Urological Emergencies

Urological Emergencies

- ✓ A **urologic emergency** arises when a life or organ threatening condition requires rapid diagnosis and immediate treatment.
- ✓ Compared to other surgical fields there are relatively few true emergencies in Urology.
- ✓ Nethertheless **urological cases** are very frequently faced every day in the Departments of Emergengy

Urological Emergencies

Non traumatic

- Haematuria
- Renal Colic
- Urinary retention
- Acute Scrotum
- Priapism

Traumatic

- Renal Injury
- Ureteral Injury
- Bladder Injury
- Urethral Injury
- Penile Injury
- Testicular Injury

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Hematuria

- ✓ Blood in the urine
- ✓ Macroscopic (frank, or gross hematuria) or microscopic (the presence of > 3 red blood cells per high power microscopic field)
- ✓ Painless or painful
- ✓ Initial / Terminal / Total

Hematuria

Causes

1. Medical causes:
   - ✓ glomerular and nonglomerular
   - ✓ blood dyscrasias, interstitial nephritis, and renovascular disease

2. Surgical/urological nonglomerular causes:
   - ✓ urothelial tumours (bladder, ureteric, renal collecting system), renal tumors, prostate cancer, bleeding from vascular benign prostatic enlargement, trauma, renal or ureteric stones, and UTI.
   - ✓ Haematuria in these situations is usually characterised by circular erythrocytes and absence of proteinuria and casts.

Hematuria

Is hematuria an emergency?

Only in few conditions

- ✓ **Anemia**
- ✓ **Acute urinary retention**
- ✓ **Renal colic**

Rare event

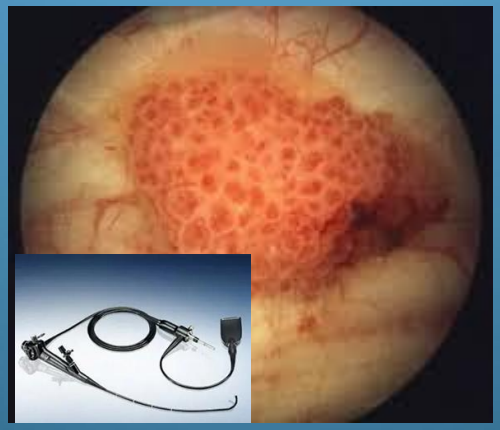
Bladder Clots

Ureteral Clots

Hematuria

1. Investigation :
   - ✓ Renal US
   - ✓ Flexible cystoscopy,
   - ✓ Computed tomography (CT) scan in selected groups

2. Treat the cause



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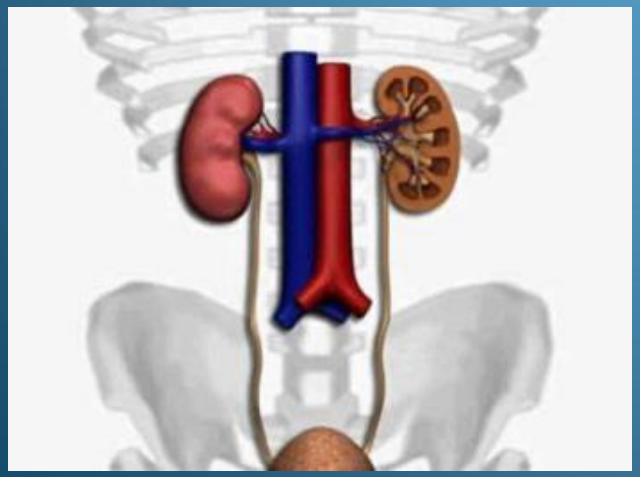
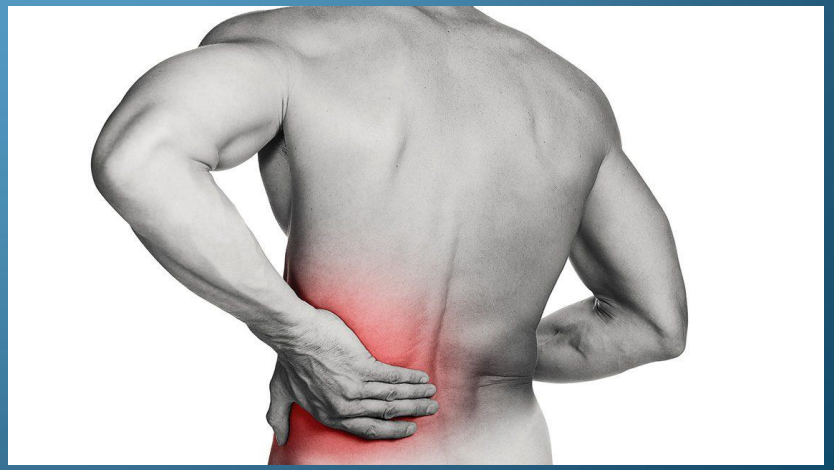
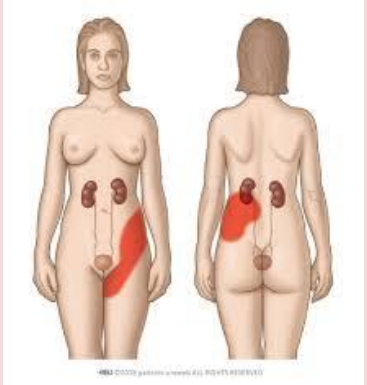
Renal Colic

- ✓ The most common urological case seen in Emergencies Departments
- ✓ One of the most common causes of the “Acute Abdominal Pain”
- ✓ Sudden onset of severe colic pain in the flank and in the upper abdomen.
- ✓ Most often due to the migration of a kidney stone down through the ureter (but not only a kidney!).





Renal Colic



Typical clinical presentation:

- ✓ Very sudden onset
- ✓ Acute and intense colic pain
- ✓ May change in location, from the flank to the groin as the stone migrates in the lower ureter , (the location of pain does not provide a good indication of the position of the stone)
- ✓ The patient cannot get comfortable in any position , and may roll around in agony.
- ✓ Associated to nausea / vomiting

The pain of a ureteric colic can be similar for intensity to that induced by delivery

Renal Colic

Generaly a very typical presentation

Differential diagnoses:

- ✓ Leaking abdominal aortic aneurysms
- ✓ Pneumonia
- ✓ Myocardial infarction
- ✓ Ovarian pathology (e.g., twisted ovarian cyst)
- ✓ Acute appendicitis
- ✓ Testicular torsion
- ✓ Inflammatory bowel disease (Crohn's, ulcerative colitis)
- ✓ Diverticulitis
- ✓ Ectopic pregnancy
- ✓ Burst peptic ulcer
- ✓ Bowel obstruction

Renal Colic

Imaging: Abdominal US

- ✓ Upper urinary tract obstruction (hydronephrosis)
- ✓ Location of the stone

Renal Colic

Imaging: CT scan

- ✓ No need for contrast administration
- ✓ Great specificity (95%) and sensitivity (97%) for diagnosing ureteric stones
- ✓ Can identify other, non-stone causes of flank pain
- ✓ Fast results

Renal Colic

Management of ureteral colic

Pain relief

- ✓ Nonsteroidal anti-inflammatory drugs (**NSAIDs**):
  Intramuscular or intravenous injection,
- ✓ +/- Opiate analgesics (Pethidine or Morphine)
- ✓ +/- Hyoshine Butyl Bromide (Buscopan®) antimuscarinic agent to reduce ureteral peristalsis.

'Watchful Waiting'

- ✓ Analgesic supplements and Tamsulosine
  - 90% of stones measuring 5mm or less pass spontaneously
  - If not: endoscopic scheduled surgery

Renal Colic

Indications for immediate surgical intervention

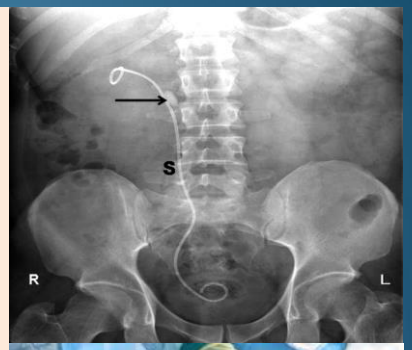
- ✓ Pain that fails to respond to medical therapy
- ✓ **Risk of Uro- Sepsis**: Fever, **White Blood Cell count ⬆** and/or **CRP (C-reactive protein) ⬆**
- ✓ Renal function is impaired (solitary kidney obstructed by a stone, bilateral ureteric stones, or preexisting renal impairment)
- ✓ Obstruction unrelieved for > 4 weeks

Renal Colic

Surgical treatment in emergency

1. **Temporary relief of the obstruction and infected urine drainage**:
   - ✓ Insertion of a JJ stent or percutaneous nephrostomy tube

2. **Simultaneous definitive treatment of stones:**
   - ✓ Laser endoscopic stone fragmentation <u>in rare cases</u>



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Urinary Retention

- ✓ Acute urinary retention

  Painful inability to void

- ✓ Complete urinary retention without pain

  Elevated post-voiding volume

  Paradoxical iscuria

Urinary Retention

Pathophysiology:

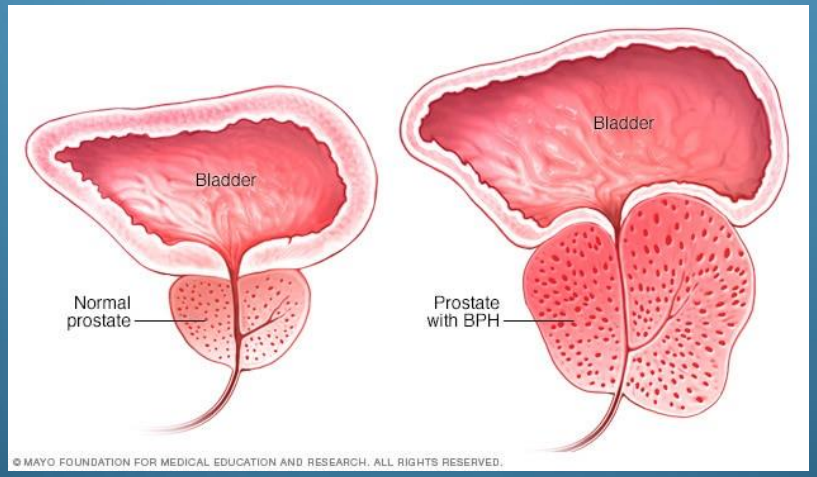
- ✓ Increased urethral *resistance, i.e., bladder outlet obstruction* (BOO)
- ✓ Low bladder *pressure, i.e., impaired bladder contractility*
- ✓ Interruption of sensory or motor innervations of the bladder

Urinary Retention

Causes

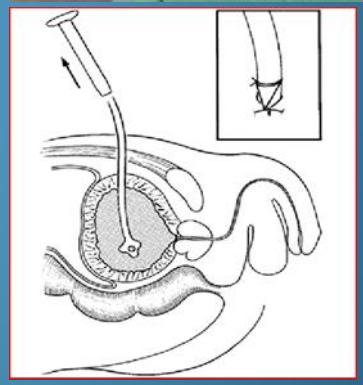
Men A relatively frequent event

- ✓ Benign prostatic enlargement (BPE) due to BPH
- ✓ Functional sclerosis of the bladder neck
- ✓ Urethral strictures
- ✓ Prostatic abscess /cancers (rare)



Urinary Retention

1. **Initial Management**
   - ✓ Urethral catheterization
   - ✓ Suprapubic urethral catheterization
2. **Late Management**
   - ✓ Treating the underlying cause



Urinary Retention

Complete Urinary retention without pain and with paradoxical iscuria

Obstruction develops slowly, the bladder is distended (stretched) gradually over weeks/months/years,
….pain is thus not a clinical presentation

Presentation:

- ✓ Urinary dribbling
- ✓ Overflow incontinence (paradoxical iscuria)
- ✓ Palpable lower suprapubic mass

Urinary Retention

1. Usually associated with:
   - ✓ Reduced renal function
   - ✓ Upper tract dilatation

2. Early management is directed to renal support

3. Bladder drainage (trans-urethral or supra-pubic catheter)

4. Late management: treating the underlying cause

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Acute Scrotum

Acute scrotal pain

Emergency situation requiring:

- prompt evaluation
- differential diagnosis
- potentially immediate surgical exploration

