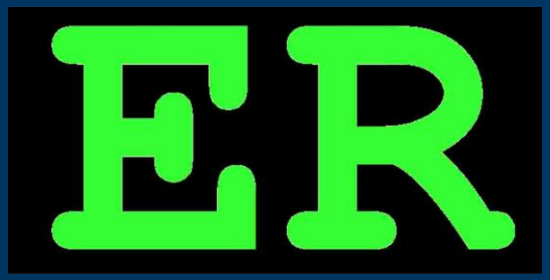


Urologic emergencies

Csaba Pusztai MD

Emergency

- life threatening
- can lead to persistent impairment
- contagious – dangerous to others (STD)
- causes severe pain or discomfort

Urologic emergencies

renal trauma, bladder rupture, testicular torsion, anuria, renal occlusion, renal colic, severe pyelonephritis, renal abscess, perirenal abscess, Fournier's gangrene, retroperitoneal hematoma, priapism, penile fracture, scrotal trauma, paraphimosis, urinary retention, ureter occlusion, foreign body, gonorrhoea, syphilis, AV fistula ...

Contents

Discussed:

- Urologic trauma
- Scrotal emergencies
- Urosepsis
- Urinary retention
- Penile emergencies
- Miscellaneous

Not discussed:

- STD
- Renal colic
- Acute renal failure

Mind urologic trauma, if

- Blunt trauma to the abdomen/perineum
  - hematuria
  - diminished urine output
  - genital or flank mass
- Penetrating wound of abdomen/perineum
  - 20% w/o macrohematuria
- Deceleration injury
  - motor vehicle accident

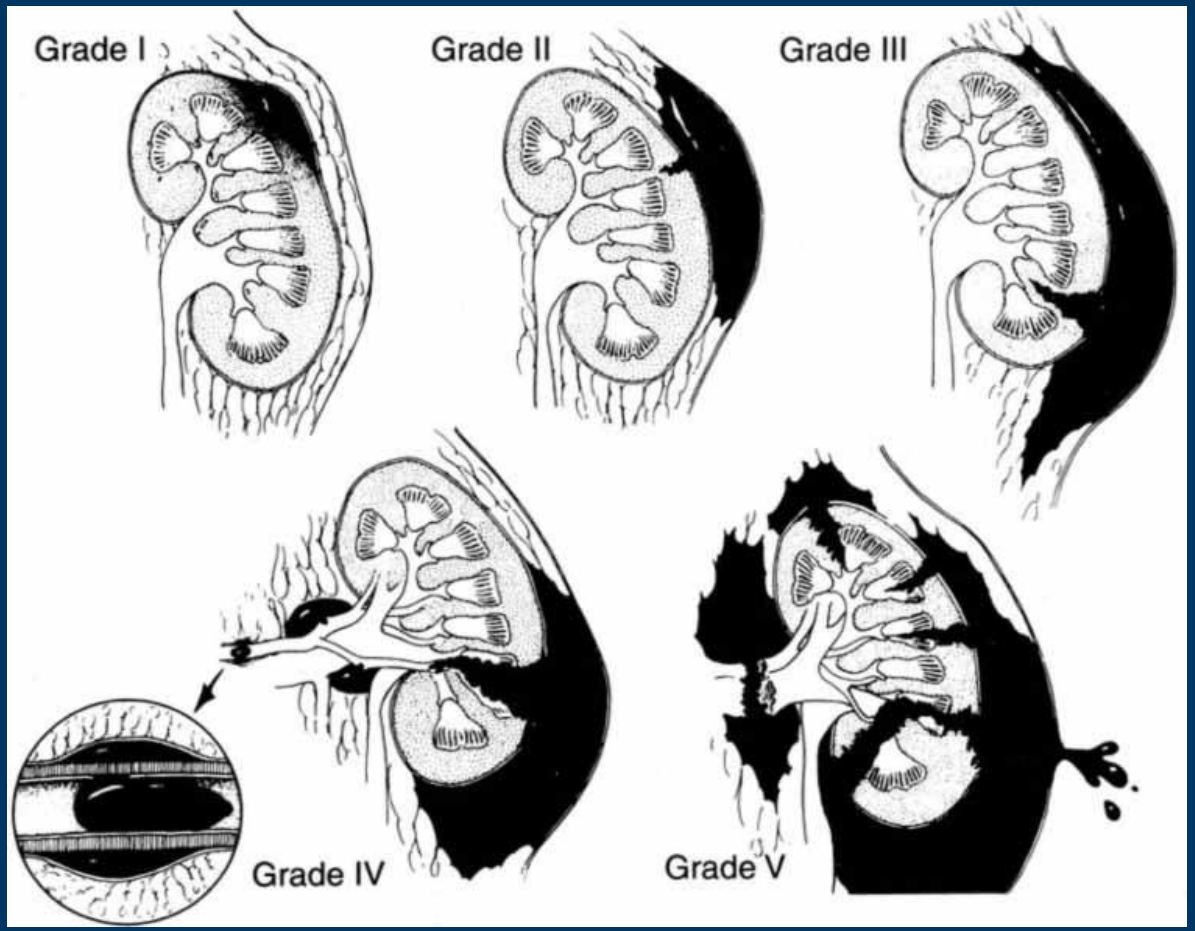
Suspicius signs

- X-XII. rib fracture
- pelvic bone fracture
- flank mass, discoloration, wound
- lower abdominal mass, tenderness
- genital swelling and discoloration
- inability to void
- blood at the urethral meatus

Evaluating urologic trauma

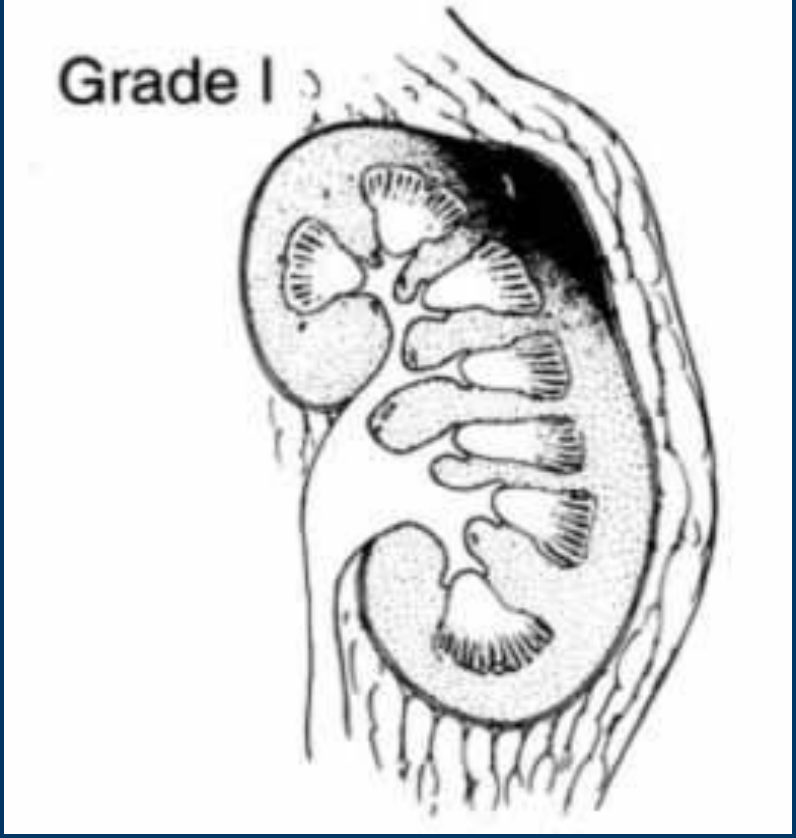
- Kidney
  - CT > US > IVP > angiography
- Bladder
  - RCG > CT > IVP > US
- Urethra
  - RUG
- Testis
  - US (>5 MHz)

