Paediatric Urology

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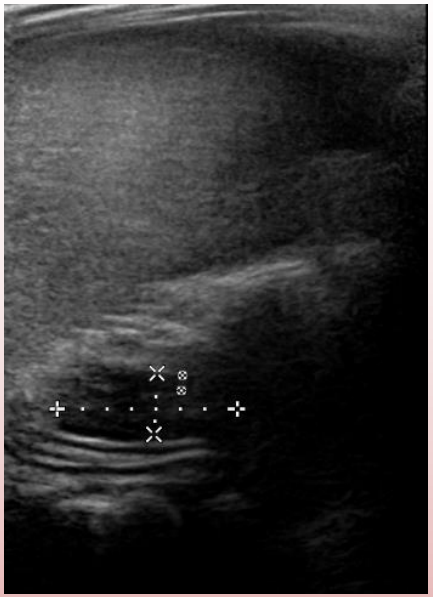
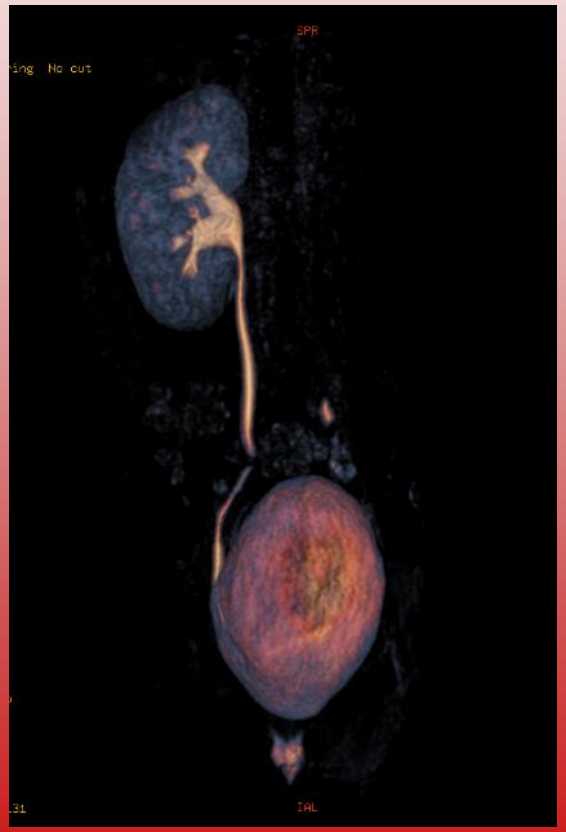
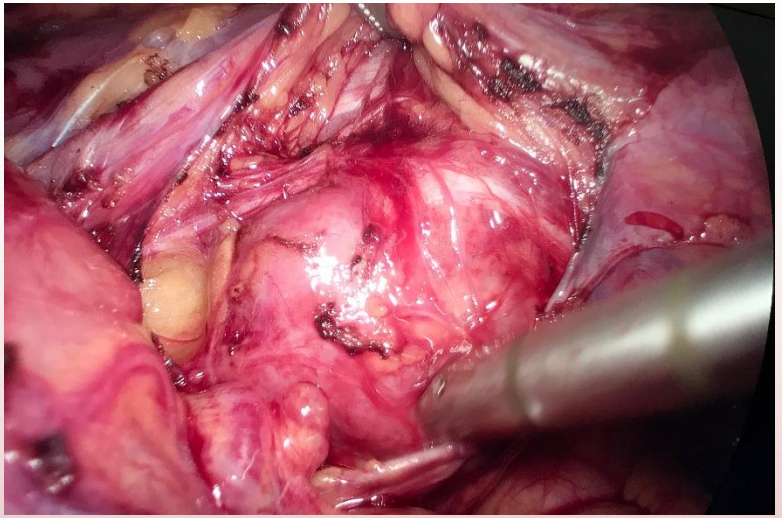
Rare cause of childhood urinary icontinence

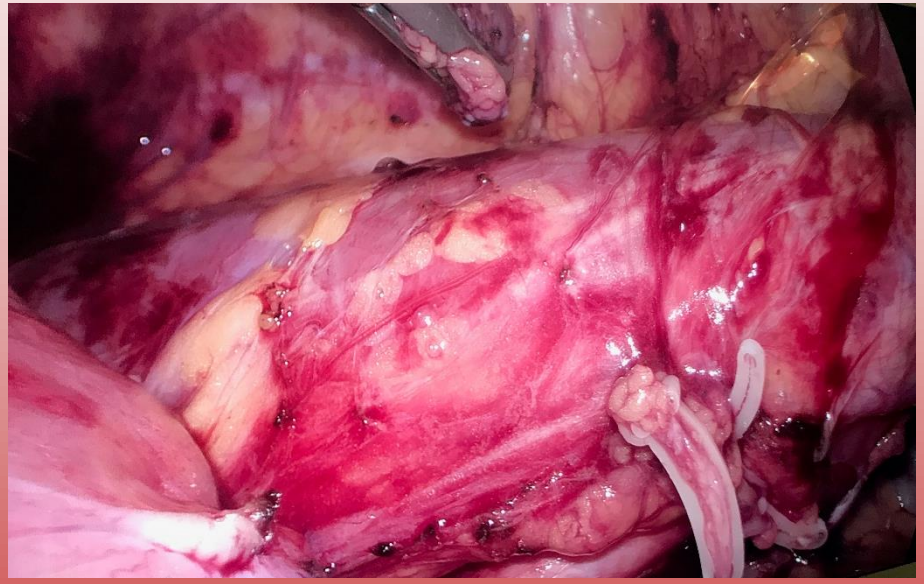
- 5 years old girl
- loss of urine day- and nighttime
- physical examination
- ultrasound
- scintigraphy
- MRI



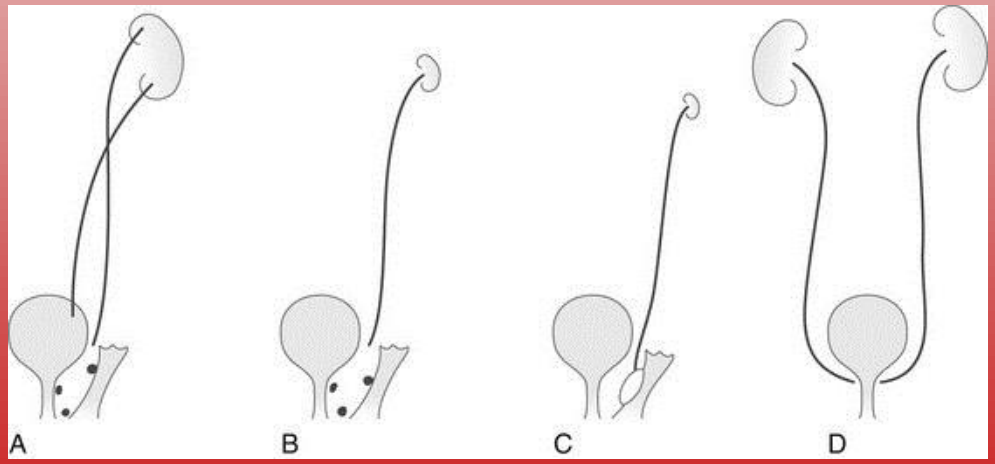


- laparoscopic nephrectomy





- in general with duplex kidney
- usually drains into the reproductive organs or urethra
- typical complain!!!



- What is paediatric urology?
  - children age 0-18 years
  - treating disorders of development:
    - on male genito-urinary system
    - on female urinary system
    - useful to know embriology of genito-urinary system
  - in smaller number of cases acquired disease

- Diagnostic tools:
  - complaints
  - symptoms
  - physical examination
  - laboratory examination
  - radiology imaging

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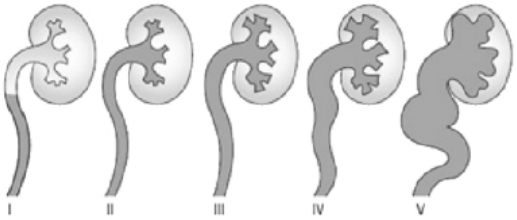

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Grade	Description
I	Into a nondilated ureter
II	Into the pelvis and calyces without dilatation
III	Mild to moderate dilatation of the ureter, renal pelvis, and calyces with minimal blunting of the fornices
IV	Moderate ureteral tortuosity and dilatation of the pelvis and calyces
V	Gross dilatation of the ureter, pelvis, and calyces; loss of papillary impressions; and ureteral tortuosity

What complaints and symptoms shall we find in paediatric urology patient?

- abdominal, groin, scrotal, penile pain
- fever, meteorism, nausea, vomiting
- dysuria (enuresis, incontinence, stranguria, urge, pollakisuria)
- alteration of lab. findings (purulent or/and bloody urine, elevated CRP, PCT, serum white cell number, creatinin, carbamid)
- atrophy/aplasia, hypotrophy/hypoplasia of organs
- anuria, polyuria, retention of urine

Sicknesses of penis

Cellular adhesion

- physiological state!!
- spontaneous resolve
- no need lysis (forceful retraction)

Congenital phimosis

- spontaneous resolve
- topical steroid ointment
- circumcision

Acquired/secondary phimosis

- earlier retrahating foreskin
- scarry, tight foreskin, stricture of urethra opening, pseudomembrane of glans
- special type BXO (Lichen sclerosus et atrophicus)
- circumcision

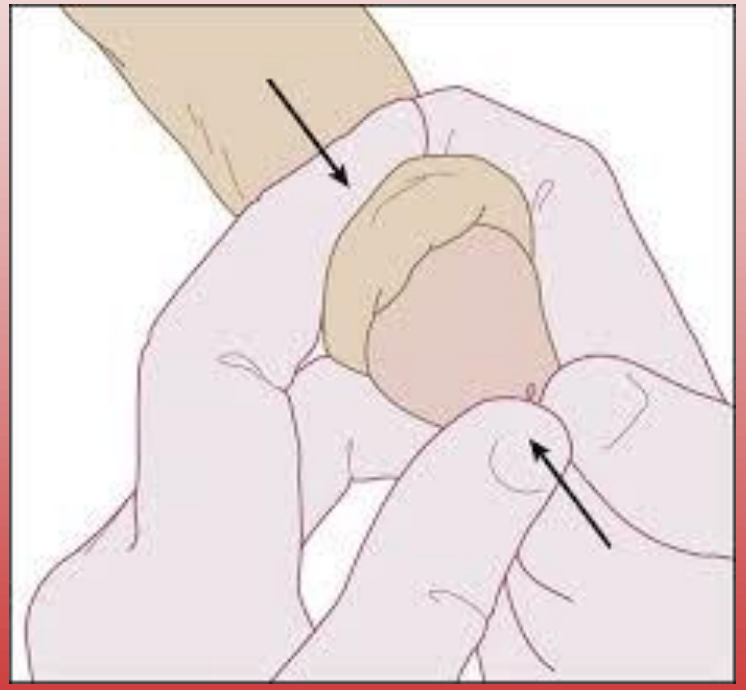
Balanitis / balanoposthitis

- inflammation of glans és foreskin
- phimosis, cell. adh.
- purulent
- local therapy with antiseptic solution