Acute Scrotum

Differential Diagnosis

Table 67–2. DIFFERENTIAL DIAGNOSIS OF THE ACUTE/SUBACUTE SCROTUM

- Torsion of the spermatic cord
- Torsion of the appendix testis
- Torsion of the appendix epididymis
- Epididymitis
- Epididymo-orchitis
- Inguinal hernia
- Communicating hydrocele
- Hydrocele
- Hydrocele of the cord
- Trauma/insect bite
- Dermatologic lesions
- Inflammatory vasculitis (Henoch-Schönlein purpura)
- Idiopathic scrotal edema
- Tumor
- Spermatocele
- Varicocele
- Nonurogenital pathology (e.g., adductor tendinitis)

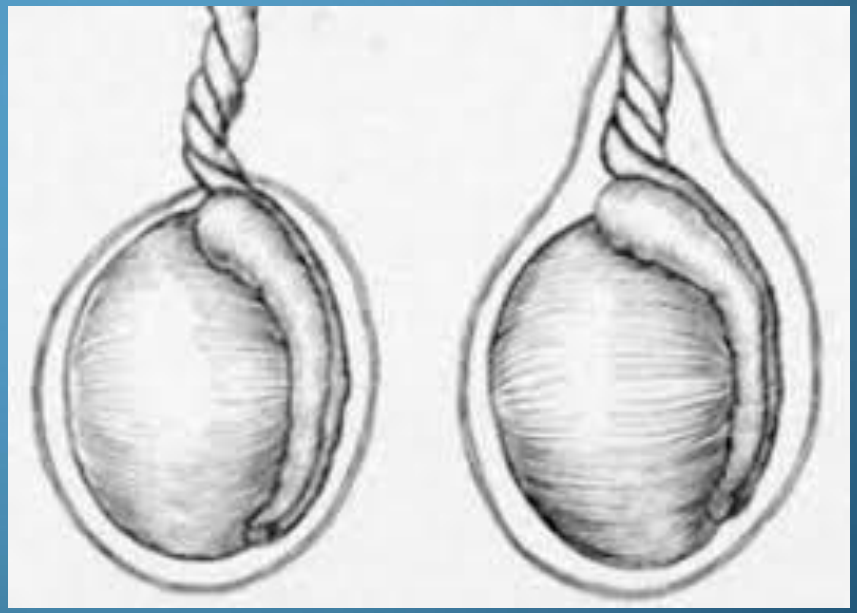
Testicular tumors generally are not associated to pain

Acute Scrotum

Differential Diagnosis

- ✓ Torsion of the Spermatic Cord (most serious)
- ✓ Torsion of the Testicular and Epididymal Appendages
- ✓ Epididymitis (most common)

Torsion of the Spermatic Cord



(A) extravaginal (B) intravaginal

Torsion of the Spermatic Cord

- ✓ True surgical emergency of the highest order
- ✓ Irreversible ischemic injury to the testicular parenchyma may begin as soon as 4 hours
- ✓ Testicular salvage possibility ↓ as duration of torsion ↑

Torsion of the Spermatic Cord

Clinical Presentation: Sympthoms

- ✓ Generally in a young adult (age 14-30 yrs)
- ✓ Acute onset of scrotal pain
- ✓ Majority with history of prior episodes of severe, self limited scrotal pain and swelling
- ✓ Nausea/Vomiting
- ✓ Referred to the ipsilateral lower quadrant of the abdomen
- ✓ Dysuria and other bladder symptoms are usually absent

Torsion of the Spermatic Cord

Clinical presentation Physical Examination

- ✓ The affected testis is high-riding and transversally orientated
- ✓ Acute hydrocele or massive scrotal edema
- ✓ Cremasteric reflex is absent
- ✓ Tender larger than other side

Torsion of the Spermatic Cord

Adjunctive tests

- ✓ To aid in differential diagnosis of the acute scrotum
- ✓ To confirm the absence of torsion of the cord.

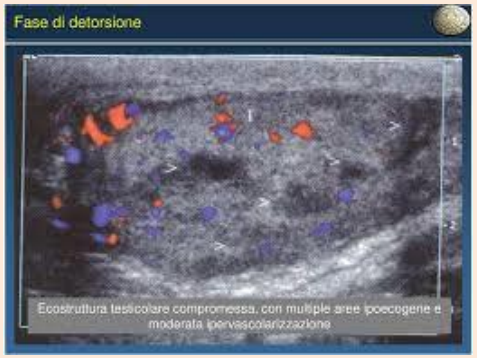
Doppler examination of the cord and testis

High false-positive and false-negative results

Torsion of the Spermatic Cord

Color Doppler Ultrasound of the Testis

- ✓ Assessment of anatomy and determining the presence or absence of blood flow
- ✓ Sensitivity: 88.9% Specificity: 98.8%
- ✓ Operator dependent



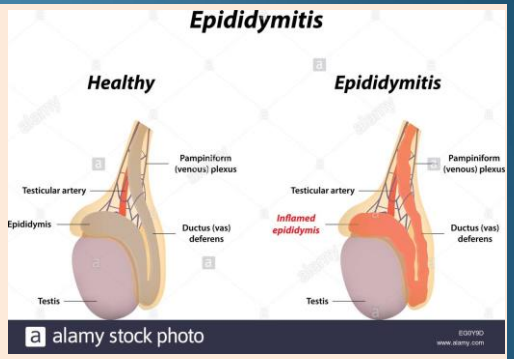
Torsion of the Spermatic Cord

Treatment : Immediate Surgery

- ✓ A median raphe scrotal incision or a transverse incision.
- ✓ The cord should be detorsed.
- ✓ Testes with marginal viability should be placed in warm sponges and re-examined after several minutes.
- ✓ A necrotic testis should be removed
- ✓ The contralateral testis must be fixed to prevent subsequent torsion.

The golden rule: do not hesitate to explore surgically a testicle if even a low probability of torsion exist

Epididymitis



1. Presentation:
   - ✓ Scrotal swelling, erythema, and pain
   - ✓ Dysuria and fever is common
2. Physical examination:
   - ✓ localized epididymal tenderness, a swollen and tender epididymis, or a massively swollen hemiscrotum with absence of landmarks.
   - ✓ Cremasteric reflex should be present
3. Urine:
   - ✓ pyuria, bacteriuria, or a positive urine culture (Gram-negative bacteria)

Epididymitis

Management

- ✓ Oral or Parenteral antibiotic therapy should be instituted
- ✓ Bed rest for 1 to 3 days then relative restriction
- ✓ Scrotal elevation, the use of an athletic supporter

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Priapism

Persistent erection of the penis for more than 4 hours that is not related or accompanied by sexual desire

Priapism

2 Types

- ✓ *Ischaemic (veno-occlusive, low flow)* *most common!*
  - ✓ Due to haematological disease, malignant infiltration of the corpora cavernosa with malignant disease, or drugs
  - ✓ Painful
- ✓ *Non-ischaemic* (arterial, high flow)
  - ✓ Due to perineal trauma, which creates an arteriovenous fistula
  - ✓ Painless

	Ischaemic priapism	Arterial priapism
Corpora cavernosa fully rigid	Usually	Seldom
Penile pain	Usually	Seldom
Abnormal penile blood gas	Usually	Seldom
Haematological abnormalities	Usually	Seldom
Recent intracorporeal injection	Sometimes	Sometimes
Perineal trauma	Seldom	Usually

Priapism

Table 1: Potential causative factors for ischaemic priapism

• Idiopathic
• Haematological dyscrasias (sickle cell disease, thalassemia, leukaemia; multiple myeloma, Hb Olmsted variant, fat emboli during hyperalimentation, haemodialysis, glucose-6-phosphate dehydrogenase deficiency, Factor V Leiden mutation)
• Infections (toxin-mediated) (i.e. scorpion sting, spider bite, rabies, malaria)
• Metabolic disorders (i.e. amyloidosis, Fabry's disease, gout)
• Neurogenic disorders (i.e. syphilis, spinal cord injury, cauda equina syndrome, autonomic neuropathy, lumbar disc herniation, spinal stenosis, cerebrovascular accident, brain tumour, spinal anaesthesia)
• Neoplasms (metastatic or regional infiltration) (i.e. prostate, urethra, testis, bladder, rectal, lung, kidney)
• Medications
o Vasoactive erectile agents (i.e. papaverine, phentolamine, prostaglandin E1/alprostadil, combination of intracavernous therapies)
o Alpha-adrenergic receptor antagonists (i.e. prazosin, terazosin, doxazosin, tamsulosin)
o Antianxiety agents (hydroxyzine)
o Anticoagulants (heparin, warfarin)
o Antidepressants and antipsychotics (i.e. trazodone, bupropion, fluoxetine, sertraline, lithium, clozapine, risperidone, olanzapine, chlorpromazine, thiorizadine, phenothiazines)
o Antihypertensives (i.e. hydralazine, guanethidine, propranolol)
o Hormones (i.e. gonadotropin-releasing hormone, testosterone)
o Recreational drugs (i.e. alcohol, marijuana, cocaine [intranasal and topical], crack, cocaine)

- ✓ **Idiopathic 30-50%**
- ✓ **Vasoactive erectile agents: intracavernous or oral**
- ✓ **Haematological dyscrasias: sickle cell disease, thalassemia**

https://uroweb.org/guideline/male-sexual-dysfunction/2017

Priapism

Diagnosis

1. Usually obvious from the history
   - ✓ Duration of erection >4 hours?
   - ✓ Is it painful or not?
   - ✓ Previous history and treatment of priapism?
   - ✓ Identify any predisposing factors and underlying cause

2. Examination
   - ✓ Erect, tender penis (in low-flow priapism)
   - ✓ Characteristically the corpora cavernosa are rigid and the glans is flaccid
   - ✓ Abdomen for evidence of malignant disease
   - ✓ DRE:to examine the prostate and check anal tone

Priapism

Investigations

- ✓ CBC (white cell count and differential, reticulocyte count)
- ✓ Hemoglobin electrophoresis for sickle cell test
- ✓ Urinalysis including urine toxicology
- ✓ Blood gases taken from corpora:

Table 5 – Typical blood gas values*

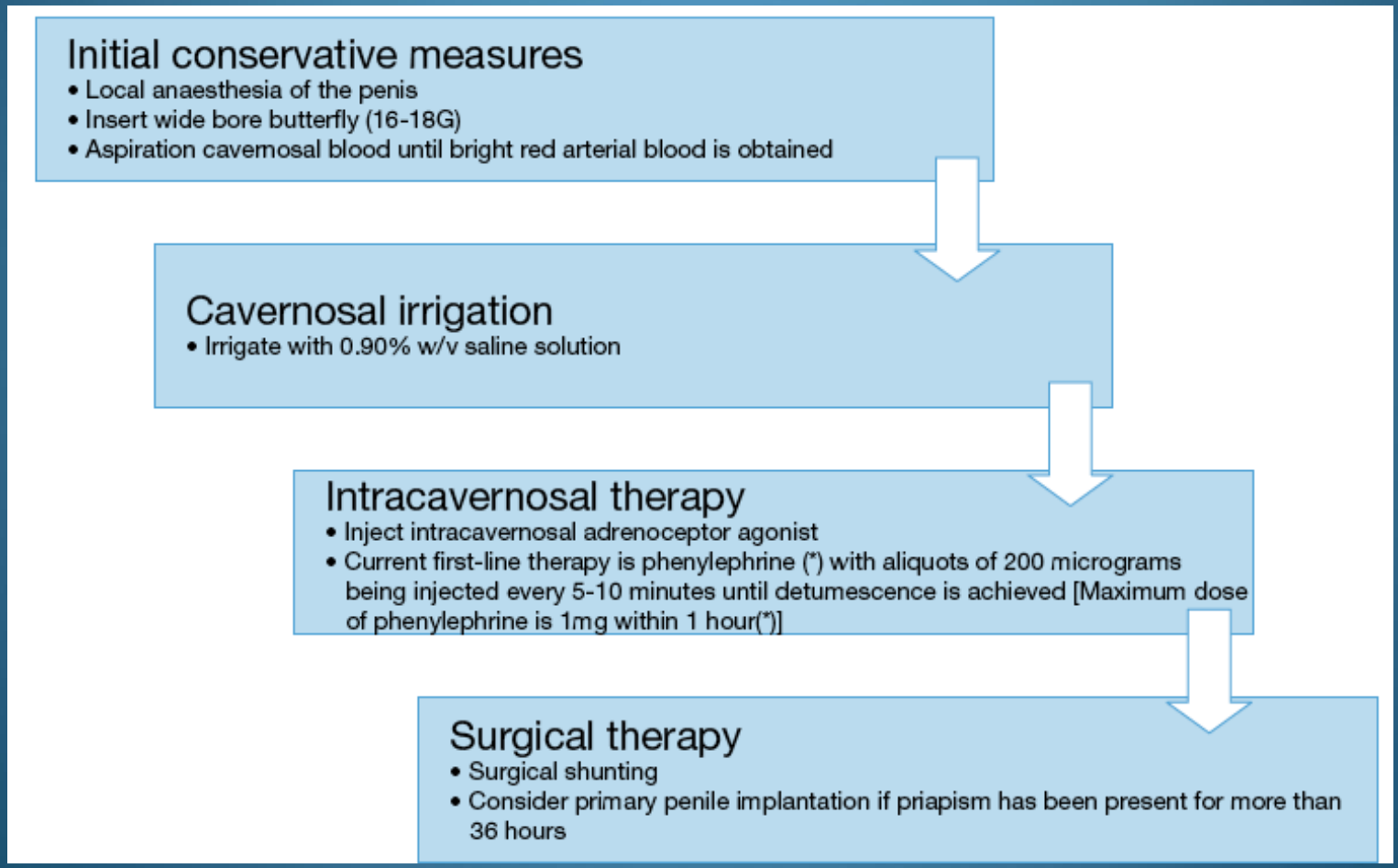
Source	pO_2 (mmHg)	pCO_2 (mm Hg)	pH
Normal arterial blood (room air)	>90	< 40	7.40
Normal mixed venous blood (room air)	40	50	7.35
Ischaemic priapism (first corporal aspirate)	<30	>60	<7.25