Renal injury - staging



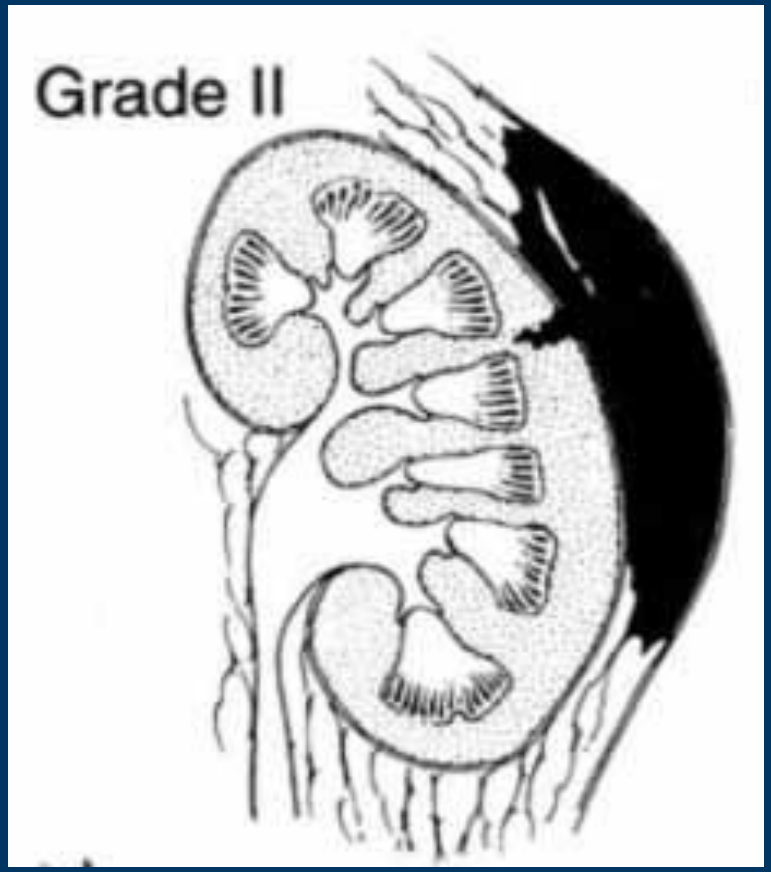
American College of Surgeons Committee on Trauma

Grade I



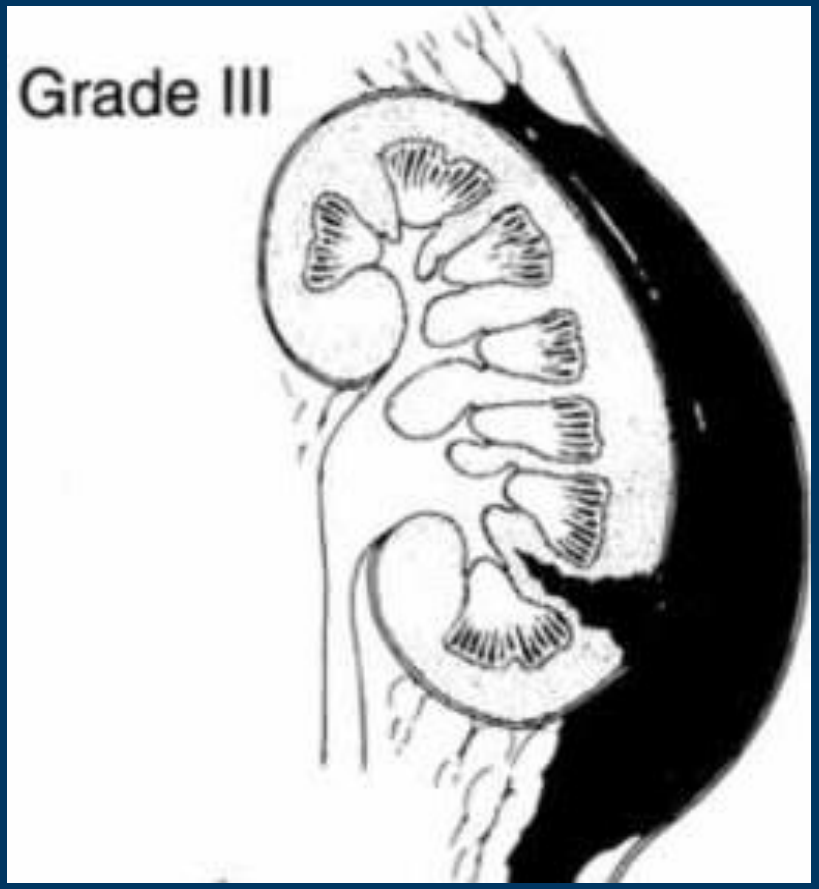
- Contusion
  - Microscopic or gross haematuria
  - urologic studies normal
- Haematoma
  - Subcapsular, nonexpanding haematoma without parenhymal laceration

Grade II



- Haematoma
  - Nonexpanding perirenal haematoma confined to renal retroperitoneum
- Laceration
  - <1 cm parenchymal depth of renal cortex without extravasation

