Urological emergencies

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Traumatic

- Kidney
- ureter
- bladder
- urethra

Non-traumatic

- hematuria
- renal colic
- testicular torsion
- Urinary retention

Renal colic

Case

A 24-year-old male presented with left flank pain for 2 days.

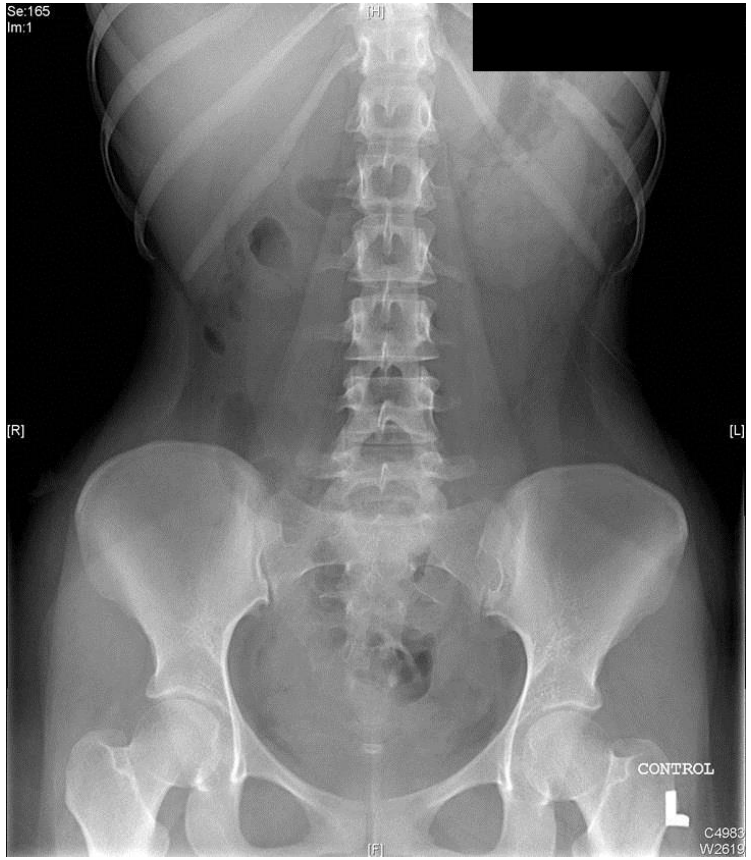
Differential Diagnosis

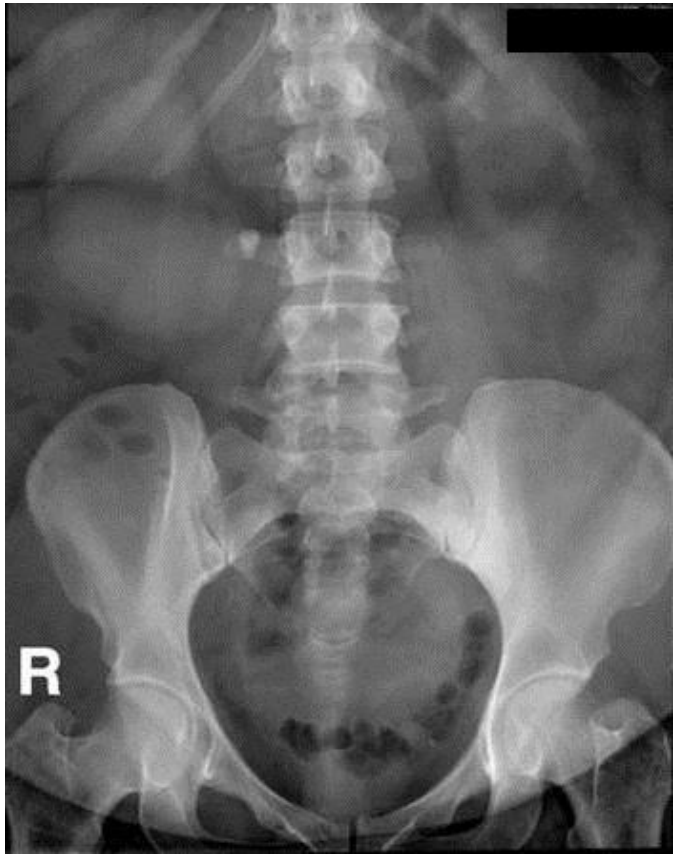
- Radiculitis (pseudo-renal)
- Leaking abdominal aortic aneurysms
- Pneumonia
- Myocardial infarction
- Ovarian pathology (e.g., twisted ovarian cyst)
- Acute appendicitis
- Testicular torsion
- Inflammatory bowel disease (Crohn’s, ulcerative colitis)
- Diverticulitis
- Ectopic pregnancy
- Burst peptic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

Investigations

- CBC
- Renal profile
- Urine analysis
- Imaging (which one)

KUB





US

IVU

MRU

Gold Standard

- CT without contrast

- Next?

