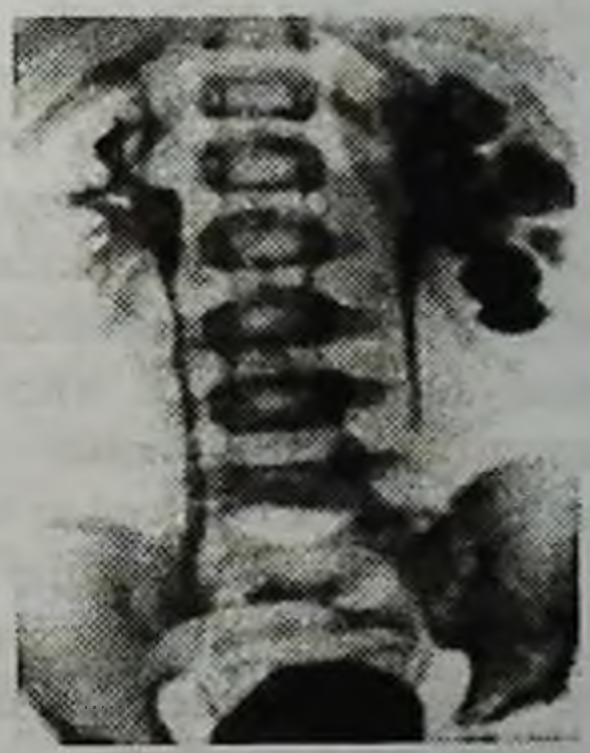


**Figure 60. Excretory urogram hydrocalicosis of the left kidney**

**Treatment** of hydronephrosis is only surgical. Indications for surgery are established after confirmation of the diagnosis. The volume of surgical intervention is determined by the degree of preservation of renal function. If the kidney function is slightly reduced, a reconstructive plastic surgery is performed - resection of the altered ureteropelvic segment, followed by pyeloureterostomy (Hynes-Andersen-Kuchera operation). In the case of a significant decrease in renal function, it is possible to resort to a preliminary diversion of urine using a nephrostomy. With a subsequent improvement in renal function, detected using a radionuclide study, it is

possible to perform a reconstructive operation. If changes in kidney function are irreversible, the question of nephrectomy arises.

The postoperative prognosis of the disease largely depends on the degree of preservation of the kidney function and the activity of the pyelonephritic process. Dispensary observation of children who underwent surgery for hydronephrosis is carried out jointly by a urologist and a nephrologist. Control X-ray examination is performed at intervals of 6-12 months. Good patency of the ureteropelvic segment and the absence of exacerbations of pyelonephritis for 5 years make it possible to remove the child from the register.

## MEGAURETHER

Megaureter (megadolichoureter, hydroureter, ureterohydronephrosis) - a significant expansion of the ureter caused by mechanical obstruction, vesicoureteral reflux or hypotension of its walls. Depending on the cause of development, obstructive megaureter, reflux ureter and ureteral achalasia are distinguished.

**Obstructive megaureter** develops against the background of stenosis in the region of the mouth of the ureter or ureterocele. Violation of the emptying of the ureter leads to its significant expansion and tortuosity (megadolichoureter), dilatation of the renal collector system, the rapid onset of urethritis and pyelonephritis. With a bilateral process, chronic renal failure develops quite early.

**Refluxing megaureter** is not so severe, but reflux, being a dynamic obstruction, over time causes the development of reflux nephropathy, slowing down of kidney growth, and sclerotic changes in the renal parenchyma. Joining pyelonephritis accelerates the process of scarring of the kidney.

**Achalasia of the ureter** is characterized by local dilatation of the ureter, limited to the distal or less commonly middle cystoid, without dilatation of the pelvis and calyces. Its cause is the immaturity of the neuromuscular structures of the ureter wall, which tend to mature (maturation), which can lead to self-healing.

**Clinic and diagnostics.** The manifestations of the megaureter are due to the course of chronic pyelonephritis. Parents note weakness, pallor, stunting of the child, unexplained rises in temperature. Urine is sometimes cloudy, in the analyzes - leukocyturia, bacteriuria, sometimes erythrocyturia. With exacerbations of concomitant cystitis, frequent and painful urination appears.

Cystoscopy often shows signs of chronic cystitis, narrowing or, conversely, gaping of the mouths of the ureters, their lateral displacement and deformation.

In the radionuclide study, a decrease in the accumulation and excretion of the radiopharmaceutical by the parenchyma and collecting system of the kidney is determined.

**Treatment** is a difficult task due to severe primary and secondary changes. With a very large expansion and tortuosity of the ureters, a nephrostomy is applied to unload them, and after 3-6 months, a resection of the terminal ureter is performed with reimplantation into the bladder using the antireflux technique. However, in 1/3 of patients, especially with bilateral megaureter, it is not possible to establish a

satisfactory passage of urine, and many of them become candidates for kidney transplantation.

**The prognosis** is slightly better in children with ureteral achalasia. If they develop pyelonephritis, then it usually proceeds benignly, and surgical intervention is not required. Over time, dilatation of the ureter decreases and spontaneous recovery may occur.

It is possible to equip a general practitioner with knowledge, to teach standard skills in the indicated professional field, to teach the skills of working with a patient, his relatives and friends, to teach rational tactics in solving medical and social problems only by non-traditional, active, problem-based learning, choosing methods that are adequate to the goals and objectives. To this end, it is proposed to conduct business games, solving situational problems.

**I. Curation of patients on the topic - 15 minutes**
**II. Participation in the dressing room and in the operating room - 20 minutes;**
**III. Implementation of practical skills - 15 minutes:**

## PRACTICAL SKILLS

### BLADDER PUNCTURE

**Indications:**

- acute urinary retention, if it is impossible to pass into the bladder with a catheter (anomaly in the development of the urethra in newborns, trauma to the urethra).

**Preparation:**

1. By percussion make sure that the bladder is full;
2. Tell the child's parents about the upcoming manipulation.

**Necessary conditions, tools and medicines:**

1. Dressing room or manipulation room;
2. Operating or dressing table;
3. Disposable syringe (5.0 ml) with a needle;
4. Alcohol;
5. Alcohol solution of iodine 2%;
6. Tweezers;
7. Sterile balls and wipes;
8. A strip of medical adhesive plaster;
9. Tray.

**Execution technique (asepsis rules are observed):**

1. Position of the patient on the back;
2. The suprapubic region is treated with iodine, then with alcohol;
3. Find the puncture point along the midline 0.5 - 1 cm above the symphysis;
4. Holding the needle strictly perpendicular to the surface to be punctured, a puncture is made until a characteristic sensation of failure is obtained;
5. A tray is placed under the stream of excreted urine;
6. When urine begins to be excreted in drops, slightly press on the suprapubic region (this achieves the most complete emptying of the bladder);

7. Hermetically close the blunt end of the needle and remove it;
8. The puncture site is smeared with iodine tincture and sealed with a strip of adhesive plaster.
a) needle insertion technique. b) puncture scheme.

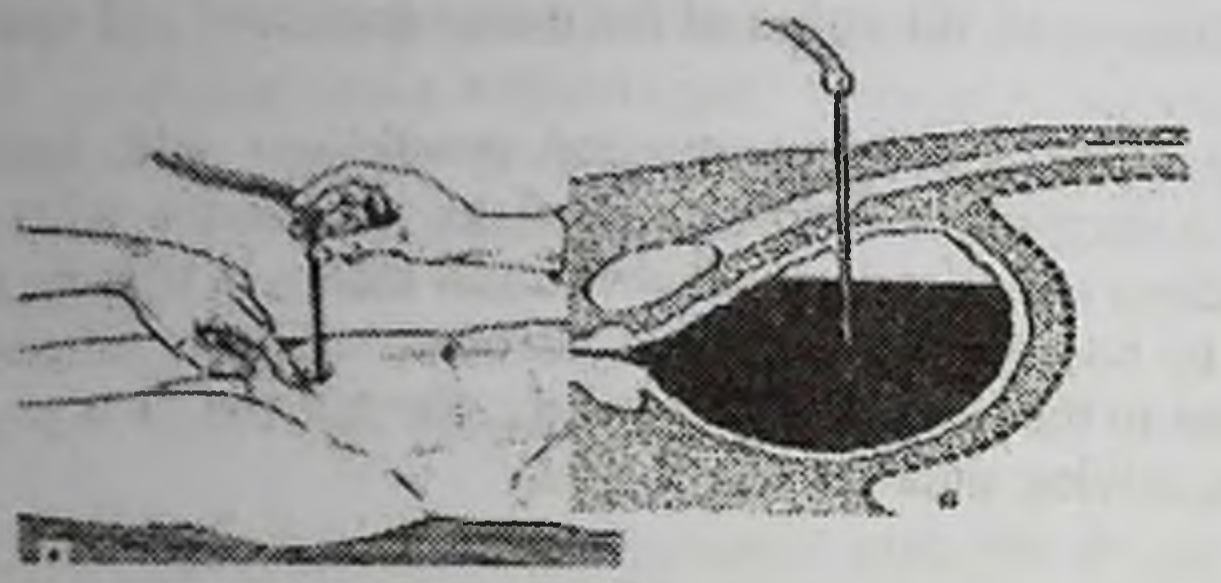


**Figure 61. Technique for bladder puncture**

## BLADDER CATHETERIZATION WITH SOFT CATHETER

**Indications:**
1. Acute urinary retention.
2. The need to check the patency of the urethra.
3. Taking urine for analysis.
4. Washing the bladder.
5. Introduction to the bladder of medicinal substances.

**Preparation:**
Tell the child's parents about the upcoming manipulation.

**Necessary conditions, tools and medicines:**
1. Dressing room or manipulation room.
2. Operating or dressing table.
3. Sterile soft urinary catheter of the appropriate diameter (for children, catheters No. 10-14 are most common).
4. Furacillin solution 1:5000.
5. Tray.
6. Sterile balls and wipes.
7. Vaseline oil.
8. Tweezers.

**Technique for performing catheterization** (asepsis rules are observed):
1. The position of the patient on the back with a slightly raised head, the legs are slightly bent at the hip and knee joints, abducted and turned outward.
2. Stand to the left of the patient, back to his back.
3. The opening of the urethra is washed with a solution of furacillin.
4. Check the patency of the catheter with furacillin solution.
5. Lubricate the end of the catheter with vaseline oil.
6. Place a tray between the thighs.
7. The head of the penis is held with the left hand.

8. Using tweezers, gently advance the catheter until urine appears.
9. Direct the stream of urine into the tray.
10. After emptying the bladder, carefully remove the catheter.

## BLADDER CATHETERIZATION WITH A SOLID (METAL) CATHETER

**Indications:**

1. Acute urinary retention.
2. Inability to pass a soft catheter.
2. The need to check the patency of the urethra.
4. Taking urine for analysis.
5. Washing the bladder.
6. Introduction to the bladder of medicinal substances.

**Preparation:**

Tell the child's parents about the upcoming manipulation.

Necessary conditions, tools and medicines:

1. Dressing room or manipulation room.
2. Operating or dressing table.
3. Sterile solid (metal) urinary catheter of the appropriate diameter (for children, catheters No. 10-14 are most common).
4. Furacillin solution 1:5000.
5. Tray.
6. Sterile balls and wipes.
7. Vaseline oil.
8. Tweezers.

**Technique for performing catheterization** (ascpsis rules are observed):

1. The position of the patient on the back with a slightly raised head, the legs are slightly bent at the hip and knee joints, abducted and turned outward.
2. Stand to the left of the patient, back to his back.
3. Check the patency of the catheter with furacillin solution.
4. The opening of the urethra is washed with a solution of furacillin.
5. Lubricate the end of the catheter with vaseline oil.
6. Take the catheter in your right hand.
7. Having placed the catheter parallel to the pupart ligament, its beak is inserted into the external opening of the urethra, the head of the penis is pushed onto the catheter until the beak is at the lower edge of the symphysis (the catheter is advanced without the slightest violence!).
8. Having determined the position of the beak with the left hand from the side of the perineum, direct it to the angle between the pubic bones.
9. With the right hand, the catheter is transferred downwards, they describe an arc of 1800 in the sagittal plane, while the beak slips through the membranous part of the urethra into the bladder.
10. Direct the stream of urine into the tray.
11. Remove the catheter, performing the techniques indicated in points 7-9 in reverse order.

**Figure 62. Technique of bladder catheterization with a metal catheter**

**IV. Big break - 40 minutes (11.50-12.30).**

**V. Practical lesson (part 2) - 1 hour 35 minutes (12.30-14.05):**

**1. During classes, the use of electronic textbooks, video and photographic materials - 20 minutes;**

**2. UMM - 45 minutes**

## STUDY TASKS

**Appendix 1**

### Group rules

Member of each group

- Respect for the thoughts of their comrades;
- Active and joint participation in tasks, manifestation of responsibility for the task;
- Can ask for help if necessary from comrades;
- Help your comrades in the group;
- Participate in the evaluation of the group;
- Must know the rules "In the same boat, a common fate - to be saved or drown"

Structure responses to questions.

1. What is included in subjective research?
2. Laboratory and instrumental research.

Give the following concepts: anuria, dysuria, ischuria, palpable tumor, pain.

**Appendix 2**

### Tasks for groups

1. Specify 6 causes of congenital hydronephrosis? Make a cluster, SWOT table, Venn diagram for the word "anuria" and draw diagrams Why? and hierarchical diagram How?

2. Clinical signs of congenital hydronephrosis. Make a cluster, SWOT table, Venn diagram for the word "ischuria" and draw diagrams Why? and hierarchical diagram How?

3. Specify the clinical signs of kidney hypoplasia. Cluster, SWOT table, Venn diagram for the word "pain" and chart Why? and hierarchical diagram How?

4. What method of surgical intervention is used for congenital hydronephrosis?.Create a cluster, SWOT table, Venn diagram for the word "habitus" and draw diagrams Why? and hierarchical diagram How? Congenital short esophagus.

5. What are the main symptoms of congenital hydronephrosis? Compile a cluster, SWOT table, Venn diagram for the word "palpable tumor" and chart Why? and hierarchical diagram How?

**TABLE / X / Y** - Students answer the questions "what do you already know about this topic?" and "what do you want to know?"; Allows you to conduct research work on the text, topic, section

| Concept | know "+", don't know "-" | learned "+", could not find out "-" |
|---|---|---|
| Binary nomenclature: | | |
| Etiology | | |
| Pathogenesis | | |
| Clinic | | |
| Deontology | | |
| Symptom | | |
| Syndrome | | |
| Disease | | |
| Disease history | | |
| Outpatient card | | |
| Genetics | | |
| Infection | | |
| Diagnosis | | |
| Instrumental examination of patients: | | |
| Thermometer | | |
| Phonendoscope | | |
| Tonometer | | |
| Iodolipol, barium sulfate | | |
| Nasogastric tube | | |
| Palpation | | |
| Percussion | | |
| Auscultation | | |

| | | |
|---|---|---|
| Anamnesis | | |
| Examination | | |
| General blood analysis, blood biochemistry | | |
| General urine analysis | | |
| ECG | | |
| FCG | | |
| EchoCG | | |
| Chest X-ray | | |

Rules for compiling an INSERT table:

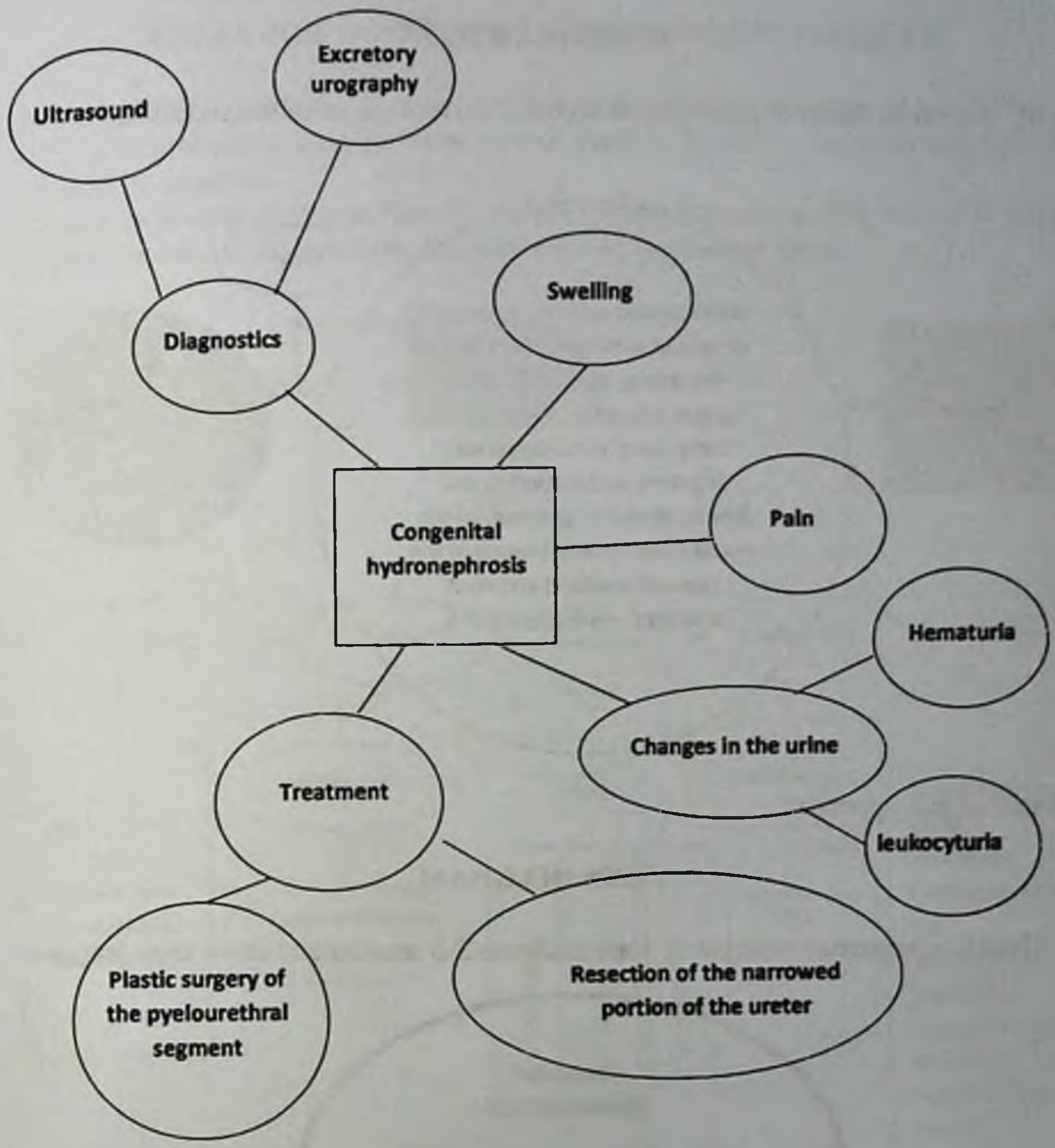
**Table Insert**

| Concepts | V | + | - | ? |
|---|---|---|---|---|
| Congenital malformations and anomalies in the development of the kidneys and urinary tract (agenesis, aplasia, hypoplasia, anomaly in development, position, quantity, structure and relationships, hydronephrosis, ureterohydronephrosis) clinic, diagnosis, treatment. | | | | |
| Place in medicine | | | | |
| The main objective of the subject | | | | |
| Types of disease | | | | |
| The sequence of studying the subject | | | | |
| Learning aids | | | | |

Where: V - corresponds to the existing knowledge (information) about ...
- contradicts existing knowledge about ...
+ - is new information
? -incomprehensible or requiring clarification, addition information

**CLUSTER (Bunch, bundle)**

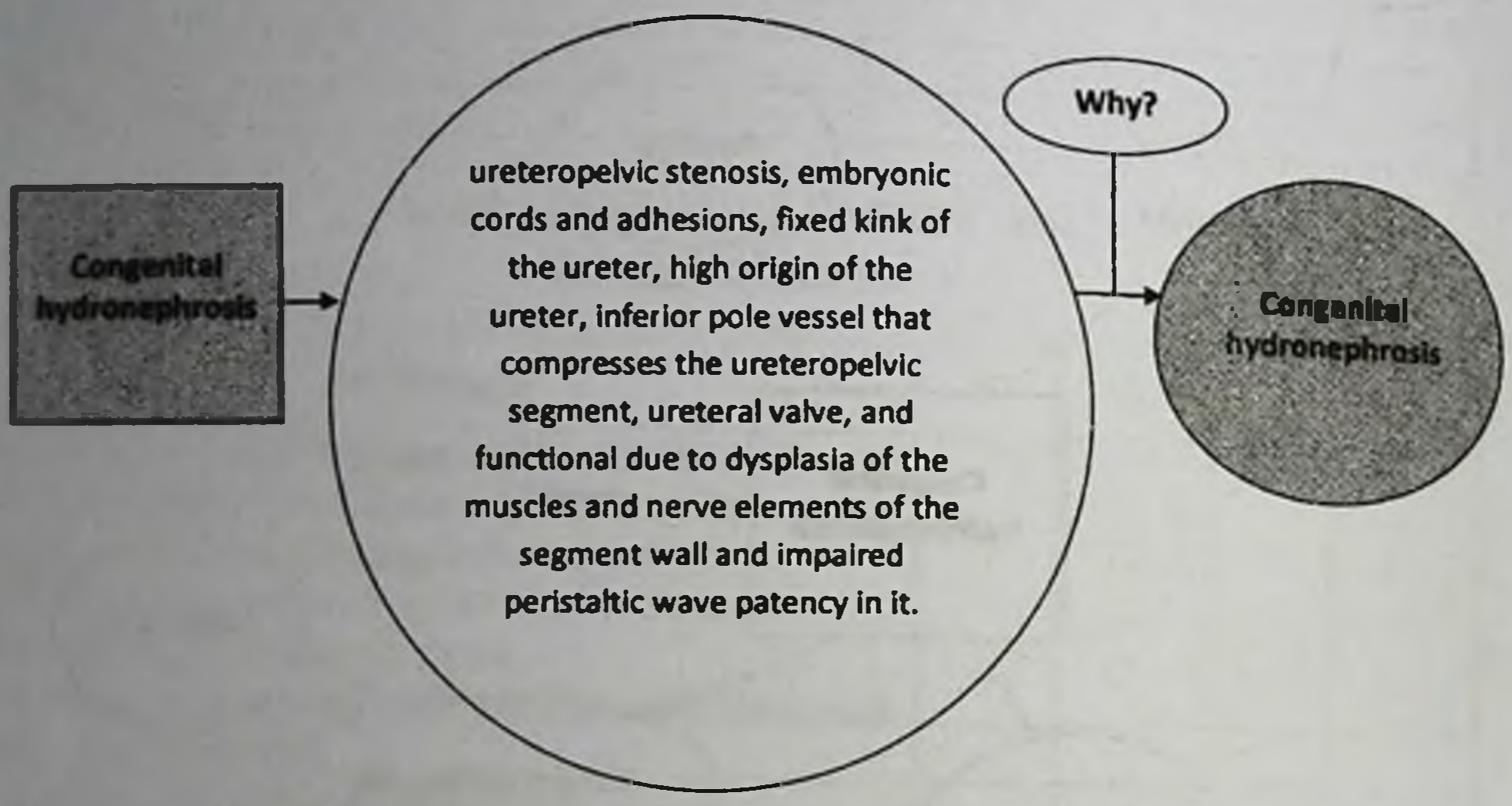
A way of mapping information - gathering ideas around a major factor to focus and make sense of the whole construct




Note: see 2nd appendix

## SCHEME "WHY?"

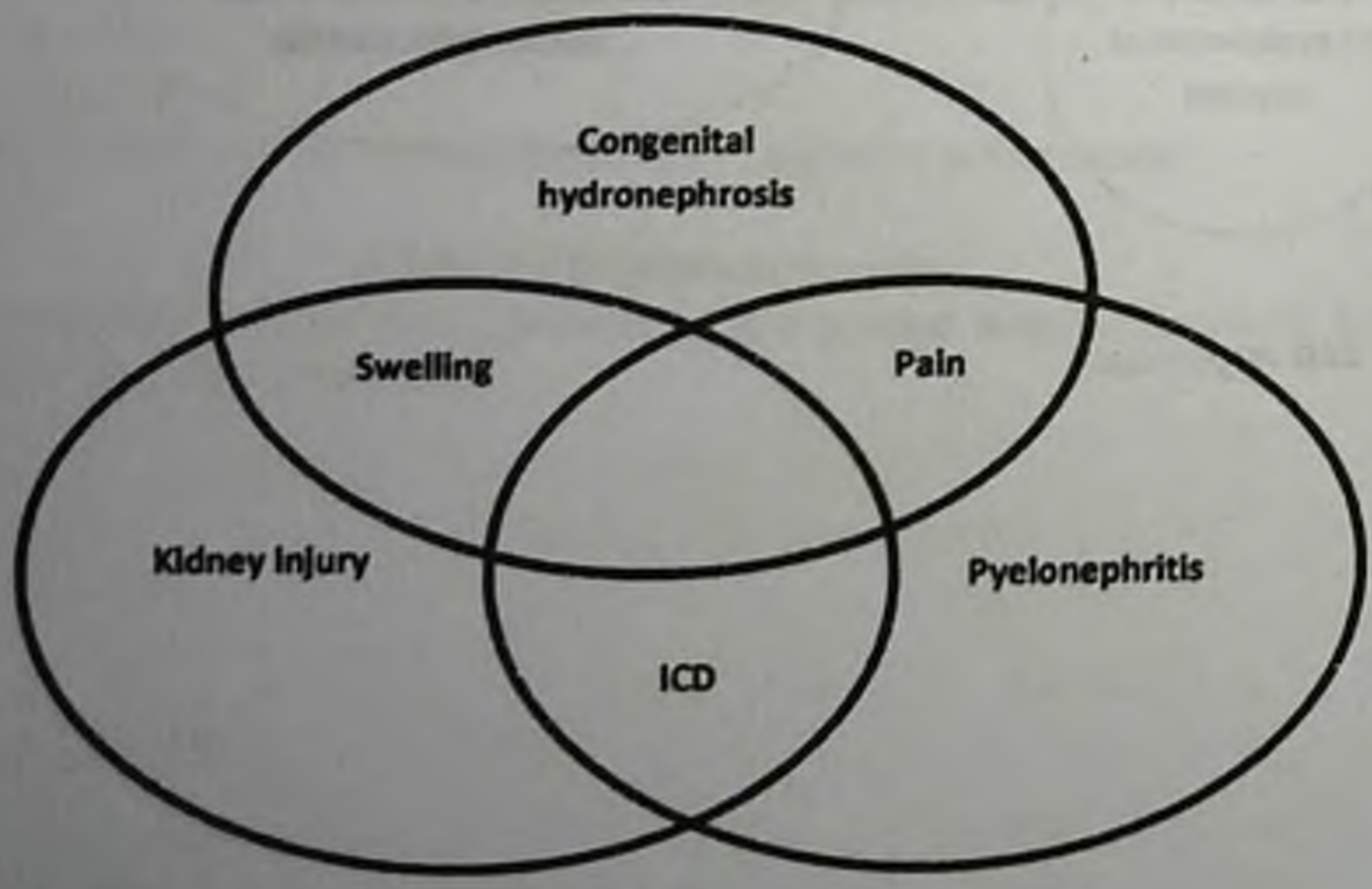
This is a whole chain of reasoning to identify the root cause of the problem.