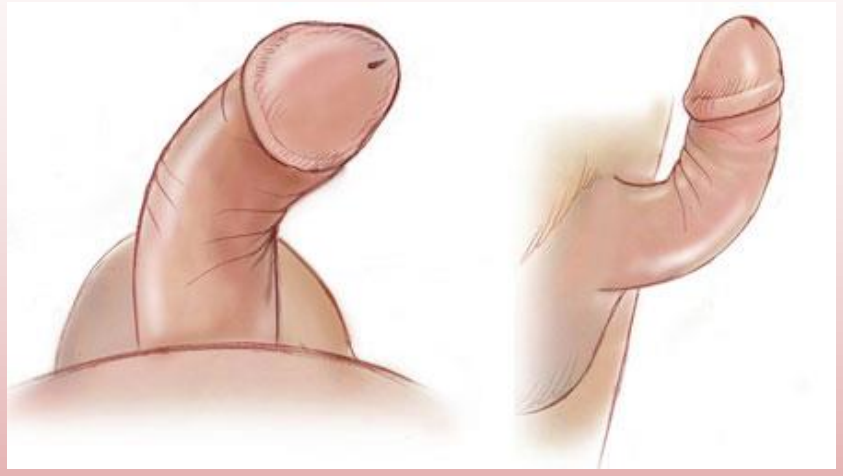
Echtyma gangraenosum

- very rare
- Pseudomonas aeruginosa sepsis
- necrosis of the skin of penis
- AB, debridément, intensive therapy

Paraphimosis

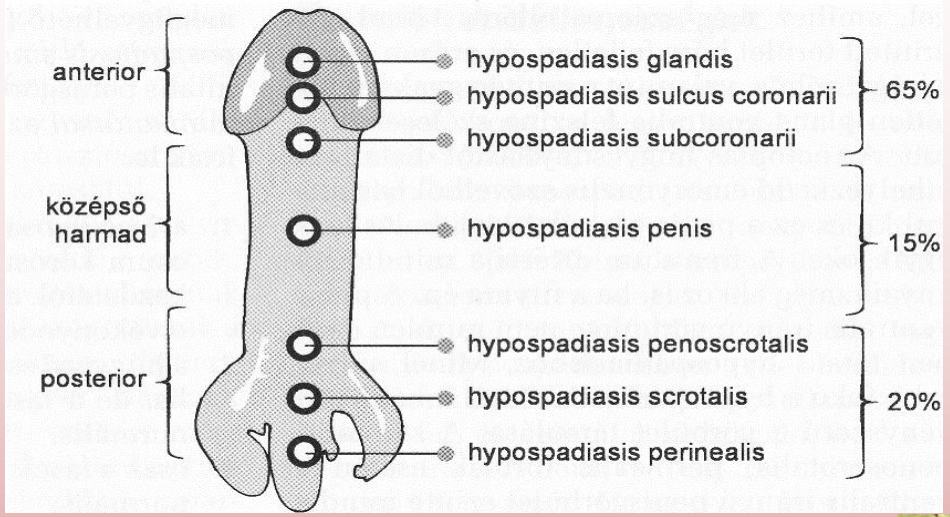


Congenital curvature of penis



- hypoplasia of corpus cavernosum
- dysplasia of fascia
- tunica albuginea
- + hypospadiasis
- operation

Hypospadiasis



Risk factors:

- endocrin
- genetic
- enviromental effect

Hypospadiasis

Urethra

- from urethra plate (iu. 12 – 14 week)

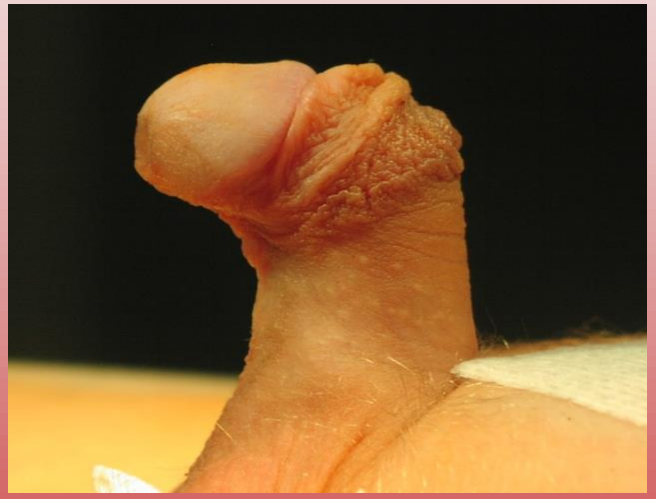
- from proximal direction

- dihydrotestosteron effect

Therapy: operation (because of functional /aesthetic/ cause

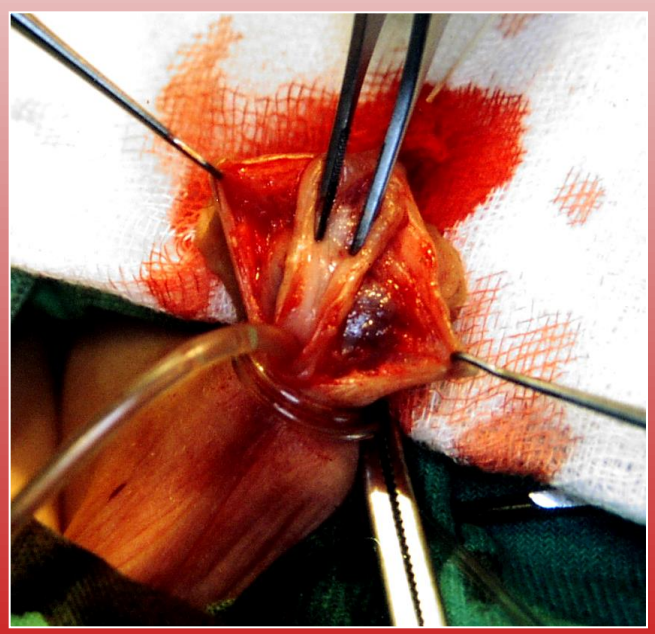
Hypospadiasis

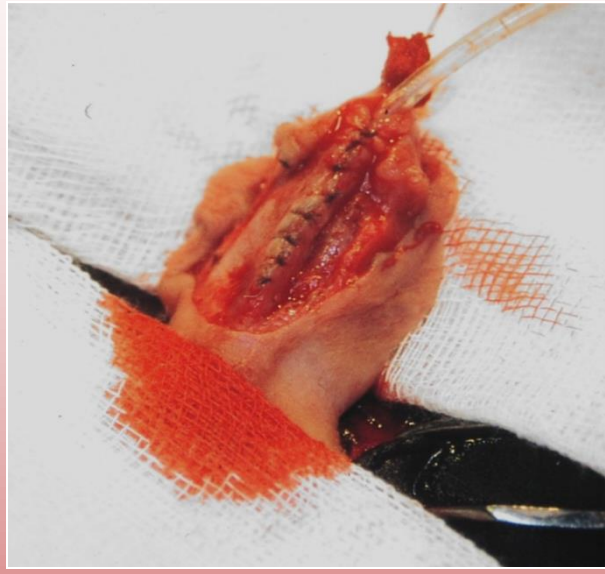
The aim of operation: 1. alignment of the penis



Hypospadiasis

The aim of operation: 2. configuration of urethra (plastica)





Hypospadiasis

The aim of operation: 2. configuration of urethra (plastica)