Grade III

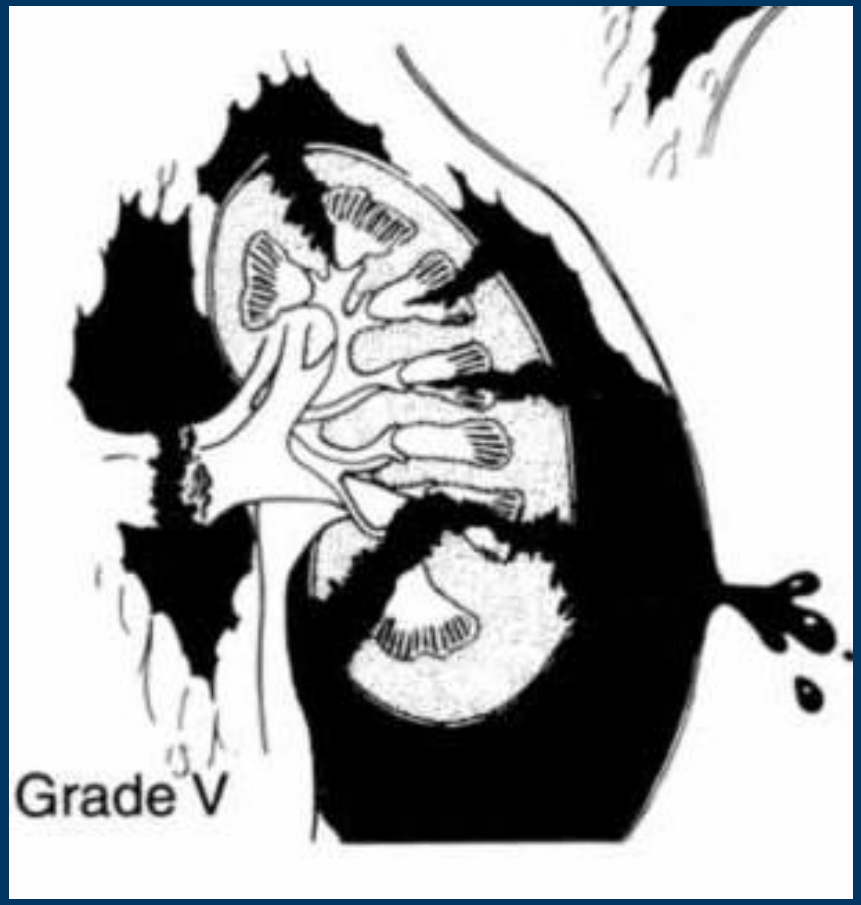


- Laceration
  - >1 cm parenchymal depth of renal cortex without collecting system rupture or urinary extravasation

Grade IV

- Laceration
  - Parenchymal laceration extending through renal cortex, medulla and collecting system
- Vascular
  - Main renal artery or vein injury with contained hemorrhage

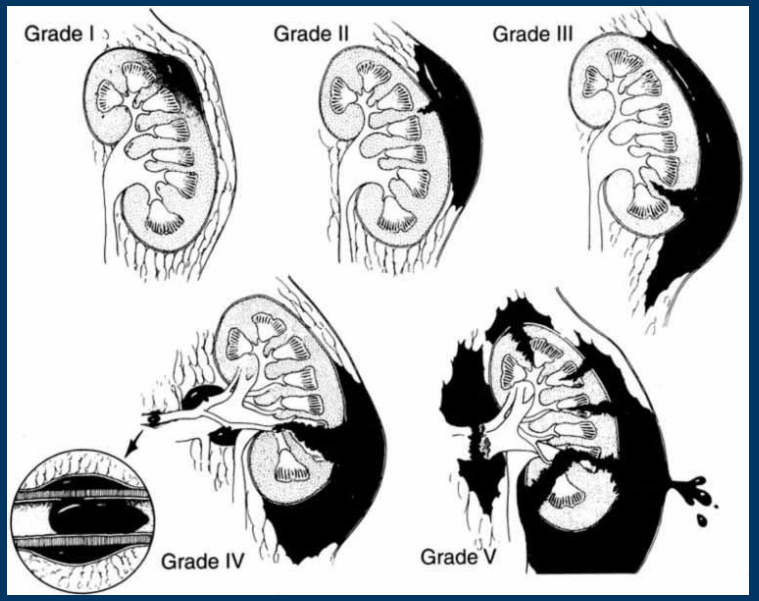
Grade V



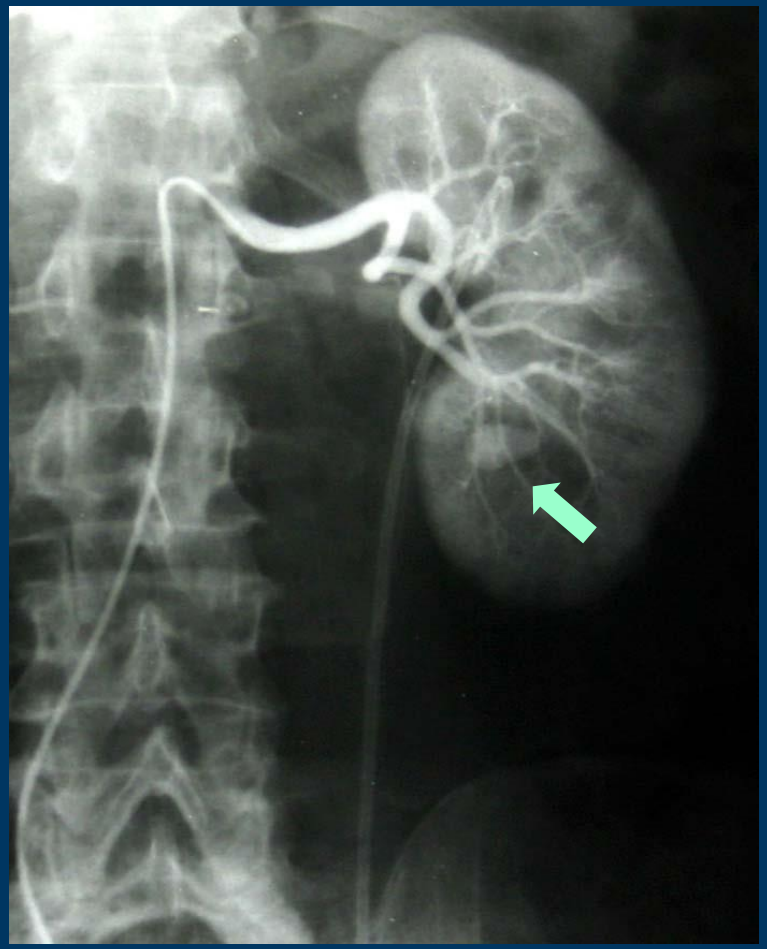
- Laceration
  - Completely shattered kidney
- Vascular
  - Avulsion of renal hilum, devascularizing the kidney

Renal injury - treatment

- Grade I-II – conservative Tx
  - bed rest
  - antibiotics
- Grade III – controversial
  - stent
  - surgery in case of urine fistula
- Grade IV-V – surgery
  - try to spare renal parenchyma