Note: see 2nd appendix

## VENN DIAGRAM

Used to compare or contrast or contraindicate 2-3 aspects and show their features

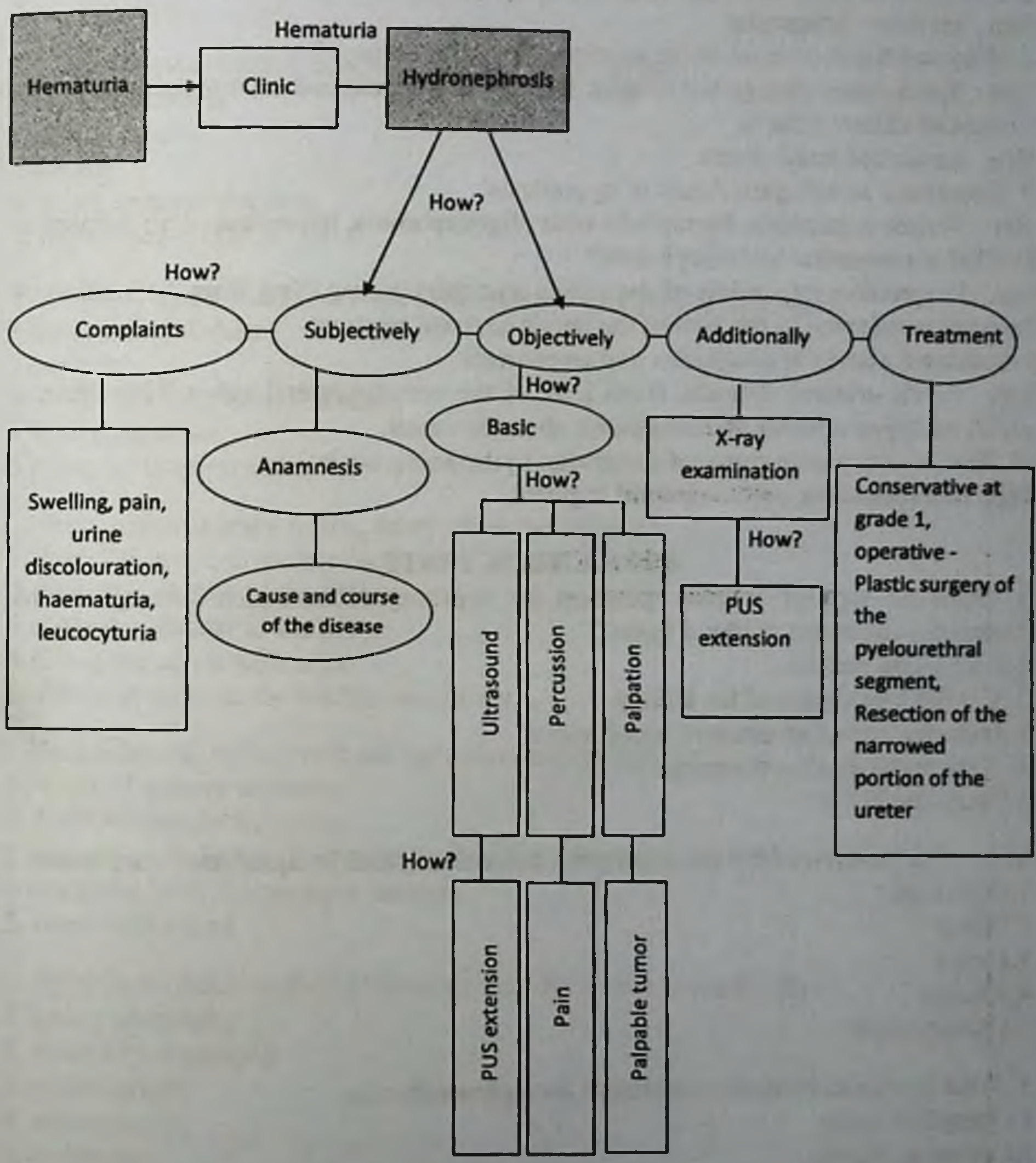



Note: see 2nd appendix

## RULES FOR CONSTRUCTING THE "HOW" DIAGRAM

When solving a problem, in most cases you do not need to think about "What to do?". The problem is usually "How do I do this?". "How?" - the main question that arises in its solution.

Consistent posing questions "how?" allows you to: Explore not only all the available options for solving the problem, but also ways to implement them;




Note: see 2nd appendix

**Questions of interactive games:**

1. What congenital malformations are usually associated with renal agenesis?
Rep. Lack of bladder, genital dysplasia, pulmonary hypoplasia, meningocele.
2. Specify 3 types of kidney dystopia.
Rep. High, low and cross.
3. Describe the varieties of low kidney dystopia.
Rep. Lumbar, iliac and pelvic.
4. The main method for diagnosing hydronephrosis:
Rep. excretory urography.
5. What are the anomalies of the relationship of the kidneys?
Rep. Symmetrical (horseshoe-shaped and biscuit-shaped) and asymmetric 6. Specify 2 forms of kidney aplasia.
Rep. Large and small forms.
7. Describe 3 histological forms of hypoplasia.
Rep. Simple hypoplasia, hypoplasia with oligonephronia, hypoplasia with dysplasia.
8. What is congenital hydronephrosis?
Rep. Progressive expansion of the pelvis and calyces, resulting from a violation of the outflow of urine in the area of the pelvic-ureteral segment.
9. Specify 6 causes of congenital hydronephrosis.
Rep. Pelvic-ureteral stenosis, fixed kink of the ureter, ureteral valve, high ureteral outlet, embryonic bands and adhesions, aberrant vessel.
10. The most common cause of congenital hydronephrosis is....
Rep. Stenosis of the pelvic-ureteral segment.

**SELF-CHECK TESTS**

1. Show the type of optimal operation for hydronephrosis, which develops in the treatment of an aberrant blood vessel?
1.Bind blood vessels
2. Cut the lower parts of the kidney
3.Transposition of an aberrant blood vessel
4. Antivenous pyeloureteremia
5.Operation Foley

2. At what location of the stone is most often complicated by apastomous nephritis?
1.High cups
2.Pelvis
3.Ureter
4.Bladder
5.Urinary canal

3. What is a good corrective operation for hydranephresis.
1.Operation Faley
2.Operation Benin
3.Operation Kuchera
4.cut extra blood vessels

5.ureterolysis.

4. What research method is considered the most informative for trauma to the urethra.



1. excretory urography
2. ascending urethrography
3.cystoscopy
4.uroflowmetry
5. cystography.

5. Under what condition is urgent cystoscopy required?
1.gross hematuria
2.kidney stones
3.anuria
4. acute urinary retention
5. hypertensive crisis

6. In which disease is a color test important for differential diagnosis?
1.neurogenic bladder
2.enuresis
3.ectopia of the adjacent urethra
4.total epispadias
5.posterior urethral valve.

7. With vesico-urinary reflux, where does the urine go.
1. from the ureter to the bladder
2. from the bladder to the ureter
3. from the bladder to the ureter
4.filling the ureter with urine
5. filling of urine in the bladder and ureter.

8. Vesicoureteral reflux what are the main clinical signs
1.Hours of urinary retention
2. frequent painful urination
3.without cause fever, discoloration of urine and pain in the side.
4.increased body temperature, anemia
5. urine with blood

9. What is the main method of investigation for vesicoureteral reflux.
1.survey urography
2. excretory urography
3.urethrography
4. cystography
5.cystoscopy
10. With vesicoureteral reflux, an indication for surgery is considered.
1.I-degree reflux

2. II-degree reflux
3. III-degree reflux
4.ureterohydronephrosis
5. pyonephrosis

11. As a result of the study, a stone was found in the left kidney and a complete absence of functions in the saine kidney. Which method of treatment is considered correct:
1.conservative
2.nephrectomy
3.nephroureterectomy
4.nephrolithotomy
5.pyelolithotomy

12. A patient with grade III hydronephrosis is in a very serious condition, the kidneys are enlarged, the function is reduced, what is your treatment strategy.
1.nephrectomy
2.nephroureterectomy
3. Andersen-Kuchera operation
4. apply nephrostomy
5.conservative treatment

13. During an ultrasound examination of a urological patient, what can we not determine?
1. presence or absence of kidneys
2. kidney size
3. the presence of stones or tumors in the kidney
4. violation of the passage in the collection system of urine
5. kidney function

14. During excretory urography, the quality of R-graphy depends on:
1.child's age
2.kidney function
3.dose and type of contrast agent
4. the presence of a concomitant disease
5. position of the child

15. For antegrade pyelography, how is a contrast agent administered?
1.through the mouth
2. intravenously
3.through the ureter
4.intra-arterial
5. through nephrostomy tubes or by puncture method into the kidneys

16. When is infusion urography performed?
1. the presence of kidney stones, but without impaired function

2.decrease in kidney function
3. hydronephrosis 1 degree
4.chronic pyelonephritis with impaired renal function
5. the presence of a tumor with impaired renal function

17. What tactics is considered correct in acute urinary retention
1. increased diuresis
2. excretory urography
3.Puncture the bladder
4. introduction of solutions into the vessel
5.bladder catheterization

18. What signs are found on excretory urography in case of kidney rupture
1.decreased excretion of the contrast agent
2. accumulation of contrast agent in the renal pelvis
3.contrast agent enters the bladder within 7 minutes
4. passage of the contrast agent into the perirenal tissue
5.contrast retention in the lower part of the ureter

19. In boys, during cystography, an x-ray is taken in which projection?
1.front projection
2.rear projection
3.keep your foot high
4.side projection
5. the position of the child does not matter

20. In what type of exstrophy is it necessary to form the bladder from local tissues?
1.bladder diameter up to 4 cm, with papilomatous phenomenon
2. the bladder diameter is greater than 4 cm, and there is one polyp in the mucosa
3. the bladder diameter is more than 4 cm and there is papillomatosis in the mucous membrane
4. the bladder diameter is more than 4 cm and there is a valve in the right urethra on the distal part
5. the bladder diameter is more than 4 cm and the weight of the newborn is 1600 g

21. What age is considered optimal in the treatment of ectopic urethrocele
1. neonatal period
2. after diagnosing
3. one year after diagnosis
4. preschool age
5. up to 15 years

22. Phimosis is -
1. narrowing of the urethra
2. narrowing of the opening of the foreskin
3. narrowing of the external mouth

4. narrowing of the external urethra
5. narrowing of the opening of the foreskin, as a result of which it becomes impossible to expose the glans penis

23. Balanitis is -
1. Inflammation of the urethra
2. inflammation of the bladder
3. inflammation of the glans penis
4. inflammation of the foreskin and glans penis
5. inflammation of the foreskin

24. Balanoposthitis is
1.inflammation of the urethra
2.bladder inflammation
3.inflammation of the glans penis
4. inflammation of the foreskin and glans penis
5. inflammation of the foreskin

25. Types of phimosis
1. malnutrition, hypertrophy, cicatricial
2. hypertrophy, atrophy, cicatricial
3. atrophy, hypertrophy, cicatricial
4. scarred, scarless, hypertrophy
5. cicatricial, scarless, atrophy

26. What is the main treatment for balanoposthitis?
1. circumcision
2.physiotherapy methods
3.phytotherapy
4.local treatment
5.there is no correct answer

27. Paraphimosis is
1.constriction of the urethra
2. Narrowing of the opening of the foreskin
3. Narrowing of the external urethral orifice
4.narrowing of the internal mouth of the urethra
5. infringement of the glans penis by the foreskin

**Answers to tests for self-control**

**1-1, 2-1, 3-3, 4-2, 5-4, 6-1, 7-2, 8-3, 9-4, 10-4, 11-4, 12-3, 13-4, 14-3, 15-5, 17-4, 18-5, 19-4, 20-1, 21-1, 22-2, 23-5, 24-5, 25-4, 26-4, 27-4, 28-5.**

# CHAPTER 6. CONGENITAL MALFORMATIONS AND ANOMALIES OF THE GENITAL ORGANS AND LOWER URINARY TRACT (VALVE AND STRICTURE OF THE URETHRA, VESICOURETERAL REFLUX, HYPOSPADIAS, EPISPADIAS, EXSTROPHY OF THE BLADDER, HEMATOCOLPOS), CLINIC, DIAGNOSIS, TREATMENT, COMPLICATIONS, POSTOPERATIVE REHABILITATION

**The purpose of the training:** the development of skills and abilities of clinical diagnostics, treatment and rehabilitation of children with congenital malformations and developmental anomalies requiring surgical correction.

**Learning objectives:**

• Formation of knowledge on the etiology, pathogenesis and clinic of the most common malformations and developmental anomalies in children;

• Development of students' skills and abilities of clinical examination and examination of a child with congenital malformations and developmental anomalies, including laboratory, radiation and instrumental research methods;

• Students mastering the diagnostic algorithm for malformations and developmental anomalies that pose a threat to a child's life;

• Acquaintance with the principles of surgical treatment of malformations and developmental anomalies and their complications;

• Development of skills and abilities of general medical care: based on treatment and diagnostic standards and protocols for postoperative rehabilitation of children with congenital malformations and developmental anomalies.

**Location of the lesson:** Department of Thoracic Surgery, Operating Room, Computer Room, Training Room

**Monitoring and evaluation:** oral control, control questions,
performance of educational tasks in groups.

**Written control:** control questions.

## VESICOURETERAL REFLUX

**Vesicoureteral reflux** is the reflux of urine from the bladder into the ureters and the renal collecting system. This is one of the most common diseases in childhood, detected in 35-60% of patients with chronic pyelonephritis.

Vesicoureteral reflux causes a violation of the outflow from the upper urinary tract, which creates favorable conditions for the development of pyelonephritis (Fig. 63).

Why does reflux occur?

Normally, the mouth of the ureter is a valve, the closing force of which reaches 60-80 cm of water. Violation of the function of the vesicoureteral fistula can be congenital and acquired.

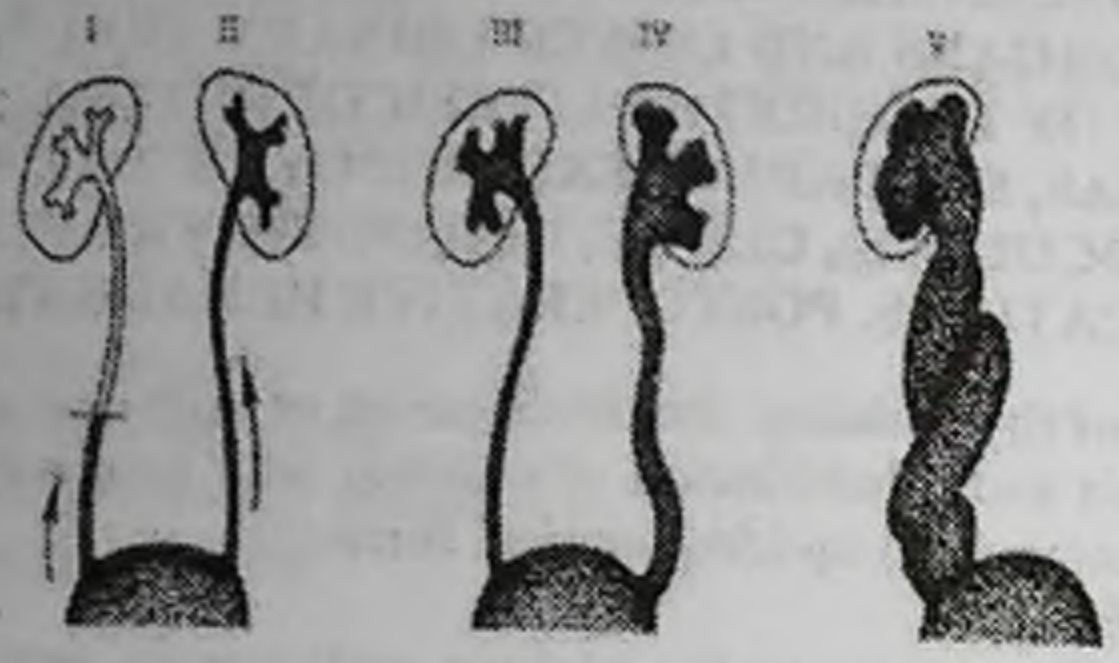



**Figure 63. Variants of vesicoureteral reflux**

Dysplasia of the closing apparatus, shortening of the intramural ureter, dystonia of the mouth are common causes of reflux. Among the causes of secondary changes in the mouths, one of the first places is chronic cystitis, which causes sclerotic changes in the ureterovesical segment, shortening of the intramural ureter and gaping of the mouth. In turn, chronic cystitis often occurs and is maintained by infravesical obstruction. A certain role in the genesis of vesicoureteral reflux is played by dysfunctions of the bladder, on the one hand, supporting cystitis, on the other hand, causing functional valve failure due to episodes of a sharp increase in intravesical pressure. The immaturity of the closing apparatus of the mouths is not excluded, the disappearance of which is possible with the growth of the child.

Vesicoureteral reflux, even in the case of a latent course of pyelonephritis, should be considered as a pathological condition, the result of which may be kidney shrinkage and the development of chronic renal failure or hypertension.

**Clinic and diagnostics.** Vesicoureteral reflux in children does not have a characteristic clinical picture. It is usually manifested by symptoms of pyelonephritis. Older children complain of pain in the lumbar region or after urination. When combined with cystitis or dysfunction of the bladder, complaints of dysuric disorders (pollakiuria, imperative urinary incontinence, urinary incontinence) or pain in the lower abdomen are possible.

Examination of the patient begins with clinical and laboratory methods. The presence of persistent leukocyturia, bacteriuria, accompanied by fever, intoxication, make one suspect pyelonephritis and require the exclusion of obstructive uropathy.

Ultrasound scanning, excretory urography do not provide reliable information in the diagnosis of vesicoureteral reflux and can only reveal the expansion of the collector system and the kidneys and ureter, sometimes suspect sclerotic changes in the renal parenchyma (compaction and thinning of it, smoothness of the fornic apparatus).

The main method for diagnosing vesicoureteral reflux is cystography. According to the height of the reflux of the contrast agent and dilatation of the collector system of the kidney and ureter, five degrees of reflux are distinguished. At grade I, reflux is noted only in the distal ureter, the diameter of the latter is not

changed. At the II degree, the contrast agent fills the radiologically unchanged pelvicalyceal system of the kidney. Grade III is characterized by a moderate expansion of the ureter, pelvis, smoothness of the fornic apparatus. At the IV degree, a pronounced dilatation of the renal collector system, an expansion of the ureter, which becomes tortuous, are revealed. At grade V, a sharp expansion of the collector system of the kidney and ureter is accompanied by the death of the renal parenchyma.

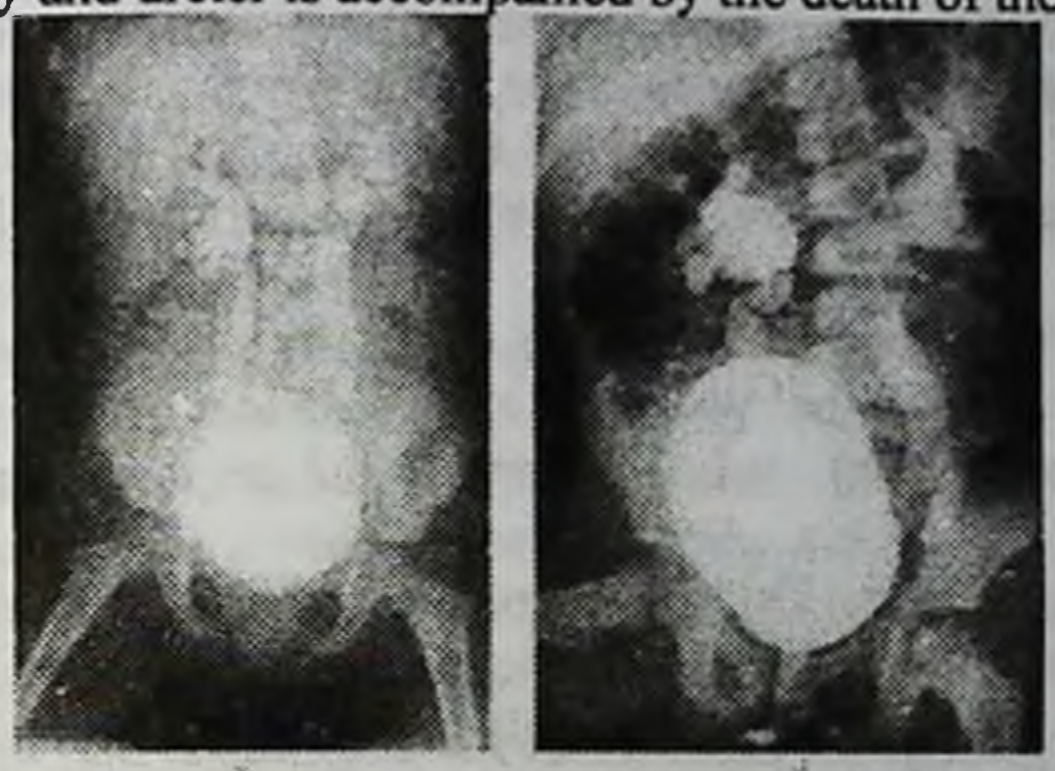


**Figure 64. Voiding cystography. Bilateral vesicoureteral reflux**

According to the mechanism of occurrence, passive, active and mixed reflux are distinguished: reflux of urine into the upper urinary tract occurs both during passive filling of the bladder and at the time of urination (Fig. 64). The examination plan for patients with vesicoureteral reflux must include cystoscopy to exclude cystitis, uroflowmetry and cystometry to assess the urodynamics of the lower urinary tract, radioisotope study to quantify renal function.

**Treatment** of vesicoureteral reflux can be conservative or surgical. Conservative treatment is indicated for any degree of reflux and includes the following measures.

Treatment of pyelonephritis: antibacterial (taking into account the sensitivity of the pathogen), desensitizing, immunocorrective, herbal medicine.

Treatment of concomitant cystitis: local medication and physiotherapy.

Elimination of existing disorders of urodynamics at the level of the lower urinary tract.

The duration of conservative therapy is from 6 to 12 months. After the course of treatment, control cystography is performed. The effectiveness of conservative treatment for I-III degree of vesicoureteral reflux is 60-70%. In cases of persistence of reflux and recurrent course of pyelonephritis, the question of surgery is raised. The volume of surgical intervention is determined by the degree of reflux. With the first degrees of reflux (the diameter of the ureter is slightly changed), the Gregoire operation is performed - lengthening the intramural ureter without opening the bladder. In case of grade IV-V vesicoureteral reflux, resection of the distal ureter and neoimplantation into the bladder with antireflux protection are performed.

**The prognosis** is largely determined by the degree of preservation of renal function and the severity of the pyelonephritic process.

**Clinical supervision** of children suffering from vesicoureteral reflux or undergoing antireflux surgery is carried out by a urologist and a nephrologist.