Treatment

- Hydration
- Analgesia
- Medical expulsion therapy
- When do you admit/intervene?

Indications

- Infection
- Renal impairment
- Persistent nausea and vomiting
- Persistent pain not responding to oral analgesia
- Failure of medical therapy

Case

Same patient presented with fever and increase left flank pain

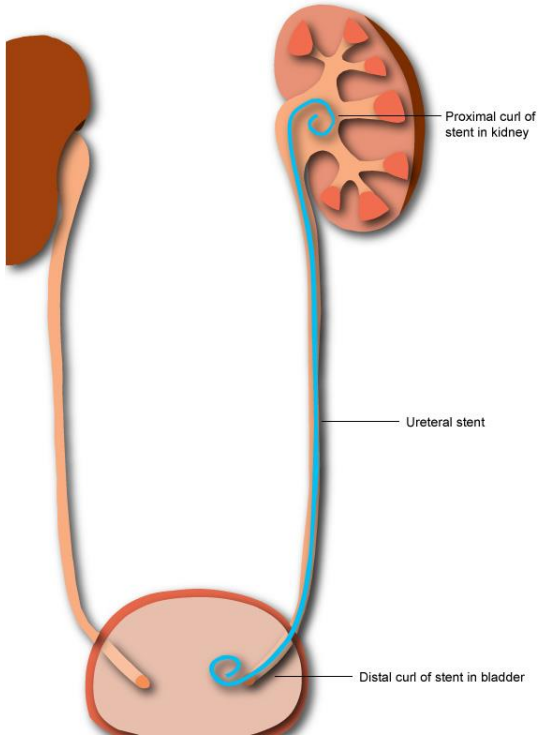
CBC:	Elevated WBC
Renal profile :	Normal
CT:	Same

Treatment

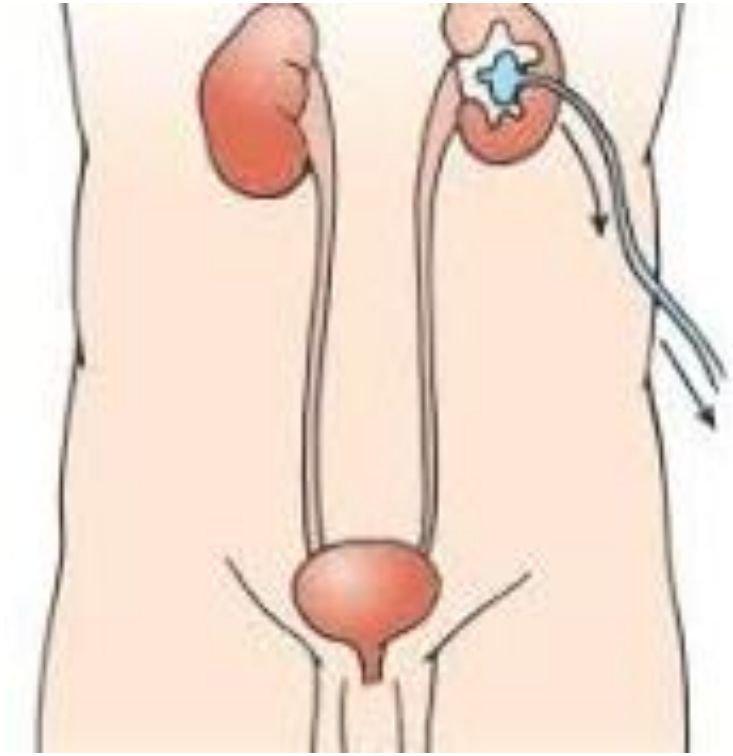
- Hydration
- Analgesia
- UA and C/S and blood C/S
- Broad spectrum antibiotics
- Urine diversion