Iatrogenic renal injury



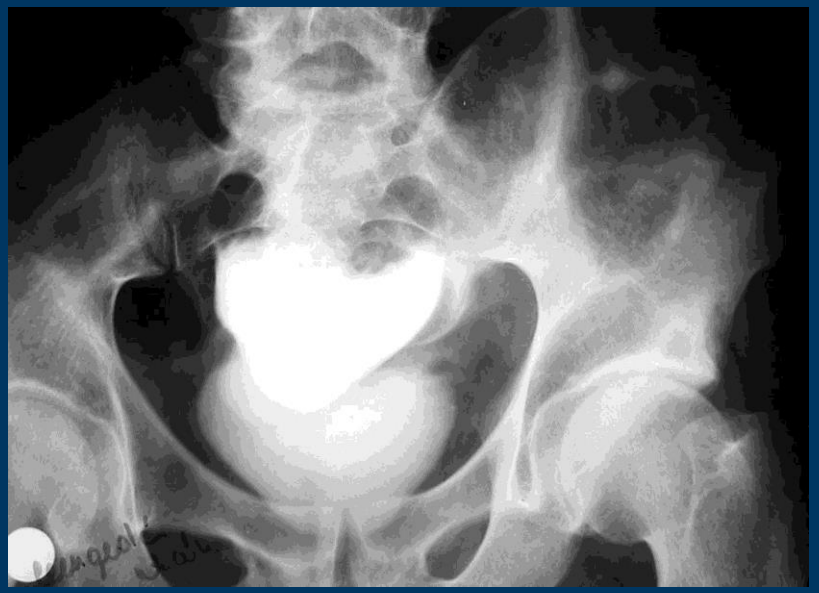
- NSS
- percutaneous surgery
- ESWL
- renal biopsy

Bladder injury

- Etiology
  - fracture of the pelvic ring
  - filled bladder + blunt abdominal trauma (seat belt)
- Symptoms
  - hematuria
  - pain
  - defense
  - micturition difficulity

Bladder rupture

- Diagnosis: cystography (RCG)
  - >300 ml, sterile, water-soluble contrast
  - ap. and oblique
  - post-drainage
- Therapy
  - catheterisation
  - AB
  - exploration if ip.



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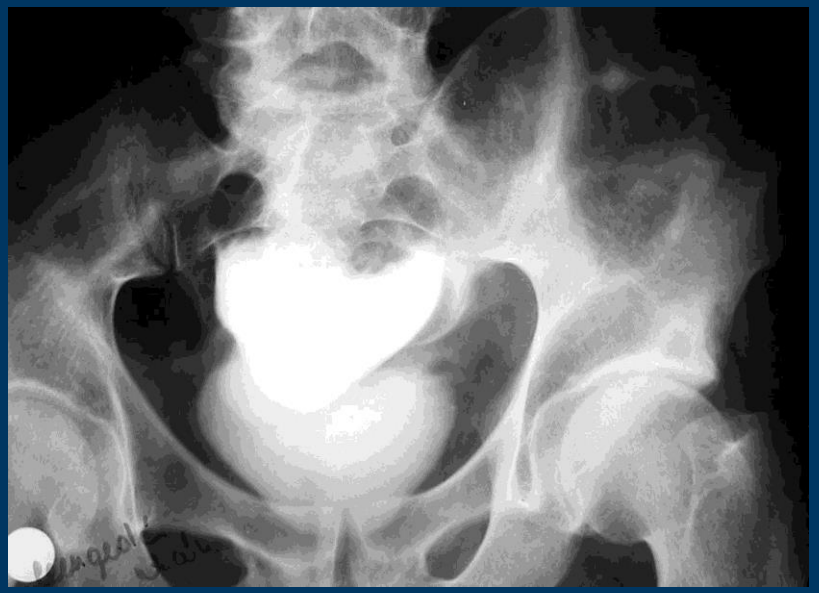
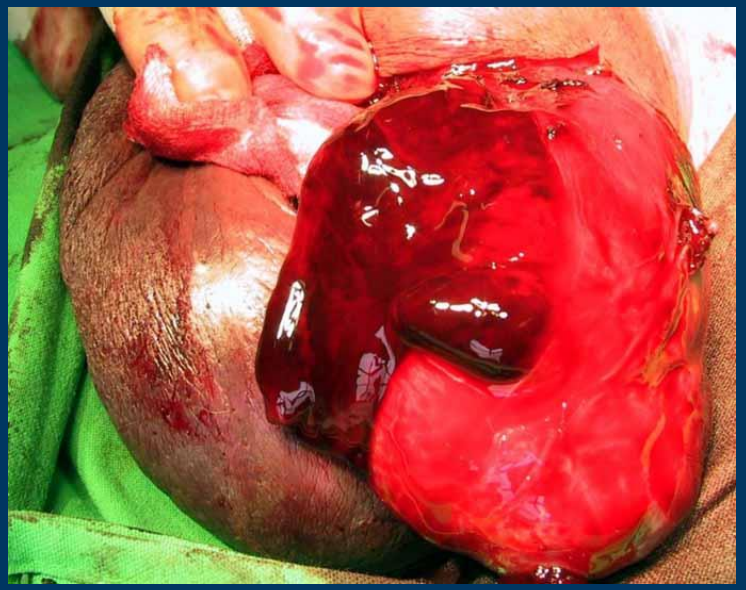