## BLADDER EXTROPHY

Exstrophy of the bladder is a severe malformation, manifested by the congenital absence of the anterior wall of the bladder and the corresponding section of the anterior abdominal wall. Bladder exstrophy is always accompanied by total epispadias and divergence of the bones of the pubic symphysis. This defect occurs in 1 out of 40,000 - 50,000 newborns, in boys 3 times more often than in girls.

The occurrence of exstrophy of the bladder refers to the first 4-7 weeks of intrauterine life.

Constant urinary incontinence, severe deformity of the external genitalia, the absence of an anterior abdominal wall with a split bladder bring severe physical and moral suffering to both patients and their parents and are the main complaints when contacting a doctor.

**Clinic and diagnostics.** The clinical picture of bladder exstrophy is specific: a bright red mucous membrane of the posterior wall of the bladder swells through a rounded defect in the anterior abdominal wall. The belly button is located above the upper edge of the defect. The mucous membrane of the bladder is easily vulnerable, often covered with papillomatous growths and bleeds easily. The diameter of the bladder plate is 3-7 cm (Fig. 65).

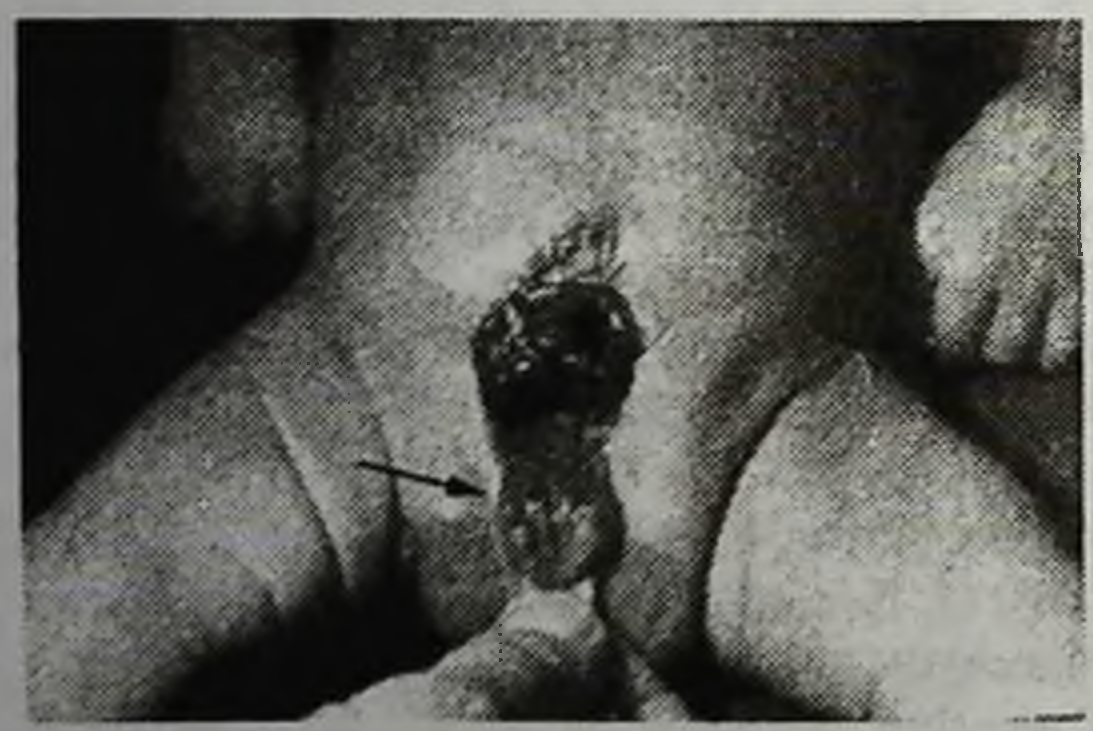


**Figure 65. Appearance of a patient with bladder exstrophy**

Over time, the mucous membrane scars. The mouths of the ureters open in the lower part of the bladder plate at the tops of cone-shaped elevations or are lost between the rough folds of the mucous membrane. Urine constantly flows out, causing maceration of the skin of the anterior abdominal wall, inner thighs and perineum. In boys, the penis is shortened, pulled up to the anterior abdominal wall, the split urethra is in contact with the mucous membrane of the bladder. The scrotum is underdeveloped, cryptorchidism is often observed. In girls, along with the splitting of the urethra, there are splitting of the clitoris, adhesions of the large and small labia. The anus is ectopic towards the front.

Often, bladder exstrophy is combined with inguinal hernia, rectal prolapse, and malformations of the upper urinary tract. Direct contact of the ureters with the external environment leads to the development of ascending pyelonephritis. Patients with exstrophy of the bladder are characterized by a "duck" gait due to the instability of the pelvic ring.

Treatment of exstrophy of the bladder is only surgical. In order to avoid the accession of ascending pyelonephritis, surgical intervention, if the child's condition allows, should be performed in the first 3 months. life. Subsequently, this facilitates the social adaptation of the child, as it relieves him of urinary incontinence.

There are three groups of surgical interventions for bladder exstrophy:

- Bladder plasty with local tissues;
- Diversion of urine into the intestines;
- Creation of an isolated bladder from a segment of the intestine.

Bladder plasty with local tissues should be performed during the neonatal period. With small sizes of the bladder plate (less than 4-5 cm in diameter), polypous degeneration of the mucous membrane of the bladder, as well as the serious condition of the child, this operation is not performed. It should be noted that even after the timely and thorough performance of reconstructive plastic surgery, 60-80% of patients still have partial or complete urinary incontinence, which makes it difficult for them to socially adapt.

The most widespread operations are aimed at diverting urine into the intestines. Urinary retention in these cases is due to the anal sphincter, so a preliminary assessment of the state of the sphincter using EMG is mandatory.

The third group of operations involves the creation of an isolated bladder from the intestine, where the ureters are transplanted with antireflux protection. The emptying of the artificial bladder is carried out 3-4 times a day by a catheter inserted by the patient himself.

## INFRAVESICAL OBSTRUCTION

Infravesical obstruction is a collective term that includes a number of diseases that cause obstruction of the outflow of urine from the bladder. The most common of these are posterior urethral valves in boys, bladder neck sclerosis, meatal stenosis in girls, and detrusor sphincter dyssynergia.

Infravesical obstruction, causing a violation of the outflow of urine, leads to infection of the lower urinary tract and often underlies the development of cystitis, which in turn contributes to infection by the urinogenic route of the upper urinary tract and leads to the development of pyelonephritis. An obstruction to the outflow of urine causes a violation of the act of urination in the form of difficulty, pollakiuria, urinary incontinence.

During the pathological process with infravesical obstruction, three stages can be distinguished: at stage I, urination is difficult, but the bladder is completely emptied due to the working hypertrophy of the detrusor, which overcomes the resistance to urine outflow. In stage II, difficulty urinating remains, but the urine stream becomes sluggish, sometimes intermittent, residual urine appears, bladder

capacity increases due to a decrease in detrusor tone. In stage III, detrusor atony develops, the urine stream is practically absent, the child urinates in drops, urinary incontinence appears.

**Clinic and diagnostics.** The main complaints of patients with infravesical obstruction are difficulty urinating, often accompanied by urinary incontinence, incomplete emptying of the bladder. There is leukocyturia.

Voiding cystography is of great diagnostic value in boys for the detection of urethral valves. At the same time, the expansion of the posterior urethra is determined; below the obstacle, the urethra has normal dimensions. In Marion's disease, voiding cystography reveals elevation and expansion of the cervix, a filling defect in the area of its location, the urethra is not changed. In the diagnosis of meatal stenosis in girls, voiding cystography does not play a decisive role, since a wide urethra is a normal variant in them.

A certain place in the diagnosis of infravesical obstruction belongs to functional methods. A decrease in the volumetric flow rate of urine makes it possible to suspect this pathology. In stage I of the disease, direct cystometry, during which a sharp increase in voiding pressure is detected, also helps to make a diagnosis. The use of a comprehensive urodynamic study, including electromyography, makes it possible to diagnose detrusor sphincter dyssynergia. It is known that the detrusor and sphincter are in a reciprocal relationship: when the detrusor contracts, the sphincter relaxes, and vice versa. Due to various innervation disorders, this ratio may change: when the detrusor contracts, the sphincter does not relax or does not relax completely, i.e. dyssynergia occurs, clinically manifested as infravesical obstruction. An electromyographic study of the sphincter at the time of urination reveals an increase in its activity, which makes it possible to make a correct diagnosis.

When making a differential diagnosis, it must be remembered that difficulty urinating can also be observed with cicatricial phimosis, meatal stenosis in boys with a coronal form of hypospadias. These diseases can be ruled out already when examining a child. In other cases, the diagnosis is helped by the use of additional research methods.

**Treatment** of bladder outlet obstruction depends on the underlying cause. At valves of a back urethra carry out their endoscopic electroresection; with meatal stenosis in girls - bougienage of the urethra or dissection of the stenosis; in Marion's disease, a V-shaped plastic of the bladder neck is performed to eliminate the obstruction to the outflow of urine. With detrusor-sphincter dyssynergy, treatment is usually conservative and is aimed at normalizing the ratio of the work of the detrusor and sphincter.

**The prognosis** of the disease, if treatment is started in stage I, is more favorable. With treatment started late, the prognosis worsens, as a long-term correction of secondary changes is required, in particular myoneurogenic atony of the detrusor, and therapy for chronic cystitis.

Dispensary observation is carried out by a urologist and a nephrologist; its duration depends on the type of infravesical obstruction. In case of meatal stenosis in girls, in the absence of symptoms of cystitis, after a control bougienage, the child can be deregistered. With concomitant cystitis, the period of dispensary observation is

determined by inflammatory changes in the lower urinary tract. Dispensary observation of children in whom infravesical obstruction is combined with malformations of the upper urinary tract. It is carried out in the same way as for patients with chronic pyelonephritis.

## HYPOSPADIA

Hypospadia is a malformation characterized by the absence of the lower wall of the urethra in the distal parts. The occurrence of this defect is associated with a violation of embryogenesis at the 7-14th week of pregnancy. In this period, the differentiation of the rudimentary epithelium ends and the urethral trough closes.

In terms of frequency, hypospadias ranks first among anomalies and malformations of the urethra: it occurs in 1 out of 400-500 newborns. The anomaly is the "privilege" of boys, although it is extremely rare, but it also occurs in girls (Fig. 66).

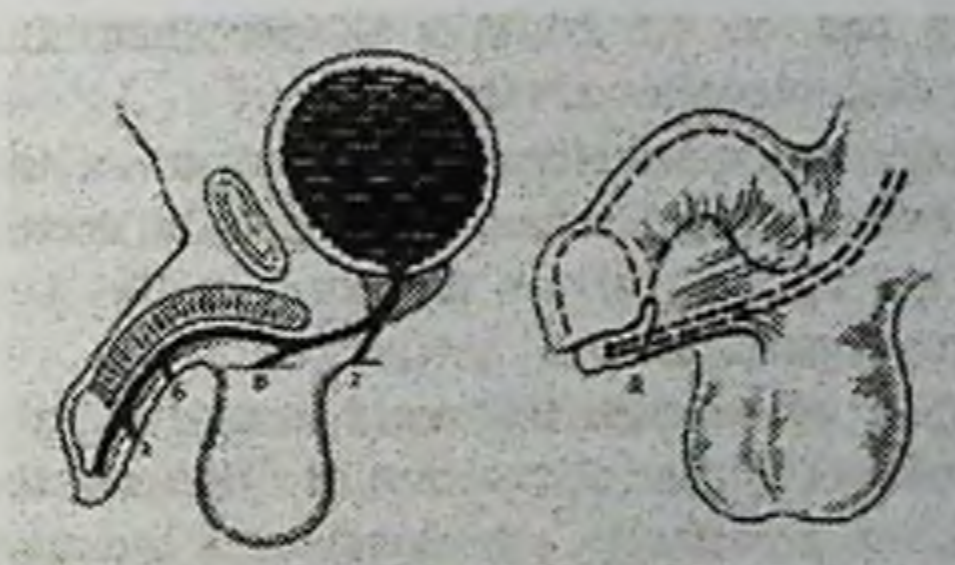


**Figure 66. Variants of hypospadias**

**The capitate form** of hypospadias is the most common and easiest malformation in which the opening of the urethra opens at the site of the frenulum of the penis. The foreskin is absent from the ventral side of the penis, and from the dorsal side, hanging in the form of an apron, does not completely cover the head. The penis is straight, sometimes there is a downward deviation of the head. With this form of hypospadias, narrowing of the external opening of the urethra or covering it with a thin film is often noted, which can significantly impede urination and lead to expansion and atony of the overlying parts of the urinary system.

**Stem form.** In this form of hypospadias, the opening of the urethra opens on the ventral surface of the shaft of the penis. The penis is deformed by fibrous bands running from the head to the hypospadic opening of the urethra, has the shape of a hook, which is especially noticeable during erection. Urination is carried out according to the male type, but at the same time the patient has to pull the penis to the stomach by the foreskin. The growth of corpora cavernosa is difficult, their deformation increases with age, erections are painful. Sexual intercourse with the stem form of hypospadias is possible, but if the urethral opening is located at the base of the penis, sperm does not enter the vagina.

**Scrotal form.** This form is accompanied by even more pronounced underdevelopment and deformation of the penis. The external opening of the urethra opens at the level of the scrotum, which is split and looks like a large labia. Urination is carried out while sitting, according to the female type. Sexual intercourse is usually impossible due to a sharp deformation of the penis.

**Perineal shape.** The appearance of the genital organs is drastically changed, which makes it difficult to determine the patient's gender. The penis is similar in shape and size to a hypertrophied clitoris, the scrotum is split in the form of labia. The opening of the urethra opens at the perineum, often there is a rudimentary vagina. With this form of hypospadias, more often than with other forms, one- or two-sided cryptorchidism is noted.

In addition to the forms described above, there is hypospadias, in which there is no dystopia of the urethral opening, but there is a pronounced deformation of the cavernous bodies of the penis. This is the so-called **hypospadias without hypospadias**. Synonyms: congenital short urethra, chorda type hypospadias. With this defect, the urethra can be 1.5-2 times shorter than the cavernous bodies. Erections are painful, sexual intercourse is impossible.

**Treatment.** Capitate hypospadias usually does not require treatment, unless accompanied by a narrowing of the external opening of the urethra or the presence of a membrane covering the opening of the urethra. In this case, a meatotomy or excision of the membrane is performed.

Usually the first stage of surgical treatment is performed at the age of 1.5-2 years. The operation consists in careful excision of fibrous tissues and displacement of the hypospadias foramen proximally, which achieves the maximum expansion of the cavernous bodies. An important point of the operation is the creation of skin reserves on the ventral surface of the penis for subsequent urethral plastic surgery. This is achieved by the exchange of triangular flaps according to A.A. Limberg or by moving the skin of the foreskin to the ventral surface of the penis.

The second stage of treatment - urethroplasty - is performed at the age of 5-13 years. About 150 methods of urethroplasty and various modifications are known, but the most common is the Duplay method - the creation of the urethra from local tissues. Recently, a single-stage operation has been widely used - straightening the penis and urethroplasty from sheets of the foreskin or skin of the dorsal surface of the penis on a vascular pedicle. This operation can be performed in children from 2-3 years of age. It should be noted that none of the many methods of urethroplasty for hypospadias is ideal, and often patients undergo repeated surgical interventions several times due to the formation of urethral strictures and fistulas.

## EPISPADIUM

Epispadias - congenital splitting of the upper wall of the urethra in the distal section or throughout. The anomaly occurs in 1 in 50,000 newborns, in boys 5 times more often than in girls.

According to the degree of splitting of the urethra in boys, epispadias of the head, epispadias of the penis and complete are distinguished, in girls - clitoral

subsymphyseal and complete. Complete epispadias is observed 3 times more often than all other forms.

**Epispadias of the head** is characterized by flattening of the head, splitting of the foreskin from above, displacement of the external opening of the urethra to the coronal sulcus. Urination is usually not disturbed.

**Epispadias of the penis** is accompanied by an upward curvature of the penis. The head is split, from it along the back of the penis a strip of mucous membrane passes to the dystopian opening of the urethra, which has the shape of a funnel. Due to weakness or partial splitting of the sphincter of the bladder, many patients with coughing, laughing and physical exertion have urinary incontinence. When urinating, urine is sprayed, which forces patients to urinate while sitting, pulling the penis backwards by the remnants of the foreskin. Often, with this form of epispadias, nonunion of the bones of the pubic symphysis and a divergence of the rectus abdominis muscles are noted. The penis is shortened and pulled up to the stomach due to the divergence of its legs, attached to the pubic bones. In adult patients, this can make sexual intercourse extremely difficult.

**Complete epispadias.** With this form, the penis is underdeveloped, looks like a hook pulled up. Cavernous bodies are split, the entrance to the bladder has the shape of a funnel. There is complete urinary incontinence due to splitting of the sphincter ring. There is a large diastasis between the pubic bones, resulting in a "duck" gait. About 1/3 of patients suffer from concomitant malformations of the kidneys and ureters, cryptorchidism, testicular and prostate hypoplasia.

Epispadias in girls is characterized by less anatomical disorders, which often makes it difficult to diagnose at an early age.

**Clitoral form.** There is a splitting of the clitoris, the external opening of the urethra is shifted forward and upward. Urination is not disturbed. The anomaly is practically irrelevant.

**Subsymphyseal episadia** is manifested by complete splitting of the clitoris, the external opening of the urethra opens above it in the form of a funnel. There is complete or partial urinary incontinence.

**Complete (total, retrosymphyseal) epispadias.** The upper wall of the urethra is absent throughout, and the urethra takes the form of a gutter. The bladder neck and symphysis are split. Urine constantly flows out, causing maceration of the skin of the thighs.

**Treatment.** In epispadias, the goal of treatment is to achieve continence and create the missing urethra. In cases of epispadias of the penis, not accompanied by urinary incontinence, urethroplasty from local tissues has become most common.

In case of urinary incontinence, plastic surgery is performed on the bladder neck, among which in our country the method proposed by V.M. Derzhavin is most often used. In this case, the mouths of the ureters move anteriorly, and the muscles of the bladder triangle, almost circularly covering the neck of the bladder, act as a sphincter. The optimal time for the operation is the age of 4-6 years.

It is possible to equip a general practitioner with knowledge, to teach standard skills in the indicated professional field, to teach the skills of working with a patient, his relatives and friends, to teach rational tactics in solving medical and social

problems only by non-traditional, active, problem-based learning, choosing adequate goals and objectives of the methodology. To this end, it is proposed to conduct business games, solving situational problems.

**I. Curation of patients on the topic - 15 minutes**
**II. Participation in the dressing room and in the operating room - 20 minutes;**
**III. Implementation of practical skills - 15 minutes:**

## PRACTICAL SKILLS

### BLUNT EXPANSION OF THE FORESKIN

**Indications:**
1. Hypertrophic phimosis;
2. Atrophic phimosis.
**Preparation:**
Tell the child's parents about the upcoming manipulation.
**Necessary conditions, tools and medicines:**
1. Dressing room or manipulation room;
2. Soft surgical clip;
3. Button probe;
4. Vaseline oil.
**Technique:**
1. Position of the patient on the back;
2. Gently stretch the outer opening of the foreskin with a soft surgical forceps;
3. Produce retraction of the foreskin with separation of adhesions with a bellied probe;
4. Remove smegma with a damp cloth;
5. The head of the penis is thickly lubricated with vaseline oil;
6. Return the foreskin to its original position.

### REDUCTION OF PARAPHIMOSIS

**Preparation:**
Tell the child's parents about the upcoming manipulation.
**Necessary conditions, tools and medicines:**
1. Dressing room or manipulation room;
2. Vaseline oil;
3. Gauze napkins.
**Technique:**
1. Position of the patient on the back;
2. Lubricate the head of the penis with vaseline oil;
3. Put a gauze pad under the thumbs and place them on the head of the penis;
4. Grasp the ring with the rest of your fingers and gradually push it over the head;
5. Push the head through the opening of the foreskin that has infringed on it.

**Figure 67. Technique for spreading phimosis**

**IV. Big break - 40 minutes (11.50-12.30).**

**V. Practical session (part 2) - 1 hour 35 minutes (12.30-14.05):**

**1. During classes, the use of electronic textbooks, video and photographic materials - 20 minutes;**

**2. UMM - 45 minutes**

## STUDY TASKS

**Appendix 1**

### Group rules

Member of each group

- Respect for the thoughts of their comrades;
- Active and joint participation in tasks, manifestation of responsibility for the task;
- Can ask for help if necessary from comrades;
- Help your comrades in the group;
- Participate in the evaluation of the group;
- Must know the rules "In the same boat, a common fate - to be saved or drown"

Structure responses to questions.

1. What is included in subjective research?
2. Laboratory and instrumental research.

Give the following concepts: Dysuria, pain, anuria, bleeding, hyperthermia

**Appendix 2**

### Tasks for groups

1. Specify the types of hypospadias? Cluster, SWOT table, Venn diagram for the word "dysuria" and chart Why? and hierarchical diagram How?

2. Clinical signs of esophageal atresia. Cluster, SWOT table, Venn diagram for the word "burning" when urinating and chart Why? and hierarchical diagram How?

3. Specify the clinical signs of vesicoureteral reflux. Make a cluster, SWOT table, Venn diagram for the word "hyperthermia" and draw diagrams Why? and hierarchical diagram How? Chalazia of the esophagus.

4. What method of surgery is used for vesicoureteral reflux?.Create a cluster, SWOT table, Venn diagram for the word "habitus" and draw diagrams Why? and hierarchical diagram How? Congenital short esophagus.

5. What are the main symptoms of infravesical obstruction? Cluster, SWOT table, Venn diagram for the word "reflux" and chart Why? and hierarchical diagram How?

Diagnostic map of learning technology in the classroom

*Evaluation indicators - the criterion was manifested in the training session:*

| Group | Task 1 | Task 2 | Task 3: (for each question 0.2 points) | | | Sum of points |
|---|---|---|---|---|---|---|
| | (1,0) | (1,4) | Question 1 | Question 2 | Question 3 | (3,0) |
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |

**TABLE / X / Y** - Students answer the questions "what do you already know about this topic?" and "what do you want to know?"; Allows you to conduct research work on the text, topic, section

| Concept | know "+", don't know "-" | learned "+", could not find out "-" |
|---|---|---|
| Binary nomenclature: | | |
| Etiology | | |
| Pathogenesis | | |
| Clinic | | |
| Deontology | | |
| Symptom | | |
| Syndrome | | |
| Disease | | |
| Disease history | | |
| Outpatient card | | |
| Genetics | | |
| Infection | | |
| Diagnosis | | |
| Instrumental examination of patients: | | |
| Thermometer | | |
| Phonendoscope | | |

| | | |
|---|---|---|
| Tonometer | | |
| Iodolipol, barium sulfate | | |
| Nasogastric tube | | |
| Palpation | | |
| Percussion | | |
| Auscultation | | |
| Anamnesis | | |
| Examination | | |
| General blood analysis, blood biochemistry | | |
| General urine analysis | | |
| ECG | | |
| FCG | | |
| EchoCG | | |
| Chest X-ray | | |

## INSERT TABLE

Insert table: a) provides systematization of information obtained during independent reading, listening to a lecture; confirmation, clarification, rejection, tracking the understanding of the information received;

b) contributes to the formation of the ability to link previously mastered information with new information.