Urine diversion

- DJ stent



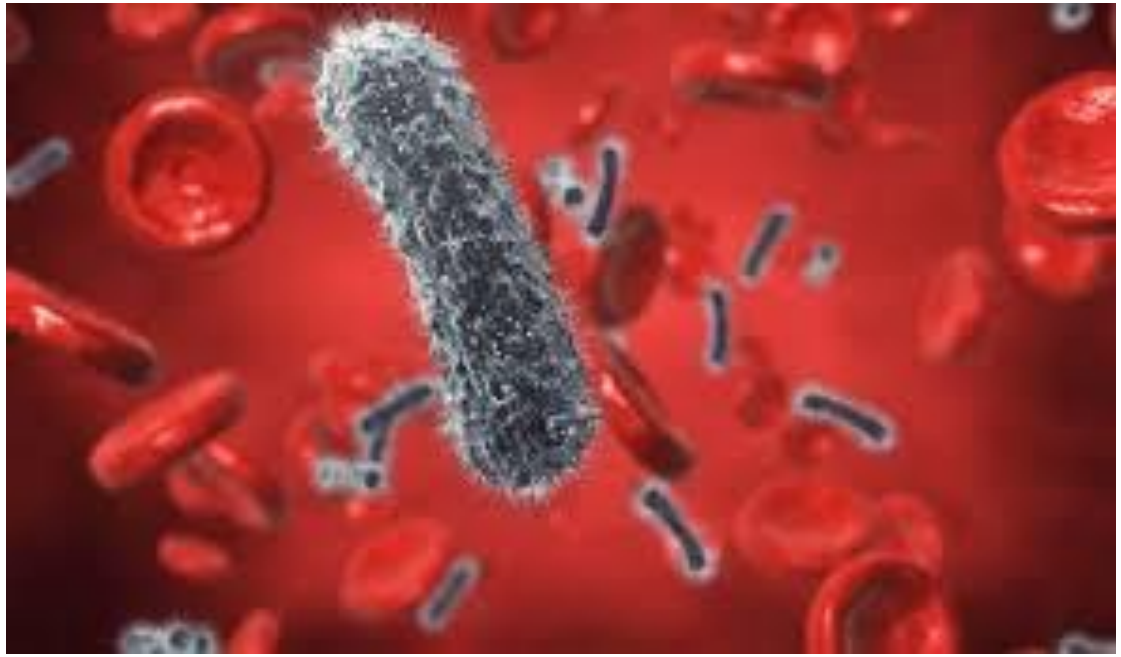
- Nephrostomy



Why?

- Antibiotic levels are low with obstruction

- Sepsis if definitive therapy



Indications

- Infection
- Renal impairment
- Persistent nausea and vomiting
- Persistent pain not responding to oral hydration
- Failure of medical therapy

Indications

- Infection

- Renal impairment
- Persistent nausea and vomiting
- Persistent pain not responding to oral hydration
- Failure of medical therapy

Hematuria

Case

- A 60-year-old male presented to the emergency room with red urine for 2 days.

- Presence of RBC in urine

- Classification:
  - Microscopic
  - Macroscopic (gross)

General urological history

- LUTS (LUTS cause)
- Pain (clot or pathology)
- Fever (infectious process)
- Timing of hematuria (origin or cause)
- Clots (severity of bleeding)
- Color (severity or cause)
- Shape of clot (location)
- Similar episodes (chronic)

Eliminate DDx

Beet	Urine discoloration
Trauma	Urological trauma, Myoglobinuria
Swimming	Schistosoma
Family history	Nephrological, hematological or neoplasm
Drugs	Discoloration or Bleeding
Smoking	Cancer
Occupation	Cancer
Bleeding disorders	Hematological disorder

Eliminate DDx

- Bleeding from other site
- Post exercise

Generalized cause

Exercise induced hematuria

Table 1. Differential Diagnosis of Hematuria

Glomerular causes

Familial causes
- Fabry disease
- Hereditary nephritis (Alport syndrome)
- Nail-patella syndrome
- Thin basement membrane nephropathy

Primary glomerulonephritis
- Focal segmental glomerulosclerosis
- Goodpasture syndrome
- Henoch-Schönlein purpura
- Immunoglobulin A nephropathy (Berger disease)
- Mesangial proliferative glomerulonephritis
- Postinfectious glomerulonephritis
- Rapidly progressive glomerulonephritis

Secondary glomerulonephritis
- Hemolytic uremic syndrome
- Systemic lupus nephritis
- Thrombotic thrombocytopenic purpura
- Vasculitis

Metabolic causes

Polycystic kidney disease

Renal artery embolism

Renal papillary necrosis

Renal vein thrombosis

Sickle cell disease or trait

Renal causes

Arteriovenous malformation

Hypercalciuria

Hyperuricosuria

Loin pain–hematuria syndrome

Malignant hypertension

Medullary sponge kidney

Tubulointerstitial cause

Vascular cause

Urologic causes

Benign prostatic hyperplasia

Cancer (kidney, ureteral, bladder, prostate, or urethral)

Cystitis/pyelonephritis

Nephrolithiasis

Prostatitis

Schistosoma haematobium infection

Tuberculosis

Other causes

Drugs (e.g., nonsteroidal anti-inflammatory drugs, heparin, warfarin [Coumadin], cyclophosphamide)