Hypospadiasis

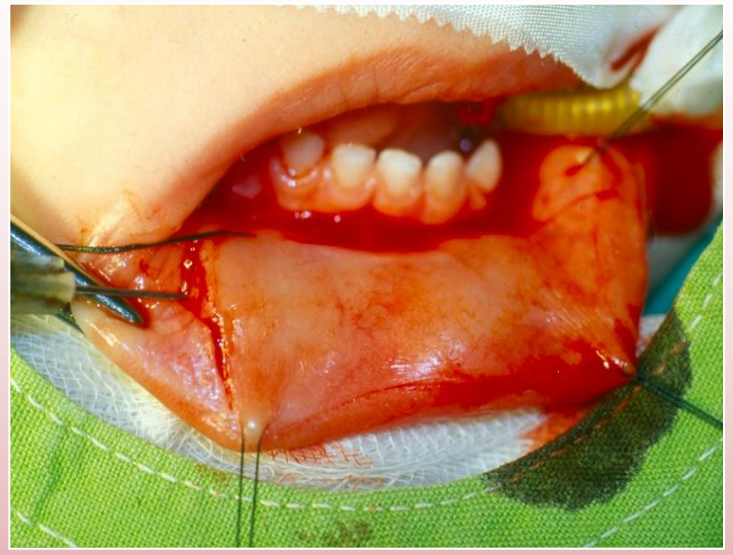
Methods

- Snodgrass
- Mathieu
- Duckett
- Denis Browne

Hypospadiasis

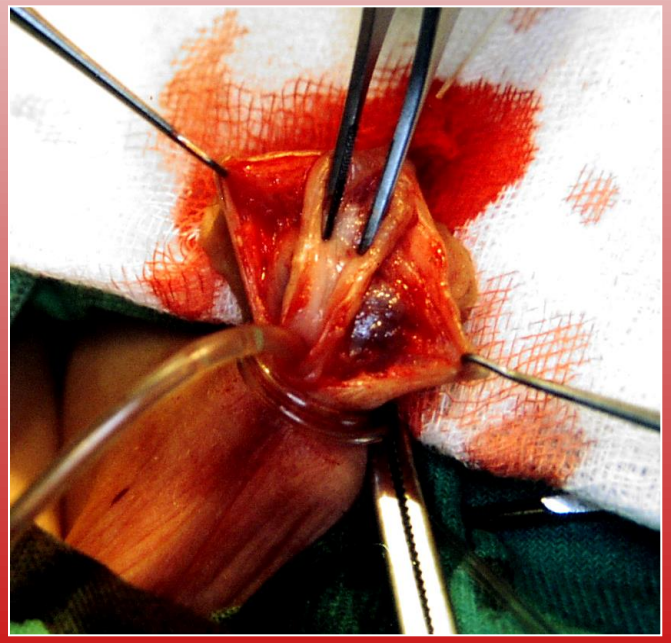
Neourethra

- skin of penis



- foreskin

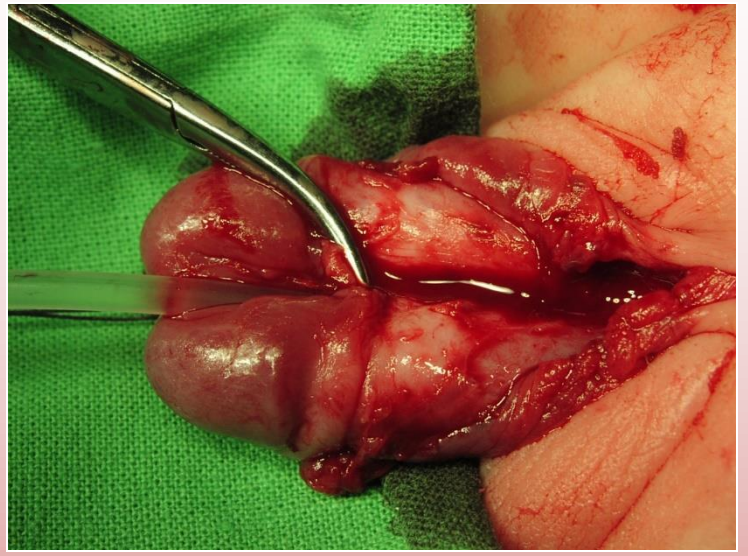
- free graft (oral mucosa, vein)



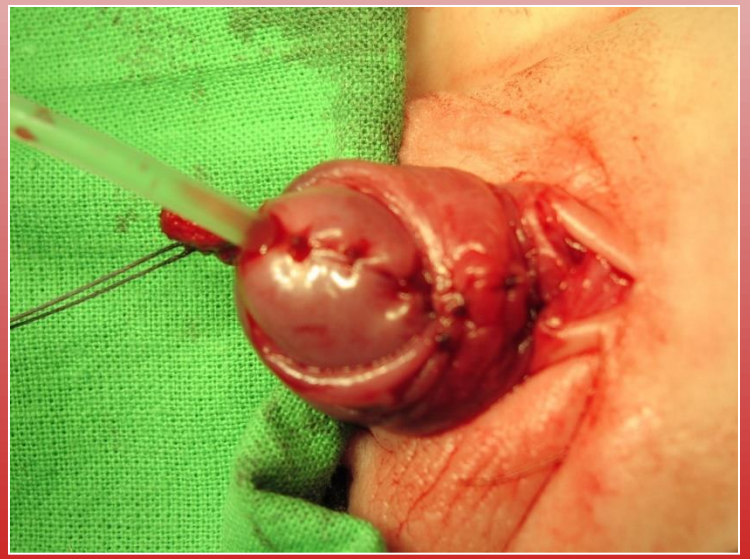
Epispadiasis

- very rare (200.000 birth/1)
- + bladder exstrophy
- abdominal wall closing defect from umbilicus to perineum
- etiology? (mesodermal cells migration is not adequate)
- dorsal curvature
- anterior form
- posterior form (incontinence)
- surgery

Epispadiasis



bladder closing in newborn age



later epispadiasis (urethra) reconstruction

Priapism

- erection of penis irrespectively of sexual stimulus

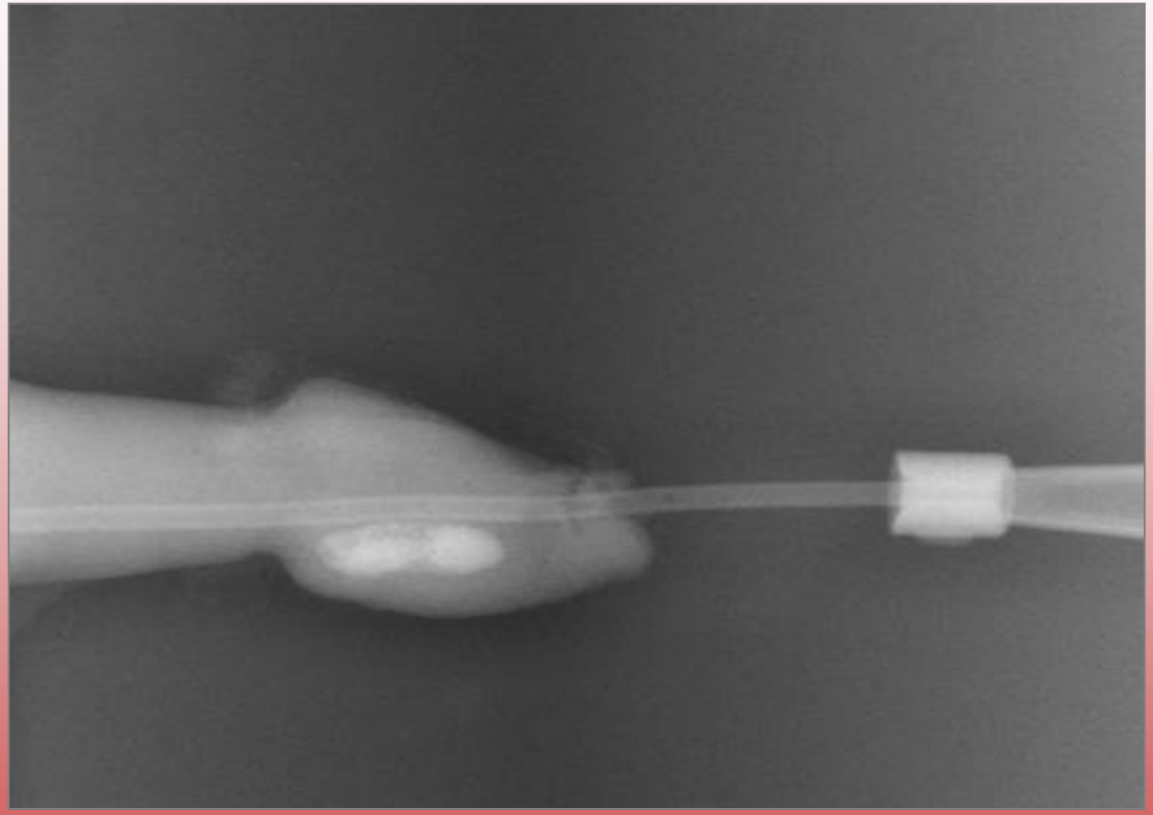
- haemodinamically
  - ischaemiac (veno-occlusive - low-flow)
  - non-ischaemiac (arterial - high-flow)

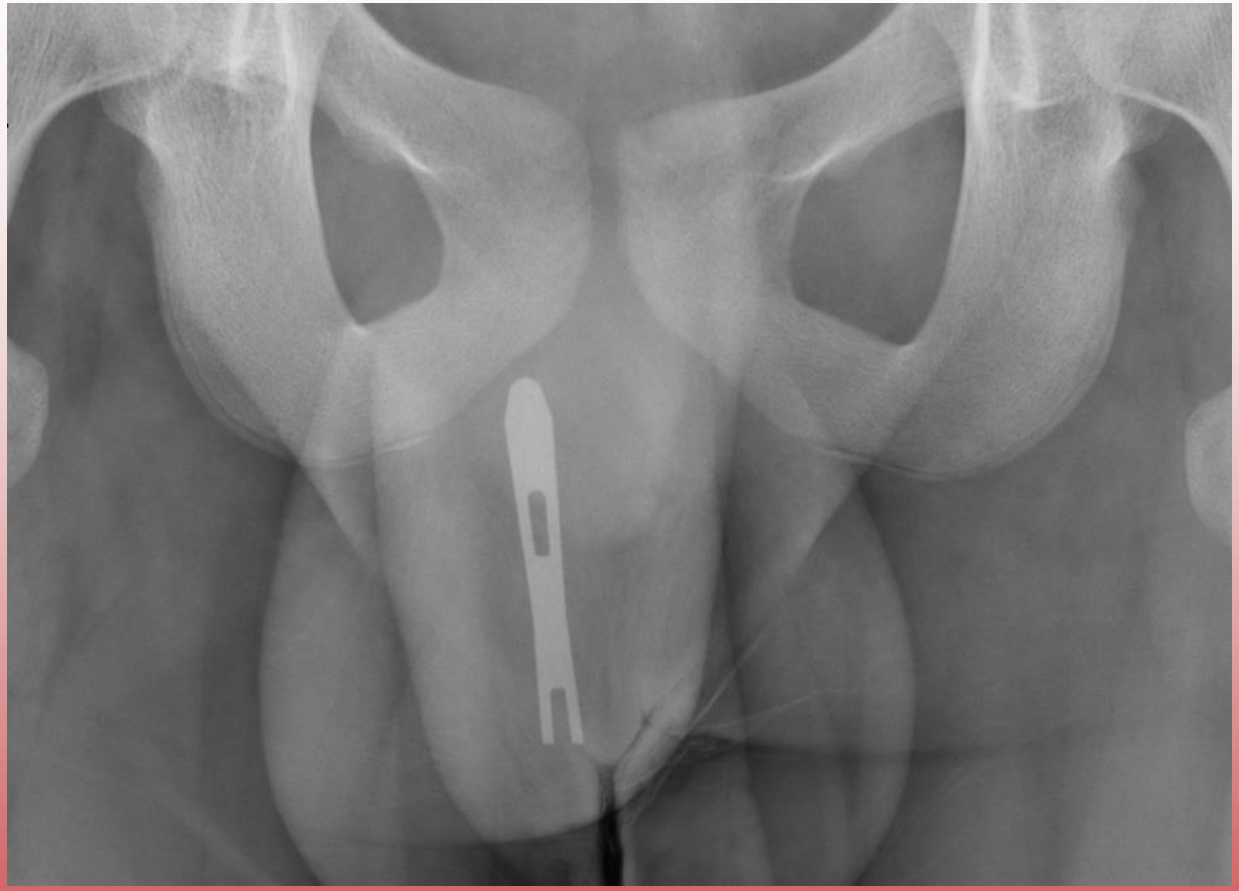
- low-flow: stasis in corp. cav., pain, fibrosis - scarring, ED (haematological diseases, drugs): urgent intervention – cons. therapy – irrigation of corp. cav. (NaCl, adrenalin)