Rules for compiling an INSERT table:

| Concepts | V | + | - | ? |
|---|---|---|---|---|
| Congenital malformations and anomalies of the genital organs and lower urinary tract (valves and urethral stricture, vesicoureteral reflux, hypospadias, epispadias, exstrophy of the bladder, hematocolpos), clinic, diagnosis, treatment, complications, postoperative rehabilitation | | | | |
| Place in medicine | | | | |
| The main objective of the subject | | | | |
| Types of disease | | | | |
| The sequence of studying the subject | | | | |
| Learning aids | | | | |

**Where:**

**V - corresponds to the existing knowledge (information) about ...**

**- contradicts existing knowledge about ...**

**+ - is new information**

**? -incomprehensible or requiring clarification, addition information**

## CONCEPT TABLE

| Vertically - comparisons with diseases (theories) are located | Horizontally - various signs or symptoms of the disease are located. (recommendations, categories, various signs, etc.) | | | | | | |
|---|---|---|---|---|---|---|---|
| | Dysuria | Hyperthermia | Pain | Bleeding | Pyuria | Palpation | X-ray picture |
| Urethral valve | | | | | | | |
| Urethral stricture | | | | | | | |
| Vesicoureteral reflux | | | | | | | |
| Hypospadias | | | | | | | |
| Epispadias | | | | | | | |
| Bladder exstrophy | | | | | | | |
| Hematocolpos | | | | | | | |

## SWOT

**(homework or independent work of the student: for creative thinking after lectures or practical classes)**

Analytical table - SWOT

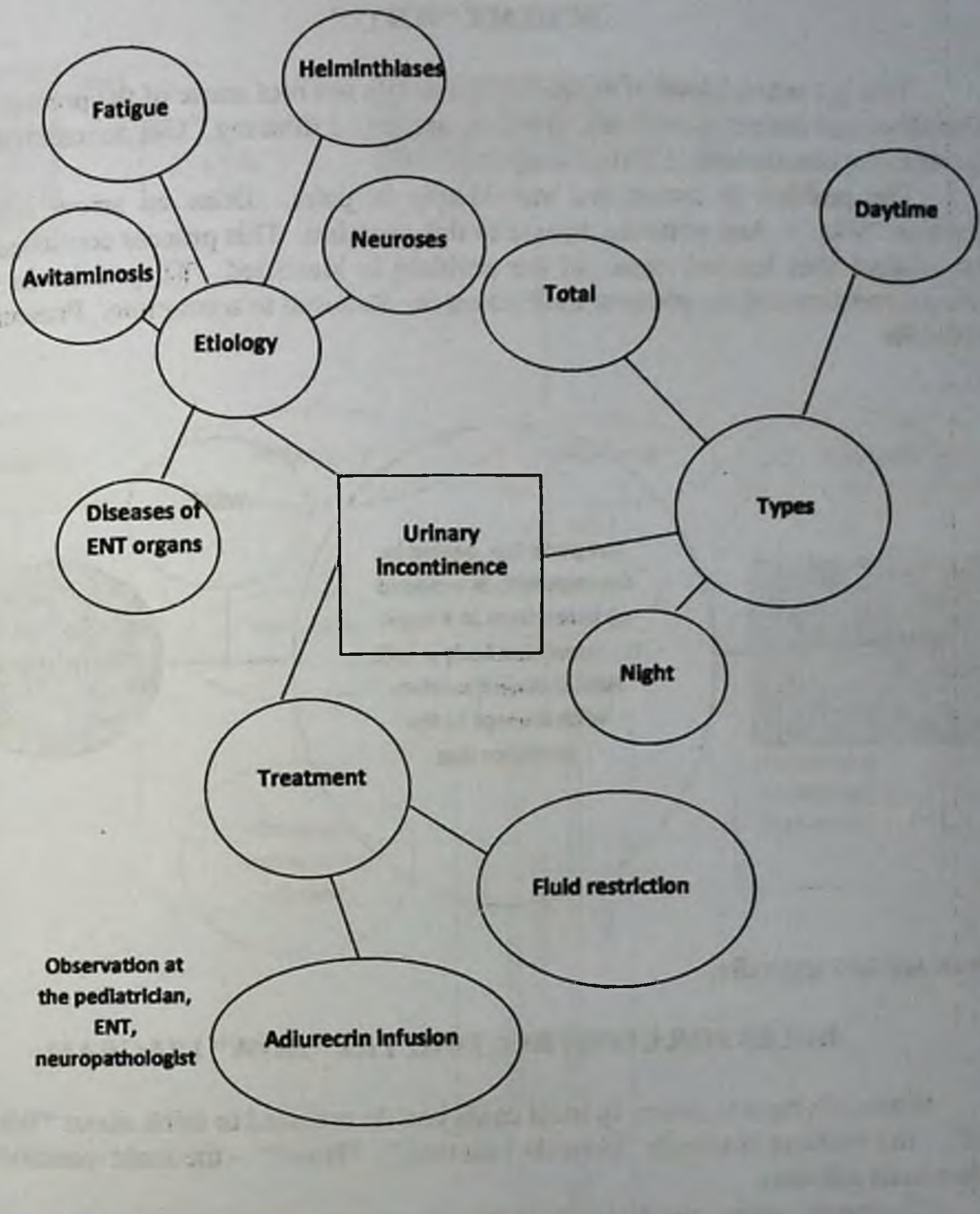
| | |
|---|---|
| S | W |
| O | T |

Note: see 2nd appendix.

## CLUSTER (Bunch, bundle)

A way of mapping information - gathering ideas around a major factor to focus and make sense of the whole construct

Clustering technology: In the center of a blackboard or a large sheet of paper, a keyword or a topic title of 1-2 words is written. By association with the keyword, "satellites" are attributed to the side of it in smaller circles - words or sentences that are related to this topic. Connect them with lines to the "main" word. These "satellites" may have small satellites, and so on. Recording continues until the allotted time expires or until ideas are exhausted.

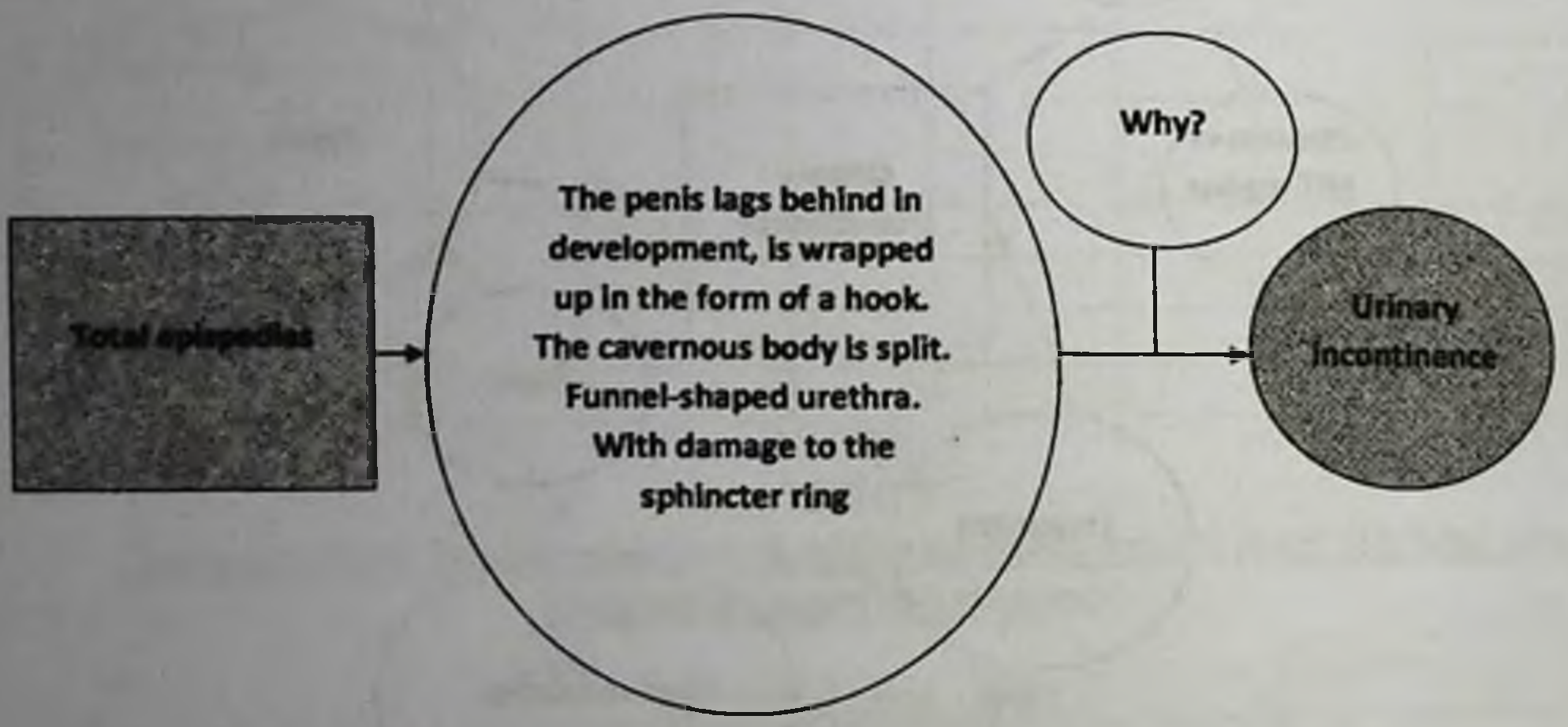



Note: see 2nd appendix.

## SCHEME "WHY?"

This is a whole chain of reasoning to identify the root cause of the problem. Develops and activates systemic, creative, analytical thinking. Get acquainted with the rules for constructing a "Why" diagram?

The problem is formulated individually in pairs. Draw an arrow with the question "Why"? And write the answer to this question. This process continues until the original (but hidden) cause of the problem is identified. They unite in mini-groups, compare and supplement their schemes. Reduced to a common. Presentation of results

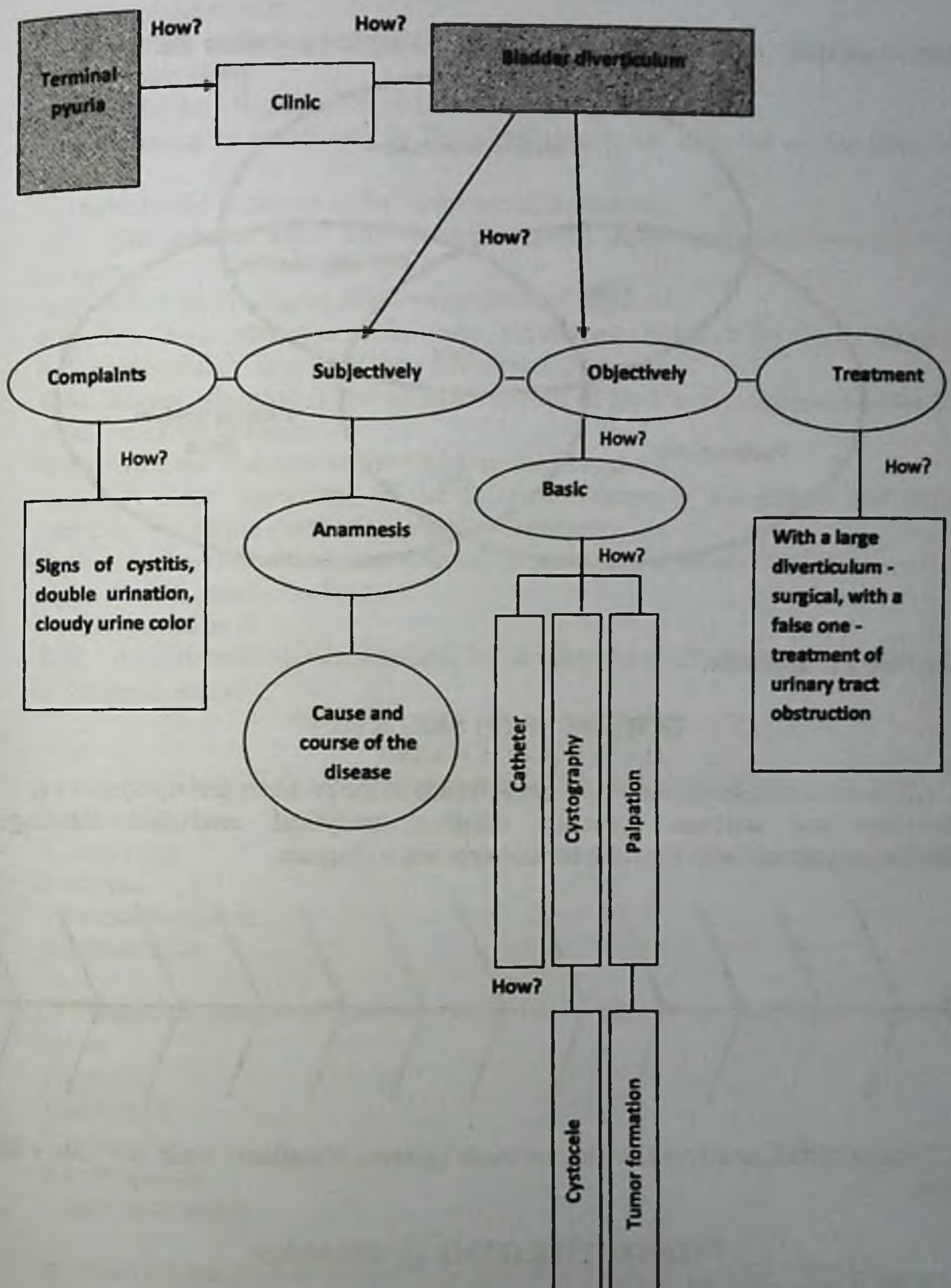



Note: see 2nd appendix.

## RULES FOR CONSTRUCTING THE "HOW" DIAGRAM

When solving a problem, in most cases you do not need to think about "What to do?". The problem is usually "How do I do this?". "How?" - the main question that arises in its solution.

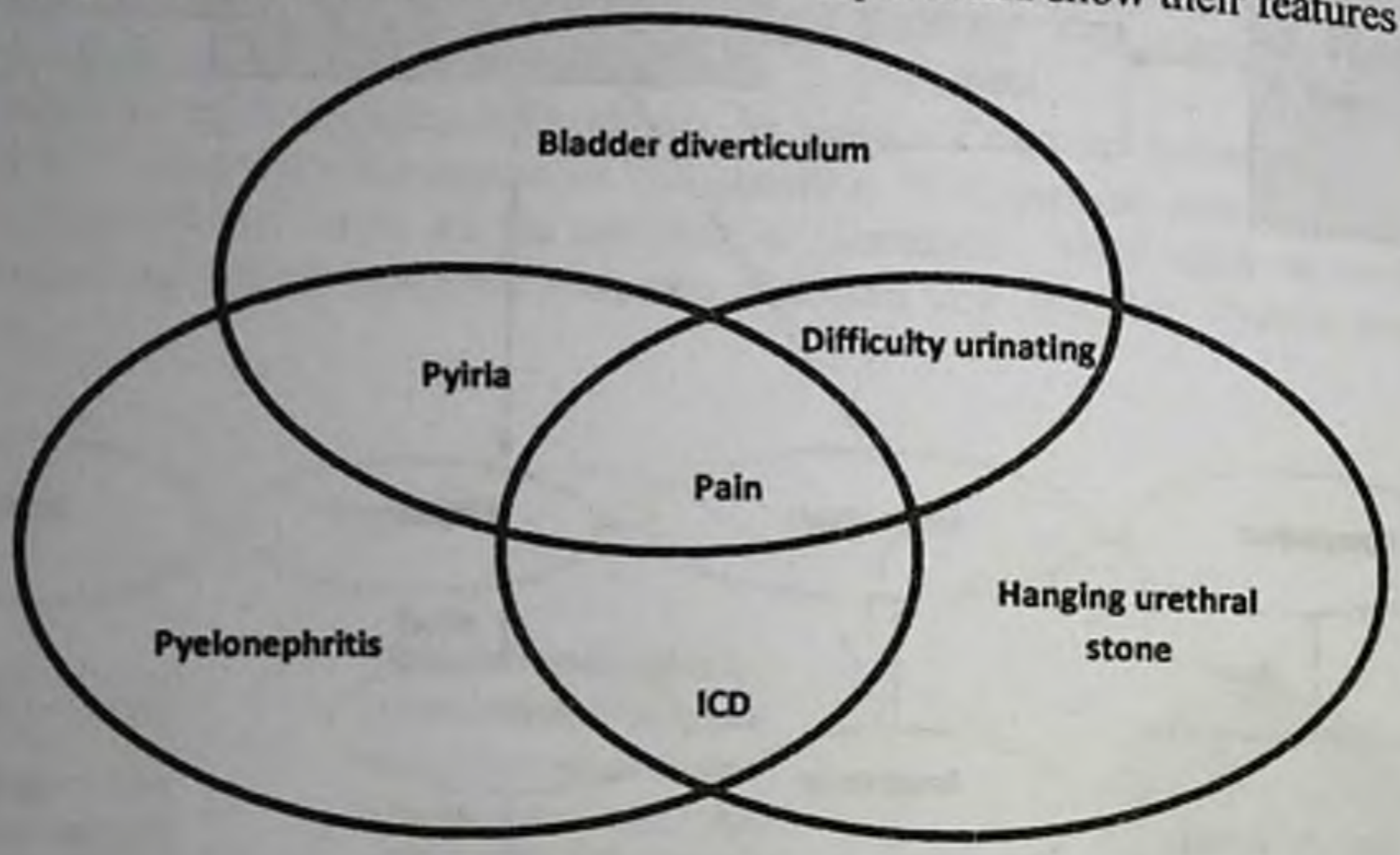
Consistent posing questions "how?" allows you to: Explore not only all the available options for solving the problem, but also ways to implement them;




Note: see 2nd appendix.

## VENN DIAGRAM

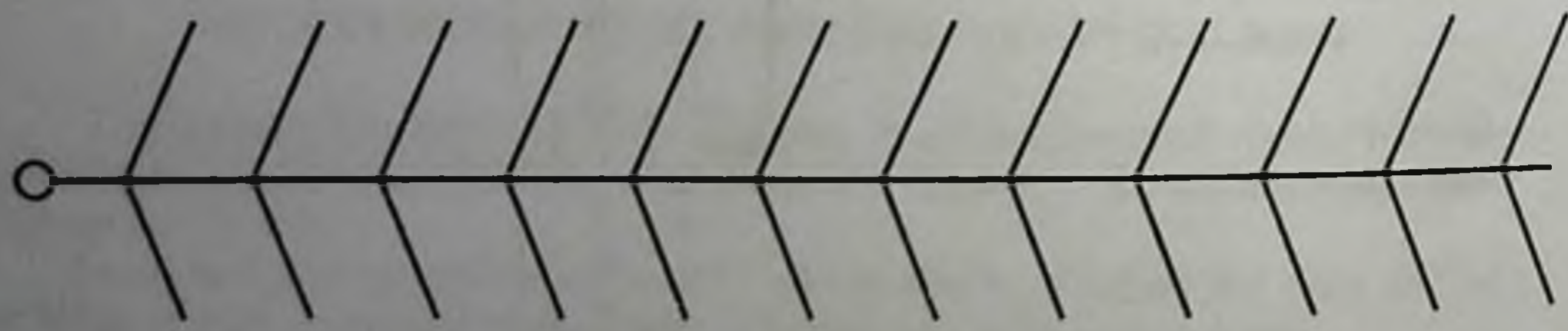
Used to compare or contrast or contraindicate 2-3 aspects and show their features




Note: see 2nd appendix.

## SCHEME "FISH SKELETON"

Allows you to describe the whole circle (field) of the problem and try to solve it. Develops and activates systemic, creative, analytical, analytical thinking. Familiarize yourself with the rules for constructing a diagram.



3. Training with interactive teaching methods (games), situational tasks and tests - 20 minutes;

## INTERACTIVE GAME QUESTIONS:

1. What is vesicoureteral reflux?

Rep. Reflux of urine from the bladder into the ureter and collecting system of the kidney.

2. List common causes of vesicoureteral reflux?

Resp. Dysplasia of the closure apparatus, shortening of the intramural ureter, dystonia of the mouth.
3. What study is the main one in the diagnosis of vesicoureteral reflux?
Rep. Cystography.
4. Describe the I degree of the vesicoureteral segment.
Rep. Casting is noted only in the distal ureter, the diameter of the latter is not changed.
5. Describe the II degree of the vesicoureteral segment.
Rep. The contrast agent fills the radiologically unchanged pyelocaliceal system of the kidney.
6. Describe the III degree of the vesicoureteral segment.
Rep. Moderate expansion of the ureter, pelvis, smoothness of the fornic apparatus.
7. Describe the IV degree of the vesicoureteral segment.
Rep. Severe dilatation of the collector system of the kidney, expansion of the ureter, which becomes tortuous.
8. Describe the V degree of the vesicoureteral segment.
Rep. A sharp expansion of the collector system of the kidney and ureter is accompanied by the death of the renal parenchyma.
9. Specify 3 forms of vesicoureteral reflux according to the mechanism.
Rep. Active, passive and mixed.
10. Hypospadias is...
Rep. A malformation characterized by the absence of the lower wall of the urethra in the distal sections.

**SELF-CHECK TESTS:**

1) Congenital absence of the anterior wall of the bladder is called
1.epispadias
2. exstrophy
3.ectopia
4.hermaphroditism
5.hypospadias

2) Congenital absence of the lower wall of the urethra in the distal parts called
1.ectopic
2.exstrophy
3.epispadias
4.hypospadias
5.hermaphroditism

3) What is hypospadias without hypospadias (hypospadias of the chorda)
1.back urethral valve
2.urethral diverticulum
3.dystopia of the urethra
4. severe deformation of the cavernous bodies

5.congenital urethral fistulas

4) Urinary incontinence is observed:
1. with trunk hypospadias
2. with scrotal hypospadias
3. epispadias head
4.epispadias of the total form
5.hypospadias without hypospadias

5) Form of urination with phimosis
1.fine jet
2.intermittent urination
3. urination drops
4. fan-shaped urination
5. urination with protrusion of the foreskin

6) Paraphimosis occurs
1. with hypospadias without hypospadias
2. with total hypospadias
3. with infravesical obstruction
4.exstrophy
5.when the foreskin is narrowed

7) Forms of hypospadias in boys:
1. capitate, stem, scrotal, perineal
2.complete, incomplete, total
3.full, clitoral, subsymphyseal
4.high, medium, low
5.full, partial

8) Which of the following malformations is always accompanied by complete urinary incontinence
1.total epispadias
2.perineal hypospadias
3. subsymphyseal epispadias
4.posterior urethral valve
5.ectopic urethrocelle

9) For what form of anomaly of the accessory ureter of a doubled kidney is the symptom of drip urinary incontinence typical?
1.ectopia of the orifice of the accessory ureter in girls
2.ectopia of the orifice of the accessory ureter in boys
3.ectopic urethrocelle
4. lateral cystic ectopia of the mouth
5.bilateral urethrocele

10) Specify the optimal time for performing meatotomy in case of hypospadias
1.1-2 years
2.3-5 years
3.6-8 years old
4.after diagnosis
5.in puberty

11) A rational way to eliminate urinary incontinence in total epispadias
1.Jung's operation
2.Operation Derzhavin
3.Lady's operation
4. Duplay operation
5. operation Rusakov

12) In what cases in case of exstrophy of the bladder should its plasty be done with local tissues
1. with a diameter of the mucous membrane of the bladder up to 4 cm with the absence of papilla
matous growths
2. with a mucous membrane diameter of more than 4 cm with one polyp
3. with a mucosal diameter of more than 4 cm with the presence of papillamatous growths
4. with a mucous membrane diameter of more than 4 cm and the presence of a valve of the distal section of the right ureter
5. with a mucous membrane diameter of more than 4 cm and a child's weight of 1600 gr.

13) Which of the following methods should be considered the method of choice in the surgical treatment of total epispadias
1. elimination of urinary incontinence by creating a mechanical obstacle
2. creation of an artificial sphincter of the bladder from the surrounding skeletal muscles
3. Creation of the bladder sphincter from local tissues
4.elimination of urinary incontinence by diverting to the intestine
5.urethroplasty

14) Which of the following research methods is the most reliable in the diagnosis of posterior urethral valves
1.cystoscopy
2.ureteroscopy
3. voiding cystourethrography
4. voiding cystourethro cinematography (telescopic)
5. polypositional cystography

15) In which of the listed forms of ectopia of the orifice of the accessory ureter, the function of the corresponding half of the kidney suffers the most
1.vaginal
2. perineal ectopia in girls
3.urethral
4.cervical ectopia of the orifice of the accessory ureter
5. prostatic urethral ectopia in boys

16) Which of the following malformations is always accompanied by urinary incontinence.
1.total episcadia
2.perineal hypospadias
3. subsymphyseal epispadias
4.posterior urethral valve
5.ectopic urethelecele

17) Which of the following operations is the method of choice with a giant ectopic ureterocele.
1. heminephroureroscopy
2. geminefroureterectomy with suction of the contents of the ureterocele
3. geminefroureterectomy with excision of the cyst membranes
4.ureteroureteroanastomosis
5.dissection of the ureterocele

**Answers to tests for self-control**

**1-2, 2-4, 3-3, 4-4, 5-2, 6-5, 7-1, 8-1, 9-4,10-1, 11-2, 12-1, 13-2, 14-3, 15-4, 16-1, 17-3.**

# CHAPTER 7. MALFORMATIONS AND ANOMALIES IN THE DEVELOPMENT OF THE LIVER, BILE DUCTS AND PANCREAS (BUDD-CHIARI SYNDROME, CONGENITAL LIVER FIBROSIS, PORTAL VEIN THROMBOSIS, BILIARY ATRESIA) CLINIC, DIAGNOSIS, TREATMENT, COMPLICATIONS POSTOPERATIVE REHABILITATION

**The purpose of the training:** to develop the skills and abilities of clinical diagnosis, treatment and rehabilitation of children with congenital malformations and developmental anomalies requiring surgical correction.

**Learning objectives:**

- Formation of knowledge on the etiology, pathogenesis and clinic of the most common malformations and developmental anomalies in children;
- Developing students' skills and abilities of clinical examination and examination of a child with congenital malformations and developmental anomalies, including laboratory, radiation and instrumental research methods;
- Students mastering the diagnostic algorithm for malformations and developmental anomalies that pose a threat to a child's life;
- Acquaintance with the principles of surgical treatment of malformations and developmental anomalies and their complications;
- Development of skills and abilities of general medical care: based on treatment and diagnostic standards and protocols for postoperative rehabilitation of children with congenital malformations and developmental anomalies.