Trauma (e.g., contact sports, running, Foley catheter)

Adapted with permission from Ahmed Z, Lee J. Asymptomatic urinary abnormalities. Hematuria and proteinuria. Med Clin North Am. *1997;81(3):644.*

Severity of hematuria

Management

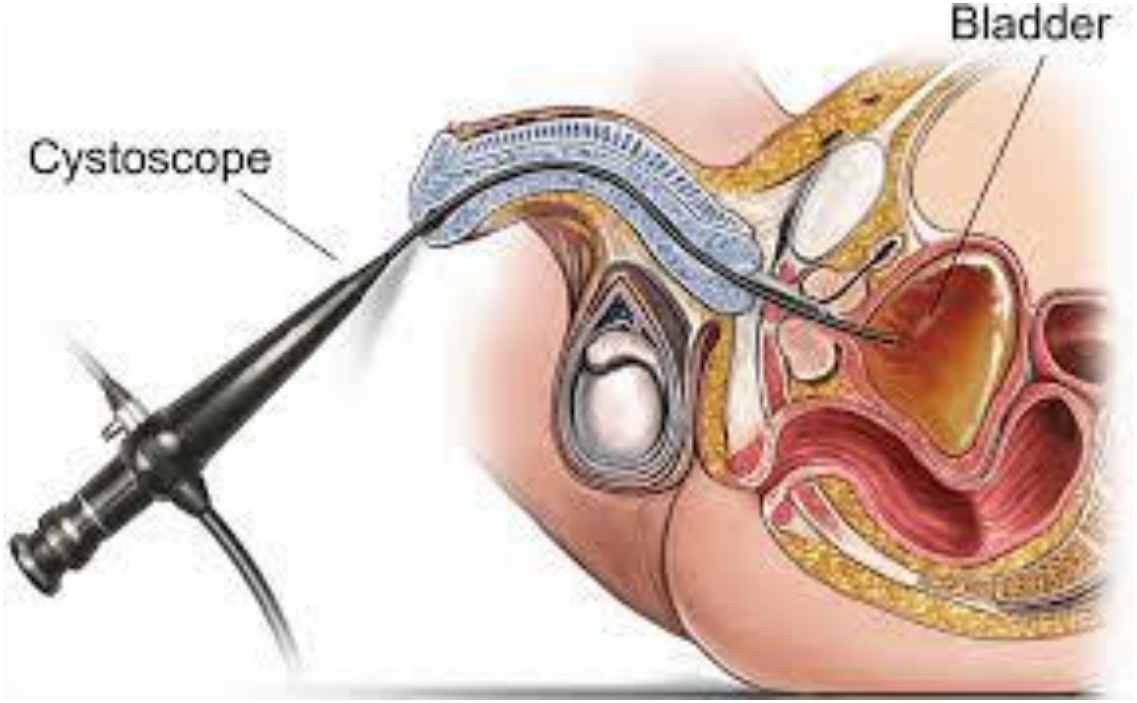
- Investigations
- Treatment
- NOTE: together

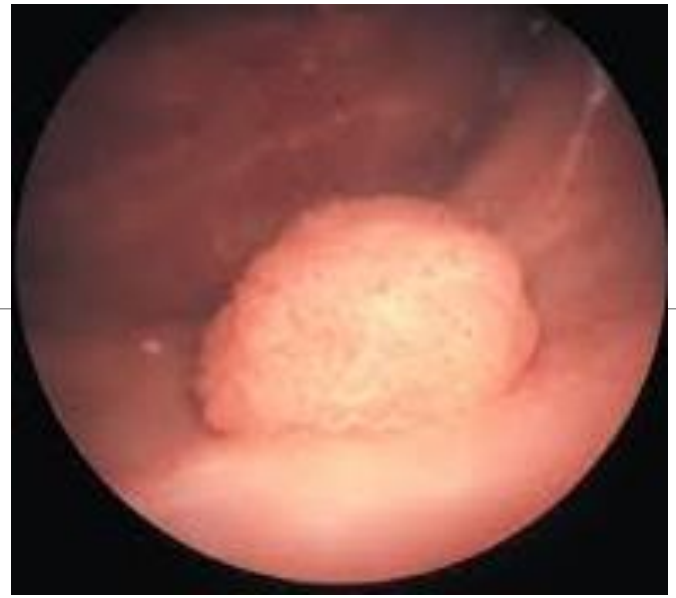
Investigations

- Any hematuria case:
  - UA and CS
  - Urine cytology
  - Imaging
  - Cystoscopy