* Adapted from Broderick et al. [8].

https://uroweb.org/guideline/male-sexual-dysfunction/2017

Priapism

Treatment – Flow chart



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Priapism

Treatment – Initial conservative measures

- Initial corporal aspirate in ischemic priapism show **dark, deoxygenated blood** Subsequent aspirations will show **brighter blood as corpus cavernosum is re-oxygenated** by inflow.
- A butterfly needle for aspiration and injection should be placed at the peno-scrotal junction
- **Failed efforts** in the emergency room could be due to
  - Distal placement of butterfly needle
  - Failure to repeat aspirations

Campbell-Walsh Urology 10th Edition

Priapism

Treatment – Surgical Therapy

Rationale: to create a fistula between the corpora cavernosa and:

- the glans
- the corpus spongiosum
- the deep dorsal vein

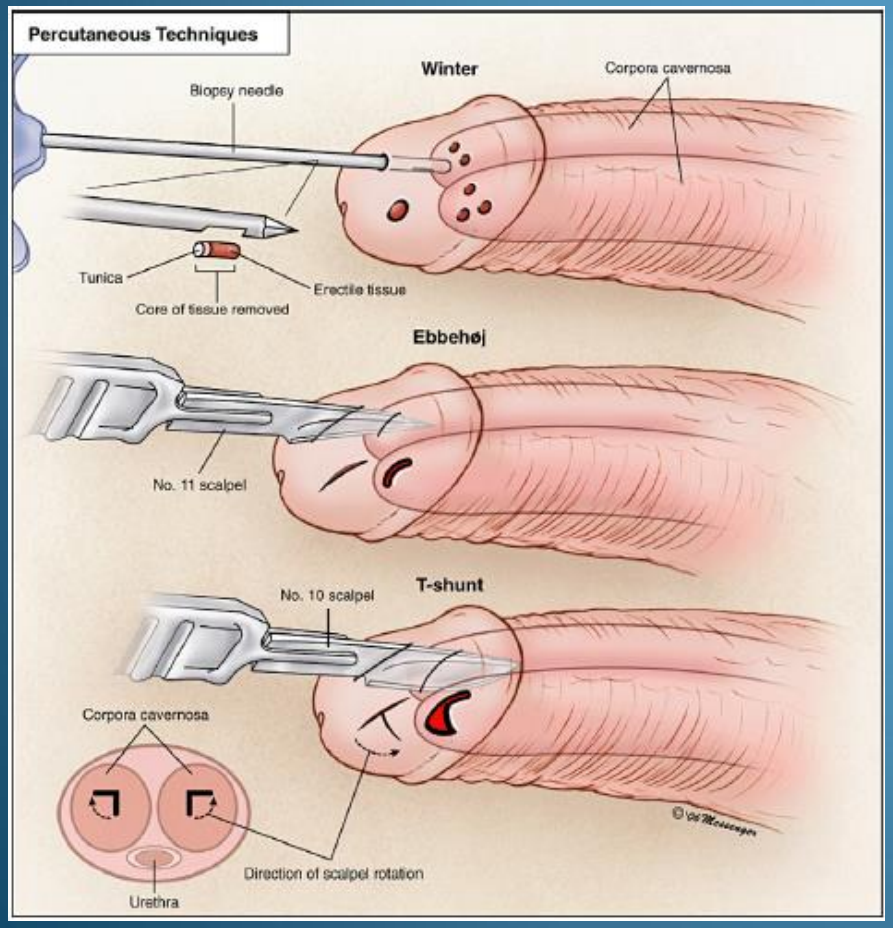
(cavernous deep dorsal vein shunt)

- the saphenous vein

(saphenous vein bypass cavernous)

Priapism

Treatment – Surgical Therapy



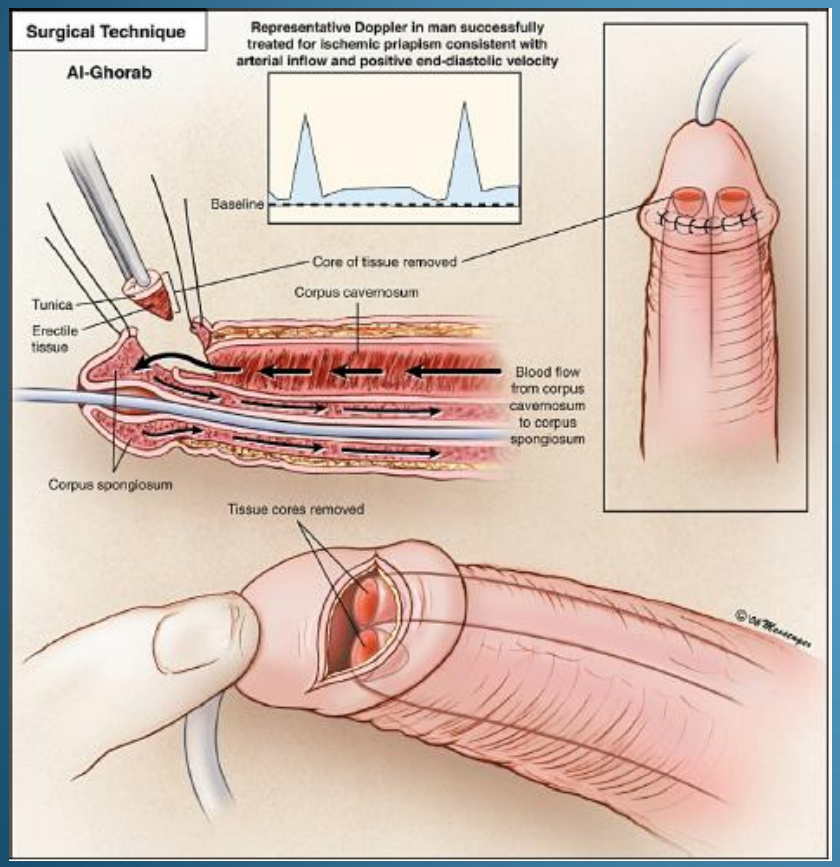
Percutaneous **distal corporoglanular shunts** may be performed in outpatient setting after penile block.

The objective is to **create a corpus cavernosum—glans communication for drainage** and permit resumption of cavernous arterial inflows

TF Lue J Sex Med 2006;3:749–752

Priapism

Treatment – Surgical Therapy



Open corporoglanular shunt is **indicated if percutaneous shunting fails to re-establish cavernous blood inflow.**

The Al-Ghorab shunt requires the excision of circular cone segments of distal tunica albuginea (5 x 5 mm).

TF Lue J Sex Med 2006;3:749–752

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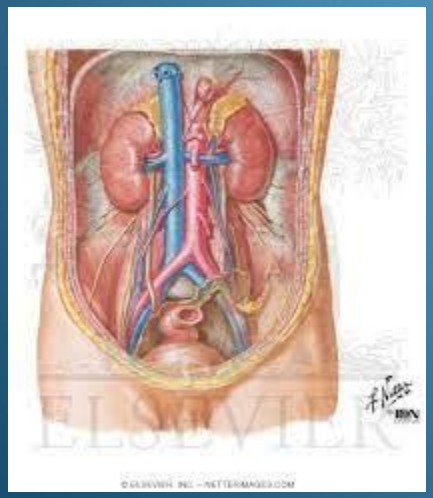
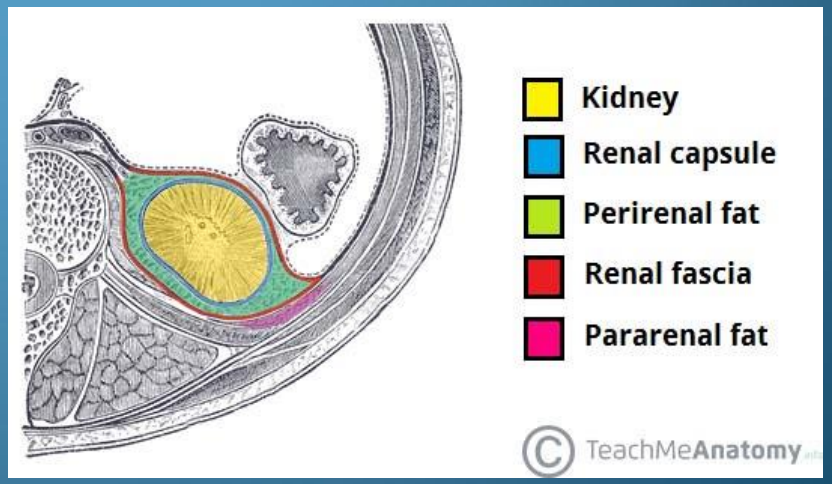
Renal Injury

- ✓ The kidneys relatively protected from traumatic injuries
- ✓ Considerable degree of power is usually required to injure a kidney





Renal Injury

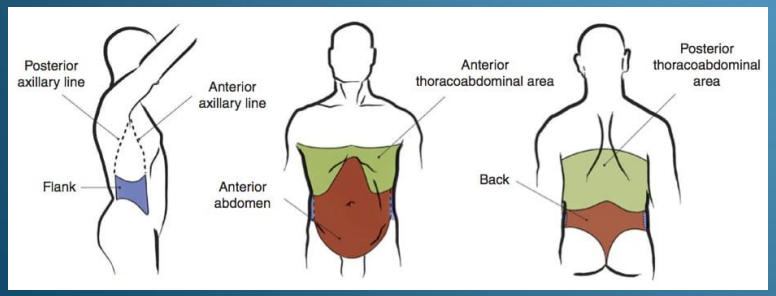
Mechanisms and causes

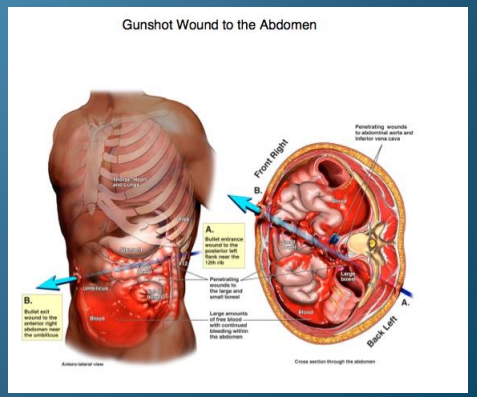
- ✓ **Blunt**

  direct blow or acceleration/ deceleration (road traffic accidents, falls from a height, fall onto flank)

- ✓ **Penetrating**

  knives, gunshots, iatrogenic, e.g., percutaneous nephrolithotomy (PCNL)





Renal Injury

Indications for renal imaging

- ✓ Macroscopic hematuria
- ✓ Microscopic [>5 red blood cells (RBCs) per high powered field] or dipstick hematuria and hypotensive patient (SBP <90mmHg)
- ✓ A history of a rapid acceleration or deceleration
- ✓ Any child with microscopic or dipstick hematuria who has sustained traum
- ✓ Penetrating chest, flank, and abdominal wounds

Renal Injury

What Imaging Study?