**Venue:** Thoracic Surgery Department, Operating Room, Computer Room, Training Room

**Monitoring and evaluation**: oral control: control questions,
performance of educational tasks in groups.

**Written control:** control questions.

## PORTAL HYPERTENSION

**Portal hypertension (PH)** develops as a result of the simultaneous interaction of two factors: an increase in the outflow of venous blood from the portal system, on the one hand, and an increase in blood flow into the portal system, on the other.

From a physiological point of view, it is necessary to distinguish PG, in which the liver parenchyma is under the influence of high portal pressure (parenchymal form) from PG, in which high portal pressure does not directly affect the liver parenchyma (non-parenchymal form) (Fig. 68).

In nonparenchymal PH, the obstruction to blood flow is located up to the sinusoids of the liver. In this case, the liver function is practically not impaired, ascites and coagulopathy develop very rarely, bleeding from the veins of the cardia is tolerated by patients relatively easily, and the prognosis of the disease is generally good. In parenchymal PH, the obstruction to the portal blood flow is located behind the sinusoids of the liver. This leads to their structural and functional damage and deterioration of the blood supply to hepatocytes. As a result, the synthetic function of the liver is disturbed, there is a tendency to develop ascites, coagulopathy, intolerable esophageal bleeding and liver failure.

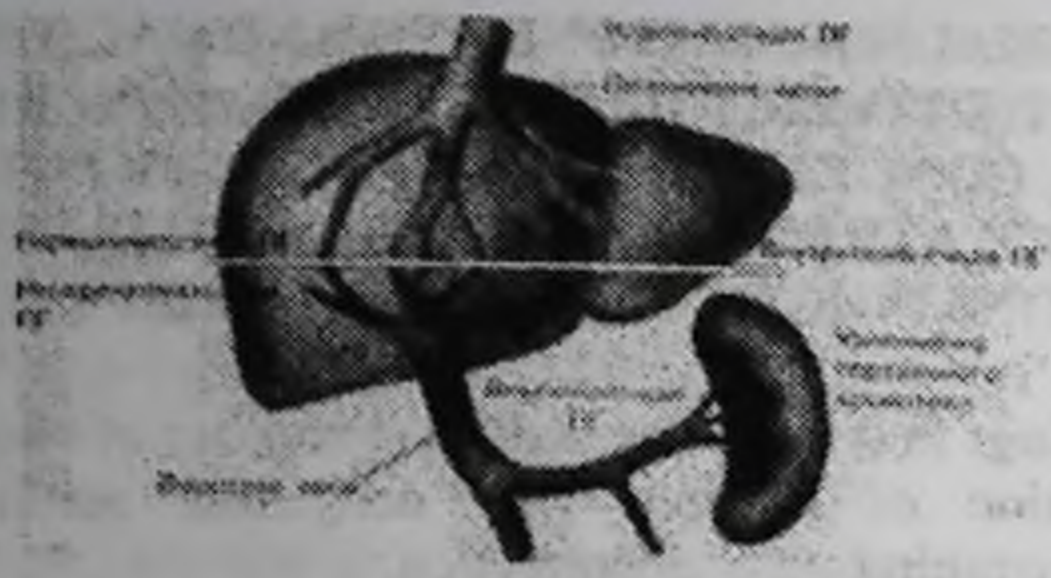


**Figure 68. Anatomy of the portal system**

Resistance to portal blood flow can be localized above the liver, inside and below the liver. From this point of view, all forms of PG are divided into suprahepatic, intrahepatic and extrahepatic.

**Suprahepatic PG.** Violation of the venous outflow from the liver (Budd-Chiari syndrome) may occur as a result of a malformation or thrombosis of the inferior vena cava or thrombosis of the hepatic veins. PH and liver dysfunction develop as a result of venous congestion in the liver.

**Intrahepatic PG.** Any chronic liver disease that leads to fibrosis or cirrhosis can cause intrahepatic PH. In most variants of cirrhosis, regeneration nodes impede the outflow of blood from the sinusoids, leading to postsinusoidal obstruction. The most common causes of intrahepatic PH are postnecrotic cirrhosis after viral hepatitis, biliary atresia, Wilson's disease, alpha-1 antitrypsin deficiency, and others. As a rule, the development of portal hypertension is accompanied by signs of liver dysfunction - jaundice, ascites, delayed child development, etc.

PG in congenital liver fibrosis develops as a result of presinusoidal block. In this disease, the portal tracts increase due to the growth of connective tissue and the proliferation of the bile ducts. Since this type of fibrosis leads to the development of a presinusoidal block, the synthesizing function of the liver remains largely unchanged.

**Extrahepatic PG.** In the vast majority of children, this form of portal hypertension is the result of obstruction of the portal vein. In almost half of children with extrahepatic PH, umbilical vein catheterization, omphalitis, intra-abdominal infections, sepsis, or dehydration can be noted during the neonatal period. However, in half of the children, the exact etiological factor cannot be identified. Obstruction of the portal vein is accompanied by the development of a network of collaterals in the gates of the liver, called "cavernous transformation of the portal vein".

Extrahepatic PH is more common in children.

**Clinic.** Clinical manifestations of PG are largely of the same type and do not depend on its genesis. However, with each disease, a number of features can be noted that help to clinically identify the form of PG.

With extrahepatic PH, the first symptoms of increased portal pressure appear in early childhood. These include an increase in the abdomen, unexplained diarrhea, hyperthermia of unknown origin, splenomegaly, and the appearance of subcutaneous hemorrhages on the lower extremities. In a laboratory blood test, signs of

10) Specify the optimal time for performing meatotomy in case of hypospadias
1.1-2 years
2.3-5 years
3.6-8 years old
4.after diagnosis
5.in puberty

11) A rational way to eliminate urinary incontinence in total epispadias
1.Jung's operation
2.Operation Derzhavin
3.Lady's operation
4. Duplay operation
5. operation Rusakov

12) In what cases in case of exstrophy of the bladder should its plasty be done with local tissues
1. with a diameter of the mucous membrane of the bladder up to 4 cm with the absence of papilla
matous growths
2. with a mucous membrane diameter of more than 4 cm with one polyp
3. with a mucosal diameter of more than 4 cm with the presence of papillamatous growths
4. with a mucous membrane diameter of more than 4 cm and the presence of a valve of the distal section of the right ureter
5. with a mucous membrane diameter of more than 4 cm and a child's weight of 1600 gr.

13) Which of the following methods should be considered the method of choice in the surgical treatment of total epispadias
1. elimination of urinary incontinence by creating a mechanical obstacle
2. creation of an artificial sphincter of the bladder from the surrounding skeletal muscles
3. Creation of the bladder sphincter from local tissues
4.elimination of urinary incontinence by diverting to the intestine
5.urethroplasty

14) Which of the following research methods is the most reliable in the diagnosis of posterior urethral valves
1.cystoscopy
2.ureteroscopy
3. voiding cystourethrography
4. voiding cystourethro cinematography (telescopic)
5. polypositional cystography

formed in parallel with the development of the secretory system of the liver. A single system of bile ducts is formed as a result of the merger of the proximal and distal sections, which, until the moment of connection, develop independently (Fig. 70).

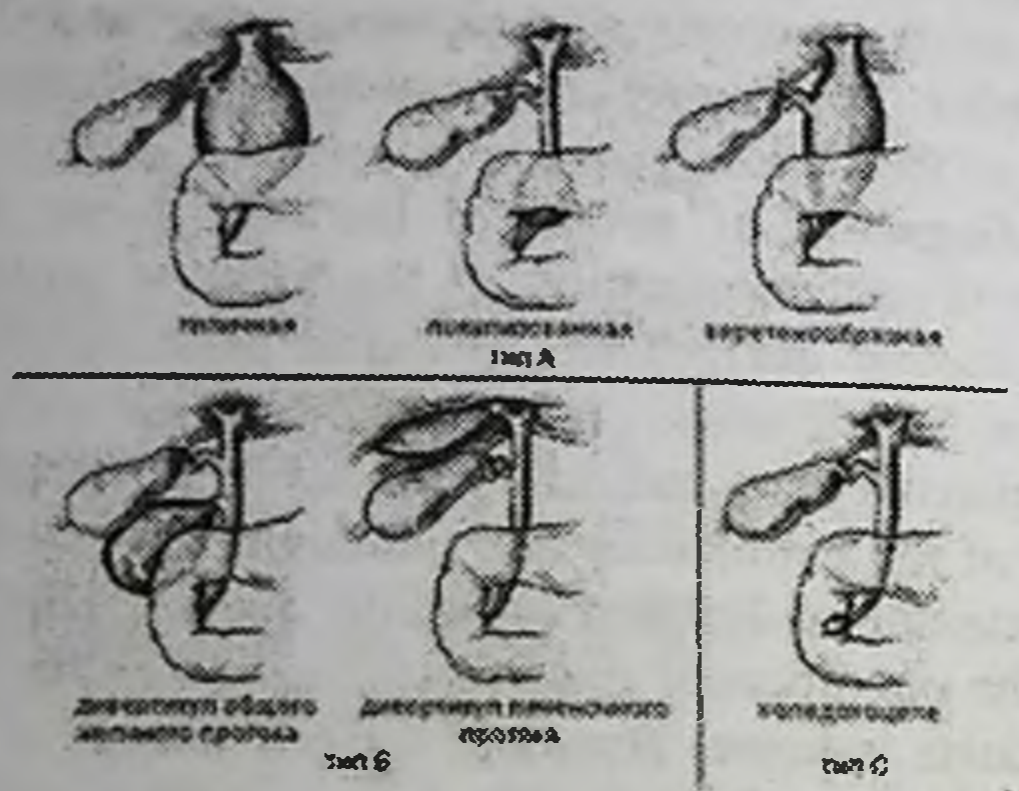


**Figure 70. Causes of common bile duct cysts**

**Clinic and diagnostics.** The clinical picture of the expansion of the common bile duct is characterized by a triad of symptoms: recurrent pain in the epigastric region or in the right hypochondrium, interspersed with jaundice, and the presence of a tumor-like formation on the right at the edge of the liver. The severity of symptoms depends on the size of the cyst, the age of the child, violations of the passage of bile. As a rule, in older children, pain is paroxysmal in nature, there is a feeling of fullness, nausea. The manifestations of jaundice are moderately expressed (icterus of the sclera, a decrease in the color of the stool, a darker color of the urine). The increase in jaundice is accompanied by an increase in abdominal pain, a temperature reaction (cholangitis phenomena), an increase in discoloration of the stool, while the urine acquires an intense dark color. During the period of exacerbation in the region of the lower edge of the liver on the right, it is often possible to palpate a dense painless tumor-like formation with fairly clear boundaries. The size of this formation may vary over time. It depends on the severity of the narrowing of the outlet section of the common bile duct and the violation of bile evacuation. During the period of exacerbation, a blood test reveals leukocytosis, mainly neutrophilia, a characteristic shift of the white blood formula to the left. In biochemical blood tests, a picture characteristic of obstructive jaundice is found. When the cyst is emptied into the duodenum, the pain syndrome quickly decreases, the manifestations of cholestasis are gradually leveled, including the normalization of blood biochemical parameters.

**Diagnosis** of cystic enlargement of the common bile duct is based on anamnesis data, clinical manifestations of the disease (the most important symptom is the frequency of obstructive jaundice clinic) and objective research methods. The latter include an ultrasound examination of the abdominal organs, in which a cystic formation with clear boundaries is determined in the projection of the common

hepatic duct. A radionuclide study with technetium reveals an increase in the accumulation of the radiopharmaceutical in the dilated cystic duct.

X-ray contrast study - a survey radiography of the abdominal organs - sometimes allows you to identify a cyst of the common bile duct (with large sizes - up to 8-10 cm in diameter), pushing the transverse colon and duodenum. When radiography of the stomach and duodenum with barium, the deformation of the latter due to compression by the cyst is visualized much more clearly. Cholegraphy is often ineffective due to impaired bile excretion. The most informative method for diagnosing a common bile duct cyst is retrograde cholecystocholangiography, which allows filling the cyst through the major duodenal papilla and determining not only its size, but also its topographic and anatomical relationships with other organs. An objective diagnostic method is also laparoscopy.

**Differential diagnosis** is carried out with diseases accompanied by jaundice: infectious hepatitis, liver cysts (parasitic and non-parasitic), cholelithiasis, malignant tumors of the abdominal cavity. Differential diagnosis with infectious hepatitis is based on the determination of hepatitis markers, the absence of cystic formation in the hilum of the liver, and the results of laboratory tests. Liver cysts increase in size over time, they are inseparable from the liver (ultrasound scanning), do not cause cholestasis clinics, have positive specific reactions to clarify the parasitic (Echinococcus) nature of the cyst.

The diagnosis of malignant tumors of the abdominal cavity and retroperitoneal space is clarified by the rapid growth of the tumor, the progressive deterioration of the general condition of the child, the palpation determination of a tuberous undifferentiated tumor, and special research methods: urography, pneumoperitoneum, retropneumoperitoneum. In doubtful cases, diagnostic laparoscopy and tumor biopsy are performed, followed by histological examination of the material.

**Treatment** of a cyst of the common bile duct is only surgical - complete excision of the cyst with the formation of a biliodigestive anastomosis of an isolated loop of the jejunum according to Roux. Prevention of ascending cholangitis is carried out by creating an antireflux mechanism in the isolated jejunum. Performing a radical operation before the development of cirrhosis of the liver gives favorable results.

It is possible to equip a general practitioner with knowledge, to teach standard skills in the indicated professional field, to teach the skills of working with a patient, his relatives and friends, to teach rational tactics in solving medical and social problems only by non-traditional, active, problem-based learning, choosing methods that are adequate to the goals and objectives. To this end, it is proposed to conduct business games, solving situational problems.

## PRACTICAL SKILLS

**Palpation of the abdomen in surgical diseases**
**Indications:**
- Surgical diseases of the abdominal organs.

**Preparation:**

1. The doctor's hands should be dry, clean, warm, nails cut short.
2. Tell the child's parents about the upcoming manipulation.
3. It is necessary at the beginning to get in touch with the child, distract his attention with a conversation, a toy.

**Necessary conditions, tools:**

1. Well lit room.
2. Couch or table for swaddling newborns.
3. In some cases, in order to obtain more accurate data, the child must be given a cleansing enema before palpation, which frees the colon from feces.
4. The position of the child during the examination (lying on his back, on a dense surface, the legs of the subject should be bent at the hip and knee joints at an angle of approximately 45 degrees, arms along the body, head on a flat surface, but not on a pillow), in a row cases, palpation is carried out in a special position of the child (on the side, standing).

**Technique:**

1. **Superficial palpation** is a gentle, sliding pressure with the tips of the folded second to fifth fingers of a slightly bent palm (it practically lies on the abdominal wall) along the surface of the abdomen in the "counterclockwise" direction.

1.2. Palpation begins with:

- sigmoid colon
- descending
- transverse colon
- ascending

departments of the large intestine, then in the epigastric region, hypochondrium, in the navel, flanks and hypogastric region.

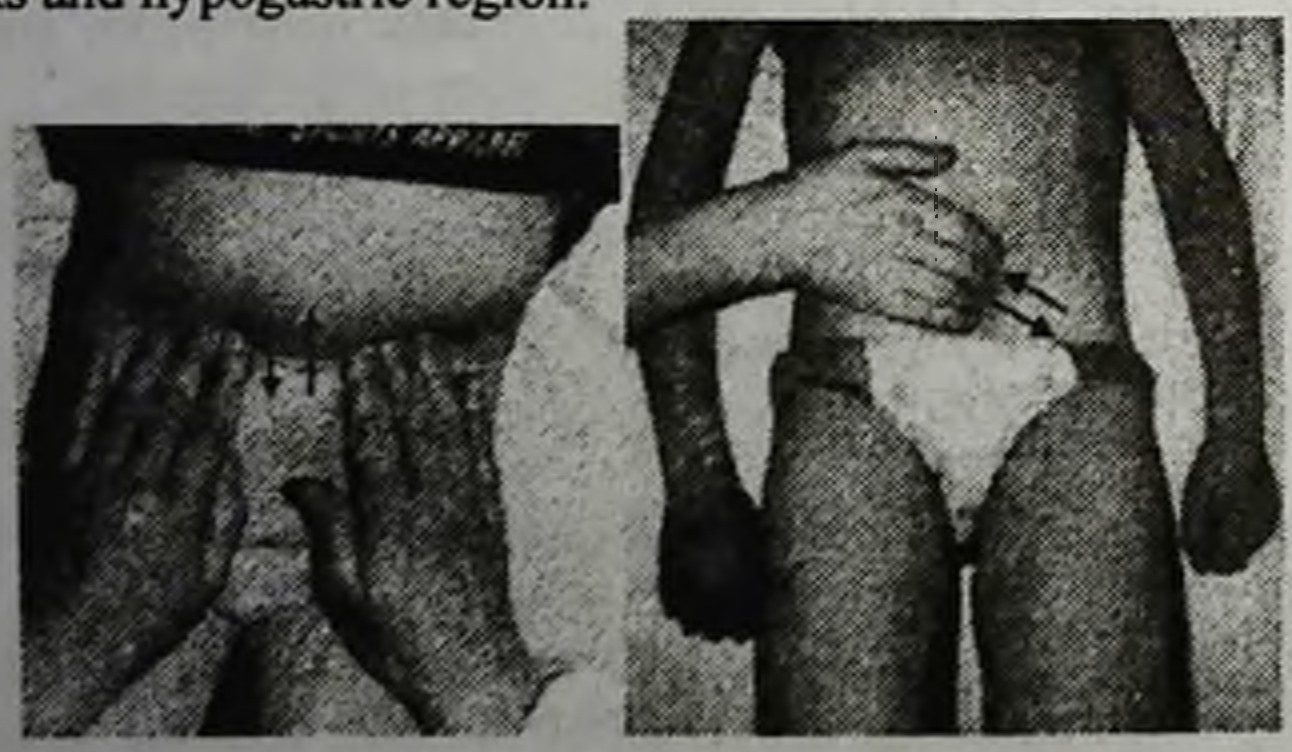


**Figure 71. Technique of superficial and comparative palpation of the abdomen**

1.3. Criteria for evaluation. With superficial palpation, the following signs are determined:

- sensitivity
- soreness
- tension (defans) of the abdominal wall "board-shaped stomach"
- dimensions of internal organs

- bloating
2. **Deep palpation** according to the Obraztsov-Strazhesko method.
2.1. with one hand it is desirable to support the body from the back;
2.2. with the fingers of the other hand, placing the palm perpendicular to the organ or edge being palpated, the skin is somewhat pulled away from the organ (in this case, a small skin fold is formed);
2.3. then the fingers are carefully immersed (preferably during exhalation) deep into the direction of the abdominal cavity and the back wall of the organ;
2.4. Evaluation criteria (each body has its own indicators):
- localization
- form
- soreness
- dimensions
- density and surface condition
- mobility
- rumbling

3. **Bimanual palpation method**, in which the abdomen is palpated with one hand, and the other hand supports the body in the opposite place from the back:
3.1. When examining organs located in the right half of the abdominal cavity, the left hand is located on the lower back on the right and with careful movements brings the organs closer to the right hand, which is used for palpation.
3.2. However, it is violated if the doctor knows about pain in some part of the abdominal cavity - this place **(Attention!)** Is examined last;


**Figure 72. Areas of the anterior abdominal wall**

When describing palpation data, the localization of the identified signs is indicated, for which the anterior abdominal wall is conditionally divided **into 9 sections by lines** (see figure.)

Visually, the lines are drawn as follows:
- 2 horizontal - along the lower edges of the X ribs on both sides and between the anterior superior iliac spines;
- 2 vertical lines - along the outer edges of the rectus abdominis muscle.

The resulting three upper parts (in Figure 1-3) - the right hypochondrium, the epigastrium itself (the epigastric region) and the left hypochondrium - together form **the epigastric region.**

The three middle parts (in Figure 4-6) - the right flank (right lateral region), the umbilical region and the left flank (left lateral region) - are **the mesogastric region.**

The three lower parts (in Figure 7-9) - the right iliac, suprapubic, and left iliac regions - form **the hypogastric region.**

**Conducting a contrast study of the gallbladder (cholecystography)**

**Indications:**

- diseases and malformations of the gallbladder.

**Contraindications:**

1. Children under 1 year old;
2. Decompensation of liver function;
3. Intolerance to iodine preparations;
4. Hyperthyroidism, thyrotoxicosis;
5. Acute cholecystitis.

**Preparation:**

Tell the child's parents about the upcoming manipulation.

**Necessary conditions, tools and medicines:**

1. Contrast agent (bilitrast, at the rate of 0.05 g per 1 kg of body weight);
2. X-ray equipment.

**Technique:**

1. In the evening, the patient is given a drink of bilitrast;
2. Before going to bed, the patient is given a cleansing enema;
3. 12 hours after giving the contrast on an empty stomach, cholecystography is performed (the position of the patient is standing).

**Note:** if it is necessary to determine the contractile function of the gallbladder, a second picture is taken 1 hour after giving a choleretic breakfast (two raw yolks)

**Figure 73. Contrast cholecystocholangiogram**

**IV. Big break - 40 minutes (11.50-12.30).**

**V. Practical lesson (part 2) - 1 hour 35 minutes (12.30-14.05):**

**1. During classes, the use of electronic textbooks, video and photographic materials - 20 minutes;**

**2. UMM - 45 minutes**

## STUDY TASKS

**Appendix 1**

### Group rules

Member of each group

- Respect for the thoughts of their comrades;
- Active and joint participation in tasks, manifestation of responsibility for the task;
- Can ask for help if necessary from comrades;
- Help your comrades in the group;
- Participate in the evaluation of the group;
- Must know the rules "In the same boat, a common fate - to be saved or drown"

Structure responses to questions.

1. What is included in subjective research?
2. Laboratory and instrumental research.

Give the following concepts: Hypotrophy, vomiting, icterus, pain, bleeding.

**Appendix 2**

### Tasks for groups

1. Specify the types of portal hypertension in children? Cluster, SWOT table, Venn diagram for the word "vomit" and chart Why? and hierarchical diagram How?
2. Clinical signs of portal hypertension in children. Create a cluster, SWOT table, Venn diagram for the word "icteric" and draw diagrams Why? and hierarchical diagram How?
3. Specify the clinical signs of liver cirrhosis in children. Cluster, SWOT table, Venn diagram for the word "bleeding" and chart Why? and hierarchical diagram How?
4. What method of surgical intervention is used for Budd-Chiari syndrome? Make a cluster, SWOT table, Venn diagram for the word "habitus" and draw charts Why? and hierarchical diagram How?
5. What are the main symptoms of Budd-Chiari syndrome? Make a cluster, SWOT table, Venn diagram for the word "regurgitation" and draw diagrams Why? and hierarchical diagram How?

**TABLE / X / Y** - Students answer the questions "what do you already know about this topic?" and "what do you want to know?"; Allows you to conduct research work on the text, topic, section

| Concept | know "+", don't know "-" | learned "+", could not find out "-" |
|---|---|---|
| Binary nomenclature: | | |
| Etiology | | |
| Pathogenesis | | |
| Clinic | | |
| Deontology | | |
| Symptom | | |
| Syndrome | | |
| Disease | | |
| Disease history | | |
| Outpatient card | | |
| Genetics | | |
| Infection | | |
| Diagnosis | | |
| Instrumental examination of patients: | | |
| Thermometer | | |
| Phonendoscope | | |
| Tonometer | | |
| Iodolipol, barium sulfate | | |
| Nasogastric tube | | |
| Palpation | | |
| Percussion | | |
| Auscultation | | |
| Anamnesis | | |
| Examination | | |
| General blood analysis, blood biochemistry | | |
| General urine analysis | | |
| ECG | | |
| FCG | | |
| EchoCG | | |
| Chest X-ray | | |

## INSERT TABLE

Insert table: a) provides systematization of information obtained during independent reading, listening to a lecture; confirmation, clarification, rejection, tracking the understanding of the information received;
b) contributes to the formation of the ability to link previously mastered information with new information.