- If bleeding significant:
  - CBC
  - Coagulation profile

Cystoscopy





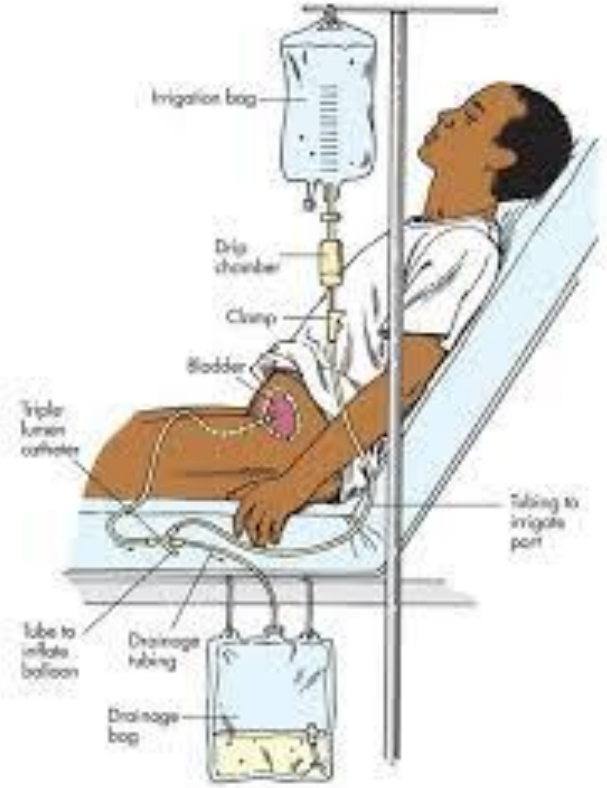
Imaging

Treatment

- Any hematuria case:
  - Treat the cause

- If bleeding is significant:
  - Admit and monitor
  - IV line and hydration
  - Cross match
  - 3 way catheter
  - Bladder irrigation

Bladder irrigation



Urinary retention

- Inability to void

- Classification:
  - Acute
  - Chronic

Case

- A 60-year-old male presented to the emergency with abdominal pain and inability to void for 1 day.

Causes

- Benign prostatic enlargement (BPE) due to BPH
- Carcinoma of the prostate
- Urethral stricture
- Prostatic abscess
- Stones
- Constipation

- Pelvic prolapse (cystocoele, rectocoele, uterine)
- Urethral stenosis
- Urethral diverticulum
- Post surgery for ‘stress’ incontinence
- pelvic masses (e.g., ovarian masses)

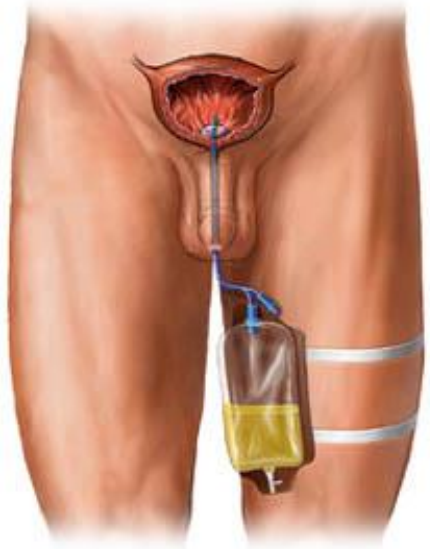
Investigations

- CBC
- Renal profile
- UA & CS
- US

- Do you complete the workup before treatment?