Renal US:

- ✓ Advantages:
  - ✓ can certainly establish the presence of two kidneys
  - ✓ the presence of a retroperitoneal hematoma
  - ✓ power Doppler can identify the presence of blood flow in the renal vessels.

- ✓ Disadvantages:
  - ✓ cannot accurately identify parenchymal tears, collecting system injuries, or extravasations of urine until a later stage when a urine collection has had time to accumulate

Renal Injury

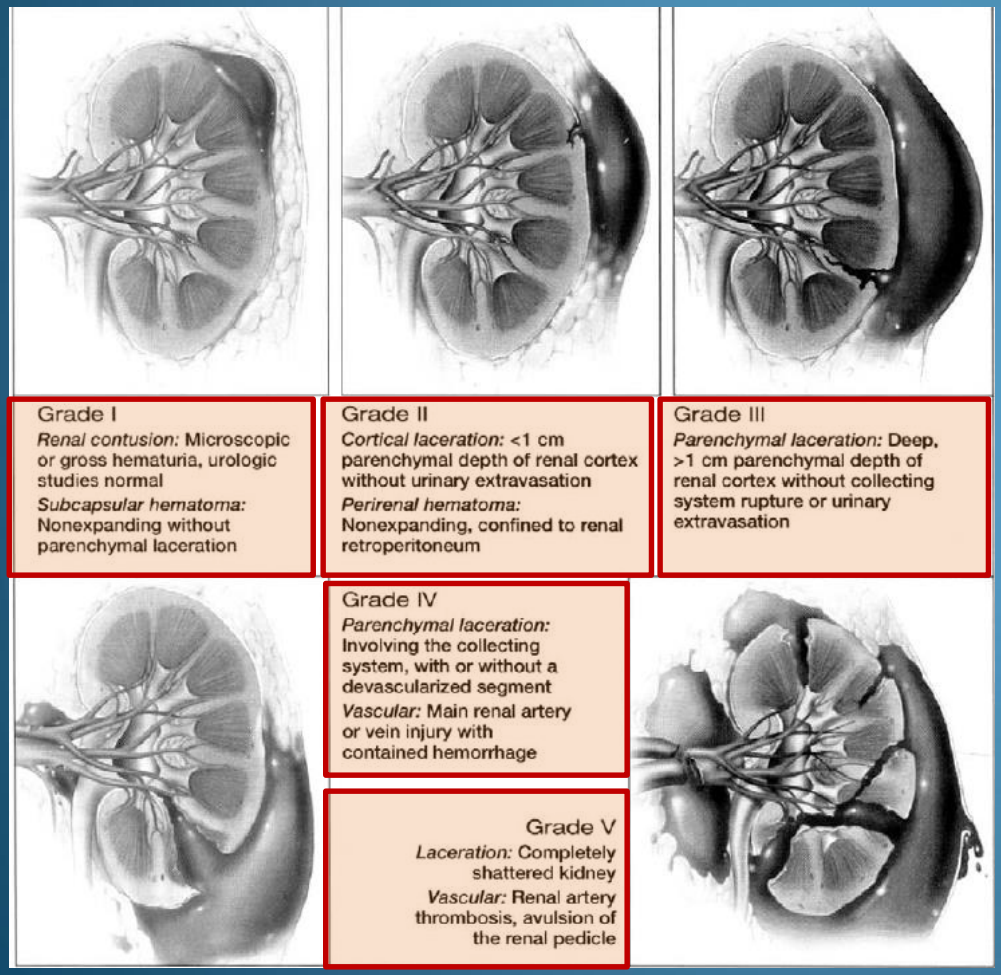
What Imaging Study?

Contrast-enhanced CT:

- ✓ the imaging study of choice
- ✓ accurate, rapid, images other intra-abdominal structures

- ✓ Contrast enhanced CT scan
  - ✓ On-table IVU if patient is transferred immediately to the operating theatre without having had a CT scan and a retroperitoneal haematoma is found

Renal Injury

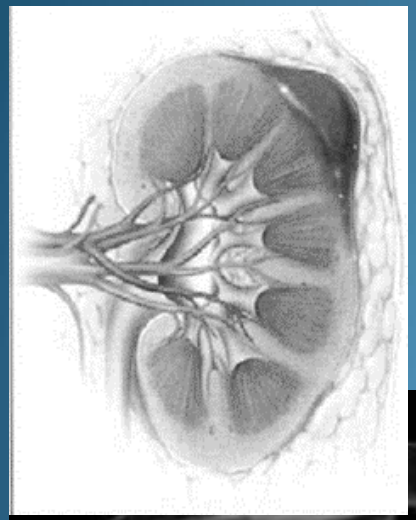


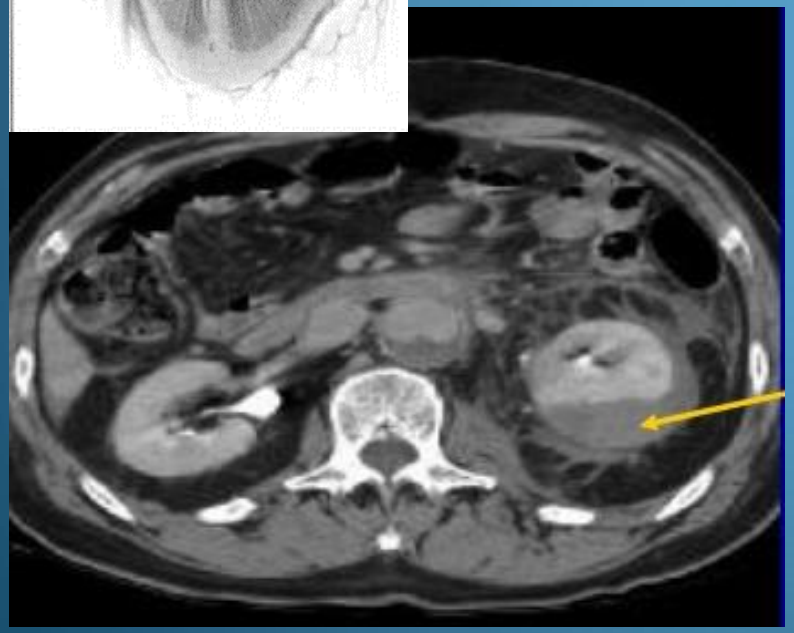
Staging (Grading)