Rules for compiling an INSERT table:

| Concepts | V | + | - | ? |
|---|---|---|---|---|
| Malformations and anomalies in the development of the liver, bile ducts and pancreas (Budd-Chiari syndrome, congenital liver fibrosis, portal vein thrombosis, biliary atresia) clinic, diagnosis, treatment, complications, postoperative rehabilitation | | | | |
| Place in medicine | | | | |
| The main objective of the subject | | | | |
| Types of disease | | | | |
| The sequence of studying the subject | | | | |
| Learning aids | | | | |

**Where:**

**V - corresponds to the existing knowledge (information) about ...**

**- contradicts existing knowledge about ...**

**+ - is new information**

**? -incomprehensible or requiring clarification, addition information**

## CONCEPT TABLE

-provides a comparison of the studied phenomena, concepts, views, topics.
- vertically is what is to be compared (views, theories)
-horizontally - various characteristics for which comparison is made

| Vertically - comparisons with diseases (theories) are located | Horizontally - various signs or symptoms of the disease are located. (recommendations, categories, various signs, etc.) | | | | | | |
|---|---|---|---|---|---|---|---|
| | Jaundice | Pain | Belly enlargement | Vomiting | Ultrasound of the abdominal organs | Increased blood pressure | Bleeding |
| Budd-Chiari Syndrome | | | | | | | |
| Atresia of the biliary tract | | | | | | | |
| Cirrhosis of the liver | | | | | | | |
| FibroCholangioCystosis | | | | | | | |
| Portal vein thrombosis | | | | | | | |

## SWOT

**(homework or independent work of the student: for creative thinking after lectures or practical classes)**

Analytical table - SWOT

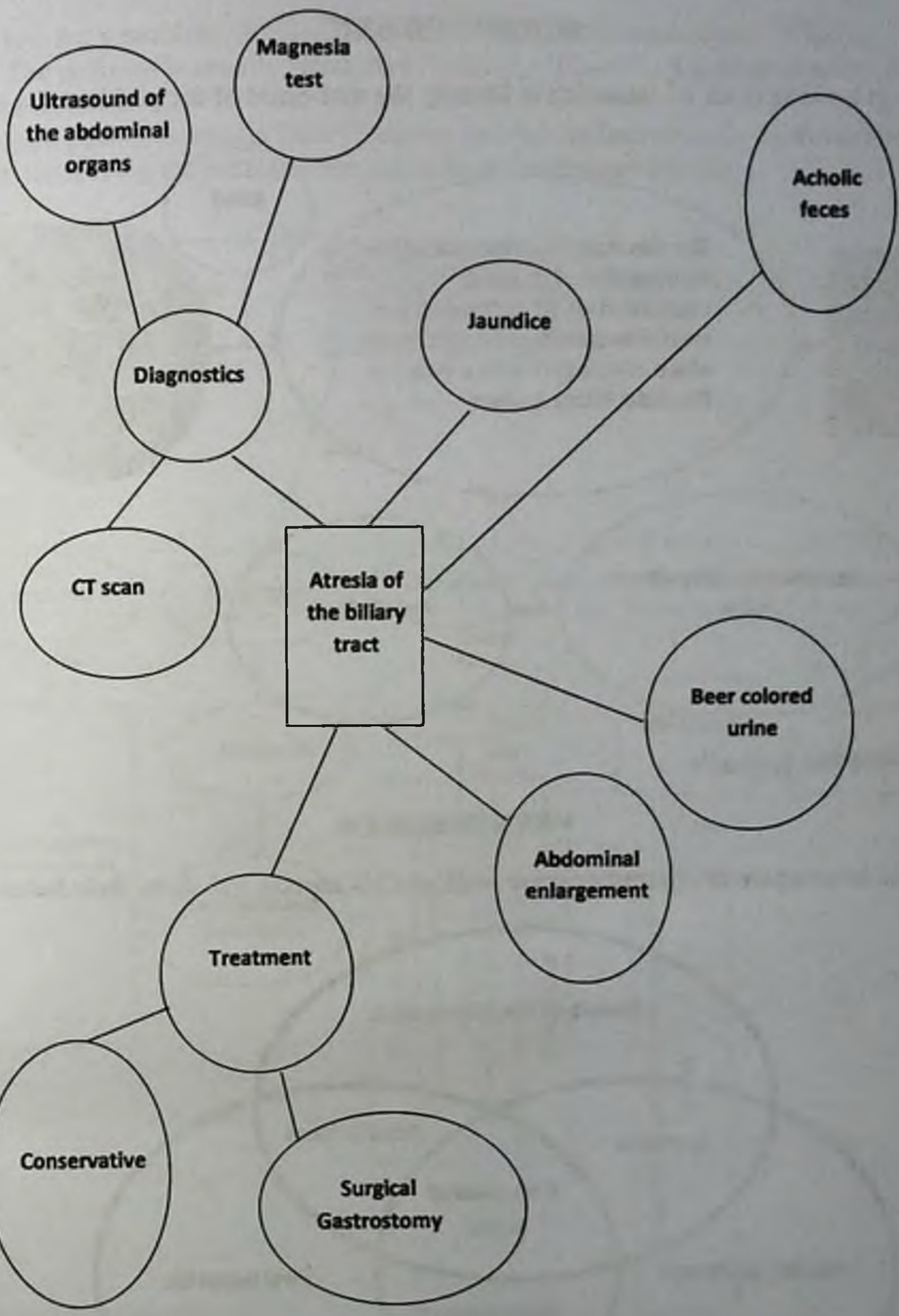
| | |
|---|---|
| S | W |
| O | T |

Note: see 2nd appendix.

## CLUSTER (Bunch, bundle)

A way of mapping information - gathering ideas around a major factor to focus and make sense of the whole construct

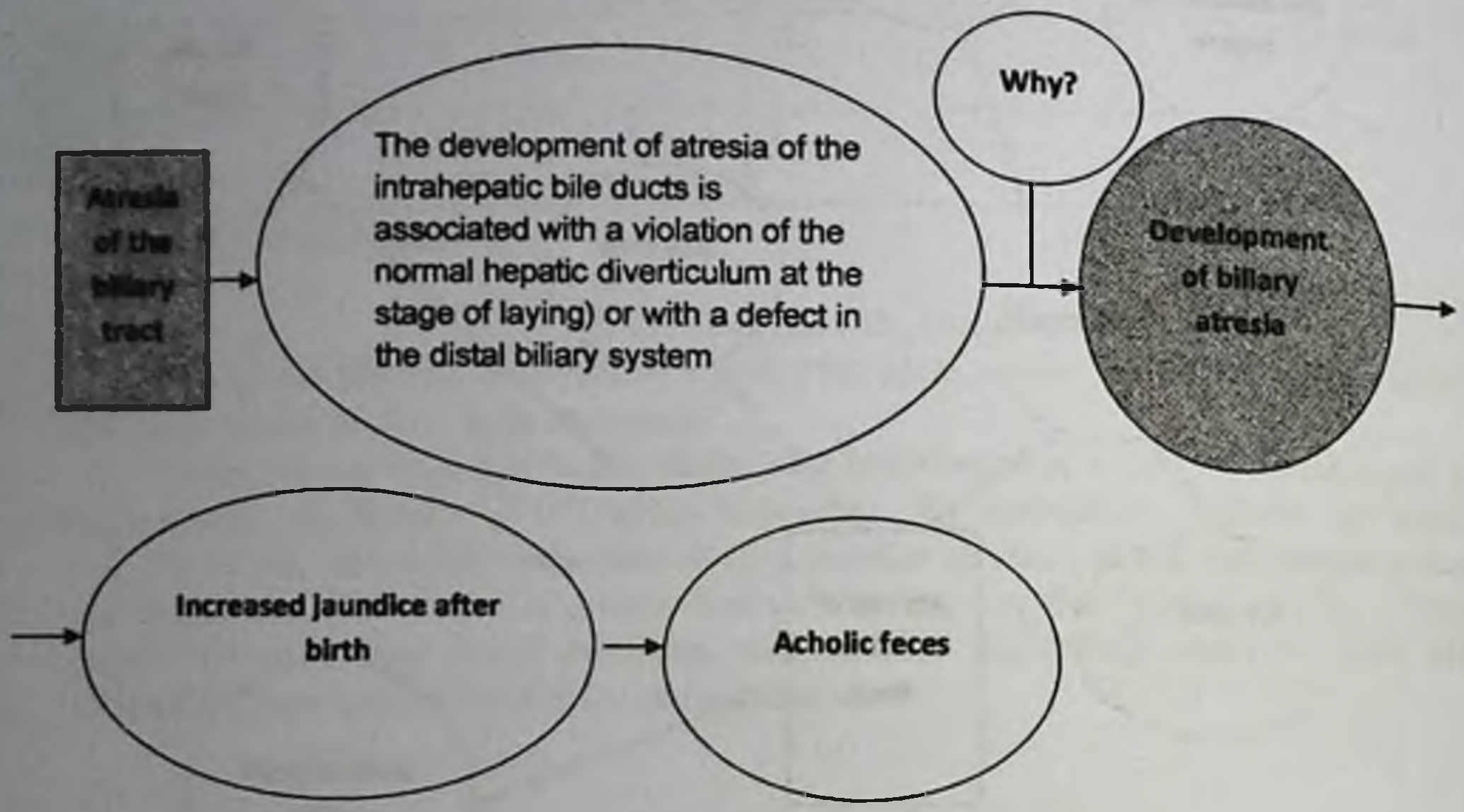
Clustering technology: In the center of a blackboard or a large sheet of paper, a keyword or a topic title of 1-2 words is written. By association with the keyword, "satellites" are attributed to the side of it in smaller circles - words or sentences that are related to this topic. Connect them with lines to the "main" word. These "satellites" may have small satellites, and so on. Recording continues until the allotted time expires or until ideas are exhausted.




Note: see 2nd appendix.

## SCHEME "WHY?"

This is a whole chain of reasoning to identify the root cause of the problem.



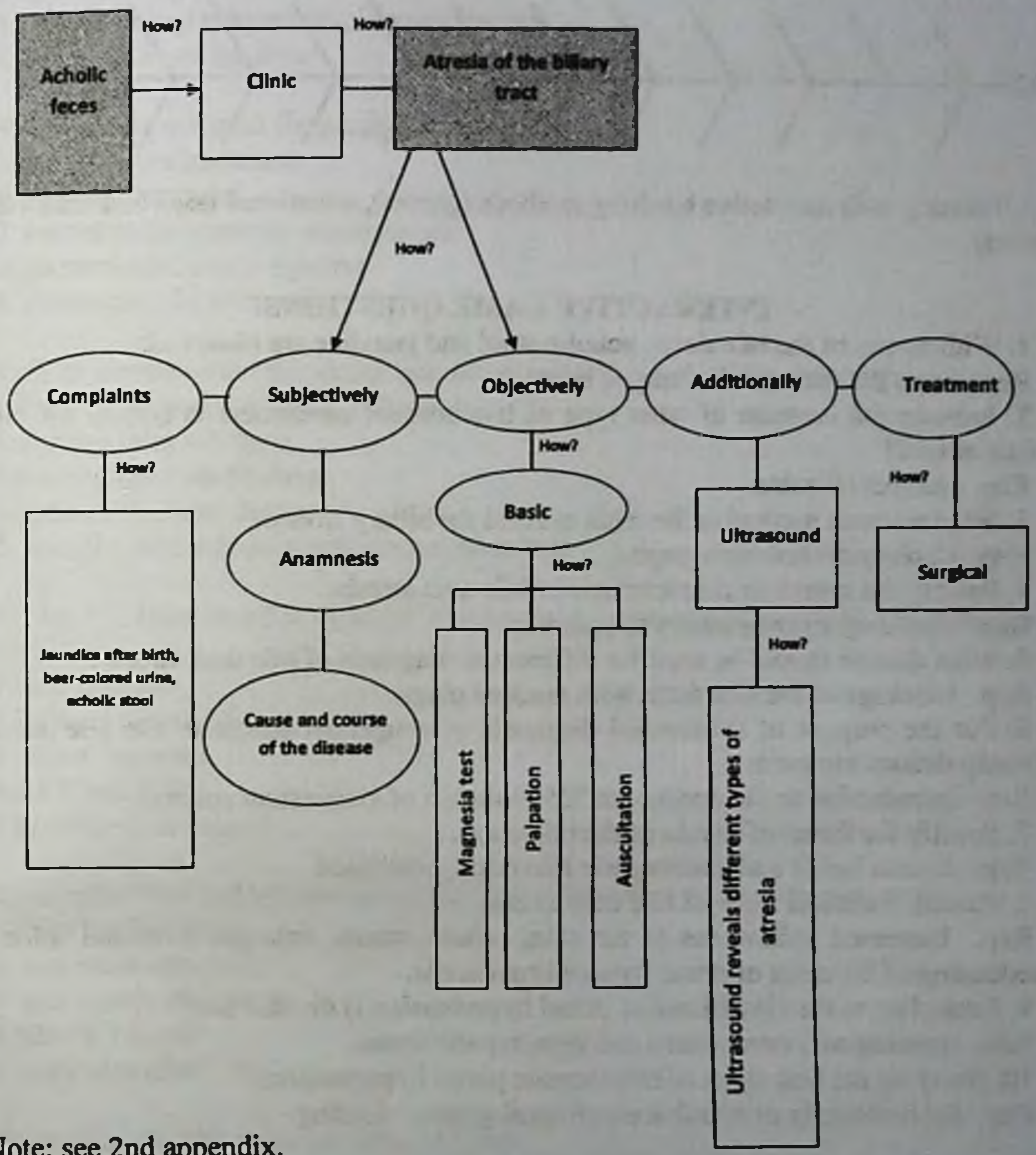

Note: see 2nd appendix.

## VENN DIAGRAM

Used to compare or contrast or contraindicate 2-3 aspects and show their features

When solving a problem, in most cases you do not need to think about "What to do?". The problem is usually "How do I do this?". "How?" - the main question that arises in its solution.

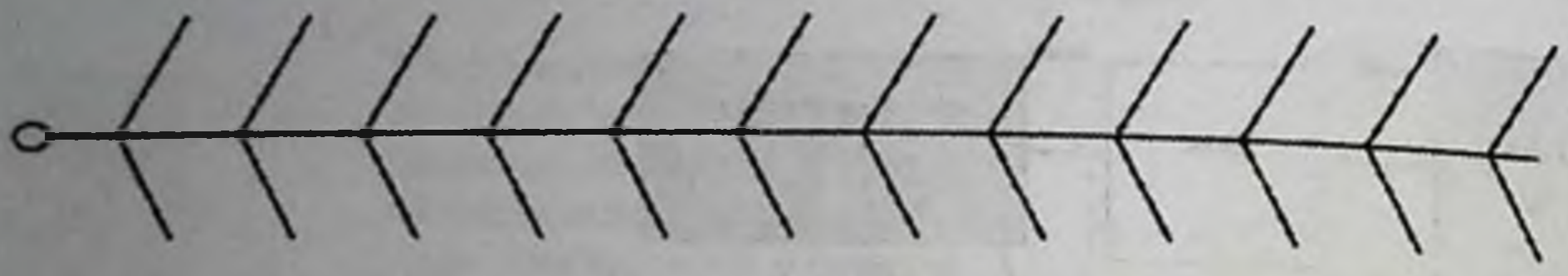
Consistent posing questions "how?" allows you to: Explore not only all the available options for solving the problem, but also ways to implement them;




Note: see 2nd appendix.

## SCHEME "FISH SKELETON"

Allows you to describe the whole circle (field) of the problem and try to solve it.
Develops and activates systemic, creative, analytical, analytical thinking.
Familiarize yourself with the rules for constructing a diagram.



3. Training with interactive teaching methods (games), situational tasks and tests - 20 minutes;

## INTERACTIVE GAME QUESTIONS:

1. With atresia of the bile ducts, acholic stool and jaundice are observed:
Rep. From the moment the baby is born.
2. Indicate the increase of what type of biochemical parameters is typical for bile duct atresia?
Rep. Indirect bilirubin.
3. What research method is the main method for biliary atresia?
Rep. Cholecystocholangiography.
4. Specify the symptom characteristic of bile duct atresia:
Rep. Tendency to progression of jaundice.
5. What disease should be used for differential diagnosis of bile duct atresia?
Rep. Blockage of the bile ducts with mucous plugs.
6. For the purpose of differential diagnosis of congenital atresia of the bile ducts, manipulations are used:
Rep. Introduction to the duodenum 25% solution of magnesium sulfate.
7. Specify the forms of atresia of the bile ducts.
Rep. Atresia inside and extrahepatic bile ducts, combined.
8. Specify 5 clinical signs of bile duct atresia.
Rep. Increased yellowness of the skin, acholic stools, enlarged liver and spleen, reddening of the color of urine, hyperbilirubinemia.
9. According to the classification, portal hypertension is divided into:
Rep. suprahepatic, intrahepatic and extrahepatic forms.
10. Hurry up the first signs of extrahepatic portal hypertension.
Rep. Splenomegaly or massive esophageal-gastric bleeding.

## SELF-CHECK TESTS:

1) Symptom uncharacteristic for intrahepatic portal hypertension:
1. liver enlargement
2. enlarged liver and spleen
3.shrinkage of the liver and spleen
4. unchanged liver and spleen

5.nosebleed

2) Portal hypertension diagnostic method:
1. liver rheography
2. echography of the liver
3.splenoportography
4. splenoportography with splenomanometry
5. Plain X-ray of the liver

3) Treatment not used for portal hypertension:
1.conservative treatment
2.surgical treatment
3. omentopexy, portocal anastomosis
4.splenectomy, artery ligation
5. splenorenal anastomosis

4) With atresia of the bile ducts, acholic stools and jaundice are observed:
1.from the moment the baby is born
2.starting from 4-5 days
3.starting from 10-15 days
4.appears at a later date
5. jaundice and acholic stools are not observed

5) An increase in what type of biochemical parameters is typical for bile duct atresia?
1.total bilirubin
2.indirect bilirubin
3. direct bilirubin
4.ALT and AST
5.urobilin in the blood

6) Acholic stool and yellowness of the skin with atresia of the biliary tract appears
1.from the first days
2. one week after birth
3. one month after birth
4.after 2-3 weeks
5. 6 months after birth

7) Intrahepatic bile ducts are formed from:
1. cranial bile duct
2. elements of the renal lobules
3.round ligament of the liver
4.glison capsule
5. elements of the peritoneum

8) Extrahepatic bile ducts are formed from:
1. cranial bile duct
2. elements of the renal lobules
3.round ligament of the liver
4.glison capsule
5. elements of the peritoneum

9) Clinical manifestations of atresia of the bile ducts develops through:
1.first days after birth
2.1 month after birth
3.3 month after birth
4.5 month after birth
5.9 month after birth

10) Select a symptom characteristic of bile duct atresia.
1.excessive staining of the stool
2. increase in the amount of AST, ALT
3.increase in the amount of direct bilirubin
4. tendency to progression of jaundice.
5.reducing the size of the liver, spleen

11) Differential diagnosis of bile duct atresia should be
to carry out with the following diseases.
1. peritonitis
2.sepsis
3. blockage of the bile ducts by mucous plugs
4.cirrhosis of the liver
5.diaphragmatic hernia

12) For the differential diagnosis of congenital artesia of the biliary
moves apply the following manipulations.
1. laparocentesis
2. introduction into the duodenum of 25% magnesium sulfate solution
3. survey radiography of the abdominal cavity
4.Diagonal laparotomy
5.X-ray tomography

13) At what age is it better to operate a child for atresia of the bile ducts.
1.up to 1.5 months
2.up to 3 months
3.up to 6 months
4.up to 8 months
5.up to 12 months

14) Potral hypertension syndrome is manifested by the following symptoms.

1. hyposplenism
2.myocardial hypertrophy
3.early onset of arthritis
4.pulmonary bleeding
5. bleeding from the veins of the esophagus, rectum

15) Classification of portal hypertension /G.M. Grozdov and M.D. Patsiora/ includes.
1.sclerosing form
2.intrahepatic form
3.biliary form
4. icteric form
5. hemorrhagic form

16) Most often, collateral blood flow in portal hypertension develops according to:
1.arterio-venous shunts
2.gastroesophageal pathway
3.caval-caval anastomosis
4. anastomoses between the renal veins
5. capillary anastomoses

17) There is the following form of bile duct atresia
1.atresia of the bile ducts of the right lobe
2.atresia of the intrahepatic bile ducts
3. atresia of the proximal bile ducts
4. atresia of the distal bile ducts
5. atresia of the bile ducts of the left lobe

18) There are the following types of surgical treatment of atresia of the bile ducts.
1. resection of the liver lobe
2. anastomosis between the bile ducts and duodenum 12
3.imposition of interintestinal anastomosis
4.lithotripsy
5. laparocentosis

19) With portal hypertension, the following study is possible.
1. Esophagogastrography with barium lime
2. Plain X-ray of the abdominal cavity
3.bronchography
4.encephalography
5. duodenal sounding

20) Surgical interventions used to treat portal hypertension include:
1. resection of the stomach
2. resection of the liver lobe

3. operations aimed at removing ascitic fluid from the abdominal cavity
4. removal of the spleen
5. termination of connection between the veins of the stomach and esophagus

21) In case of esophageal bleeding, the following measures are necessary
1. application of a hemostatic tourniquet
2.emergency operation
3.Application of the Blackmore probe
4.clamping of a bleeding vessel
5.gastric sounding

22) The cause of the intrahepatic form of portal hypertension may be.
1.portal vein thrombosis
2. malformations of the portal vein
3.acute hepatitis
4. Obliterating phlebitis of the hepatic veins \ Chiari disease \
5.tumor in the area of the gate of the liver

23) The causes of the extrahepatic form of portal hypertension can be.
1.diaphragmatic hernia
2.liver injury
3.chronic hepatitis
4. Obliterating phlebitis of the hepatic veins \ Chiari disease \
5.tumor in the area of the gate of the liver

**Answers to tests for self-control**

**1-5, 2-4, 3-3, 4-1, 5-1, 6-1, 7-1, 8-5, 9-1, 10-4, 11-3, 12-2, 13-1, 14-5, 15-2, 16-2, 17-2, 18-2, 19-5, 20-5, 21-3, 22-3, 23-5.**

## CHAPTER 8. MALFORMATIONS AND ANOMALIES IN THE DEVELOPMENT OF THE VAGINAL PROCESS OF THE PERITONEUM AND TESTICLES (INGUINAL HERNIA, HYDROCELE, CYST OF THE SPERMATIC CORD, NUKKA CYST, ANORCHISM, MONORCHISM, POLYORCHISM, CRYPTORCHIDISM, TESTICULAR ECTOPIA, VARICOCELE) CLINIC, DIAGNOSIS, TREATMENT, COMPLICATIONS, POSTOPERATIVE REHABILITATION

**The purpose of the training:** to develop the skills and abilities of clinical diagnosis, treatment and rehabilitation of children with congenital malformations and developmental anomalies requiring surgical correction.

**Learning objectives:**

- Formation of knowledge on the etiology, pathogenesis and clinic of the most common malformations and developmental anomalies in children;
- Development of students' skills and abilities of clinical examination and examination of a child with congenital malformations and developmental anomalies, including laboratory, radiation and instrumental research methods;
- Students mastering the diagnostic algorithm for malformations and developmental anomalies that pose a threat to a child's life;
- Acquaintance with the principles of surgical treatment of malformations and developmental anomalies and their complications;
- Development of skills and abilities of general medical care: based on treatment and diagnostic standards and protocols for postoperative rehabilitation of children with congenital malformations and developmental anomalies.

**Location of the lesson:** Department of Urology, Operating Room, Computer Room, Training Room

**Monitoring and evaluation:** oral control, control questions, performance of educational tasks in groups.

**Written control:** control questions.

### HYPOPLASIA OF THE TESTICULAR

**Testicular hypoplasia** develops as a result of impaired blood supply and is most often found in cryptorchidism. In the case of bilateral hypoplasia, endocrine disorders are noted. As a rule, children have adiposogenital obesity, sexual development is delayed.

In some cases, the anomaly is combined with micropenia, or "hidden penis".

**Treatment** is carried out by an endocrinologist.

**Monorchidism** is a congenital anomaly characterized by the presence of only one testicle. The occurrence of an anomaly is associated with a violation of

embryogenesis before the laying of the final kidney and gonad. Therefore, there is often a combination of monorchism and a solitary kidney.

With monorchism, along with the absence of the testicle, the epididymis and the vas deferens do not develop. The corresponding half of the scrotum is aplastic.

The diagnosis of monochism is competent only after unsuccessful searches for the testicle with a wide revision of the retroperitoneal space.

The congenital absence of one testicle with a normal second is usually not manifested by endocrine disorders and does not lead to infertility. However, in some cases, the only testicle is cryptorchid. Then the hypogonadism expressed in varying degrees can take place.

**Treatment.** With "pure" monorchism, the treatment consists in implanting a silicone testicular prosthesis into the scrotum. The operation is performed for cosmetic reasons in adolescents 12-14 years old. With hypoplasia of a single testicle, help consists in hormone replacement therapy.

**Anorchism** is the congenital absence of both testicles, due to the non-laying of the embryonic gonad. It is usually associated with bilateral agenesis or aplasia of the kidneys, but may be noted as an independent anomaly. With bilateral agenesis and aplasia of the kidneys, children are not viable. In extremely rare cases of anorchism as an independent anomaly, pronounced eunuchoidism, underdevelopment of the external genitalia, absence of the prostate gland and seminal vesicles are revealed. Secondary sexual characteristics do not develop.

**Treatment** is reduced to the appointment of hormones.

**Polyorchism** is an anomaly characterized by the presence of an additional (third) testicle. Usually it is reduced, hypoplastic, devoid of an appendage and is located in the scrotum above the main testicle. Extremely rare observations of an ectopic accessory testicle under the skin of the thigh, back, and neck are described.

**Treatment** consists in removing the accessory testicle, as it can be a source of malignant tumor development.

## CRYPTORCHISM

Cryptorchidism refers to anomalies in the position of the testis, the occurrence of which is associated with a violation of the process of their lowering. In the fetus, the testicles are located retroperitoneally on the back wall of the abdomen. From the 6th month of intrauterine development, the testicles begin to descend following the gunter band. Having passed the inguinal canal, they descend to the bottom of the scrotum and are fixed there by the time the child is born. However, due to various reasons, the process of lowering is stopped or perverted. There is also evidence that the development of cryptorchidism is based on a delay in the differentiation of mesenchymal tissue.