Treatment

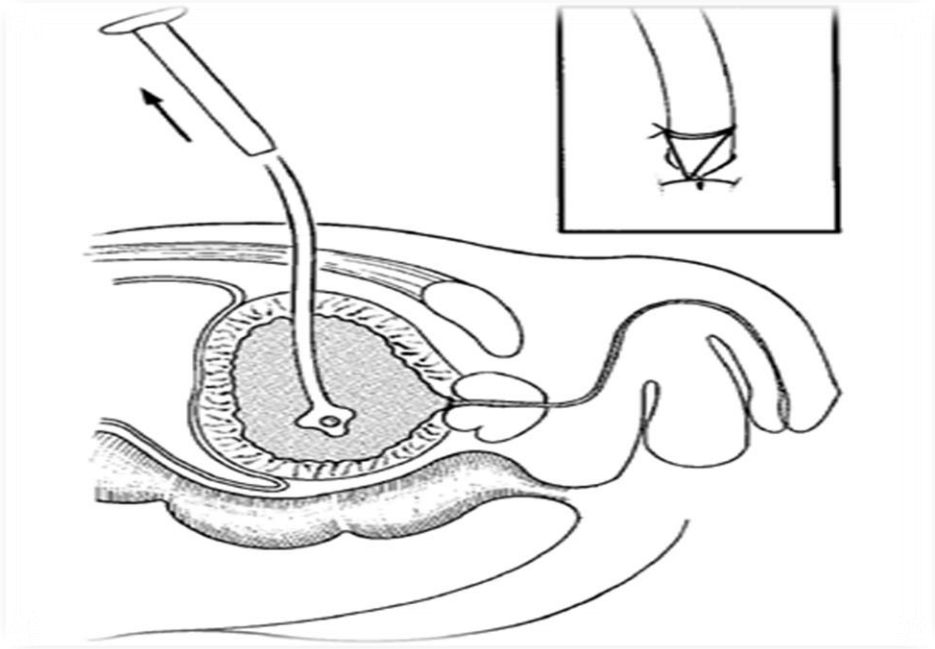
- Urethral catheterization



- What if you failed?