American Association for the Surgery of Trauma

Organ Injury Severity Scale

Renal Injury





Grade I

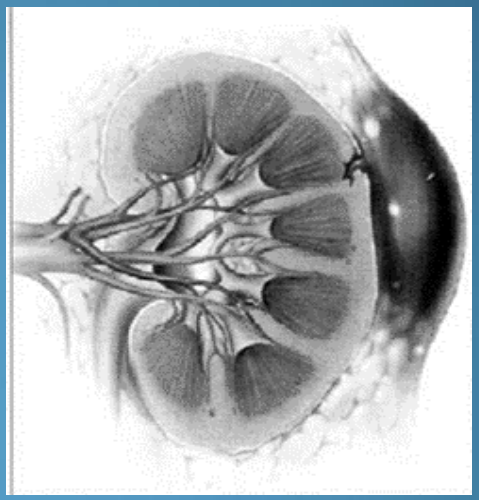
Car accident

Renal contusion

and

subcapsular haematoma

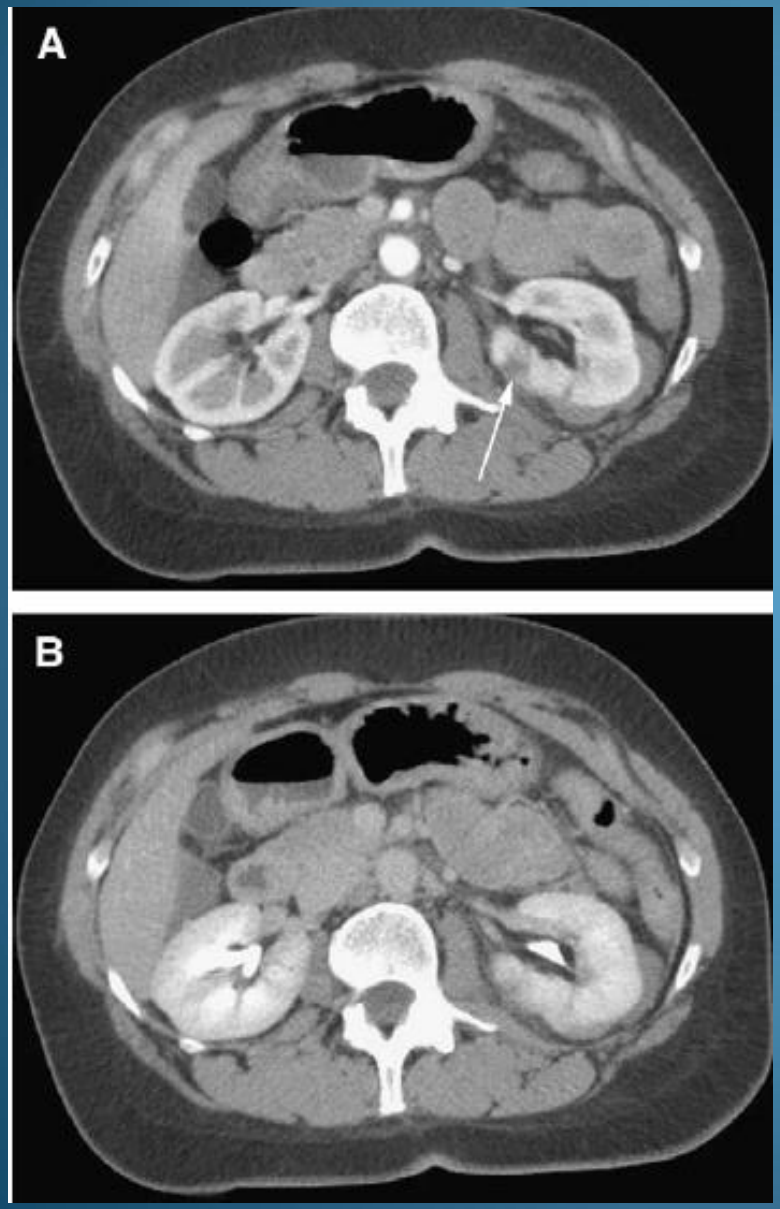
Renal Injury

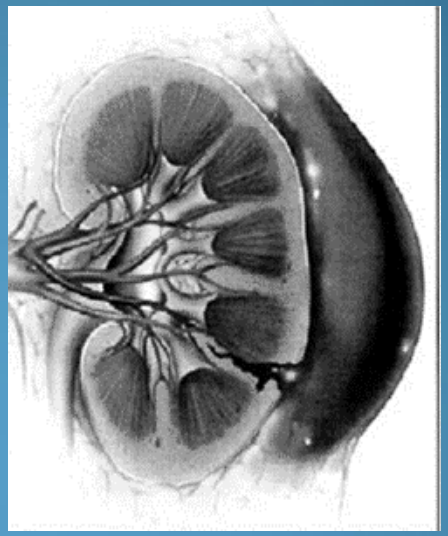


Grade II

- ✓ Cortical laceration < 1 cm
- ✓ Retroperitoneal non expanding haematoma

Renal Injury

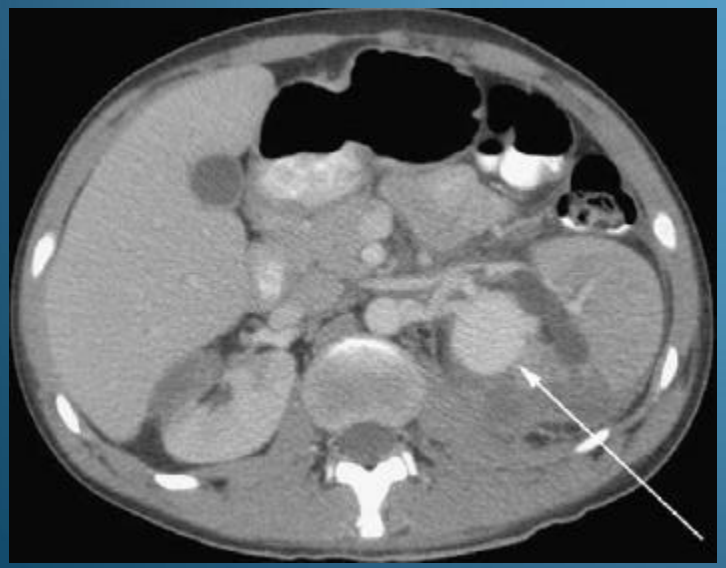


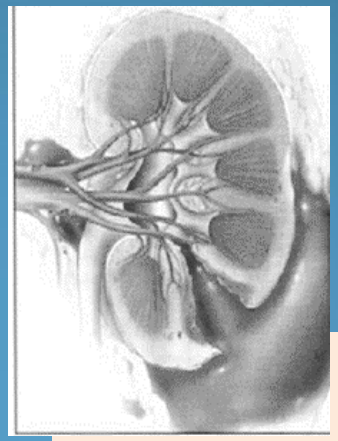


Grade III

- ✓ Parenchimal laceration > 1cm
- ✓ without urinary extravasation

Renal Injury



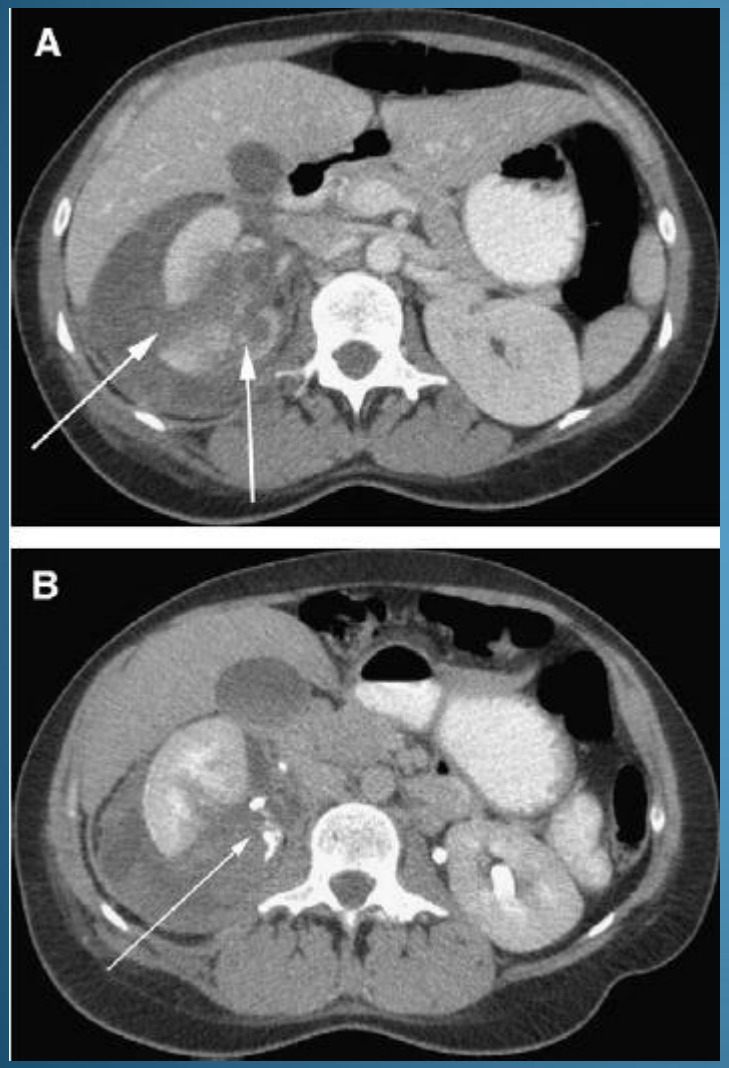


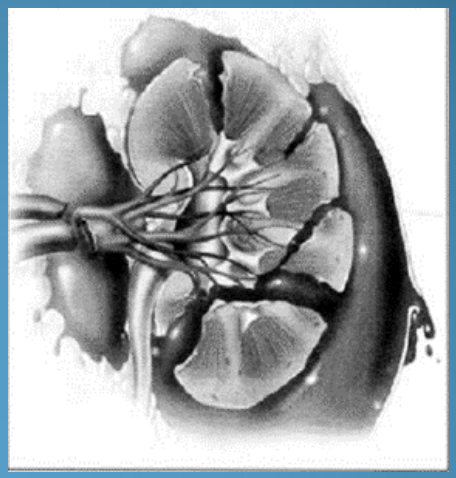
Grade IV

- ✓ Lacerations involving the collecting system
- ✓ Devascularized segment
- ✓ Pseudoaneurysm

(renal artery contained injury)

Renal Injury





Grade V

- ✓ Multiple lacerations
- ✓ Large expanding haematoma
- ✓ Urinary extravasation

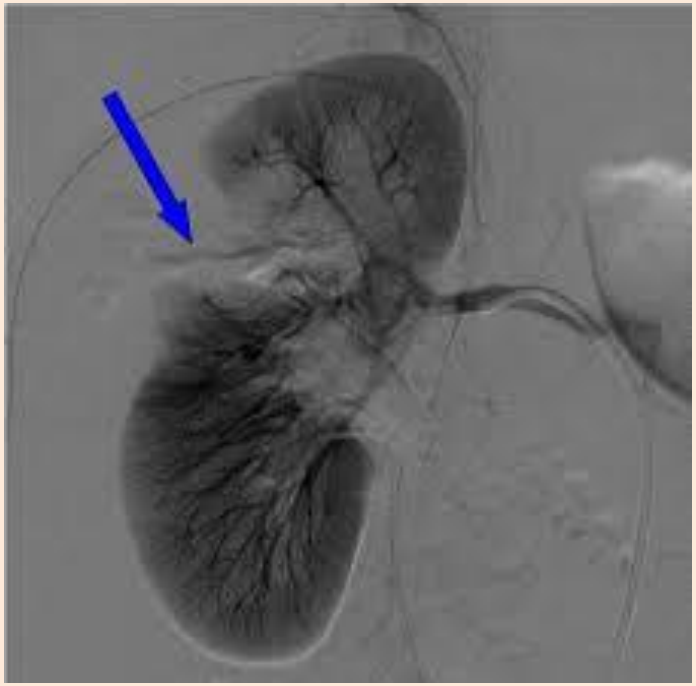
Renal Injury

Conservative Management

- ✓ Over 95% of blunt injuries
- ✓ 50% of renal stab injuries and 25% of renal gunshot wounds (specialized center)
    - Include:
        - ✓ Wide Bore IV line
        - ✓ IV antibiotics
        - ✓ Bed rest
        - ✓ serial CBC (Htc)
        - ✓ F/up US &/or CT
        - ✓ 2-3 wks

Renal Injury

Conservative management



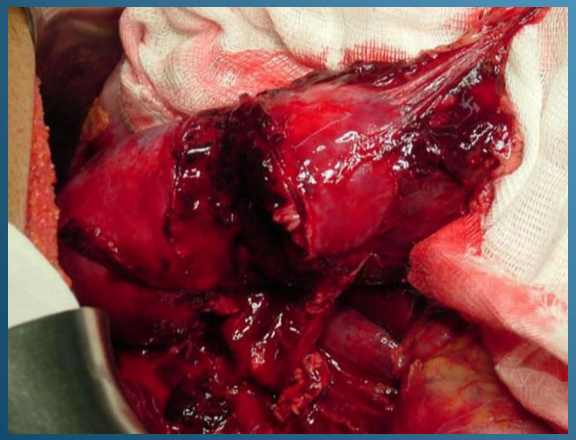
Arterial Embolization

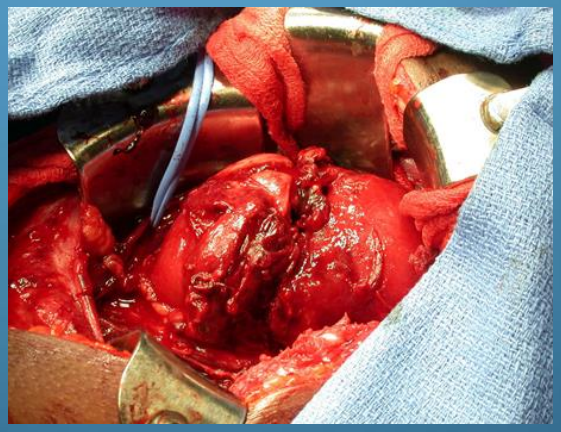
Urinary Drainage

Renal Injury

Surgical Exploration

- ✓ Persistent bleeding (persistent tachycardia and/or hypotension failing to respond to appropriate fluid and blood replacement)
- ✓ Expanding perirenal haematoma (again the patient will show signs of continued bleeding)
- ✓ Pulsatile perirenal haematoma





Urological Emergencies

Non traumatic

- Hematuria
- Renal Colic
- Urinary Retention
- Acute Scrotum
- Priapism

Traumatic

- Renal Injury
- Ureteral Injury
- Bladder Injury
- Urethral Injury
- Penile Injury
- Testicular Injury

Ureteral Injury

- ✓ The ureters are protected from external trauma by surrounding bony structures, muscles and other organs

Causes and Mechanisms:

- ✓ External Trauma
- ✓ Internal Trauma

Fig. 12. Excretory urogram of patient who suffered abdominal stab wound. Note there is no contrast distal to the site of extravasation, indicative of complete ureteral transaction. (*From* McAninch JW, Santucci RA. Genitourinary rauma. In: Walsh PC, Retik AB, Vaughan ED, et al, editors. Campbell's urology. 8th edition. Philadelphia: WB Saunders; 2002. p. 3717.)

Ureteral Injury

External Trauma

- ✓ Rare
- ✓ Severe force is required
- ✓ Blunt or penetrating
- ✓ Blunt external trauma severe enough to injure the ureters will usually be associated with multiple other injuries
- ✓ Knife or bullet wound to the abdomen or chest may damage the ureter as well as other organs

Ureteral Injury

Internal Trauma

Uncommon, but is more common than external trauma

Surgery:

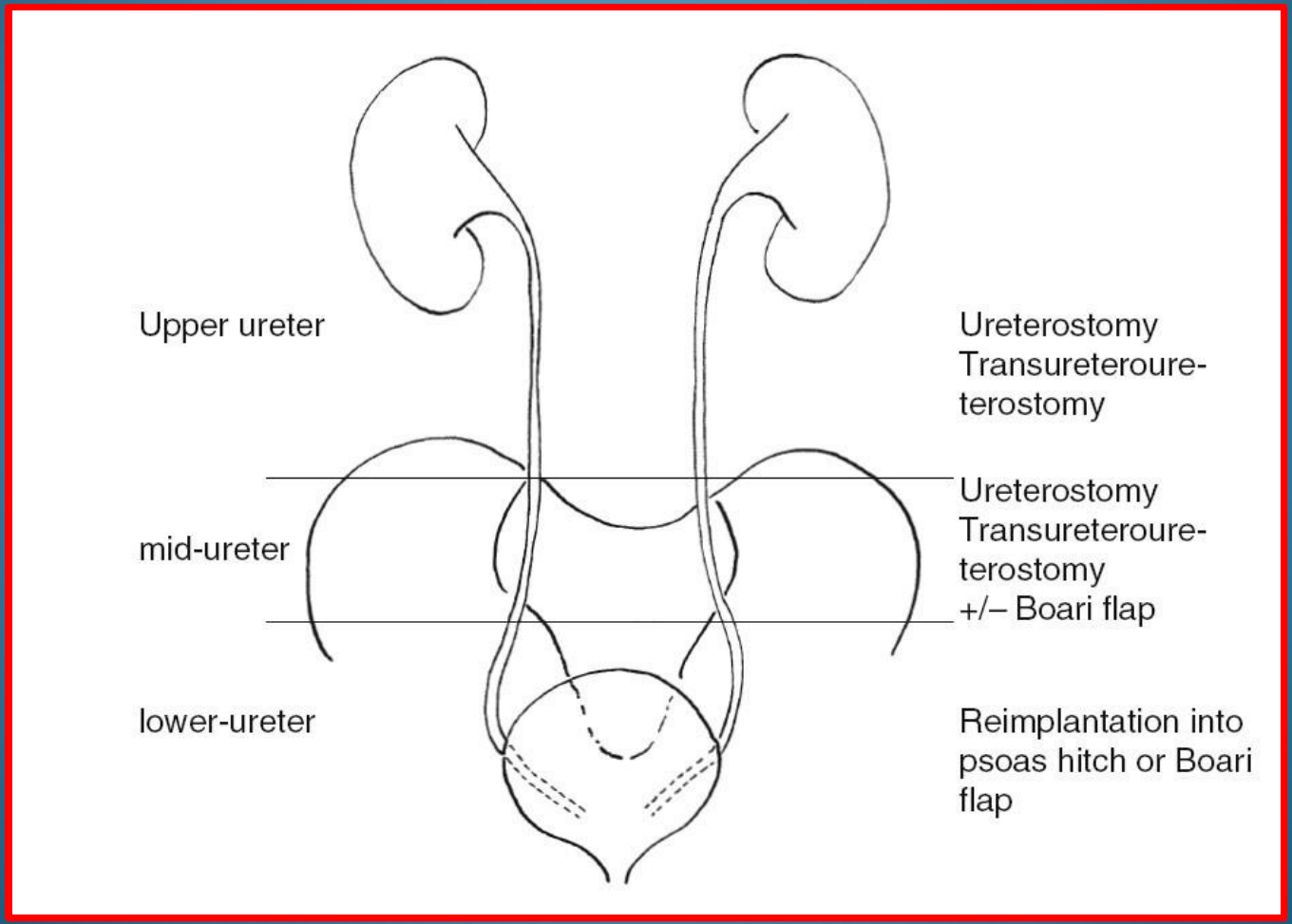
- ✓ Hysterectomy, oophorectomy, sigmoidocolectomy
- ✓ Ureteroscopy
- ✓ Caesarean section
- ✓ Aortoiliacvascular graft placement
- ✓ Laparoscopic procedures
- ✓ Orthopedic operations