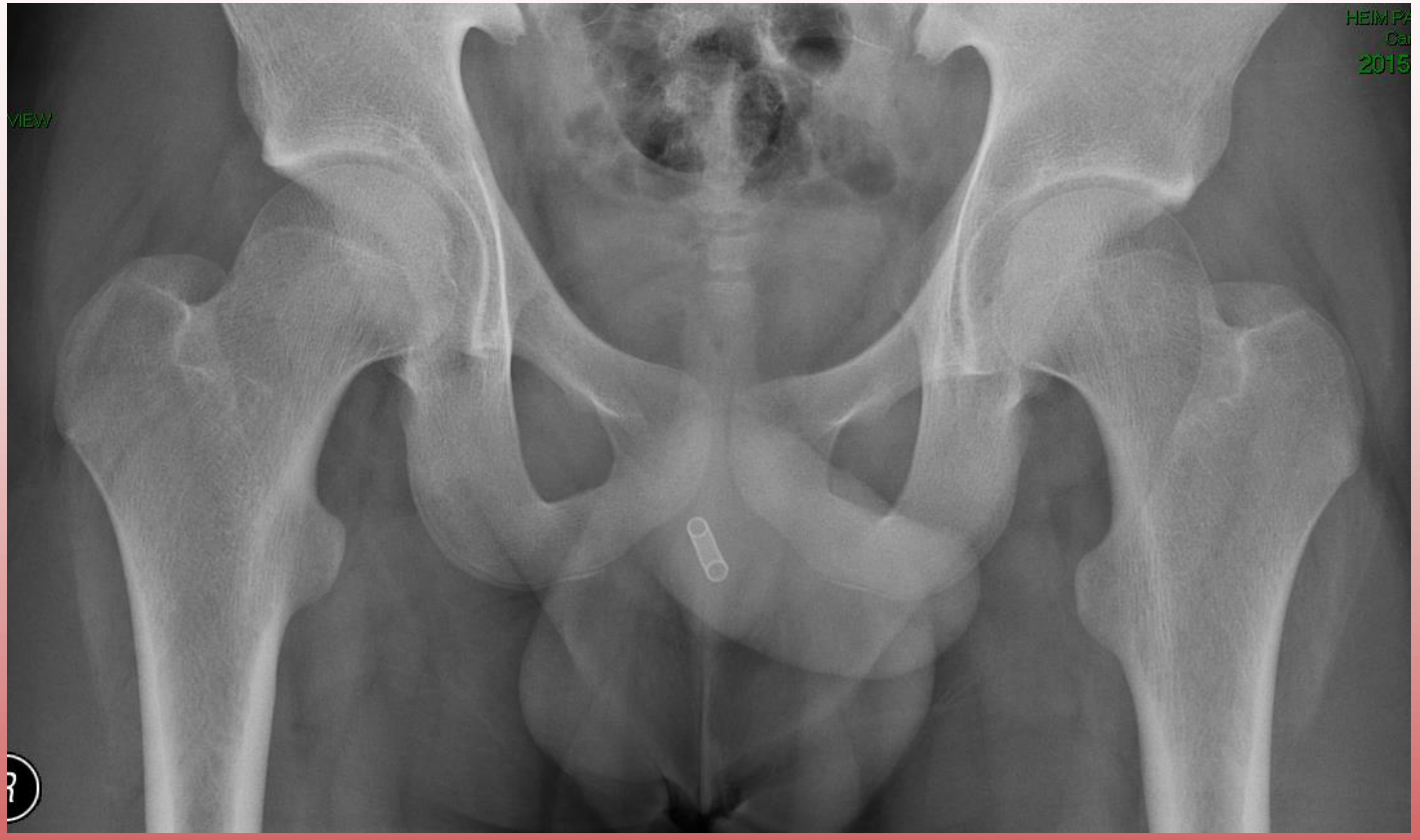
- high-flow: painless, trauma – AV fistule:
  selective embolisation

Others

- trauma
- buried (trapped) penis
- virga palmata
- condyloma
- micropenis
- torsion of penis



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Undescended testis (cryptorhidism)

Undescented testis (cryptorhidism)

•forms:

• **Undescended testis (UDT)**	The testicle is located intra-abdominally or in the inguinal canal. It is located in the normal descent pathway and shows normal insertion of the gubernaculum.
• **Cryptorchidism**	From the ancient Greek "kryptos" (hidden) and "orchis" (testicle). The testicle is not palpable and is located intra-abdominally (retentio testis abdominalis) or is not present (anorchia - aplasia).
• **Ektopia testis**	The testicle is located beneath the skin superfascially, perineally, on the thigh or shaft of the penis. The testicle shows abnormal insertion of the gubernaculum.
• **Inguinal testicle**	The testicle is palpable in the groin (retentio testis inguinalis)
• **Gliding testicle**	The testicle is located at the scrotal entrance or above the scrotum. It can be drawn down into the scrotum, but immediately slides back into its initial position.
• Retractile (hypermobile) testes	The **physiological retractile (hypermobile) testicle** is usually present in the scrotum or can be effortlessly pushed down into the scrotum, it retracts on induction of the cremasteric reflex but returns spontaneously into the scrotum. Recognizing the retractile (hypermobile) testicle is particularly important because it does not require treatment.

Undescented testis (cryptorhidism)

- distribution:
  - abdominal, inguinal, gliding testicle, aplasia: 90 %
  - ectopic testis: 10 %

- regulation of descent of testicle:
  1. Insl3 (early, abdominal phase)
  2. testosteron (late - inguinal and scrotal phase)

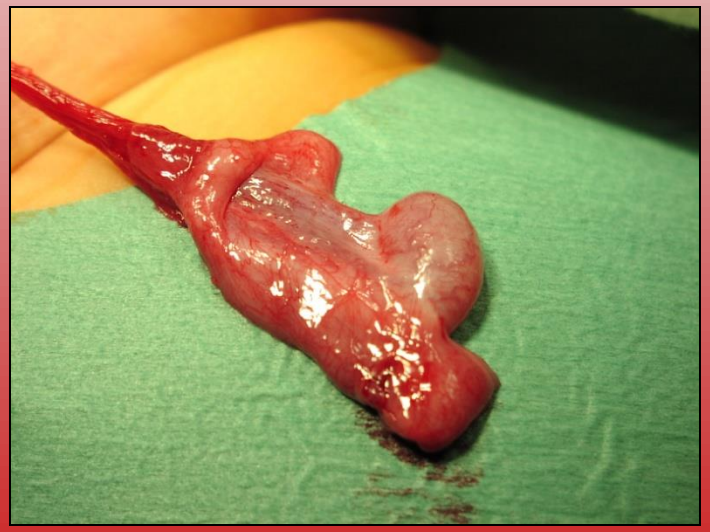
Undescented testis (cryptorhidism)

ectopic testicle – the left testicle is located and palpable perineo–femoral position

Undescented testis (cryptorhidism)

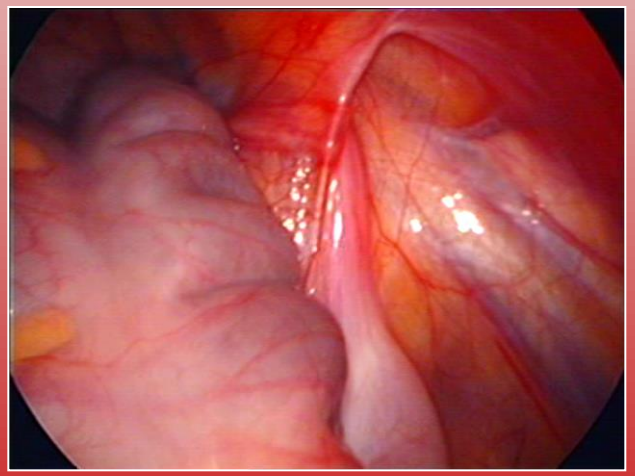
- main complications: **INFERTILITY**
  HIGHER RISK OF MALIGNANCY

- cause of infertility:
  - higher temperature
  - fusion anomaly between testicle and epididymis (30%)



Undescented testis (cryptorhidism)

- therapy:
  - hormone?
  - operation:
    - orchidopexy - Shoemaker
    - laparoscopia - Fowler - Stephens
      - Shehata
    - orchiectomy (dysgenetic testicle, after puberty)



Undescented testis (cryptorhidism)

Conclusion

The undescended testis is the most common genital malformation in boys and should be treated before the child’s first birthday. If medicinal therapy (LHRH and hCG) is ineffective, orchidopexy should be performed immediately to reduce the risk of further damage to the testicular tissue. The boy’s parents must be informed that correcting the cryptorchidism will facilitate future examination of the testicle, but will not reduce the risk of malignancy.

Severe hypospadias and undescended testis
<u>can associate with</u> <u>Wilm's tumor!</u>

<u>WT1 gene mutation (= Wilm's tumor suppressor gene)</u>
11. chromosome short arm (13. locus) (11p13).