Treatment

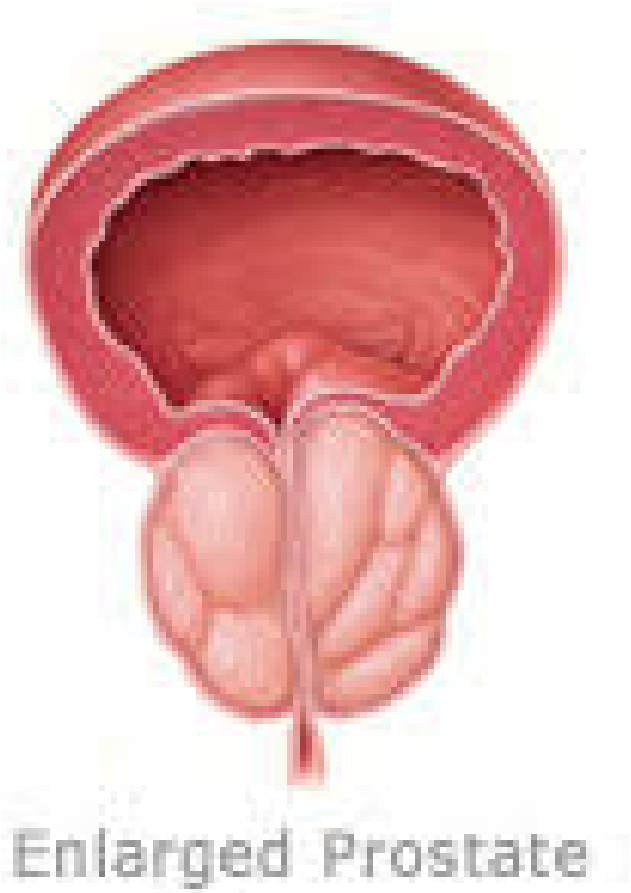
- Suprapubic catheter

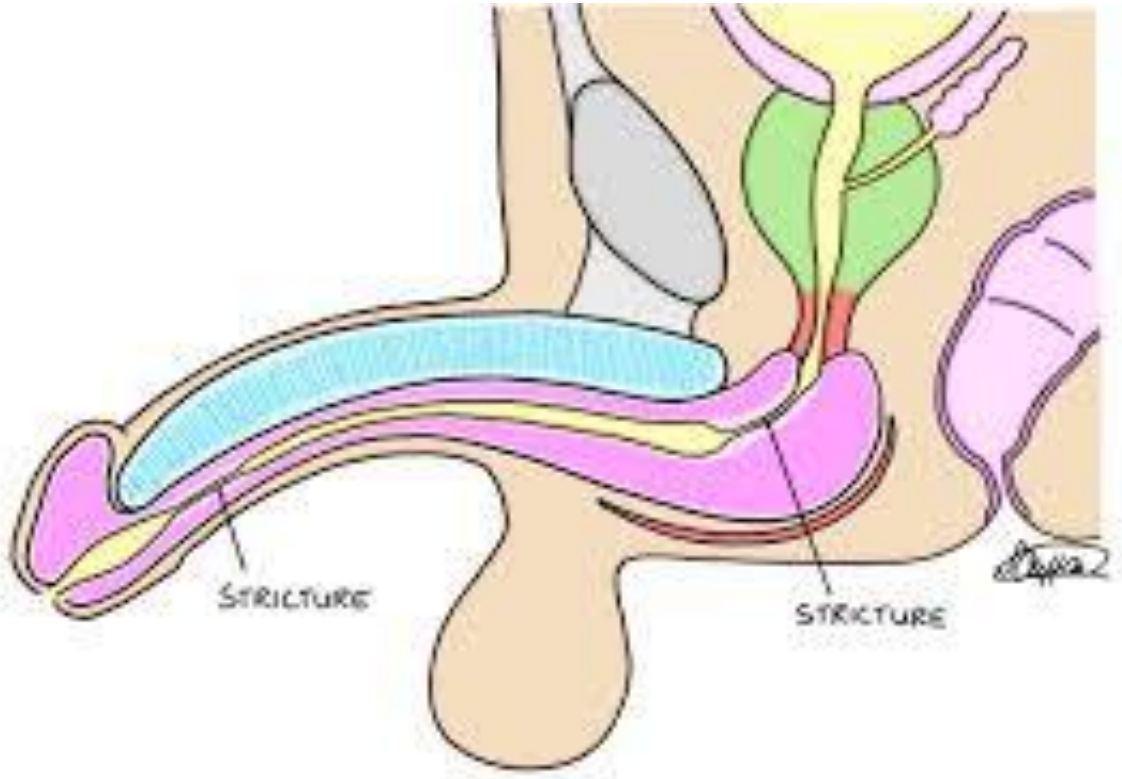


Treatment

- Treatment of the underlying cause

Causes





Testicular torsion

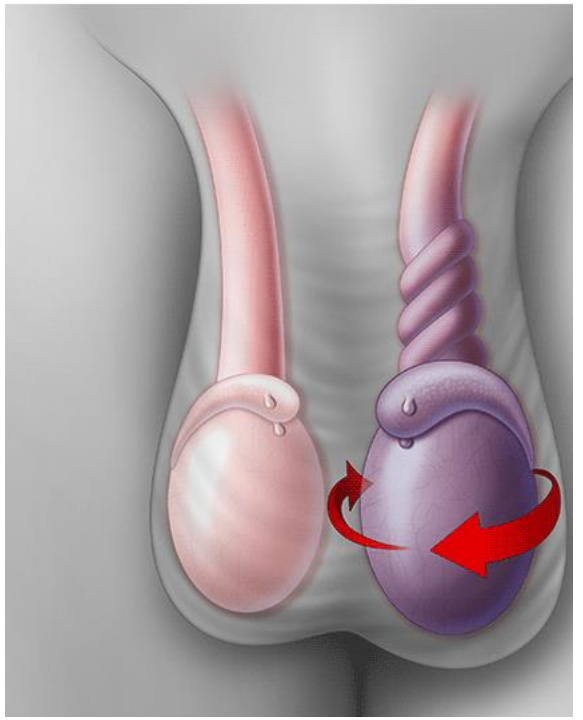
Case

- A 15-year-old patient came with scrotal pain for 1 hour.

Category	Diagnose
Infectious or Inflammatory	*Acute Epididymitis/Epidiymo-orchitis* **Fournier's Gangrene** Mumps orchitis **Appendicitis** **Nephrolithiasis**
Vascular	**Testicular torsion** **AAA** Torsion of the appendix testes *Varicocele*
Iatrogenic	Post-vasectomy pain
Neoplasm	Testicular germ cell tumor
Degenerative	-
Idiopathic	Idiopathic Scrotal Edema
Congenital	**Testicular torsion**
Anatomic, Allergic or Autoimmune	IgA Vasculitis
Trauma	**Testicular rupture** Testicular Hematoma
Environmental or Endocrine	-

Acute scrotum

- Testicular torsion: more serious
  - Irreversible ischemic injury to the testicular parenchyma may begin as soon as 4 hours
  - Testicular salvage ↓ as duration of torsion ↑