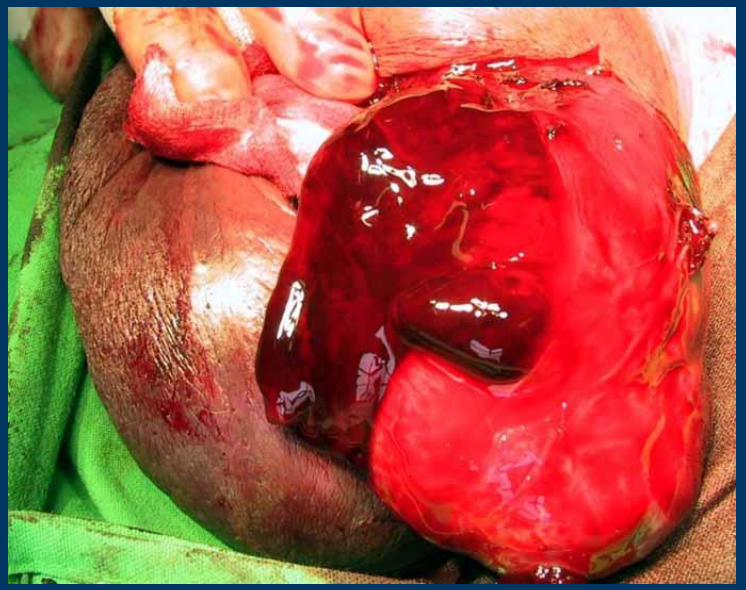
Urethral injury

- RUG
- epicystostomy
- antibiotics
- delayed surgical repair

Scrotal injury



Scrotal injury

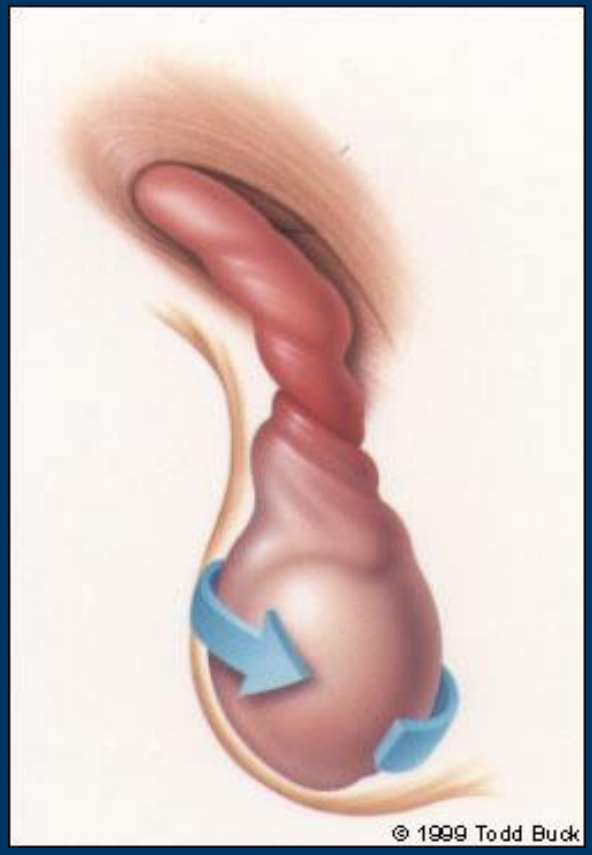


Scrotal emergencies

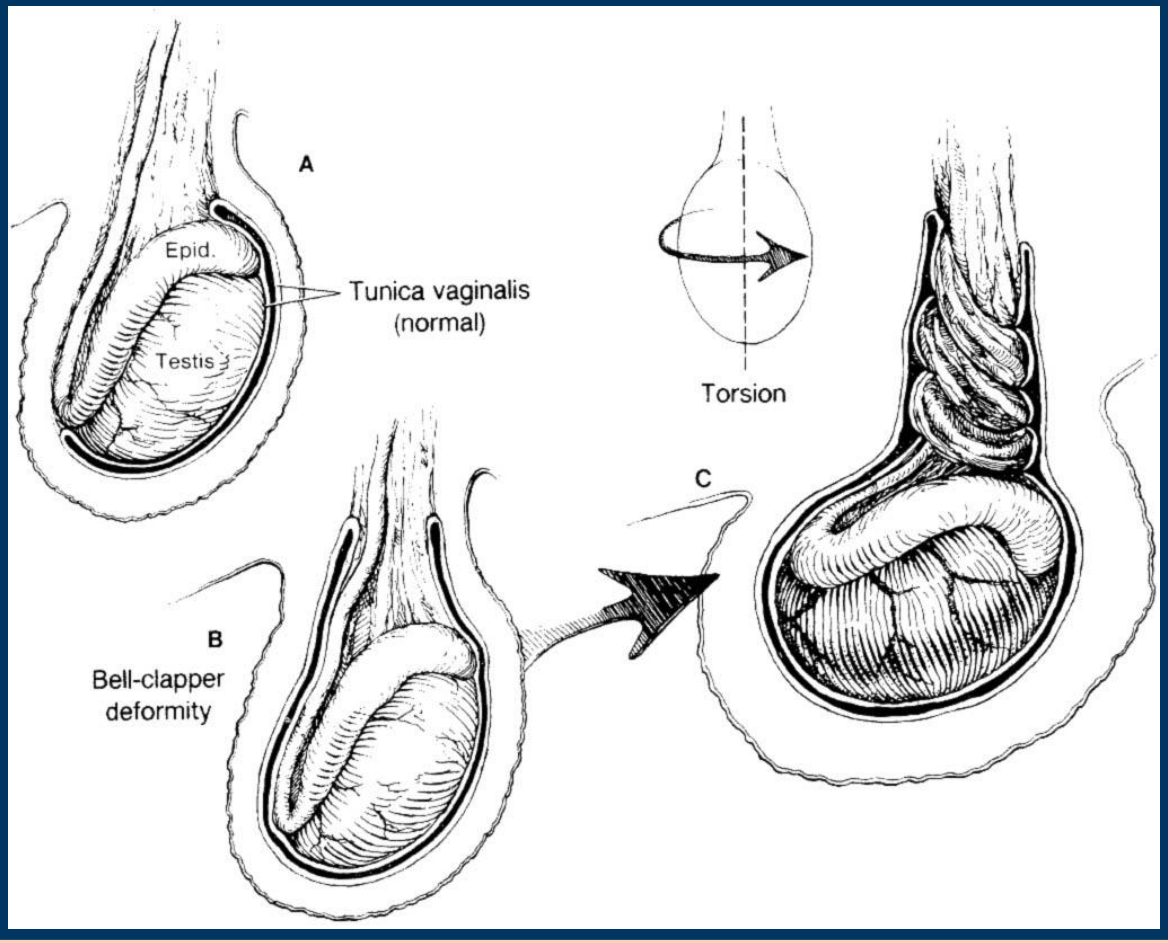
- ✓ Injury
- ✧ Torsion
- ✧ Epididymitis
- ✧ Fournier's gangrene

Testicular torsion

- most frequent in childhood
  - uncommon over 40
- results in ischemia
  - Sertoli-cell 4-6 h
  - Leydig-cell 8-10 h