Ureteral Injury

Diagnosis

- ✓ Requires a high index of suspicion
- ✓ Intraoperative
- ✓ Late contrast enhanced CT scan
  - An ileus: the presence of urine within the peritoneal cavity
  - Prolonged postoperative fever or overt urinary sepsis
  - Persistent drainage of fluid from abdominal or pelvic drains, from the abdominal wound, or from the vagina
  - Flank pain if the ureter has been ligated
  - An abdominal mass, representing a urinoma
  - Vague abdominal pain
  - The pathology report on the organ that has been removed may note the presence of a segment of ureter!

Ureteral Injury



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- Penile Injury
- Testicular Injury

Bladder Injuries

Causes

- ✓ Iatrogenic injuries
  - ✓ Transurethral resection of bladder tumour (TURBT)
  - ✓ Cystoscopic bladder biopsy
  - ✓ Transurethral resection of prostate (TURP)
  - ✓ Cystolitholapaxy
  - ✓ Caesarean section, especially as an emergency
  - ✓ Total hip replacement (very rare)

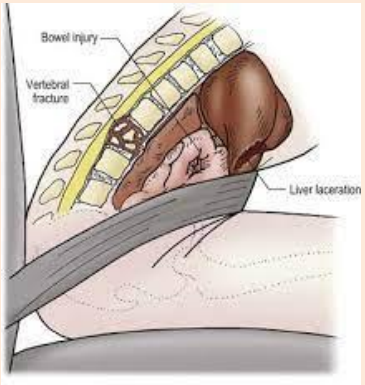
- ✓ Blunt pelvic trauma
- ✓ Penetrating trauma to the lower abdomen or back
- Penetrating trauma secondary to pelvis fractures
- Stub penetrating trauma

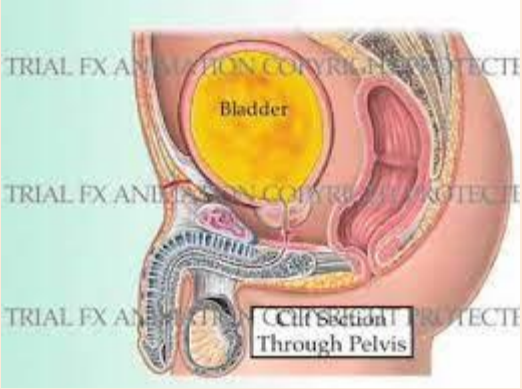
Bladder Injuries

Causes

- ✓ Blunt pelvic trauma

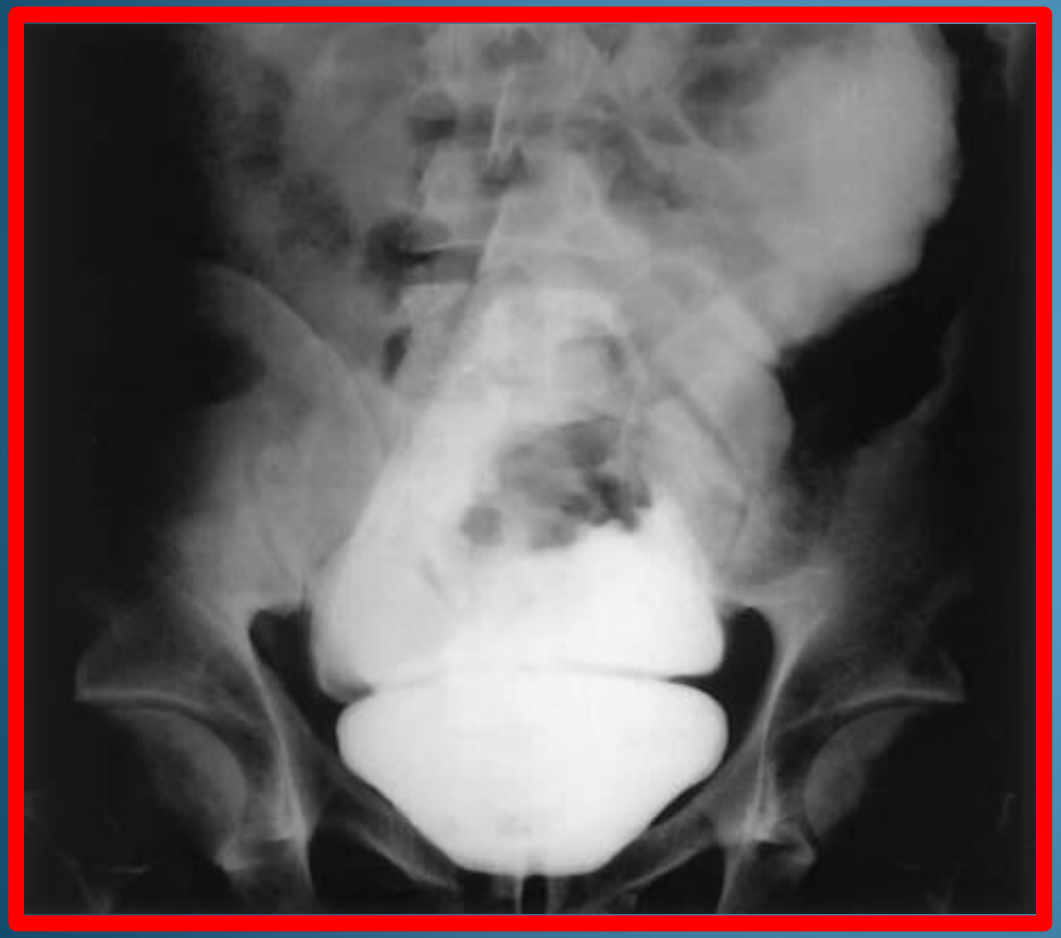
- Rapid deceleration with a full bladder
  - Seat belt injuries
  - Motorcycle accidents





- Spontaneous rupture after bladder augmentation

Bladder Injuries

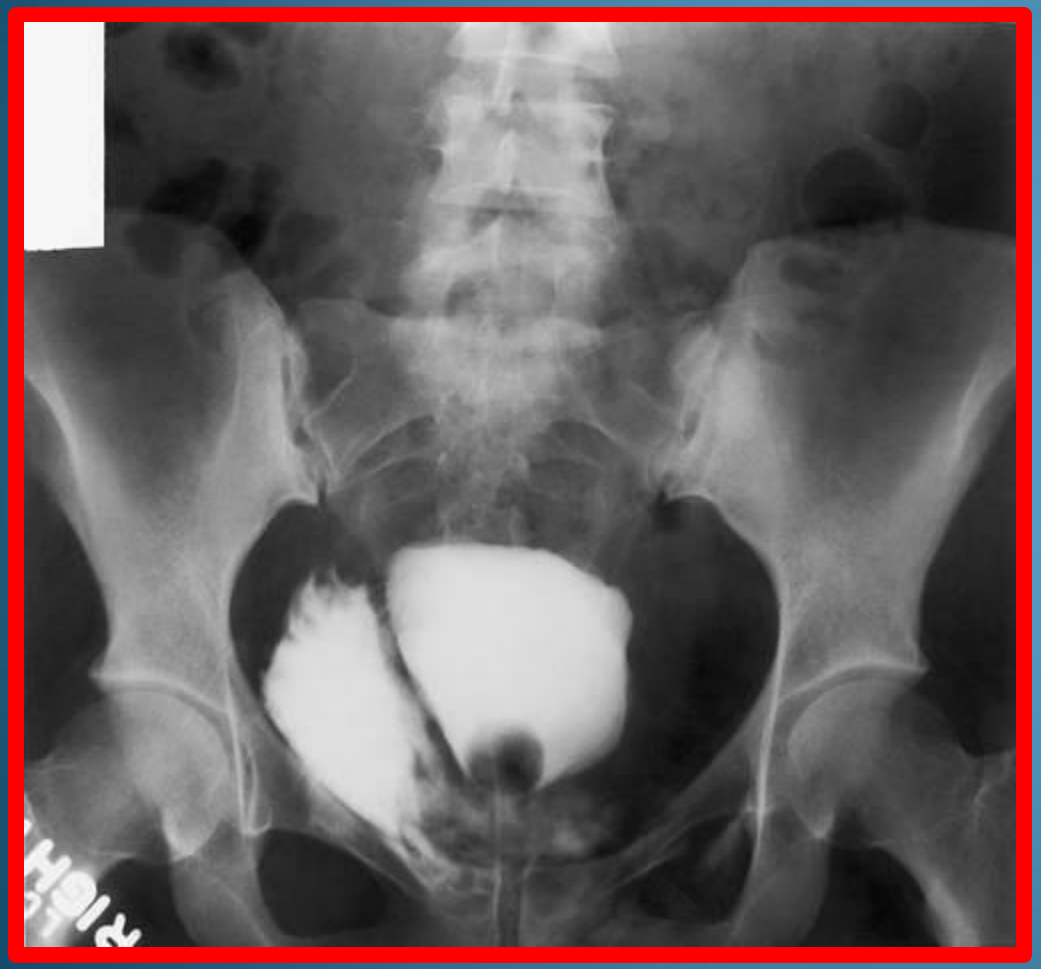


1. Intraperitoneal perforation

The peritoneum, overlying the bladder, has been breached along with the dome wall of the bladder, allowing urine to flow into the peritoneal cavity

URINARY PERITONITIS

Bladder Injuries



2. Extraperitoneal perforation

The peritoneum remain intact
and urine flow
Into the pelvis but not
Into the peritoneal cavity.

PELVIS URINOMA

Bladder Injuries

Clinical Presentation

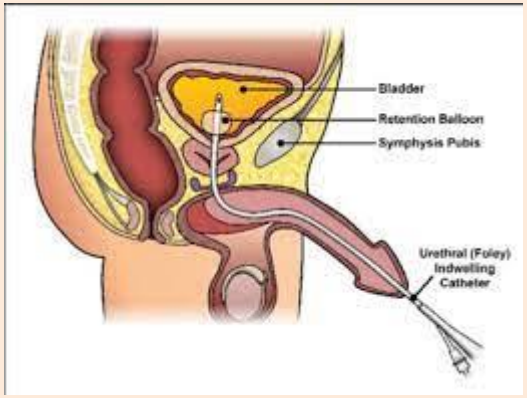
- ✓ Recognized intraoperatively and immediately repaired
- ✓ The classic triad of symptoms and signs that are suggestive of a bladder rupture
  - Suprapubic pain and tenderness
  - Inability to pass urine
  - Haematuria
  - Peritonitis for intraperitoneal bladder rupture

Bladder Injuries

Management

1. Extraperitoneal

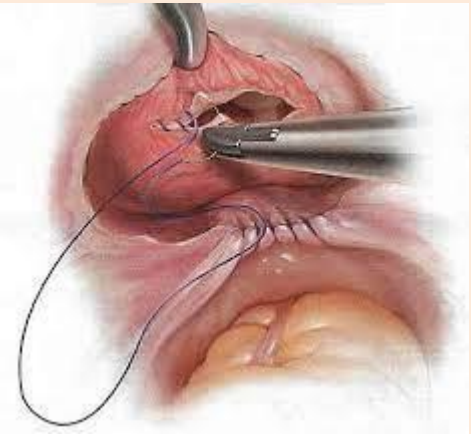
Bladder drainage or open repair



2. Intraperitoneal

Always open repair! Why?