Dilatation of upper urinary tract

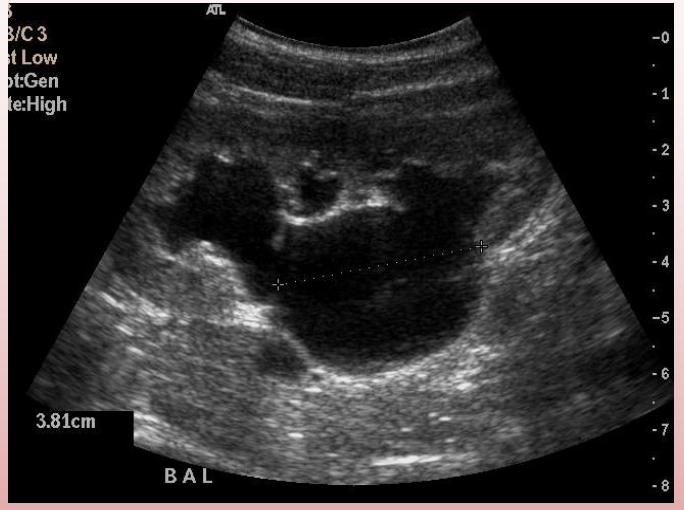
- Ureteropelvic junction obstruction (UPJO)
- Ureterovesical junction obstruction (UVJO)

Ureteropelvic junction obstruction (UPJO)

- impaired urine flow from the pelvis into the proximal ureter
- dilatation of the collecting system
- potential to damage the kidney.
- most common cause of neonatal hydronephrosis
- incidence: 1 / 1,500
- males:females=2:1 in newborns
- IMPORTANT: antenatal and postnatal US

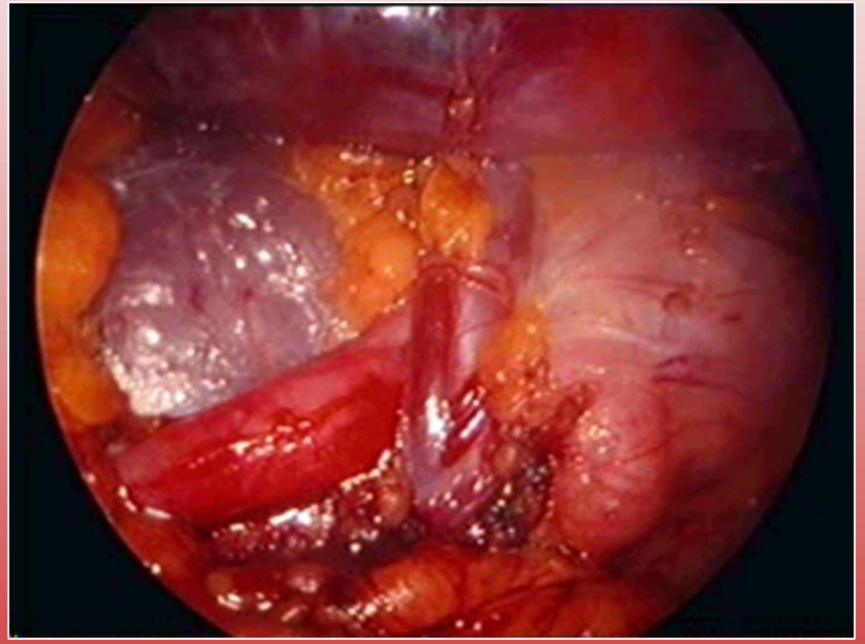
Ureteropelvic junction obstruction (UPJO)

- Cause
  - congenital obstruction
  - functional obstruction
  - high insertion of ureter



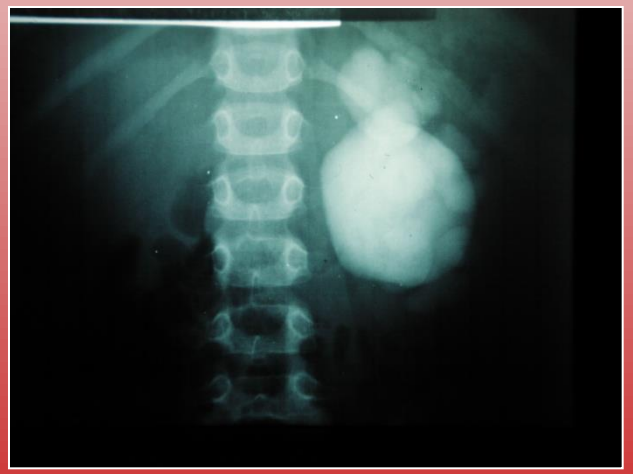
Ureteropelvic junction obstruction (UPJO)

- Cause
  - crossing vessels
  - secondary (VUR)

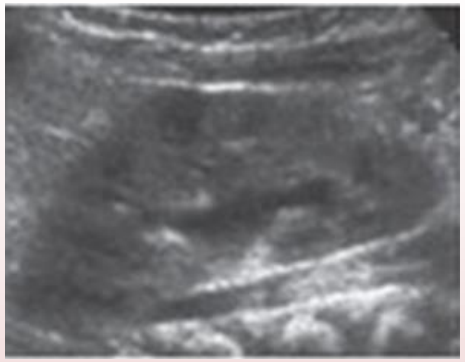


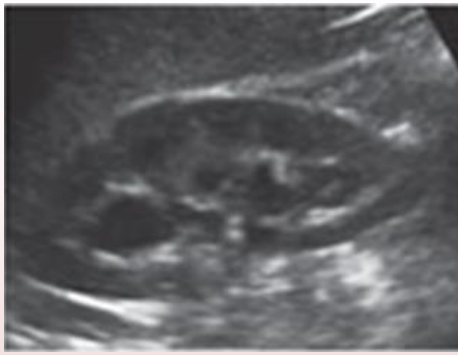
Ureteropelvic junction obstruction (UPJO)

- symptomps:
  - recurrent flank pain
  - abdominal pain
  - UTI
- diagnosis:
  - US
  - diuretic renography
  - MRI
  - (IVP)



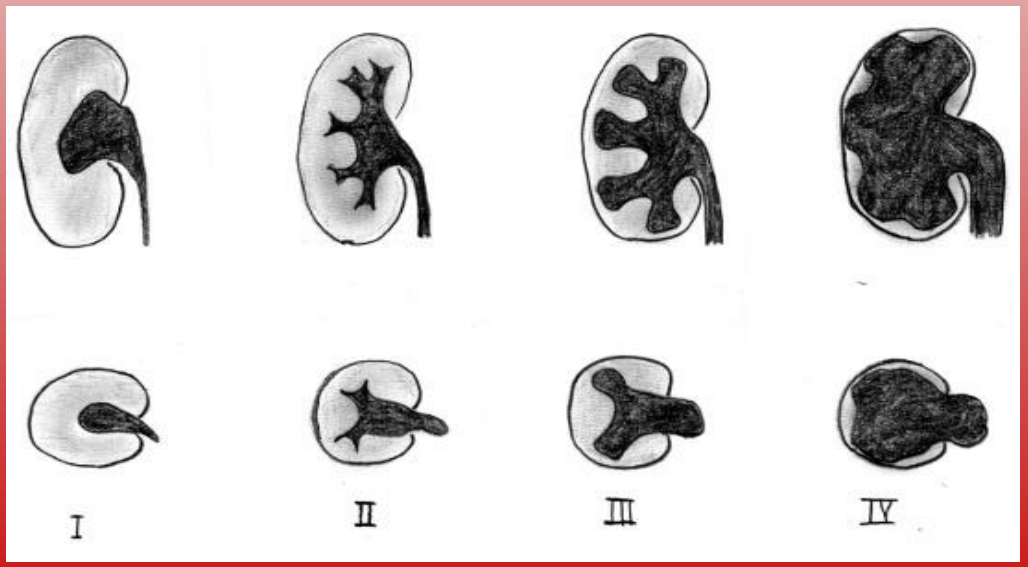
Ureteropelvic junction obstruction





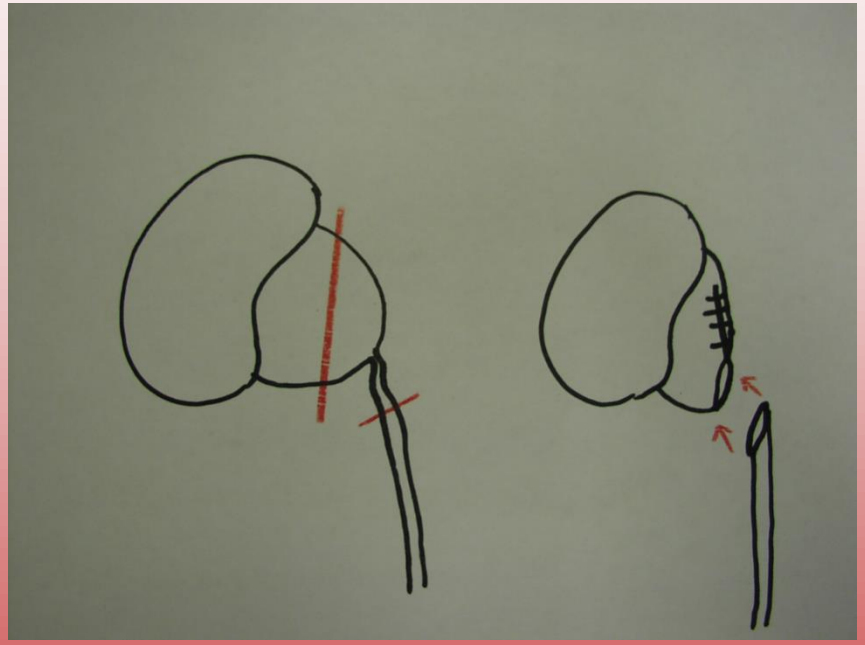
Classification:

- Grade 0 normal (pyelon 1-5 mm)
- Grade I: pyelon dilatated (6-10 mm)
- Grade II: pyelectasia & small caliectasia (pyelon >12 mm)
- Grade III: pyelectasia & all and grand caliectasia
- Grade IV: hydronephrosis + thin parenchyma



Ureteropelvic junction obstruction (UPJO)

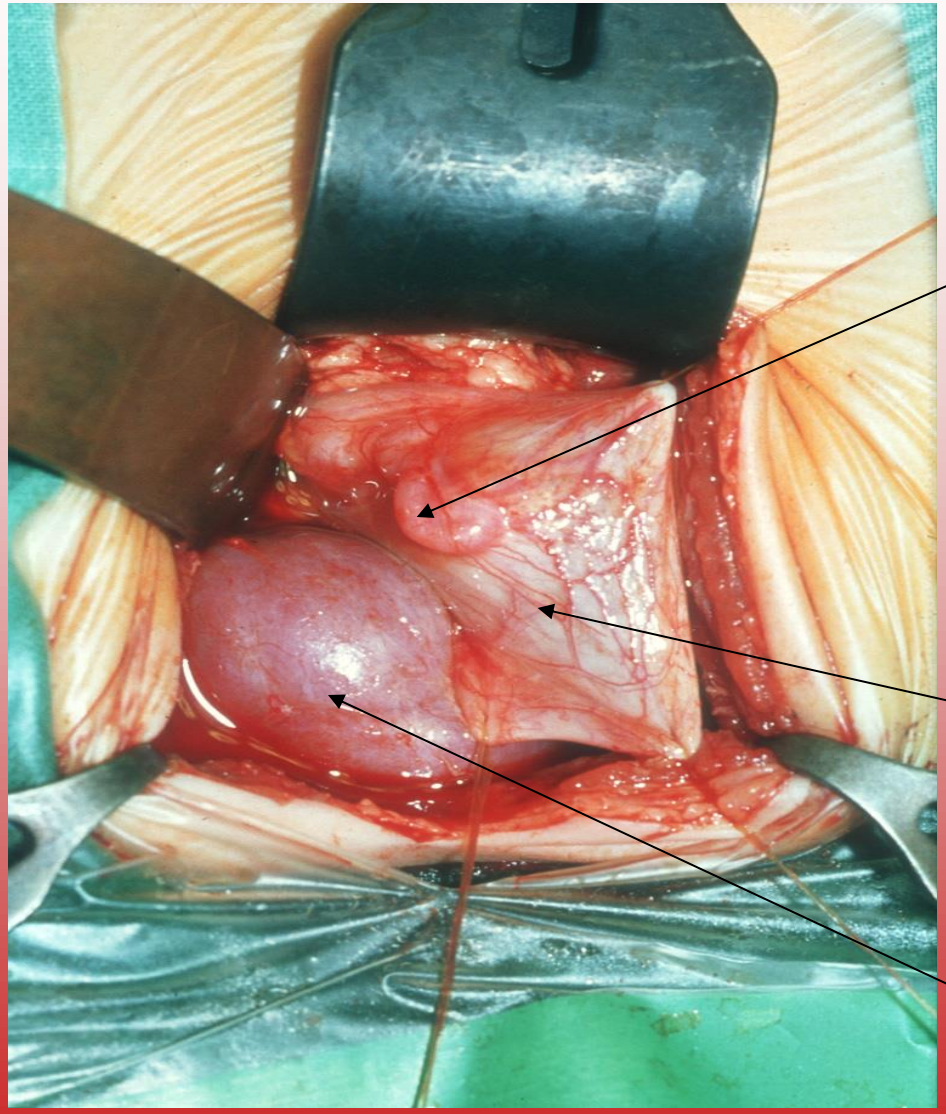
- Therapy
  - in case of symptoms
  - decreased renal function
  - increased AP diameter
  - Grade III. – IV.
  - = surgery