„Bell-clapper" deformity



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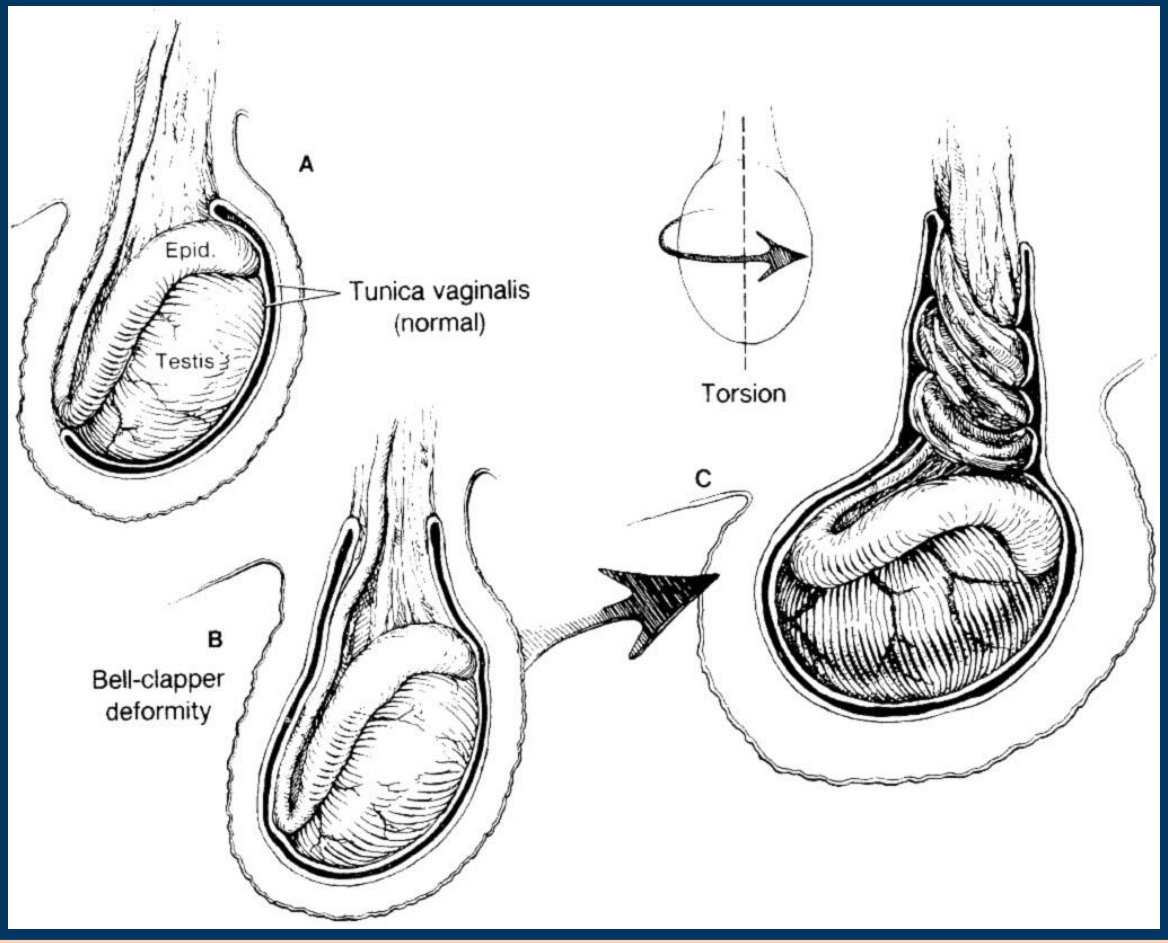
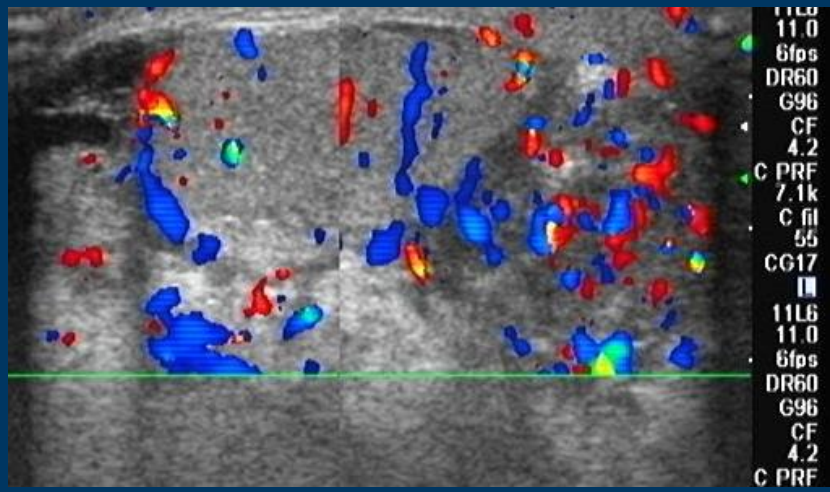


Torsion - diagnosis

- History – acute onset of pain
- Physical examination
  - tender scrotum
  - elevated testicle
  - anterior epididymis
  - lack of cremaster reflex
- Doppler ultrasonography
- Radionuclide imaging



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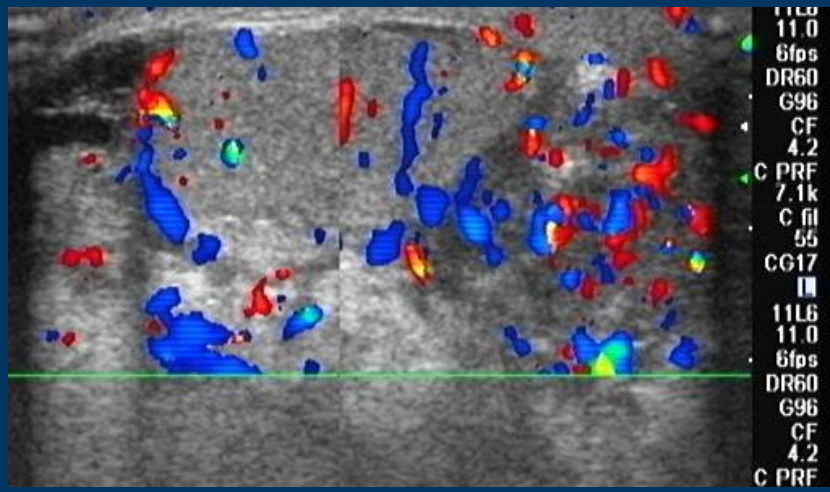
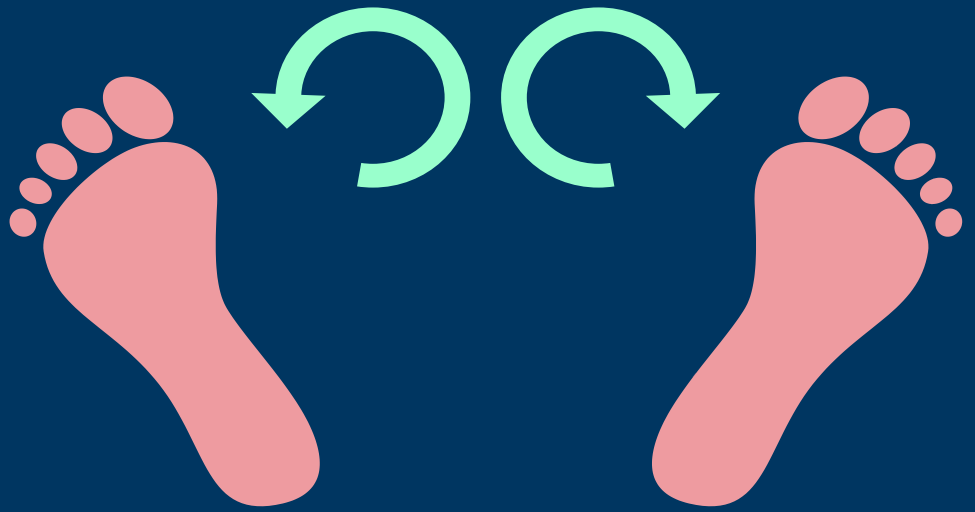