- ✓ Unlikely to heal spontaneously
- ✓ Usually large defects
- ✓ Leakage causes peritonitis
- ✓ Associated other organ injury



Urological Emergencies

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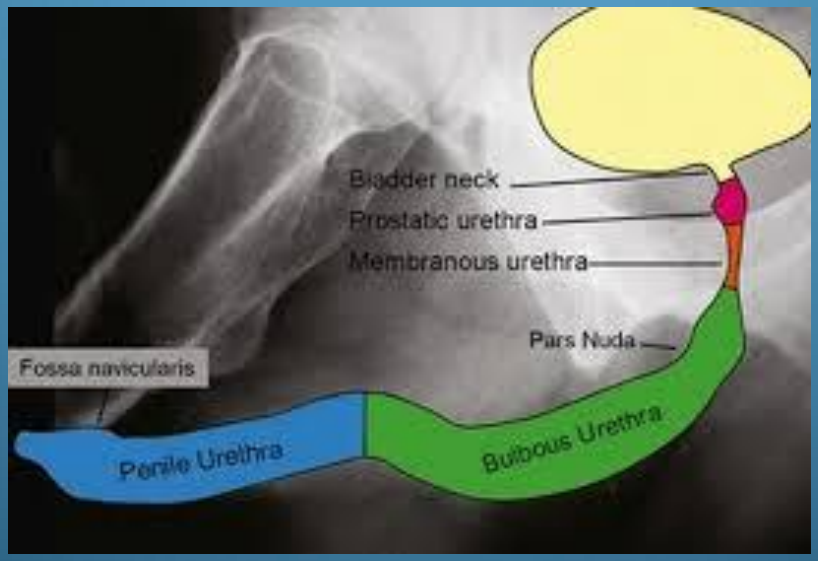
- Urethral Injury
- Penile Injury
- Testicular Injury

Urethral injuries

- ✓ ANTERIOR URETHRAL INJURIES
- ✓ POSTERIOR URETHRAL INJURIES



Anterior Urethral Injuries

Table 4.7: Aetiology of anterior urethral injuries
Causes
Blunt trauma
• Vehicular accidents
• Fall astride
• Kicks in the perineum
• Blows in the perineum from bicycle handlebars, tops of fences, etc.
Sexual intercourse
• Penile fractures
• Urethral intraluminal stimulation
Penetrating trauma
• Gunshot wounds
• Stab wounds
• Dog bites
• External impalement
• Penile amputations
Constriction bands
• Paraplegia
Iatrogenic injuries
• Endoscopic instrumentations
• Urethral catheters-dilators

A rare event

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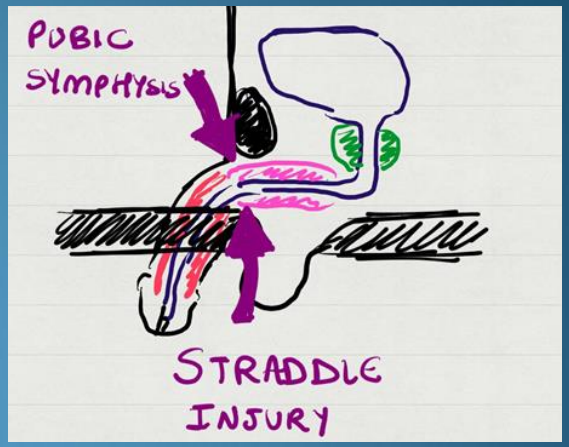
Anterior Urethral Injuries

Mechanism

- ✓ The majority are result of a straddle injury in boys or men



- ✓ Direct injuries to the penis
- ✓ Penile fractures
- ✓ Inflating a catheter balloon in the anterior urethra
- ✓ Penetrating injuries by gunshot wounds

Anterior Urethral Injuries

Signs and symptoms

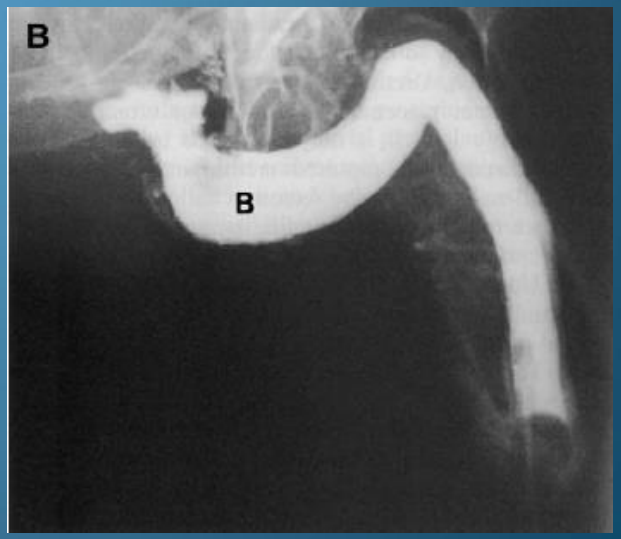
- ✓ Urethrorrhagia
- ✓ Difficulty in passing urine
- ✓ Frank hematuria
- ✓ Hematoma may around the site of the rupture
- ✓ Penile swelling

Anterior Urethral Injuries

Diagnosis

Retrograde urethrography

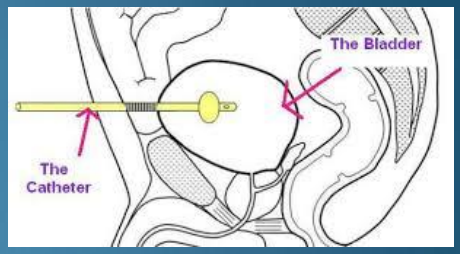
- Contusion: no extravasation of contrast
- Partial rupture : extravasation of contrast, with contrast also present in the bladder
- Complete disruption: no filling of the posterior urethra or bladder

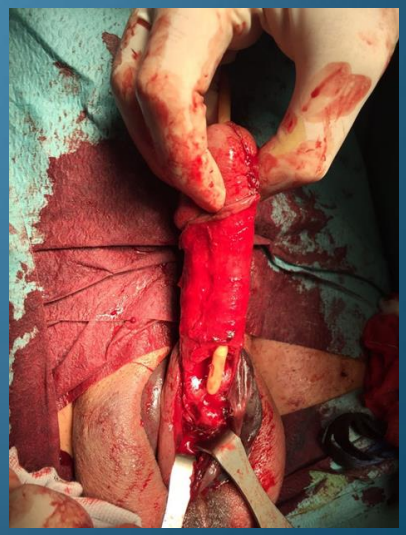


Anterior Urethral Injuries

Management

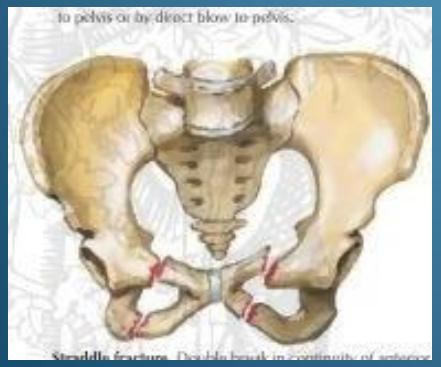
- ✓ **Contusion**
  - A small-gauge urethral catheter for one week
- ✓ **Partial Rupture of Anterior Urethra**
  - No urethral catheterization
  - Majority can be managed by suprapubic urinary diversion for one week
  - Penetrating partial disruption (e.g., knife, gunshot wound), primary (immediate) repair
- ✓ **Complete Rupture of Anterior Urethra**
  - patient is unstable a suprapubic catheter
  - patient is stable, the urethra may either be immediately repaired or a suprapubic catheter
- ✓ **Penetrating Anterior Urethral Injuries**
  - generally managed by surgical debridement and repair

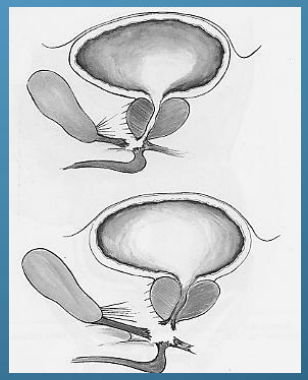


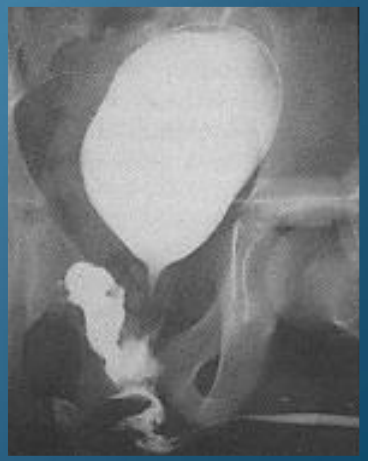


Posterior Urethral Injuries

- ✓ The great majority of posterior urethral injuries occur in association with pelvic fractures.
  Fracture of the ischio or ileo -pubic branch
- ✓ Rupture of the urethra at the prostatic apex
- ✓ Signs
  - ✓ Blood at the meatus, gross hematuria, and perineal or scrotal bruising
  - ✓ High-riding prostate
  - ✓ Balloon-like bladder







Posterior Urethral Injuries

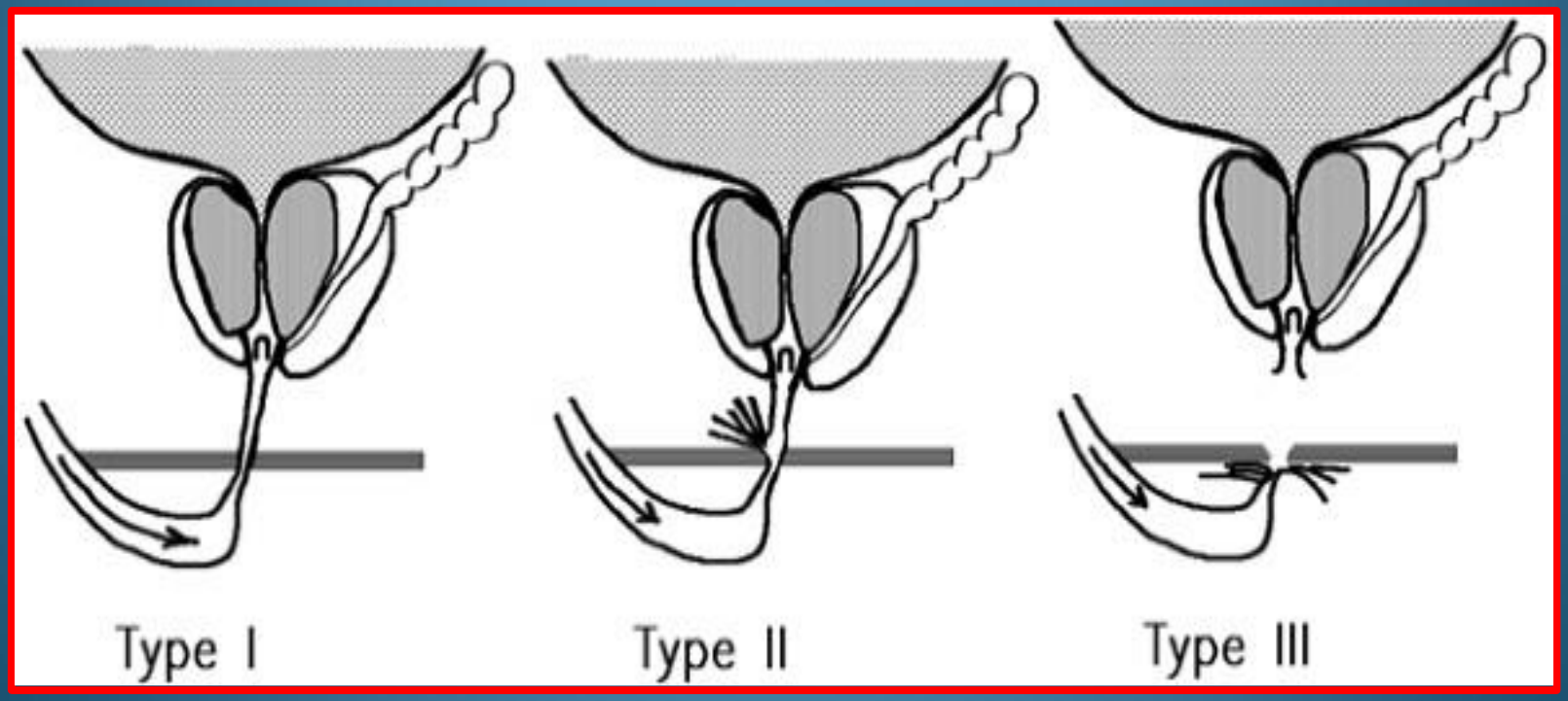
Classification - Collapinto and McCallum