- Technique:

Anderson – Hynes pyeloplasty : - open
- laparoscopic

Ureteropelvic junction obstruction (UPJO)



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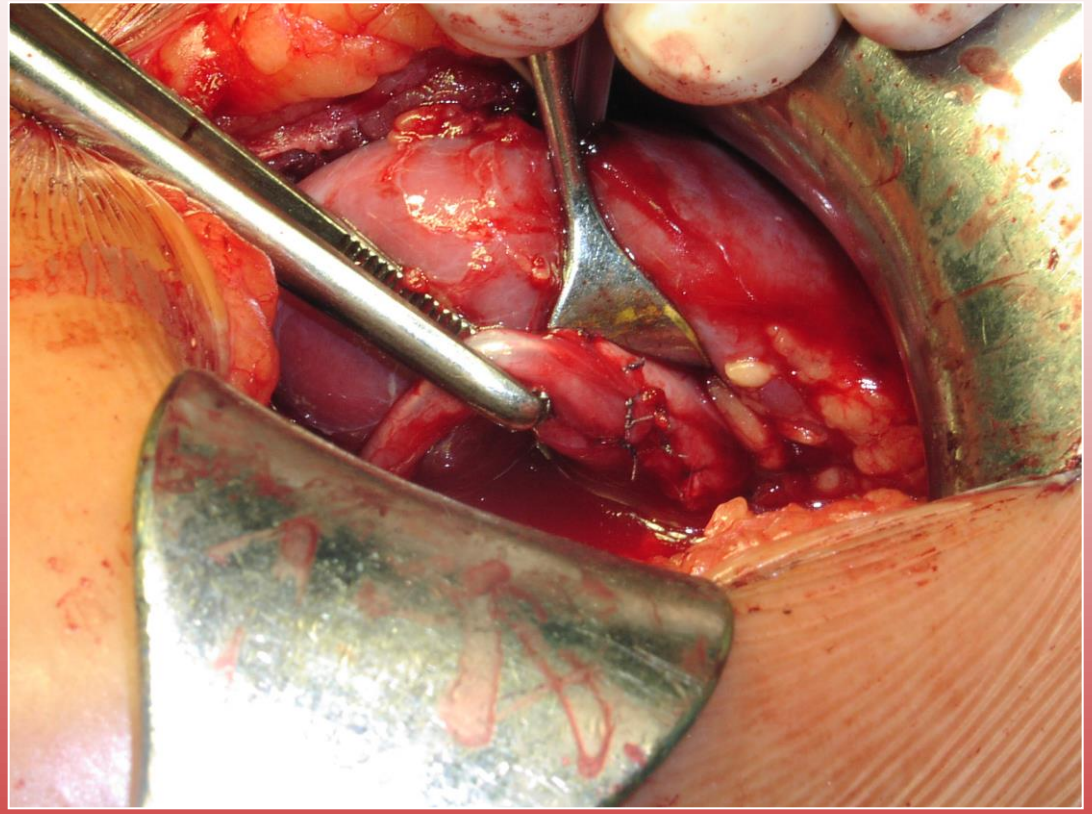
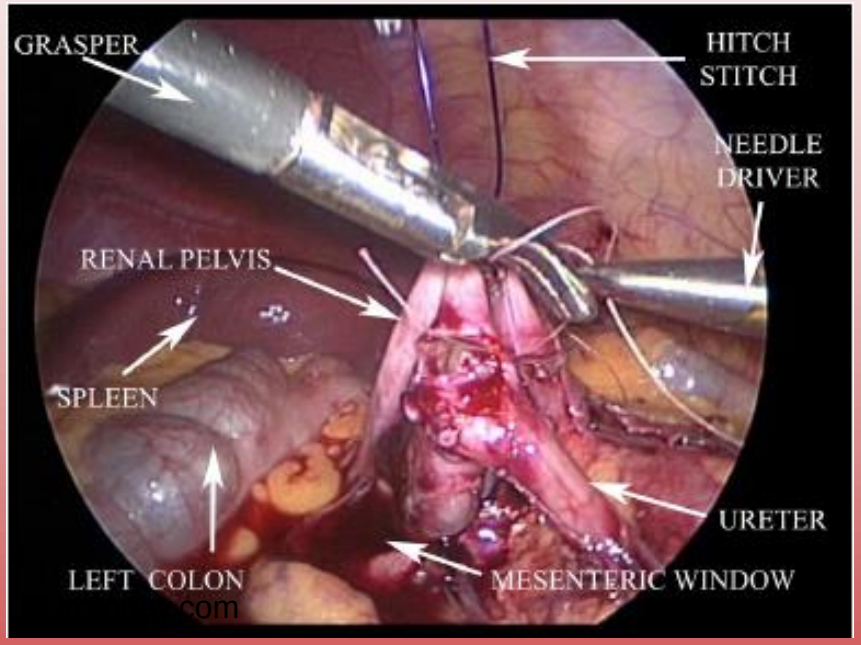
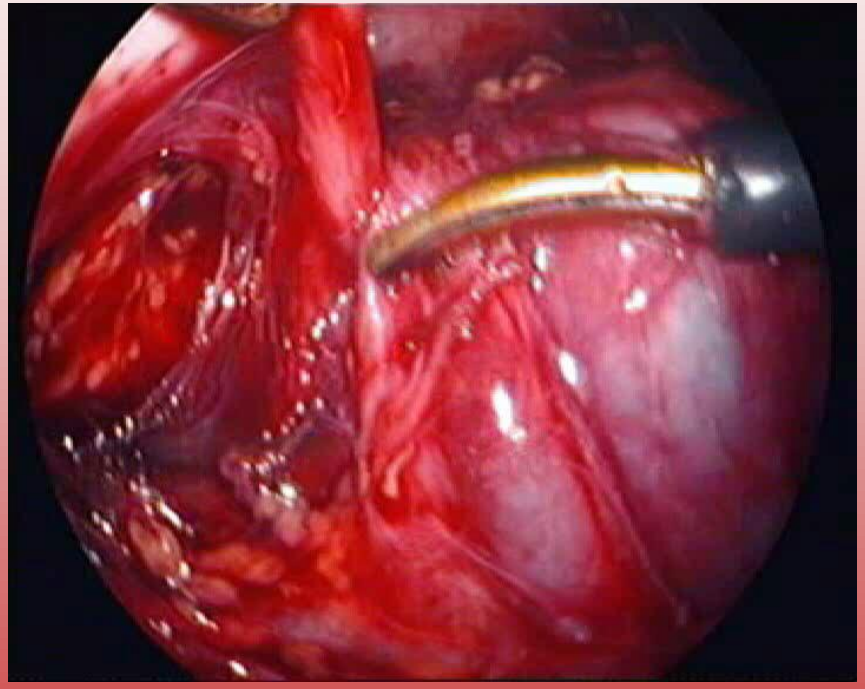


Ureteropelvic junction obstruction (UPJO)





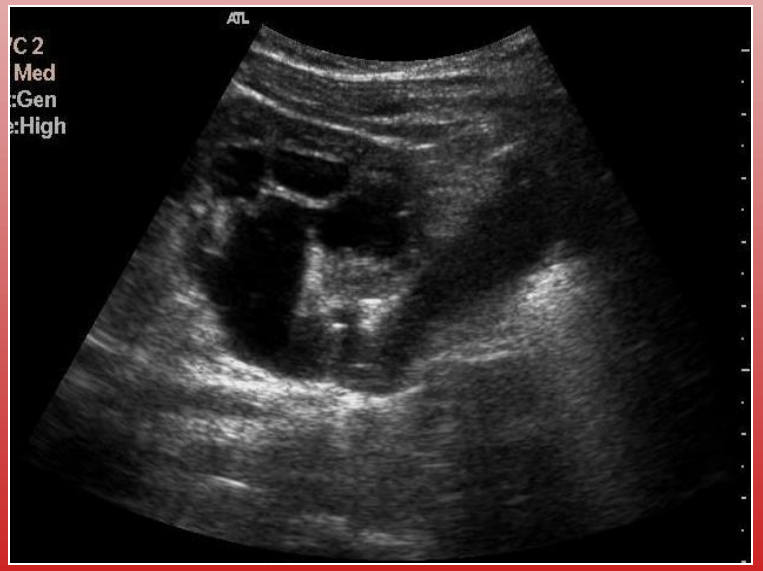
Ureterovesical junction obstruction (UVJO)

- impaired urine flow from the pelvis to the UV junction
- obstructive condition of the distal ureter
- dilatation in pyelum et ureter
- primary obstructive megaureter
- second in the diff. dg. neonat. hydronephrosis
- occurs often in males and on left side
- potential to damage the kidney.
- IMPORTANT: antenatal and postnatal US

Ureterovesical junction obstruction (UVJO)