Detorquation

- Twisting
  - right – CW
  - left – CCW
- Manual derotation

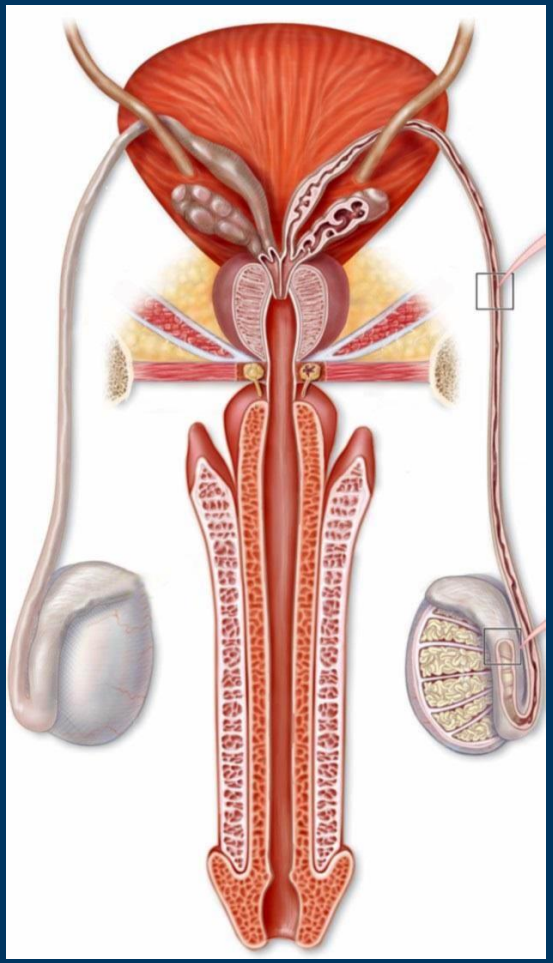


Surgical treatment

- exploration
- detorquation
- fixation (both testicles)
- orchiectomy and prothesis implantation

Epididymitis

- inflammation of epididymis
- ascending infection
  - urethra > prostate > vas > epididymis > testis



Epididymitis

- Wide range of seriousness
- Young pt: STD?
  - Chlamydia, Ureaplasma, Neisseria
- Elderly pt: urinary retention?
  - Coliform bacteria

Epididymitis – symptoms

- pain
- tender, swollen mass
- tender, boggy prostate
- fever
- elevated WBC
- elevated ESR

Epididymitis - treatment

- Antibiotics
  - fluoroquinolones (ciprofloxacine 500 mg b.i.d.)
  - doxycycline 100 mg b.i.d.
  - SMX/TMP
- ice pack
- NSAID
- bed rest, scrotal elevation
- surgery if abscess formation

Torsion vs. epididymitis

	torsion	-itis
Typical age	prepubertal	postpubertal
Onset	sudden	slow
Fever	(-)	+++
Pain	+++	+
Cremaster reflex	-	+
Prostate tenderness	-	+

Fournier's gangrene

- Rapidly progressive, necrotizing infection of genitalia and perineum
- E. coli, Strepto/Staphylococci, Bacteroides, Clostridium
- 13-22 % mortality
- immunocx. pts.

Fournier's gangrene – diagnosis

- examine the genitalia !
- induration, pain, erythema, crepitus, necrosis, odor
- nidus of infection
  - periurethral – RUG
  - perirectal – DRE, rectoscopy
  - skin lesion

Fournier's gangrene – Tx

- wide spectrum combined antibiotics
  - against both aerobs and anaerobs
- surgical debridement and drainage
- epicystostomy
- hyperbaric oxygene (?)
- hyperalimentation

Sepsis

- sepsis = SIRS* + evidence of infection
- SIRS: at least 2 from the followings
  - hyper- or hypothermia (<36°C or 38°C<)
  - tachycardia (over 90/min)
  - tachypnea (over 20/min)
  - WBC <4 G/L or 12 G/L<
- urosepsis: sepsis with urogenital source of infection

**Systemic Immune Response Syndrome*

Septic shock

- sepsis with clinical signs of hypotension, hypoperfusion
- multiple organ dysfunction (MODS)
  - hypoxia → ARDS* (lung)
  - oliguria → renal failure
  - anaemia → bone marrow dysfunction
  - icterus → liver damage
  - coma → brain damage

** Adult Respiratory Distress Syndrome*

Urosepsis – causes

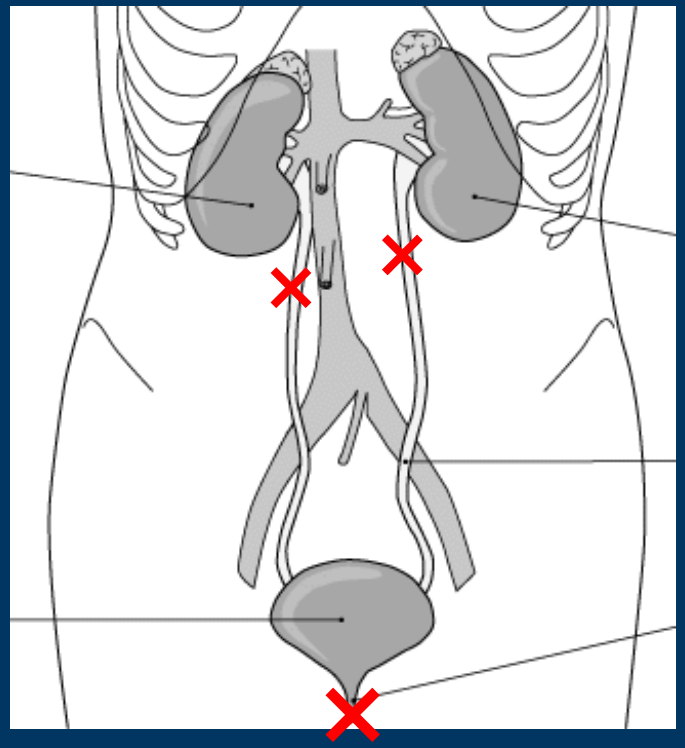
- pyelonephritis (apostematosa)
- acute prostatitis, prostatic abscess
- severe epididymo-orchitis
- Fournier's gangrene
- bladder rupture (peritonitis)
- foreign body
- (+ immuncompromised pt.)