- ✓ type I (rare) stretch injury with intact urethra
- ✓ type II (25%) partial tear but some continuity remains
- ✓ type III (75%) complete tear with no evidence of continuity

Type	Description	Radiographic appearance
1	Urethral contusion or stretch injury	Passage of contrast into the bladder, without extra-vasation and elongation of posterior urethra
2	Partial or complete rupture above the urogenital genital diaphragm (supra-diaphragmatic rupture)	Contrast may reach the bladder, but extravasation is present into the pelvis
3	Complete disruption of the membranous urethra and urogenital diaphragm (sub- and supra-diaphragmatic rupture)	Contrast does not reach the bladder and extravasation is seen into the perineum

Posterior Urethral Injuries

Classification – Collapinto and McCallum



Posterior Urethral Injuries

Management

- ✓ Stretch injury (type I) and incomplete urethral tears (type II) are best treated by stenting with a urethral catheter

- ✓ Type III
  - ✓ Patient is at varying risk of urethral stricture, urinary incontinence, and erectile dysfunction
  - ✓ Initial management with suprapubic cystotomy and attempting realignment or primary repair as a second surgical step when more urgent orthopedic or surgical problems ghave been fixed

Urological Emergencies

Non traumatic

- Hematuria
- Renal Colic
- Urinary Retention
- Acute Scrotum
- Priapism

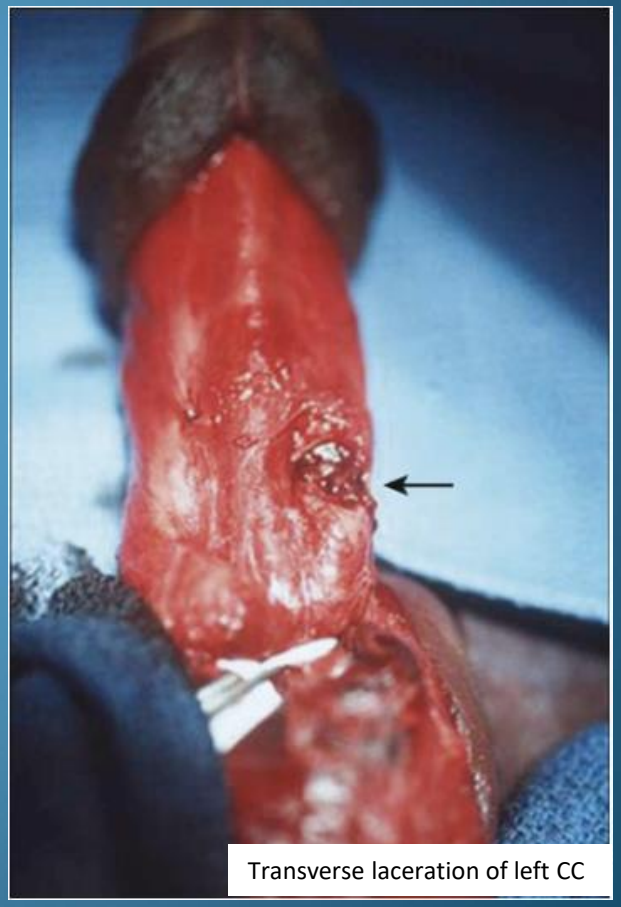
Traumatic

- Renal Injury
- Ureteral Injury
- Bladder Injury
- Urethral Injury
- Penile Injury
- Testicular Injury

Penile Injuries

Rupture of the *corpus cavernosum*

- ✓ Most common in the 4th decade of life
- ✓ Mostly unilateral
- ✓ Associated urethral injury seen in roughly 20 – 30%



Transverse laceration of left CC

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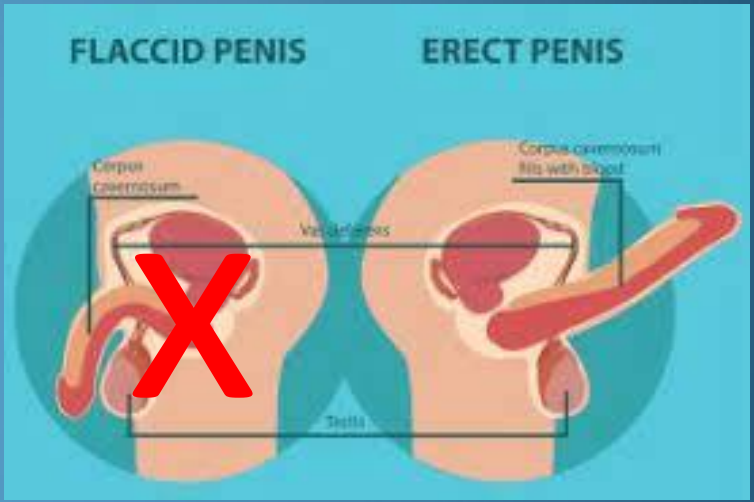
Penile Injuries

Aetiology:

- Only during erection!
- Complete fracture of the tunica albuginea.
- When?

✓ Sexual intercourse (66.7%) (woman on top positions)
✓ Forced flexion
✓ Masturbation



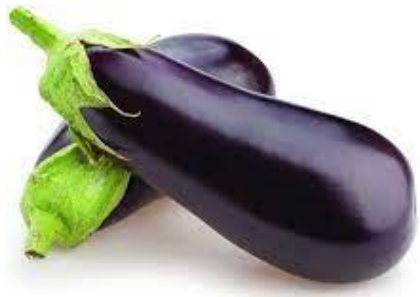
Tear or laceration in the tunica albuginea.

Penile Injuries

Clinical presentation

Most cases present as emergencies and the complaints are mostly those of:

- ✓ Pain
- ✓ Swelling
- ✓ Typical eggplant aspect of the penis
- ✓ Loss of erection
- ✓ ± bleeding per urethra and inability to pass urine



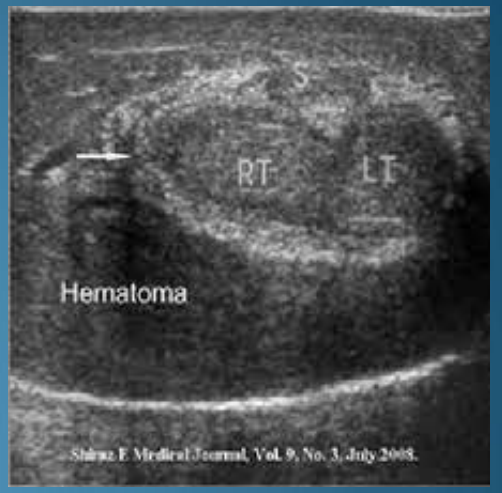
«Eggplant deformity»

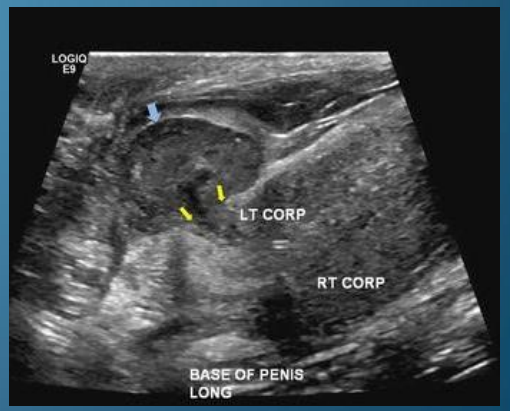
Penile Injuries

Diagnosis

- ✓ This is basically clinical but there are some instances where investigations may be required for confirmation.
- ✓ Differentials:
  - ✓ Rupture of the dorsal penile vessels
  - ✓ Rupture of the suspensory ligament of the penis

- ✓ Imaging modalities are not essential to make a diagnosis as they usually just increase cost and do not necessarily change the treatment plan.
  - ✓ Penile ultrasound
  - ✓ MagneticResonanceimaging
  - ✓ Penile Cavernosography
  - ✓ Retrogradeurethrography





Penile Injuries

Management

Surgical

- ✓ Circumferential incision and degloving • *Most common approach*
- ✓ Suture of the ruptured corpus cavernosum

Conservative

- ✓ Rarely performed
- ✓ May be attempted if the history is suggestive but the examination findings are not in line with penile fracture.
- ✓ Investigations do not show any tear in the tunica albuginea ot the tear is < 0.5cm with minimal haematoma formation

Penile Injuries

Complications

- ✓ Erectile dysfunction
- ✓ Penile deformity
- ✓ Urethral strictures
- ✓ Painful erection
- ✓ Painful intercourse
- ✓ Skin necrosis
- ✓ Fistulas (A-V, urethro-cavernous)
- ✓ Priapism
- ✓ Peyronie's disease

Frequent for untreated injuries!

Urological Emergencies

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- Testicular Injury

Scrotal Injuries

- ✓ Haematocele
- ✓ Haematoma
- ✓ Testicular dislocation/torsion
- ✓ Testicular rupture

Testicular Injuries

Clinical Presentation

Direct trauma

Testicular Injuries

Clinical Presentation

- ✓ Acute pain
- ✓ Scrotal haematoma

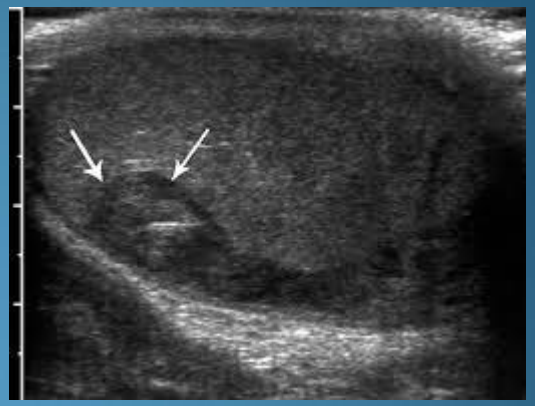
Testicular Injuries

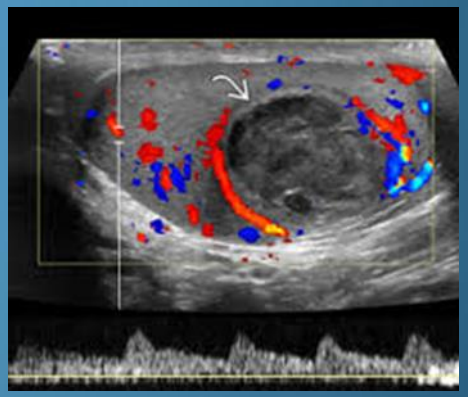
Diagnosis

Testicular ultrasound

Looking for:

- ✓ Scrotal haematoma
- ✓ Testicular haematoma
- ✓ Altered vascularization
- ✓ US signs of testicular rupture





Testicular Injuries

Treatment

Contusions.

Observation

Testicular fracture

Surgery

Scrotal Injuries

Fournier's Gangrene

- ✓ Anaerobic infection as a complication of a Urinary Tract Infection of Abscess
- ✓ Necrotizing fasciitis or **gangrene** affecting the external genitalia or perineum.

Frequently related conditions

- ✓ Diabetes
- ✓ Alchool abuse
- ✓ Chemotherapy
- ✓ HIV infections

SURGERY IS MANDATORY