




Clinical aspects in urogenital injuries

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Urogenital injuries in trauma patients

-  • Renal injury
- Ureteral injury (infrequent/iatrogenic)
-  • Bladder injury
-  • Urethral injury
- Scrotal and penile injuries (infrequent)
- Vaginal lacerations

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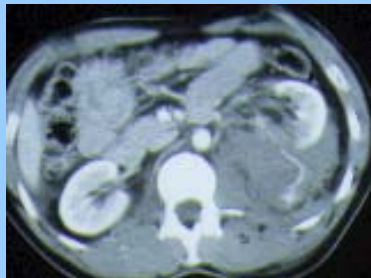
Urogenital trauma – general considerations

- Well protected organs
- Predominant associate injuries
- High degree of SUSPICION
 - Haematuria
 - Mechanism of trauma
 - What kinds of associated injuries?
- Accurate radiological diagnosis and grading (conservative treatment)

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”The clinician should actively involve him-/herself in the interpretation of the radiological procedures”

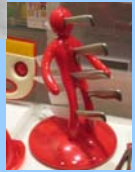


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RENAL INJURIES

- In 10% of abdominal trauma
- High energy or direct trauma
- 90-95% from blunt trauma, < 10% penetrating trauma
- Haematuria
 - Suspicious
 - No correlation to extent of injury
 - May not be present (30%)

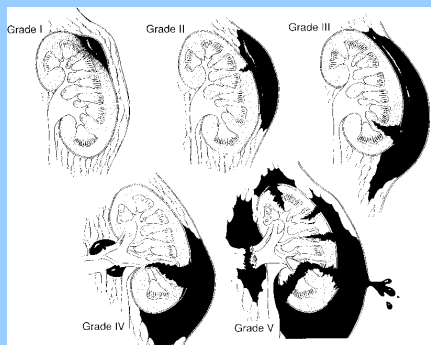


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Renal injuries - grading

- Contusion/superficial lacerations – 85%
- Deep laceration (collecting system incl.) – 10%
- "Crushed" kidney/ avulsion of vascular pedicle – 5%



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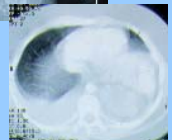
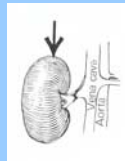
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Radiological evaluation - indications

- CT scan for general exam. of abd. trauma
- Specific assessment of renal injury
 - All penetrating trauma with haematuria
 - Blunt trauma + *macroscopic* haematuria
 - Blunt trauma + *microsc.* haematuria + BP<90 mmHg
 - Significant deceleration trauma
 - All children with abdominal/flank/deceleration trauma with positive dip-stick test of urine.

Renal injuries in children

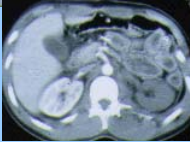
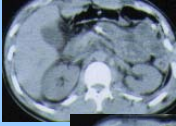
- Less protected kidney:
 - Less developed muscles
 - Softer rib cage (costae)
 - Less perirenal fat (less fixed)
- Children compensate shock
- More vulnerable kidney by congenital malformations (hydronephrosis)



Liberal indications for radiographic evaluation of children

Radiographic assessment – requirements from the clinician

- **Triple contrast CT scan**



Perfusion of the kidney?



- Leakage of contrast?
- Contrast in the ureter?



Associated injuries?

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Treatment of renal injuries

- **NON-OPERATIVELY**



3 weeks



- Surgery (2-5%)- nephrectomy/simple reconstruction
 - Expanding retroperitoneal haematoma at laparotomy (?)
 - Life threatening haemorrhage not responding to transfusion
- Radiological embolization of bleeding segmental arteries

?????

- On-table IVP – NO
- Reconstruction/stenting of injured renal artery: NO

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Complications of renal injuries - treatment

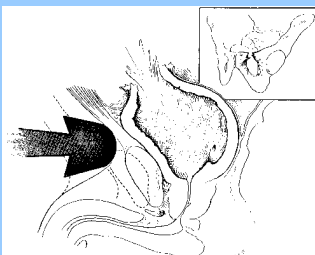
- Leakage from renal pelvis
 - Antibacterial treatment
 - Retrograde internal ureteral stent (JJ)
- Infected perirenal urinoma/abscess
 - Percutaneous drainage + JJ-stent/percutaneous nephrostomy
- Hypertension (infrequent)
 - BP control by GP (\geq grade 3 injuries – hypoperfusion)

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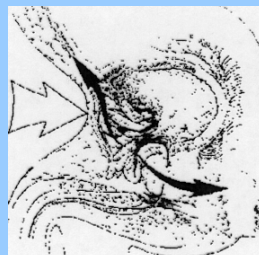
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BLADDER INJURIES – high energy trauma

- **Intraperitoneal rupture**
 - Blunt abd. trauma with filled bladder
- **Extraperitoneal rupture**
 - Pelvic fracture (10%)
 - Ass. urethral rupture?



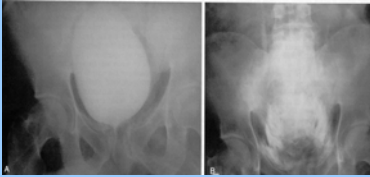
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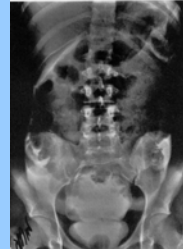
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Diagnosis

- SUSPICION (blood from the catheter, mechanism of injury, intraper. fluid by FAST)
- Plain X-ray film of pelvis (Fracture? Type of fracture? Diastasis of symphysis? Bony fragments pointing towards the bladder?)
- CT cystography, alternatively conventional cystography



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Bladder rupture - treatment

- *Intraperitoneal rupture* : Surgical repair
- *Extraperitoneal rupture*: Catheter drainage for 10-14 days + antibiotics.

Surgical repair in selected cases:

- At anterior osteosynthesis of pelvic fracture
- Injury of bladder neck
- Concomitant vaginal injury
- Massive rupture



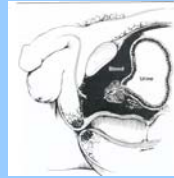
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URETHRAL INJURIES

- "Mens injury", rare in women
- Cardinal clinical sign: Blood at the urethral meatus
- Two levels of injury – different mechanisms of injury:
 - Posterior rupture (prostatic and membranous urethra):
 - High energy pelvic ring fractures (5-10%)
 - Anterior rupture (bulbous and pendulous urethra)
 - Straddle injury



Posterior rupt.



Anterior rupt.



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Urethral rupture - treatment

- Posterior rupture
 - Suprapubic cystostomy (open/percutaneously)
 - Removal of sp. cath. 3 months
 - Subsequent handling of stricture
 - Operative alignment of urethra by a stenting catheter performed during the orthopedic reconstruction, 2nd./3rd. day
- Anterior ruptur
 - Suprapubic cystostomy and subsequent stricture repair at >3 months OR primary surgical repair.

Urethral rupture – devastating long-term sequela

- Urethral stricture
- Erectile dysfunction
- Urinary incontinence

SUMMARY – urogenital injuries and radiology

- Accurate radiographic assessment of the injury is necessary for correct diagnosis, subclassification and grading of the injury
- Decision making on treatment strategy depends on a reliable radiographic assessment