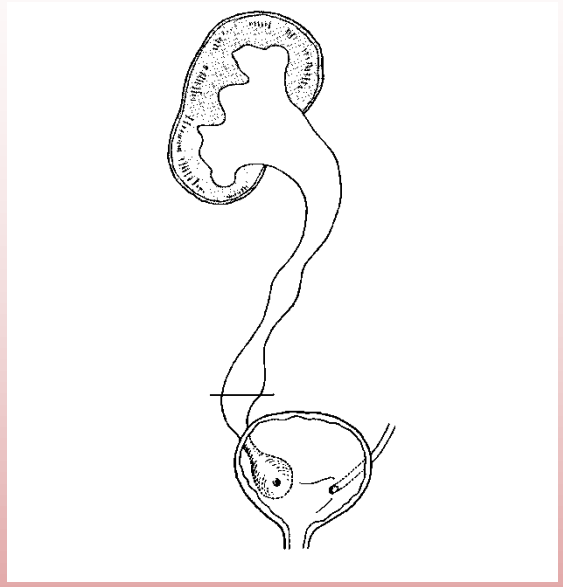
- symptomps:
  - recurrent flank pain
  - abdominal pain
  - UTI

- diagnosis:
  - US
  - diuretic renography
  - (IVP)

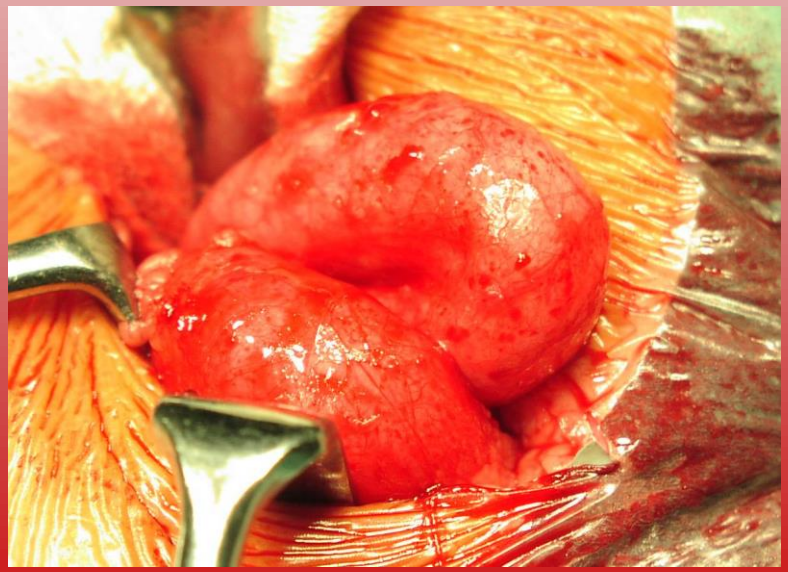


Ureterovesical junction obstruction (UVJO)

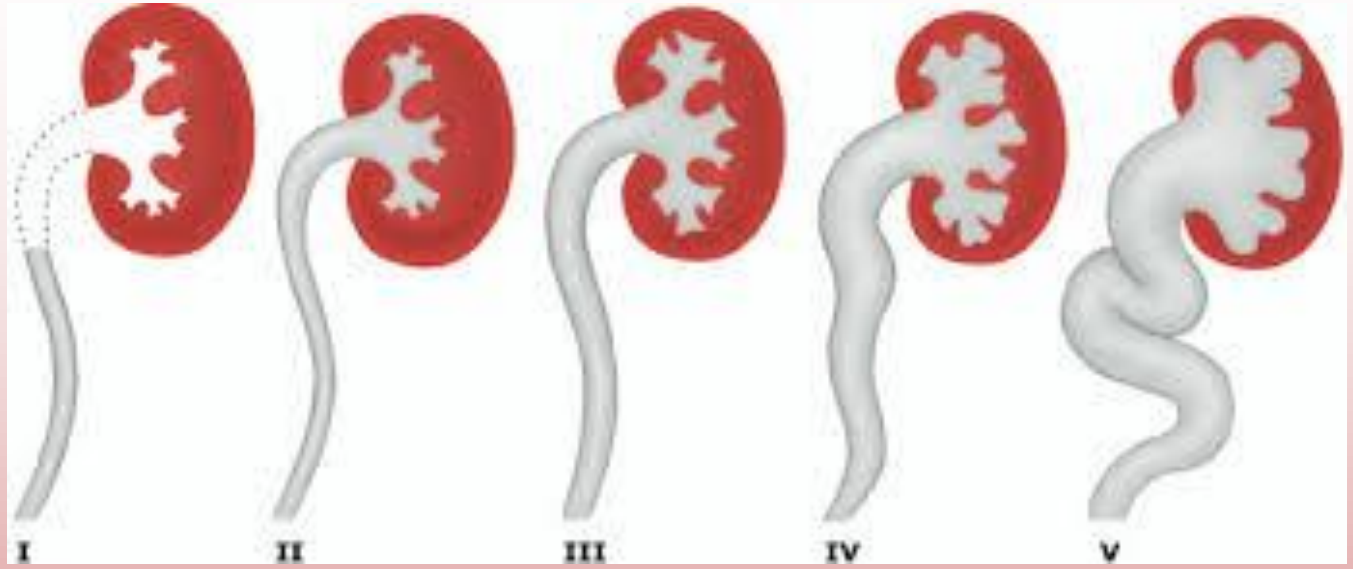
Ureterovesical junction obstruction (UVJO)



- therapy:
  - spontaneous improvement (85%)
  - if not = need surgery
  - if decreased renal function
  - in case of symptomps
- reimplantation methods:
  - Politano-Leadbetter
  - **Cohen**
  - Lich-Gregoir
  - **Tóth**
  - Kalicinsky



Vesicoureteric reflux



Grade I Reflux does not reach the renal pelvis; varying degrees of ureteral dilatation

Grade II Reflux reaches the renal pelvis; no dilatation of the collecting system; normal fornices

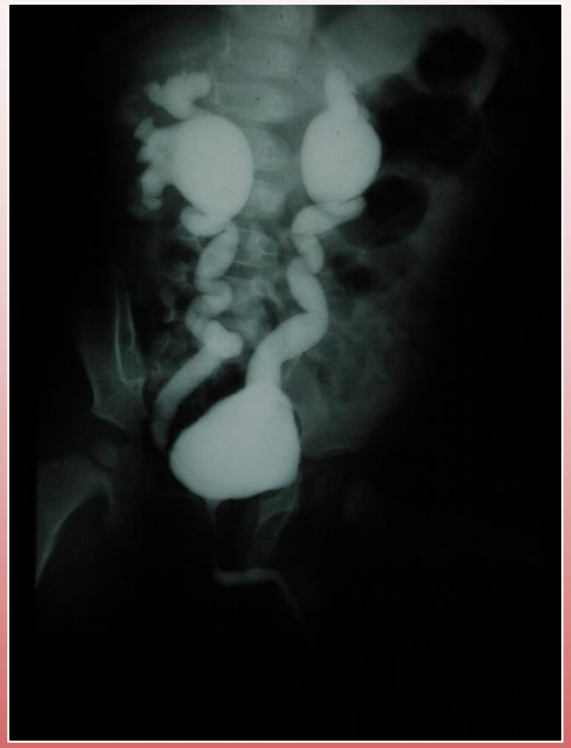
Grade III Mild or moderate dilatation of the ureter, with or without kinking; moderate dilatation of the collecting system; normal or minimally deformed fornices

Grade IV Moderate dilatation of the ureter with or without kinking; moderate dilatation of the collecting system; blunt fornices, but impressions of the papillae still visible

Grade V Gross dilatation and kinking of the ureter, marked dilatation of the collecting system; papillary impressions no longer visible; intraparenchymal

Vesicoureteric reflux

Diagnosis: VCUG (gold standard)

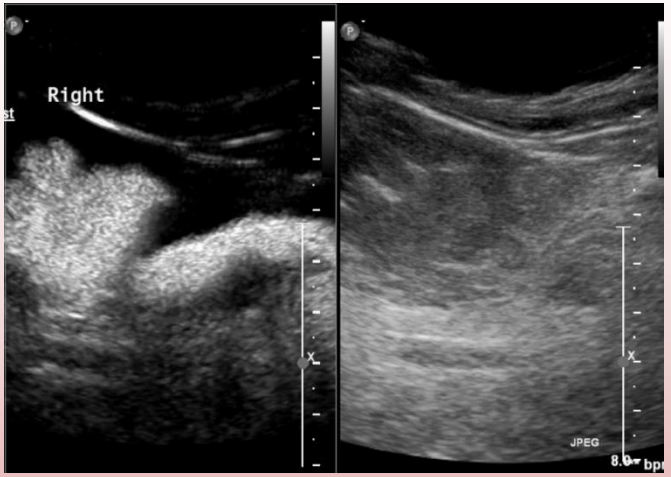


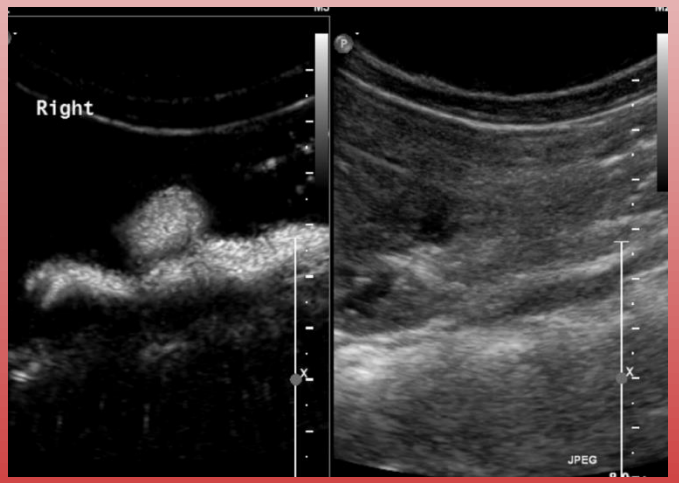
VUR grade IV. on both side

VUR grade V. on right side

Vesicoureteric reflux

Diagnosis: CEUS





VUR grade IV. on both side, and in both system of right kidney

Vesicoureteric reflux

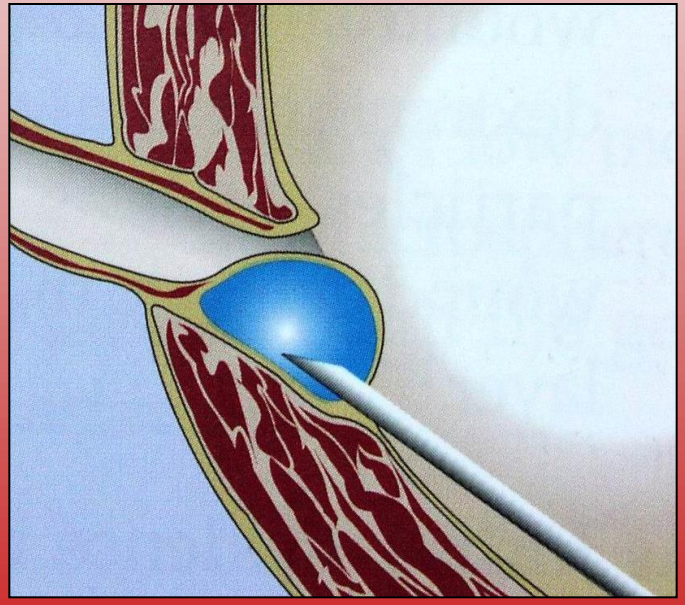
Diagnosis: - renal scan (DMSA)
- US
(- MRI)