In the presence of short vessels or obstructions along the inguinal canal, the testicle lingers at the entrance to it or in its lumen. In these cases, we are talking about true cryptorchidism. In other words, cryptorchidism is the thirst for the testicle on its way to the scrotum. If the testicle is located in the abdominal cavity, before

entering the inguinal canal, such retention is called abdominal. The retention of the testicle in the inguinal canal is called inguinal.

If in the process of lowering the testicle at the entrance to the scrotum there is an obstacle in the form of a connective tissue membrane, the conductor of the testicle paves the way in the subcutaneous tissue to the bosom, to the inguinal region, to the thigh or to the perineum. The location of the testicle in these areas is called ectopic testis. In other words, ectopia is the deviation of the testicle from the path to the scrotum. The forms of ectopy are determined by the location of the testicle.

**Clinic and diagnostics.** Identification of cryptorchidism and testicular ectopia is based on examination and palpation data. With ectopia, the testicle, in the form of an elastic, slightly painful formation, is palpated in the subcutaneous tissue. His mobility is limited. The corresponding half of the scrotum is flattened, underdeveloped. With cross dystopia in one half of the scrotum, two testicles are determined, located one above the other.

With bilateral true cryptorchidism, which is less common than unilateral, signs of sexual infantilism and hormonal dysfunction are often noted. Due to the fact that the vaginal process of the peritoneum with cryptorchidism almost always remains non-obliterated, patients have an inguinal hernia.

**Treatment.** An undescended testicle must be brought down into the scrotum. The operation is performed early due to the risk of various complications due to the abnormal location of the testicle. Based on these considerations, the operation of bringing down the testicle is performed at the age of 1-2 years.

With ectopia, the testicle is isolated from the surrounding tissues and lowered into the scrotum, fixing the membranes to the tunica dartos (Schüller's operation). In the case of cryptorchidism, bringing down and fixing the testicle - orchidopexy - is carried out in different ways, depending on the possibility of elongation of the testicular vessels. Sometimes at the first stage, the testicle can be fixed only in the outer inguinal ring or at the entrance to the scrotal-scrotal region.

In the case of severe endocrine disorders, hormonal treatment is carried out, which in some cases leads to testicular descent without surgery.

**The prognosis** for ectopic testis is usually favorable. With cryptorchidism, it depends on the degree of underdevelopment of the testicles. According to combined statistics, with unilateral cryptorchidism, only 40% of men have viable sperm, with bilateral cryptorchidism, men are usually infertile.

## DROPSY OF THE MEMBRANES OF THE TESTICLES AND THE SPERMAL CORD

Dropsy of testicular membranes (hydrocele) and spermatic cord (funiculocele) are very common anomalies in children; their development is associated with non-closure of the vaginal process of the peritoneum and the accumulation of serous fluid in its cavity. In the absence of obliteration of the vaginal process, dropsy of the testicular membranes is formed in the distal section. If the process is obliterated in the distal section, and the proximal one remains open and communicates with the abdominal cavity, we are talking about a communicating dropsy of the spermatic

cord. In the case of non-obliteration of the entire vaginal process, a communicating dropsy of the membranes of the testis and the spermatic cord is formed. When the process is obliterated in the distal and proximal sections, and fluid accumulates in its middle section, they speak of a non-communicating dropsy of the membranes of the spermatic cord, or a cyst of the spermatic cord (Fig. 74).

**Figure 74. Variants of dropsy of the testicles**

In older children and adults, trauma and inflammation are the causes of hydrocele and funiculocele. When hit in the inguinal region, exudate can accumulate in the membranes of the spermatic cord, which does not resolve for a long time. In these cases, they speak of an acute cyst of the spermatic cord.

**Clinic and diagnostics.** Dropsy is characterized by an increase in half, and with a bilateral disease - the entire scrotum. With isolated dropsy of the testicle, the swelling has a rounded shape, the testicle is determined at its lower pole. Communicating dropsy is manifested by a soft elastic formation of an oblong shape, the upper edge of which is palpable at the outer inguinal ring. When straining, this formation increases and becomes more dense. Palpation of the swelling is painless. Diaphanoscopy reveals a characteristic symptom of translucence. With the valvular nature of the communication with the abdominal cavity, dropsy is tense, and can cause anxiety in the child. The cyst of the spermatic cord has a round or oval shape with clear contours. Its upper and lower poles are well defined.

Dropsy most often has to be differentiated from inguinal hernia. When the hernial contents are reduced, a characteristic rumbling is heard, immediately after the reduction, the swelling in the inguinal region disappears. With non-communicating dropsy, an attempt to reduce does not bring success. In the case of a message, the size of the formation in a horizontal position decreases, but more gradually than when the hernia is reduced, and without a characteristic sound. Great difficulties arise in the differential diagnosis of an acute cyst with an incarcerated inguinal hernia. In such cases, they often resort to surgical intervention with a preliminary diagnosis of "incarcerated inguinal hernia".

**Treatment.** Since self-healing is possible during the first 2 years of life due to the completion of the process of obliteration of the vaginal process, the operation is performed in children older than this age. With isolated and acquired dropsy of the testicular membranes, the Winkelmann operation is generally accepted, which consists in dissecting the membranes of the dropsy cavity and suturing them in a twisted position around the testicle and epididymis (Fig. 75).

With communicating dropsy, the Ross operation is used, the purpose of which is to stop communication with the abdominal cavity and create an outflow for the dropsy fluid. The vaginal process is ligated at the internal inguinal ring and partially removed, leaving a hole in the testicular membranes through which the dropsy fluid exits and is absorbed into the surrounding tissues. This operation is simpler than the Winkelmann operation, it is not accompanied by testicular trauma and gives a good effect.

**Figure 75. Stages of the Winckelmann operation.**

In children under 2 years of age, in case of tense dropsy of the testicular membranes, causing anxiety, the use of a puncture method of treatment is indicated. After evacuation of the dropsy fluid, a suspension is applied. Repeated puncture is performed as fluid accumulates. Suction of the liquid weakens the compression of the testicle and allows you to postpone the timing of surgical intervention.

## INGUINAL HERNIA

Inguinal hernia is one of the most common surgical diseases in childhood. There is a predominantly unilateral inguinal hernia, and on the right 2-3 times more often. Inguinal hernias are observed mainly in boys, which is associated with the process of testicular descent. Acquired hernias are extremely rare, usually in boys over 10 years of age with increased physical activity and severe weakness of the anterior abdominal wall.

Due to the fact that hernias in children are usually congenital, they descend along the inguinal canal, entering it through the internal inguinal ring, i.e. are oblique. Direct hernias in children are observed as an exception.

The contents of the hernial sac in children are most often loops of the small intestine, at an older age - often the omentum. In girls, an ovary is often found in a hernial sac, sometimes along with a tube. When the colon has a long mesentery, the contents of the hernial sac may be the caecum. In these cases, the posterior wall of the hernial sac is absent (sliding hernia) (Fig. 76).

**Figure 76. Variants of inguinal hernias**

**Clinic and diagnostics.** Usually in a small child, sometimes already in the neonatal period, a protrusion appears in the inguinal region, which increases with crying and anxiety and decreases or disappears in a calm state. The protrusion is painless, has a rounded or oval shape. In the latter case, the protrusion descends into the scrotum, causing stretching of one half and leading to its asymmetry. The consistency of education is elastic. In a horizontal position, it is usually easy to set the contents of the hernial sac into the abdominal cavity. At the same time, a characteristic rumbling is clearly audible. After reduction of the hernial contents, the enlarged external inguinal ring is well palpated. At the same time, a positive "shock" symptom is detected when the child coughs.

In girls, the protrusion with an inguinal hernia has a rounded shape and is determined at the external inguinal ring. With a large hernia, the protrusion descends into the labia majora.

In older children, if the hernia does not come out constantly, straining, coughing, and examination after exercise are used. The thickening of the elements of the spermatic cord, the expansion of the inguinal ring, the positive symptom of the "shock" in combination with the anamnestic data make the diagnosis undoubted in these cases.

It is necessary to **differentiate** an inguinal hernia mainly with a communicating dropsy of the testicular membranes. With dropsy, the testicle is inside the formation, with a hernia - outside it. The edema tumor has a tugoelastic consistency, cystic character and is translucent. In the morning it is smaller and more flabby, in the evening it increases and becomes more tense.

**Treatment.** The only radical method of treating an inguinal hernia is surgical. Modern methods of anesthesia allow you to perform the operation at any age, starting from the neonatal period. According to relative contraindications in uncomplicated cases, the operation is transferred to an older age (6-12 months).

**Strangulated inguinal hernia.** A complication of an inguinal hernia is its infringement. In this case, the intestinal loop or omentum that has fallen into the hernial sac is compressed in the hernial orifice, and their blood supply and nutrition are disturbed. The cause of the infringement is considered to be an increase in intra-abdominal pressure, impaired bowel function, flatulence, etc.

**Clinic and diagnostics.** Parents usually indicate exactly the time when the child begins to worry, cries, complains of pain in the area of the hernial protrusion. It

becomes tense, sharply painful on palpation and does not retract into the abdominal cavity. Later, the pain subsides, the child becomes limp, there are nausea or vomiting, and stool retention may be observed.

**Diagnosis** of a strangulated hernia is based on history and physical examination. If there is a history of indications of an inguinal hernia, the recognition of infringement is usually not difficult. In children of the first months of life, it can be difficult to distinguish a strangulated inguinal hernia from an acute cyst of the spermatic cord, inguinal lymphadenitis. In doubtful cases, the doctor leans towards the diagnosis of strangulated inguinal hernia. Surgery resolves doubts.

Incarceration of an inguinal hernia in children has its own characteristics, consisting in better blood circulation of the intestinal loops, greater elasticity of the vessels and less pressure on the infringing ring. Despite the fact that self-reduction of a hernia is often observed in children, strangulation is a complication that requires urgent surgical intervention.

**Treatment.** In weak, premature babies or in the presence of therapeutic contraindications, it is considered acceptable to carry out conservative treatment in the first 12 hours from the moment of infringement, aimed at creating conditions for self-reduction of the hernia. For this purpose, a 0.1% solution of atropine and a 1% solution of promedol are administered, a warm bath is prescribed for 15-20 minutes, then the child is laid down with a raised pelvis. You should not try to set the hernia with your hands, as this may damage the strangulated organs.

In the absence of the effect of conservative treatment within 1.5-2 hours, an emergency operation is indicated.

## VARICOCELE

Varicocele - varicose veins of the pampiniform plexus - occurs in boys mainly after the age of 9-10 years with a frequency of up to 15%.

Distinguish between idiopathic and symptomatic varicocele. The development of a secondary varicocele is due to compression of the outflow tract of blood from the testicle by some volumetric retroperitoneal formation.

Primary varicocele is formed, as a rule, on the left and has a rather complex genesis. As you know, the blood from the testicle flows through three veins: testicular, cremasteric and vein of the vas deferens. The last two flow into the iliac veins. The right testicular vein drains into the inferior vena cava, and the left into the renal vein. The left renal vein, approaching the inferior vena cava, is placed in the so-called aortomesenteric forceps and can be compressed, which leads to venous renal hypertension and difficulty in the outflow of blood through the testicular vein. Sometimes the renal vein is compressed by the abnormally passing testicular artery that passes through it.

**Clinic and diagnostics.** Very rarely, varicocele is found in young children. In the anamnesis of such patients, it is usually possible to identify a factor that caused a long-term violation of the outflow of blood from the testicle.

Sometimes varicose veins are noted on the right or on both sides. Varicocele only on the right is associated with an abnormal confluence of the right testicular vein

into the renal vein. Bilateral varicocele is due to the presence of intertesticular anastomoses, through which increased blood pressure in the left testicle is transmitted to the right side. After the treatment of the left-sided varicocele, the expansion of the right pampiniform plexus usually also disappears.

Children with varicocele, as a rule, do not complain, and varicose veins are detected during preventive examinations at school. Only older children sometimes notice a feeling of heaviness and some soreness in the left half of the scrotum.

Clinically, there are three degrees of varicocele:

I - the expansion of the veins above the testicle is determined only by palpation in the vertical position of the patient with tension in the abdominal muscles;

II - dilated and tortuous veins are clearly visible through the skin of the scrotum, in a horizontal position the veins collapse;

III - against the background of the dilation of veins determined by the eye, testiness and reduction of the testicle are detected by palpation (Fig. 77).

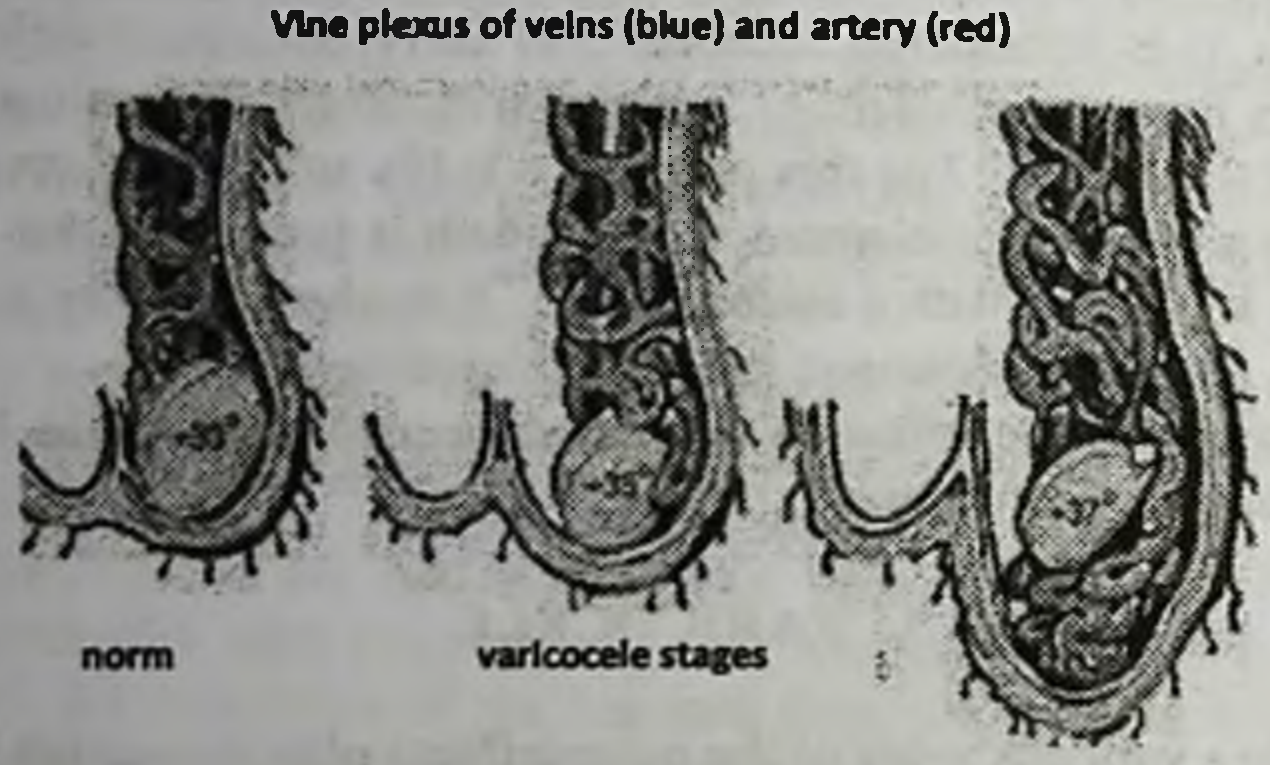



**Figure 77. Stages of varicocele**

With a varicocele that does not fall down in a horizontal position, studies are shown to detect a volumetric retroperitoneal formation.

**Treatment.** With an idiopathic varicocele, an operation is performed - ligation of the testicular vein in the retroperitoneal space or its thrombosis during angiographic examination. This stops the inverted blood flow from the kidney to the testicle and leads to the collapse of the varicose veins.

It is possible to equip a general practitioner with knowledge, to teach standard skills in the indicated professional field, to teach the skills of working with a patient, his relatives and friends, to teach rational tactics in solving medical and social problems only by non-traditional, active, problem-based learning, choosing methods that are adequate to the goals and objectives. To this end, it is proposed to conduct business games, solving situational problems.

**I. Curation of patients on the topic - 15 minutes**

**II. Participation in the dressing room and in the operating room - 20 minutes;**

**III. Implementation of practical skills - 15 minutes:**

## CONSERVATIVE TREATMENT OF UMBILICAL HERNIA

- explain to parents the essence of the treatment of umbilical hernia;
- elimination of the causes associated with the release of a hernia;
- recommendations for general treatment (rickets, malnutrition, etc.);
- swaddling the baby;

**Figure 78. Appearance of a patient with an umbilical hernia.**

- put the child on the stomach for 2-3 minutes (this achieves regular abdominal exercises, which contributes to the narrowing of the umbilical ring);
- carry out a light massage of the anterior abdominal wall with careful stroking along the rectus muscles and around the navel clockwise;
- application of an adhesive bandage;
- the hernia is reduced on both sides of the navel;
- the skin is collected in folds;
- fix it in this position with a wide strip of adhesive tape;
- the patch is changed no more than once every 7-10 days;
- in parallel, therapeutic exercises are carried out;
- the child is bathed daily.

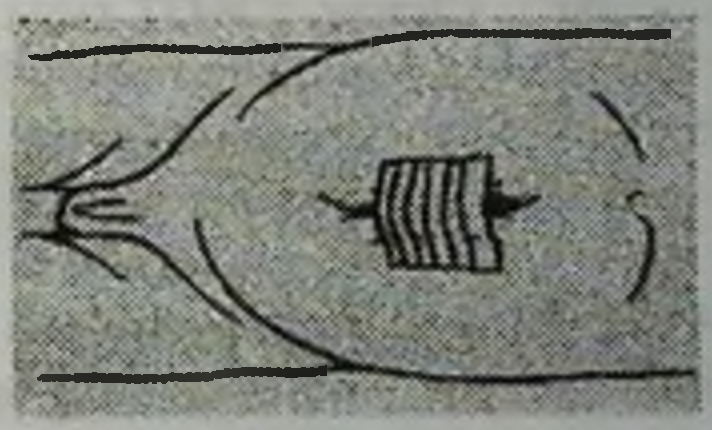


**Figure 79. Applying an adhesive bandage for umbilical hernia**

**IV. Big break - 40 minutes (11.50-12.30).**

**V. Practical session (part 2) - 1 hour 35 minutes (12.30-14.05):**

**1. During classes, the use of electronic textbooks, video and photographic materials - 20 minutes;**

**2. UMM - 45 minutes**

## STUDY TASKS

**Appendix 1**

### Group rules

Member of each group

- Respect for the thoughts of their comrades;
- Active and joint participation in tasks, manifestation of responsibility for the task;
- Can ask for help if necessary from comrades;
- Help your comrades in the group;
- Participate in the evaluation of the group;
- Must know the rules "In the same boat, a common fate - to be saved or drown"

Structure responses to questions.

1. What is included in subjective research?
2. Laboratory and instrumental research.

Give the following concepts: swelling, pain, palpable tumor, hernia

**Appendix 2**

### Tasks for groups

1. Specify the types of testicular anomalies? Make a cluster, SWOT table, Venn diagram for the word "hypoplasia" and draw diagrams Why? and hierarchical diagram How?
2. Specify the clinical signs of cryptorchidism. Make a cluster, SWOT table, Venn diagram for the word "cryptorchism" and draw diagrams Why? and hierarchical diagram How?
3. Specify the clinical signs of "varicocella". Cluster, SWOT table, Venn diagram for the word "hernia" and chart Why? and hierarchical diagram How?
4. What method of surgical intervention is used for cryptorchidism? Make a cluster, SWOT table, Venn diagram for the word "habitus" and draw diagrams Why? and hierarchical diagram How?
5. What are the main symptoms of strangulated hernia? Compile a cluster, SWOT table, Venn diagram for the word "infringement" and draw diagrams Why? and hierarchical diagram How?

Diagnostic map of learning technology in the classroom

*Evaluation indicators - the criterion was manifested in the training session:*

| Group | Task 1 | Task 2 | Task 3: (for each question 0.2 points) | | | Sum of points |
|---|---|---|---|---|---|---|
| | (1,0) | (1,4) | Question 1 | Question 2 | Question 3 | (3,0) |
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |

**TABLE / X / Y** - Students answer the questions "what do you already know about this topic?" and "what do you want to know?"; Allows you to conduct research work on the text, topic, section

| Concept | know "+", don't know "-" | learned "+", could not find out "-" |
|---|---|---|
| Binary nomenclature: | | |
| Etiology | | |
| Pathogenesis | | |
| Clinic | | |
| Deontology | | |
| Symptom | | |
| Syndrome | | |
| Disease | | |
| Disease history | | |
| Outpatient card | | |
| Genetics | | |
| Infection | | |
| Diagnosis | | |
| Instrumental examination of patients: | | |
| Thermometer | | |
| Phonendoscope | | |
| Tonometer | | |
| Iodolipol, barium sulfate | | |
| Nasogastric tube | | |
| Palpation | | |
| Percussion | | |
| Auscultation | | |
| Anamnesis | | |
| Examination | | |
| General blood analysis, blood biochemistry | | |
| General urine analysis | | |
| ECG | | |
| FCG | | |
| EchoCG | | |
| Chest X-ray | | |

## INSERT TABLE

Insert table: a) provides systematization of information obtained during independent reading, listening to a lecture; confirmation, clarification, rejection, tracking the understanding of the information received;

b) contributes to the formation of the ability to link previously mastered information with new information.