Oliguria / anuria

- oliguria: <500 ml urine/24 h
- anuria: <100 ml urine/24 h
- causes
  - prerenal
  - renal
  - postrenal

Postrenal anuria

- supravesical – renal occlusion
  - intraluminar / extrinsic ureter obstruction
  - risk factor: solitary kidney
- subvesical – lower urinary tract obstrucion
  - BPH, PCa, urethral stricture or tumor, stone, meatal stenosis



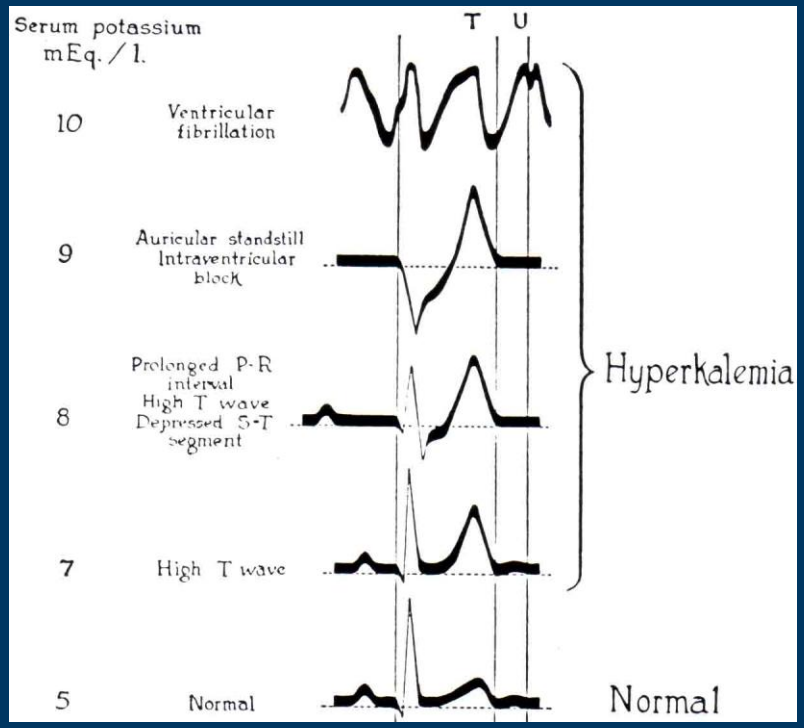
Tx of subvesical obstruction

- = Urinary retention (acute / chronic)
- Urethral catheter
- Percutaneous epicystostomy
- Treatment of the underlying disease
  - e.g. urethral stone, meatal stenosis, phimosis
- Open cystostomy (rare)

Tx of supravesical obstruction

- Usual
  - ureter catheter
  - DJ stent
  - percutaneous nephrostomy
- Rare
  - ureterocutaneostomy
  - open nephrostomy
  - extra anatomic stent

Hyperkalemia



- high T
- wide QRS

Tx of hyperkalemia

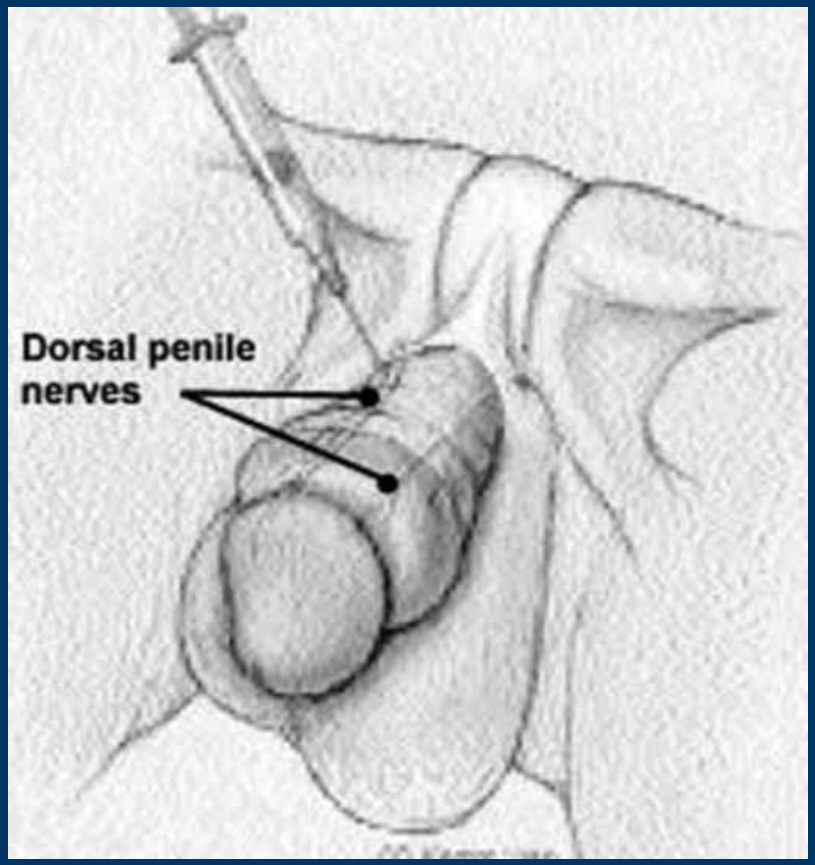
- calcium gluconate
- sodium bicarbonate
- insulin (+ glucose)
- potassium absorbing resin (Resonium)
- loop diuretics
- hemodialysis
- manage the underlying disease

Urologic emergencies

- Urologic trauma
- Scrotal emergencies
- Urosepsis
- Urinary retention
- Penile emergencies
- Miscellaneous

Paraphimosis

Paraphimosis - treatment



Priapism

- persisting and painful erection
  - lasts more than 4 hours
- Forms
  - low-flow (ischaemic)
  - high-flow

Priapus = god of fertility

Priapism – causes

PDE5 inhibitors	sildenafil, vardenafil, tadalafil
intracavernosal	prostaglandin E, papaverine
antihypertensives	Ca channel blockers hydralazine, prazosin
psychiatric	trazadone chloropromazine thioridazine / SSRIs
drugs	alcohol, cocaine
neurologic	spinal cord laesion, SM
hematologic	sickle cell anaemia
injury	straddle injury, AV fistula
other	spider bites

Priapism – treatment

- Hydration, analgesia
- Low flow
  - cavernosal aspiration & irrigation
  - phenylephrine (100-200 mg/10 min)
- High flow (non-emergent)
  - ice pack
  - embolisation

Priapism – surgical Tx

- Winter shunt (A)
- El-Ghorab shunt (B)
- Quackels/Sacher (C)
- sapheno-cavernosus shunt (Grayhack) (D)