Therapy: - resolves spontaneously
- watchful waiting
- intermittent / continuous antibiotic prophylaxis,
- bladder rehabilitation (LUTD)

Vesicoureteric reflux

Therapy - surgery

- subureteric injection of bulking materials
- open surgery (ureter reimplantation)
- (laparoscopy and robot-assisted)



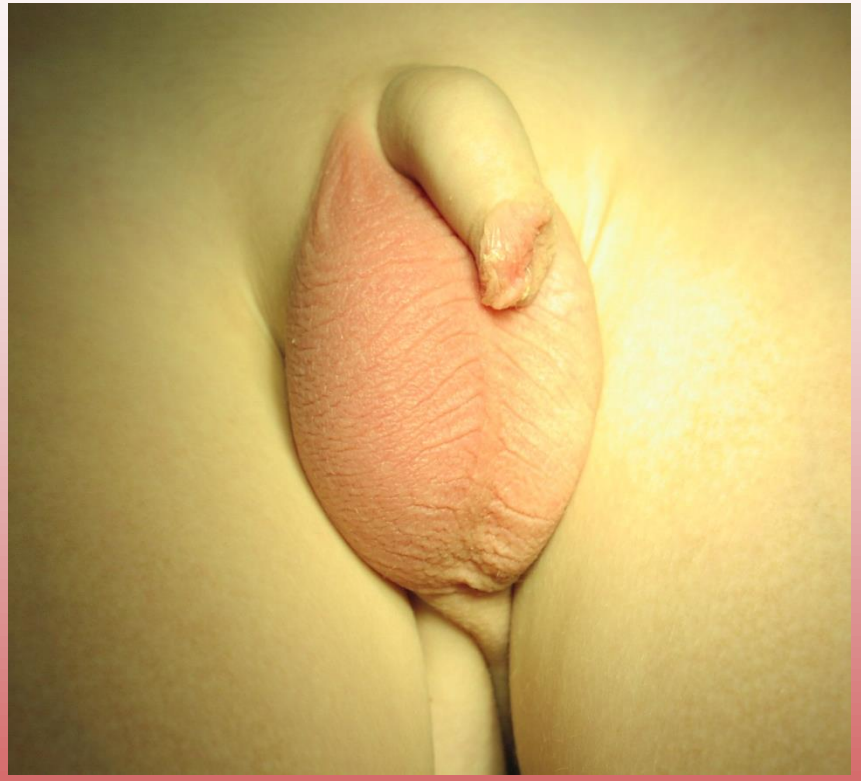
Vesicoureteric reflux

Summary of evidence

- There is no evidence that correction of persistent low-grade reflux (grades I-III) without symptoms and normal kidneys offers a significant benefit.
- The traditional approach of initial medical treatment after diagnosis and shifting to interventional treatment in case of breakthrough infections and new scar formation needs to be challenged, because the treatment should be tailored to different risk groups.
- Surgical correction should be considered in patients with persistent high-grade reflux (grades IV/V). There is no consensus about the timing and type of surgical correction. The outcome of open surgical correction is better than endoscopic correction for higher grades of reflux, whereas satisfactory results can be achieved by
- endoscopic injection for lower grades.
- The choice of management depends on the presence of renal scars, clinical course, grade of reflux, ipsilateral renal function, bilaterality, bladder function, associated anomalies of the urinary tract, age, compliance, and parental preference.
- Febrile UTI, high-grade reflux, bilaterality, and cortical abnormalities are considered to be risk factors for possible renal damage.
- The presence of LUTD is an additional risk factor for new scars.

Acute scrotum

- Symptomps:
  - suddenly evolving
  - scrotal / inguinal pain
  - hyperaemia of scrotum
  - swelling
  - unilateral
  - fever
  - pyuria



Acute scrotum

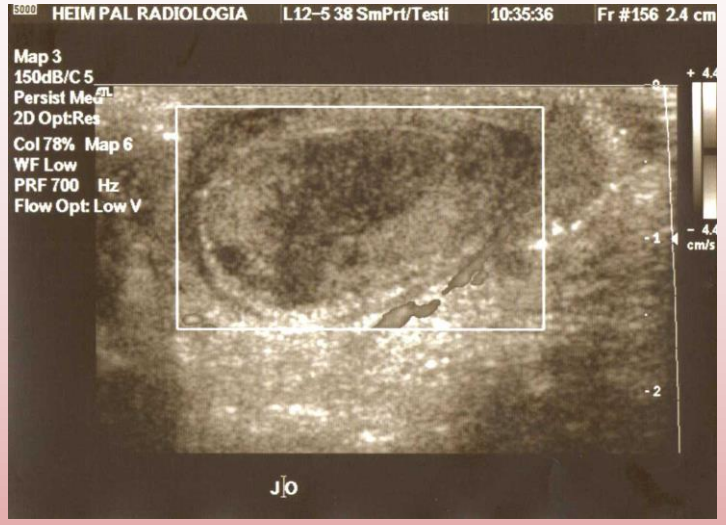
- Diagnosis:

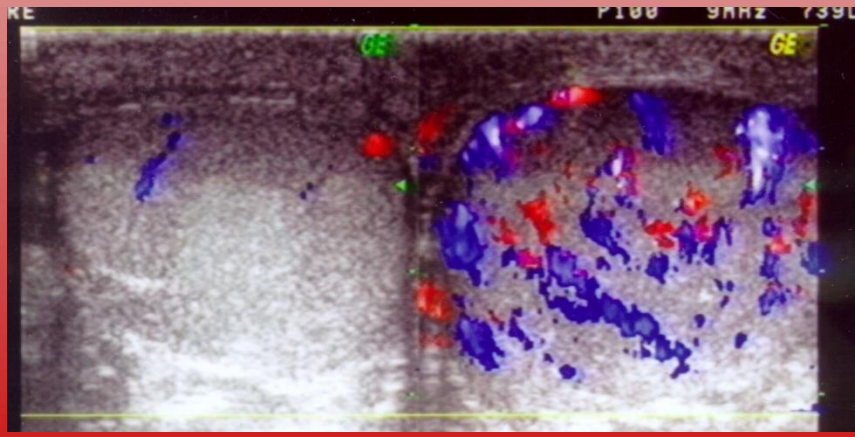
  - phyisical examination

    (abnormal (horizontal) position of the testis)

  - ultrasonography + Doppler

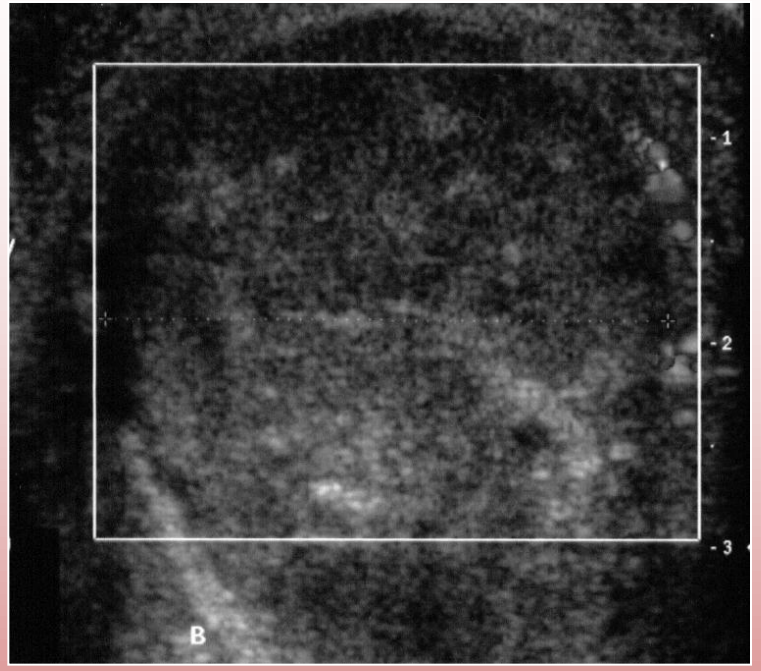
    (63.6-100% sensitivity, 97-100% specificity)



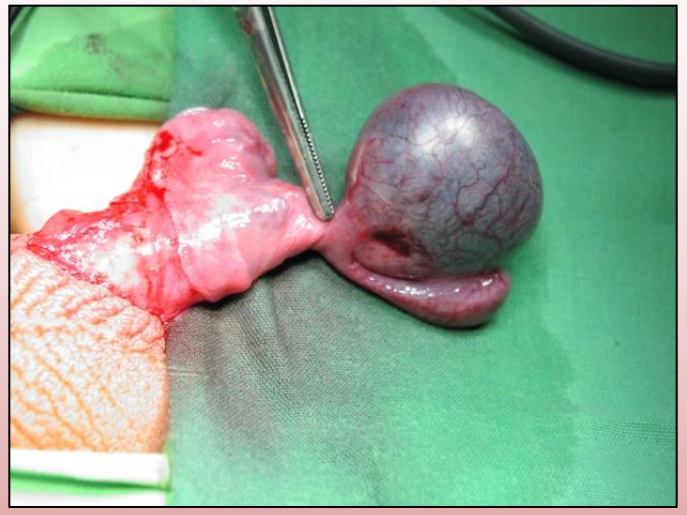


Acute scrotum

- torsion of the testis
  - newborn – adolescent
  - supra- or infravaginal
  - requires prompt surgical treatment



Torsion - detorsion of the testis



Torsion of the appendix testis

Thank you for your attention!