Rules for compiling an INSERT table:

| Concepts | V | + | - | ? |
|---|---|---|---|---|
| Congenital malformations and anomalies of the vaginal process of the peritoneum and testicles (inguinal hernia, dropsy of the testicles, spermatic cord cyst, Nukka cyst, anorchism, monorchism, polyorchism, cryptorchidism, testicular ectopia, varicocele) clinic, diagnosis, treatment, complications, postoperative rehabilitation | | | | |
| Place in medicine | | | | |
| The main objective of the subject | | | | |
| Types of disease | | | | |
| The sequence of studying the subject | | | | |
| Learning aids | | | | |

**Where:**

**V - corresponds to the existing knowledge (information) about ...**

**- contradicts existing knowledge about ...**

**+ - is new information**

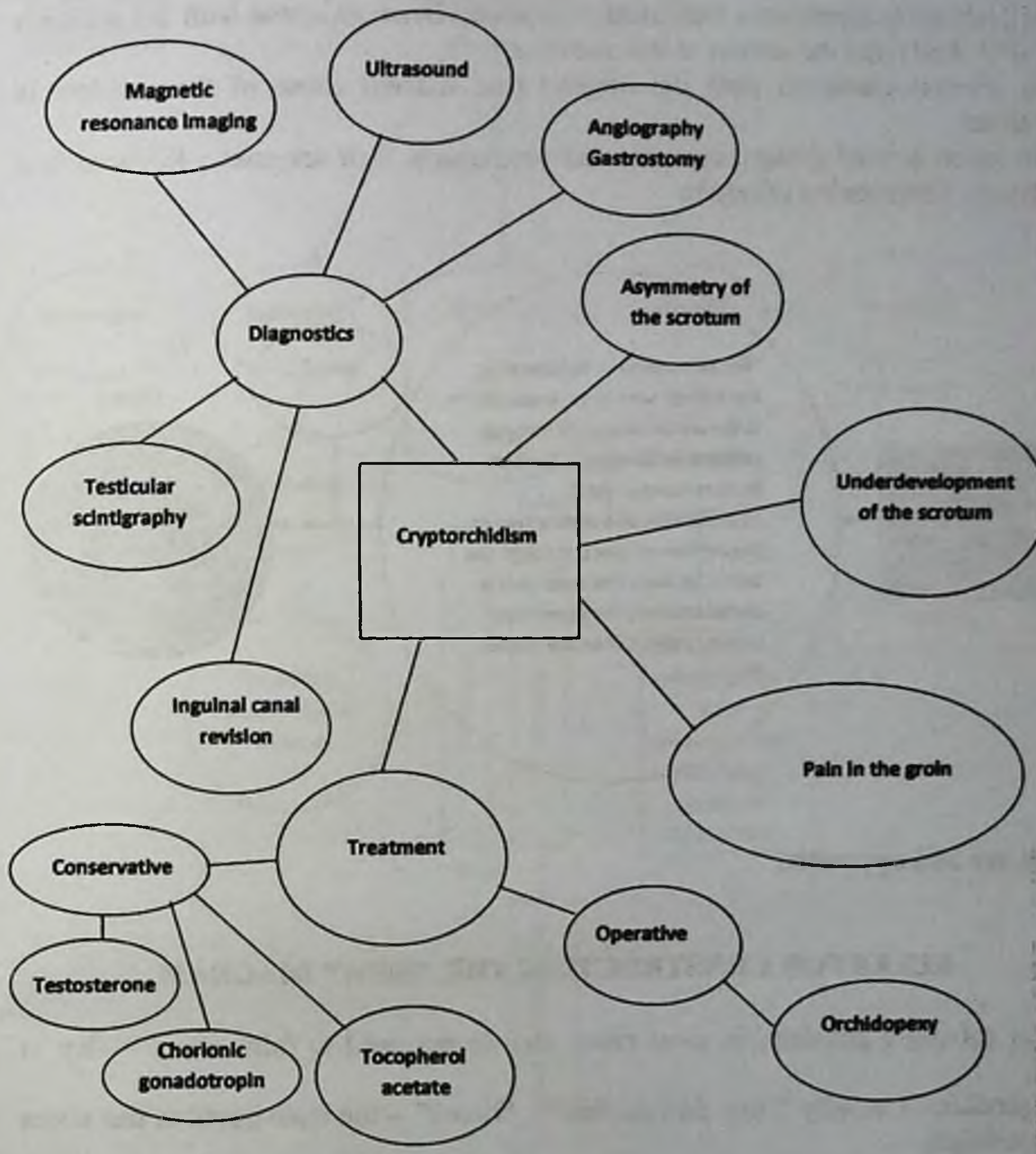
**? -incomprehensible or requiring clarification, addition information**

**CONCEPT TABLE**

| Vertically - comparisons with diseases (theories) are located | Horizontally - various signs or symptoms of the disease are located. (recommendations, categories, various signs, etc.) | | | | | |
|---|---|---|---|---|---|---|
| | Swelling | Pain | Earthworms | Diaphanoscopy | Paipation | Ultrasound |
| Inguinal hernia | | | | | | |
| Dropsy of the testicles | | | | | | |
| Cyst of the spermatic cord | | | | | | |
| Cyst Nucca | | | | | | |
| Anorchism | | | | | | |
| Monarchism | | | | | | |
| Polyorchism | | | | | | |
| Cryptorchism | | | | | | |
| Ectopic testis | | | | | | |
| Varicocele | | | | | | |

## CLUSTER (Bunch, bundle)

A way of mapping information - gathering ideas around a major factor to focus and make sense of the whole construct

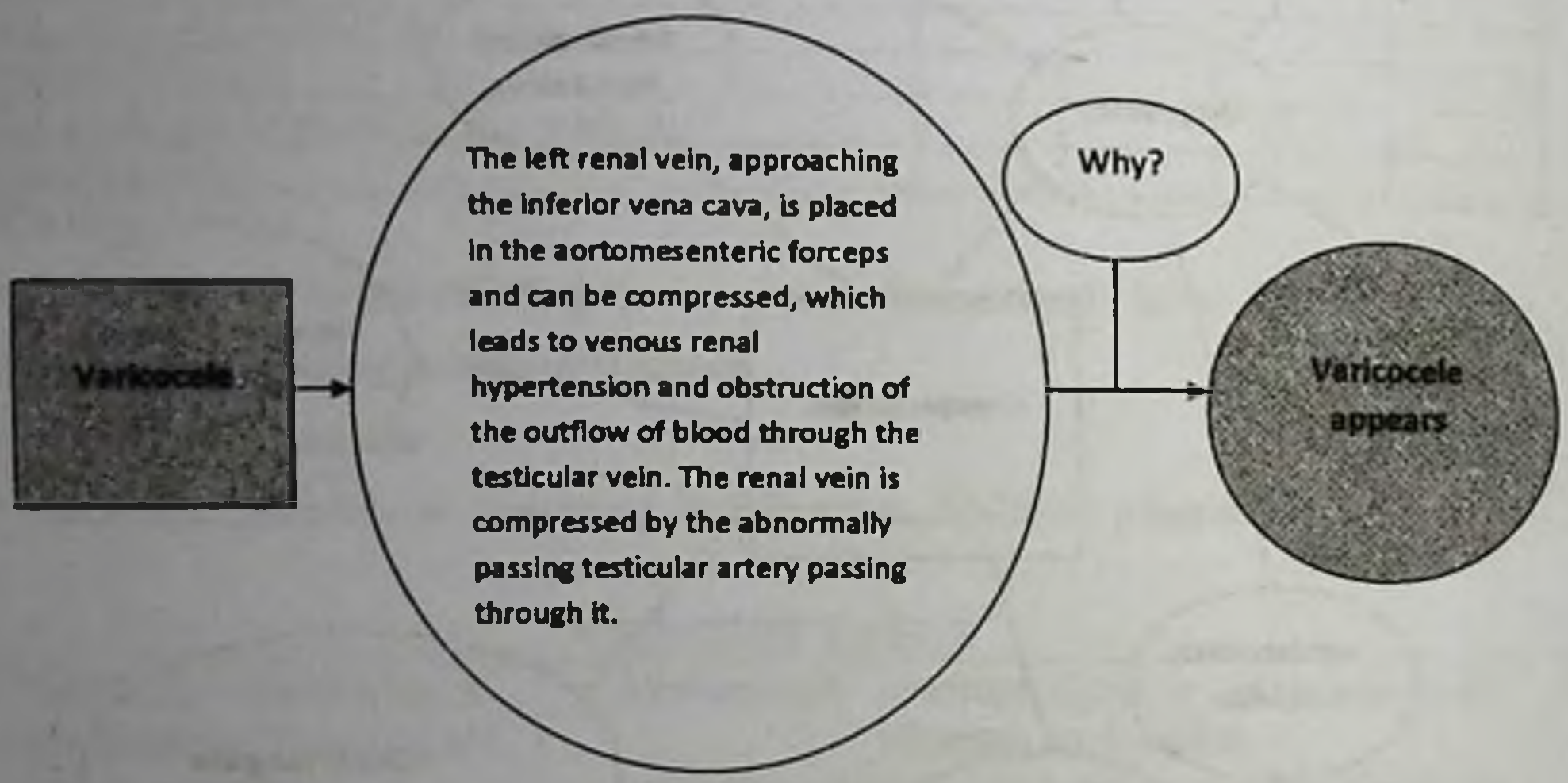



Note: see 2nd appendix.

## SCHEME "WHY?"

This is a whole chain of reasoning to identify the root cause of the problem.
Develops and activates systemic, creative, analytical thinking. Get acquainted with the rules for constructing a "Why" diagram?
The problem is formulated individually in pairs. Draw an arrow with the question "Why"? And write the answer to this question.
This process continues until the original (but hidden) cause of the problem is identified.
They unite in mini-groups, compare and supplement their schemes. Reduced to a common. Presentation of results

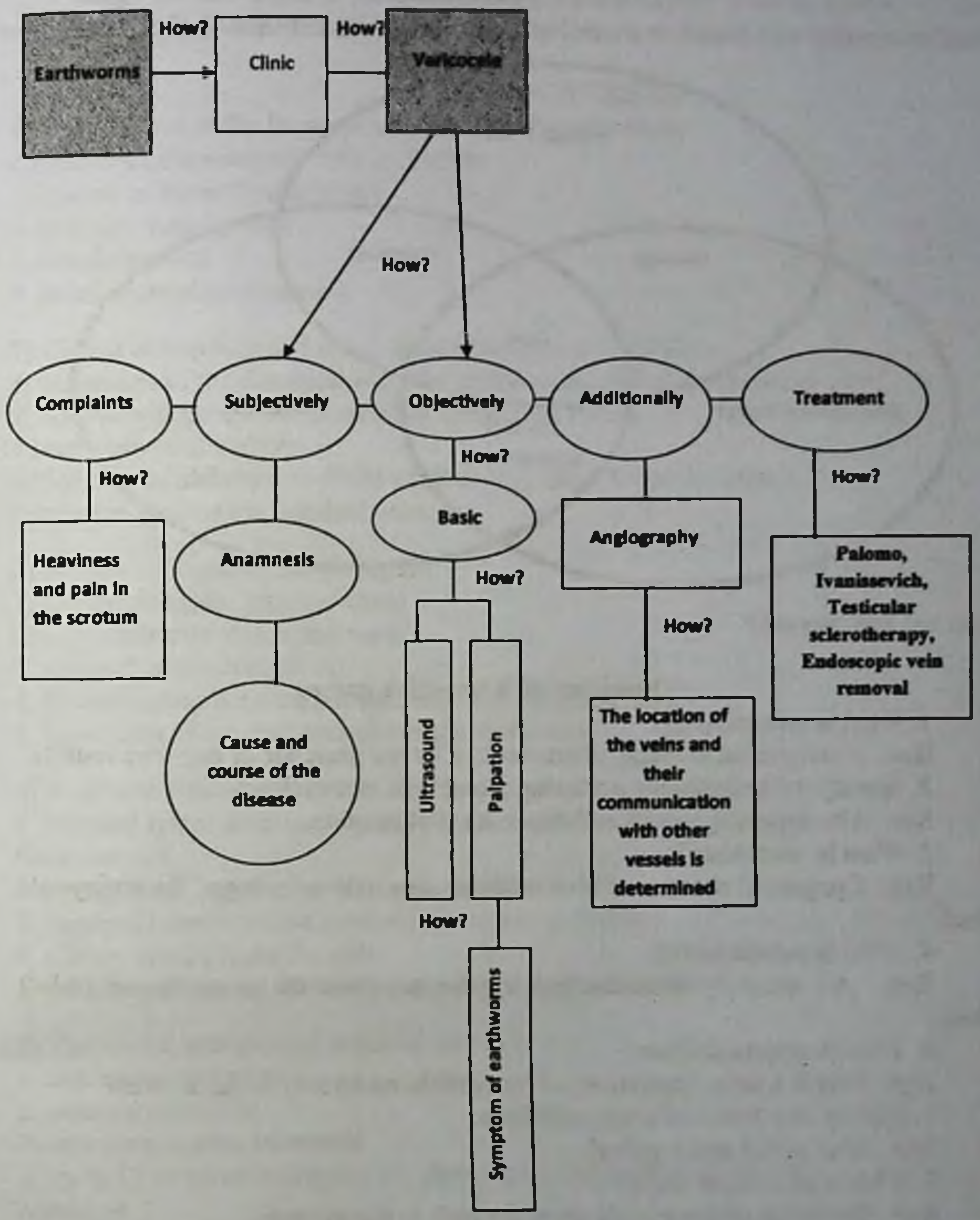





**Note: see 2nd appendix.**

## RULES FOR CONSTRUCTING THE "HOW" DIAGRAM

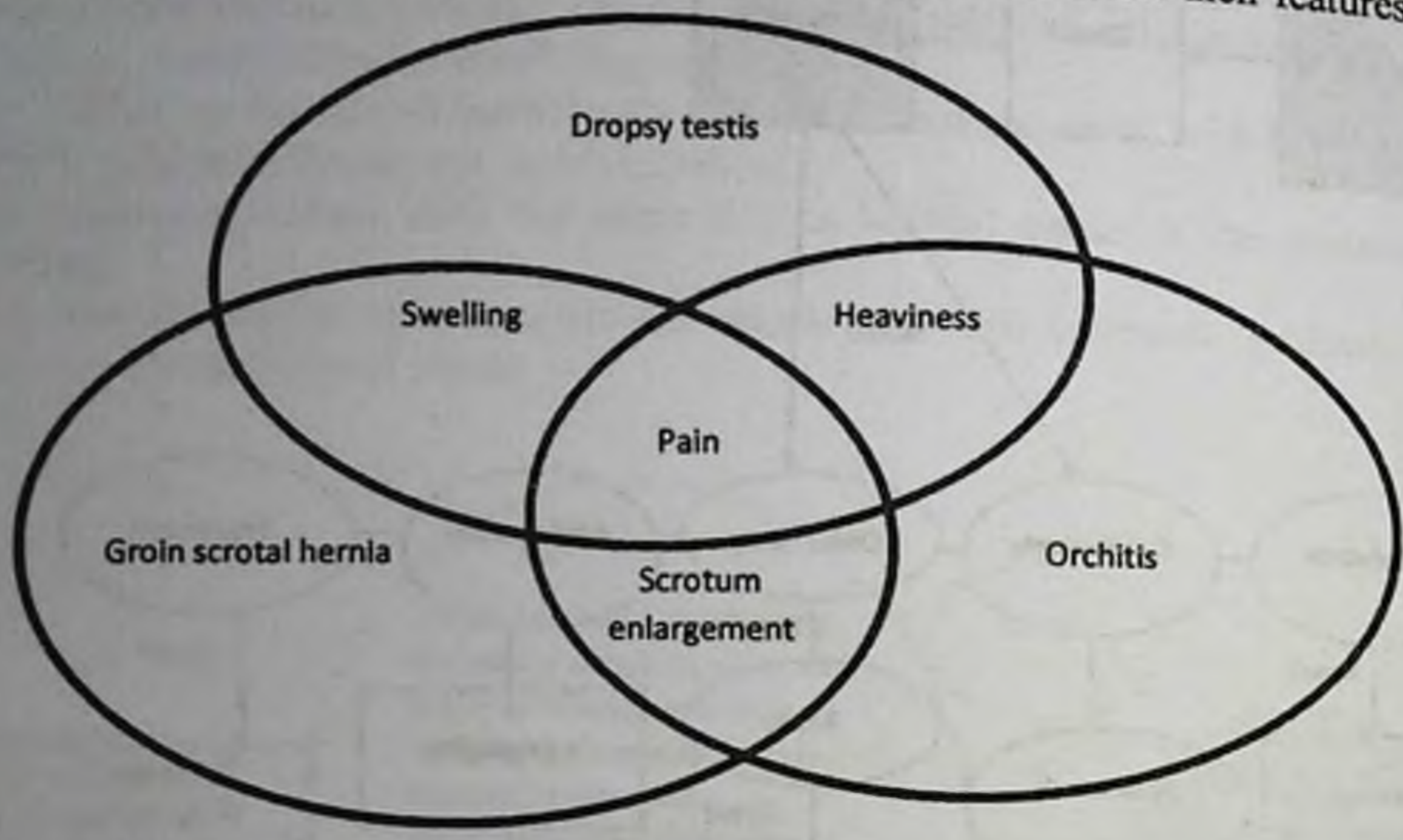
When solving a problem, in most cases you do not need to think about "What to do?".
The problem is usually "How do I do this?". "How?" - the main question that arises in its solution.
Consistent posing questions "how?" allows you to: Explore not only all the available options for solving the problem, but also ways to implement them;




Note: see 2nd appendix.

## VENN DIAGRAM

Used to compare or contrast or contraindicate 2-3 aspects and show their features




Note: see 2nd appendix.

**Questions of interactive games:**

1. What is monorchism?

Rep. A congenital anomaly characterized by the presence of only one testicle.

2. Specify the pathologies occurring along with monorchism.

Rep. The appendage and vas deferens do not develop.

3. What is anorchism?

Rep. Congenital absence of both testicles, due to non-laying of the embryonic gonad.

4. What is polyorchism?

Rep. An anomaly characterized by the presence of an additional (third) testicle.

5. What is cryptorchidism?

Rep. This is a delay (retention) of the testicle on its way to the scrotum.

6. Specify two forms of cryptorchidism.

Rep. Abdominal and inguinal.

7. What is an ectopic testis?

Rep. Deviation of the testicle from the path to the scrotum.

8. Specify the forms of testicular ectopia.

Rep. The pubic, inguinal, femoral, perineal, cross.

9. What is the development of hydrocell and funicular cell?

Rep. Their development is associated with non-closure of the vaginal process of the peritoneum and the accumulation of serous fluid in its cavity.

10. Give a definition for dropsy of the testicles.

Rep. In the absence of obliteration of the vaginal process, dropsy of the testicular membranes is formed in the distal section.

**SELF-CHECK TESTS:**

1) The purpose of the Ivanisevich operation for varicocele
1.ligation of the testicular vein and artery
2.ligation of the testicular artery
3.testicular vein ligation
4. hemikastration
5. arteriovenous anastomosis

2) Causes of inguinal and inguinal-scrotal hernias in children:
1. expansion of the dimensions of the external opening of the inguinal canal
2. underdevelopment of the anterior abdominal wall
3.heavy physical activity
4.violation of obliteration of the vaginal process of the peritoneum
5.inflammation of the inguinal canal

3) Purpose of inguinal hernia repair:
1.strengthening the inguinal canal
2.---"---- anterior abdominal wall
3. removal of the hernial sac
4. Strengthening the external opening of the inguinal canal
5. separation of the elements of the spermatic cord

4) A disease similar to a cyst of the elements of the spermatic cord:
1. inguinal lymphadenitis, appendicitis, strangulated inguinal hernia, funicular cell
2. strangulated inguinal hernia, inguinal lymphadenitis
3. inguinal lymphadenitis, pneumonia, inguinal hernia
4. sliding hernia, funicular cell
5. swollen scrotum syndrome, strangulated inguinal hernia

5) Tactics for strangulated inguinal hernia in boys:
1.emergency operation
2. planned operation
3.only conservative treatment
4. up to 12 hours of strangulation, first conservative, then emergency operation
5.physiotherapy and antibiotic therapy

6) Symptoms of varicocele:
1. swelling and redness of the scrotum, testicular hypoplasia, varicose veins rhenium of the veins of the elements of the spermatic cord and testis
2. pain in the scrotum, fever, testicular hypoplasia
3. an increase in size in the corresponding half of the scrotum, hypoplasia

testicular gap, varicose veins of the elements of the seeds. cord
4.increased body temperature, swelling and pain in the scrotum, varicose expansion of the veins of the elements of the spermatic cord
5.vomiting, redness of the scrotum, an increase in the size of the testicle

7) Treatment of varicocele:
1.conservative
2.orchidopexy according to Petrivalsky
3.Winckelmann operation
4. testicular vein ligation according to Ivanisevich or testicular vein ligation arteries and veins according to Polomo
5. Ru-Krasnobaev operation

8) X-ray signs in false hernias proper aperture?
1. ring-shaped enlightenment in the form of cellular cavities on the background heart shadow
2.homogeneous darkening of the pleural cavity, mediastinal displacement on the healthy side
3. annular enlightenment in the form of cellular cavities, displacement mediastinum to the healthy side
4. total enlightenment of the pleural cavity, medial displacement healthy side
5.multiple cavities with liquid level

9) Varicocele occurs mainly:
1. on the left in boys over 10 years old
2. on the left in boys under 10 years old
3. on the right in boys over 10 years old
4. on the right in boys under 10 years old
5. on both sides in boys over 10 years old

10) Varicocele leads to:
1. to testicular atrophy
2. to the development of hypertension
3.to testicular hypoplasia
4.to disrupt spermatogenesis
5. to inflammatory diseases of the testicle and its appendages

11) A 12-year-old patient complains of pain in the left half of the scrotum. On examination, the left half of the scrotum is somewhat enlarged and sagging, the skin of the scrotum is thinned, the testicle is tilted anteriorly on palpation, behind the testicle there is a dense formation along the spermatic cord, moderately painful. Cremasteric reflex on the side of the lesion is weakened. What is your diagnosis?
1.torsion of the hydatid
2.testicular torsion

3.varicocele
4.hydrocell
5.funicular cell

12) Varicocele is more often observed on the left. Why?
1.flow of the left ovarian vein into the renal
2. insufficiency of the valvular apparatus of the testicular vein
3. pronounced reflux in the testicular vein
4.orthostatic stenosis of the renal vein
5.organic renal vein stenosis

13) Is it cryptorchidism?
1.delay of the testicle on its way to the scrotum
2. underdevelopment of the testicles
3. a developmental defect characterized by the absence of one or both testicles
4. deviation of the testicle from the path to the scrotum
5. malformation characterized by the presence of an additional testicle

14) Is it false cryptorchidism?
1. congenital absence of the testis
2.underdevelopment (hypoplasia) of the testis
3. the testicle is located in the abdominal cavity
4.during palpation, the testicle can be lowered into the scrotum
5. the testicle is located in the inguinal region in the subcutaneous tissue

15) Hydrocele is a disease, the occurrence of which is associated with:
1. with non-closure of the vaginal process of the peritoneum
2.with the process of lowering the testicle
3. with weakness of the anterior abdominal wall
4. with a violation of the outflow of blood from the testicle
5.with circulatory disorders of the testis

16) Dropsy of the testicles is
1. non-obliteration of the vaginal process from the distal section
2. non-obliteration of the vaginal process throughout
3. non-obliteration of the vaginal process of the peritoneum in the proximal section
4. obliteration of the vaginal process of the peritoneum in the distal and proximal sections
5. obliteration of the vaginal process of the peritoneum in the distal section

17) Communicating dropsy of the membranes of the testis and spermatic cord - is this?
1. non-obliteration of the vaginal process in the distal section
2. neobliteration of the vaginal process in the proximal section
3. non-obliteration of the vaginal process throughout

4. obliteration of the vaginal process in the distal and proximal sections
5. obliteration of the vaginal process in the distal section

18) Is it a cyst of the spermatic cord?
1. obliteration of the vaginal process in the proximal section
2. neobliteration of the vaginal process in the proximal section
3. neobliteration of the vaginal process in the proximal section
4. obliteration of the vaginal process in the distal and proximal sections
5. obliteration of the vaginal process in the distal section

19) A symptom characteristic of a hydrocele is:
1.symptom of "translucence"
3. cough symptom
2.fluctuation symptom
4. "click" symptom
5. "hourglass" symptom

20) Hydrocele is most often differentiated
1. with strangulated inguinal hernia
2. with testicular torsion
3.with torsion hydatitis
4. with acute orchitis
5.phlegmon of the scrotum

21) An acute cyst of the spermatic cord differentiates
1. with strangulated inguinal hernia
2. with testicular torsion
3.with hydatid torsion
4. with acute orchitis
5.phlegmon of the scrotum

22) Funiculocele is a disease that occurs due to
1. with non-closure of the vaginal process of the peritoneum
2.with the process of lowering the testicle
3. with weakness of the anterior abdominal wall
4. with detection of blood outflow from the testicle
5. with impaired testicular lymph flow

23) What is the condition of the vaginal process of the peritoneum with inguinal hernia
1.coated
2. not obliterated
3.partially obstructed
4.not related to the appearance of a hernia
5.filled with watery liquid

24) In which disease will be a positive symptom of a cough "thrust"

1.groin hernia
2. dropsy of testicular membranes
3. cryptorchidism
4. lymphadenitis
5. tumor

25) Varicocella is...
1.expansion of testicular veins
2.varicose veins of seminal corditis
3. swelling of the scrotum
4.dilation of the veins and arteries of the scrotum
5. varicose expansion of the artery of the spermatic cord

26) With what method of operation is it necessary to open the inguinal canal in a patient with inguinal-scrotal hernia
1.Martynov method
2. Petrivalsky method
3. Ru-Krasnobaev method
4. Czerny method
5. Spasokukotsky method

27) With the absence of one testicle in the scrotum, this ...
1.monorchism
2.anorchism
3.ectopic testis
4.agenesis
5. aplasia

28) Clinic of reducible inguinal-scrotal hernia:
1. swelling in the inguinal-scrotal region, a positive symptom of "cough", at rest, swelling increases
2. swelling in the inguinal-scrotal region, a positive symptom of "cough", at rest, swelling decreases
3. swelling in the inguinal-scrotal region, a positive symptom of "cough",
4. swelling in the inguinal-scrotal region in a calm state is not reduced
5. swelling in the inguinal-scrotal region, the symptom of "cough" is negative.

29) What is the main cause of a Nukka cyst?
1. Violation of obliteration of the inguinal diverticulum of the peritoneum
2.infection
3.injury
4. disproportion in the development of the circulatory and lymphatic systems of the inguinal region
5. violation of metabolic processes

30) In a 4-month-old child with a generally satisfactory condition, a formation in the inguinal region measuring 3x3 cm was noted. It was painless, limitedly mobile, densely elastic in nature, not decreasing in size when palpated. Select diagnostic method

1.diagnostic puncture
2.R-graphy or R-scopy
3.urgent operation
4. diaphanoscopy
5.blood and urine tests

31) Specify the main cause of dropsy of the testicular membranes and spermatic cord in children under the age of 1.5 years

1.injury
2.infection
3.violation of obliteration of the vaginal process of the peritoneum
4. disproportion in the development of the circulatory and lymphatic systems of the inguinal-scrotal region
5. violation of metabolic processes

32) What is the main cause of dropsy of the testicular membranes and spermatic cord in children over the age of 1.5 years

1.injury
2.violation of obliteration of the vaginal process of the peritoneum
3. decreased function of the cremaster muscle
4. violation of water-salt metabolism in the body
5.infection

33) With what nosogological form does the differential diagnosis of isolated dropsy of the testicular membranes begin?

1.varicocele
2.testicular tumor
3.groin-scrotal hernia
4.pathology of testicular suspensions
5.testicular torsion

34) With what nosological form does the differential diagnosis of an insular cyst of the spermatic cord begin?

1.polyorchia
2. strangulated inguinal hernia
3. cryptorchidism
4. inguinal lymphadenitis
5. acute appendicitis

**Answers to tests for self-control**

**1-3, 2-4, 3-4, 4-2, 5-4, 6-3, 7-4, 8-2, 9-1, 10-3, 11-3, 12-1, 13-1, 14-4, 15-1, 16-2, 17-3, 18-4, 19-1, 20-1, 21-1, 22-1, 23-2, 24-1, 25-2, 26-3, 27-1, 28-2, 29-1, 30-4, 31-3, 32-3, 33-2, 34-3, 35-2.**

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Textbook
for students of foreign faculties in the direction of education "General medicine"

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