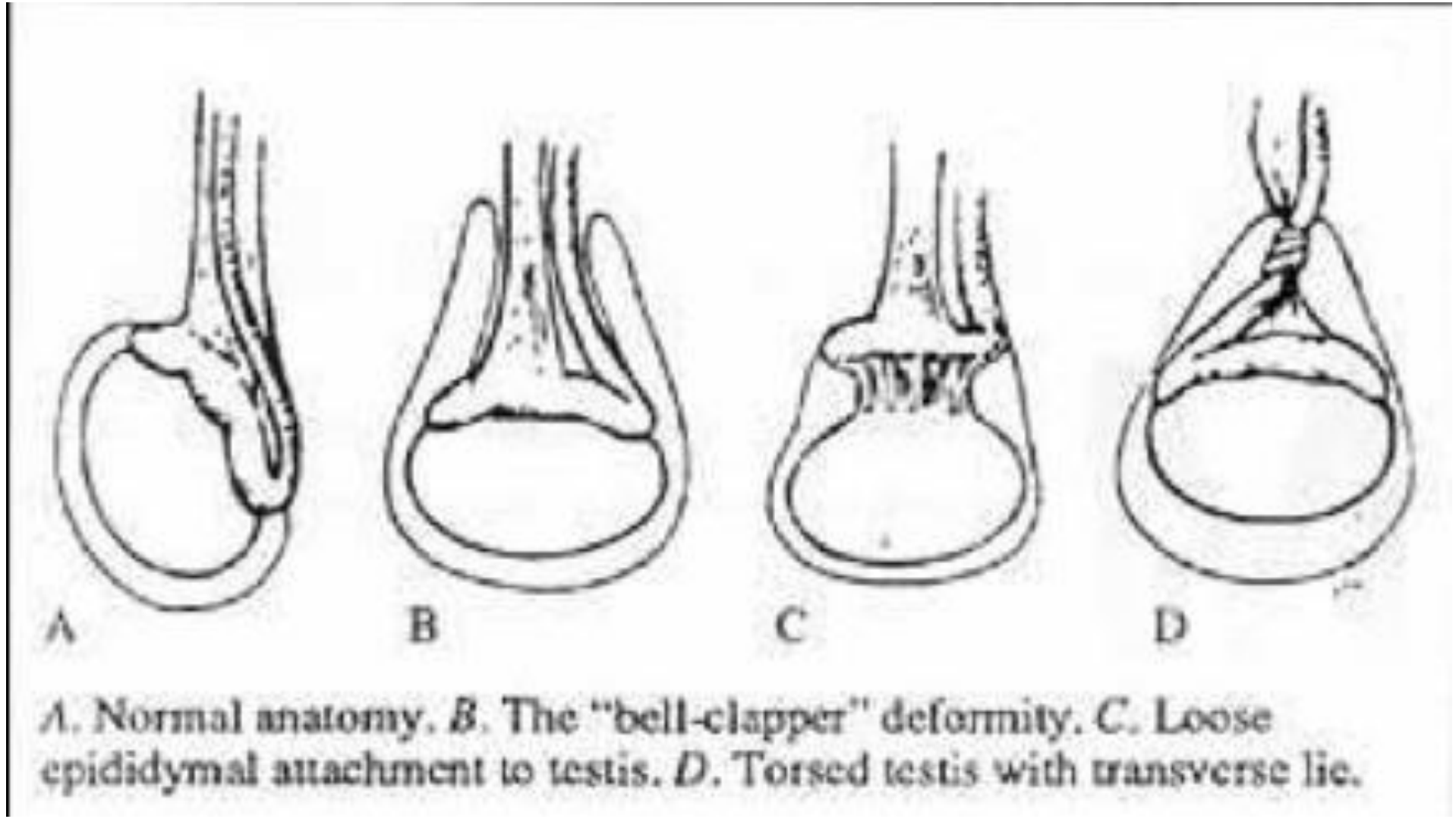
- Epididymitis: more common

Testicular torsion

- common in teenagers (12-18)
- rare after 25
- can occur in children and neonates

Testicular torsion

- Irreversible ischemic injury > 4 hours (salvageability 6 hours)
- Presentation
- Physical exam
- Investigations
- Treatment



A. Normal anatomy. *B*. The "bell-clapper" deformity. *C*. Loose epididymal attachment to testis. *D*. Torsed testis with transverse lie.

Management

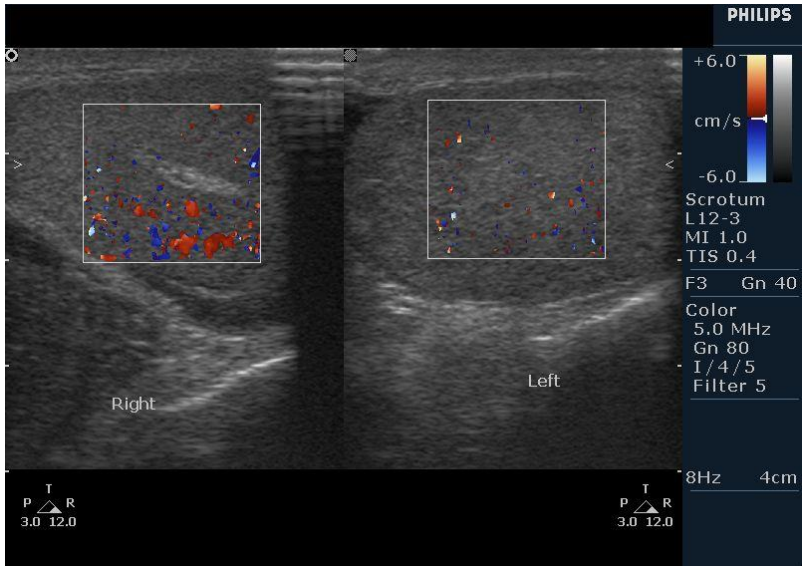
- Investigations

- Treatment:

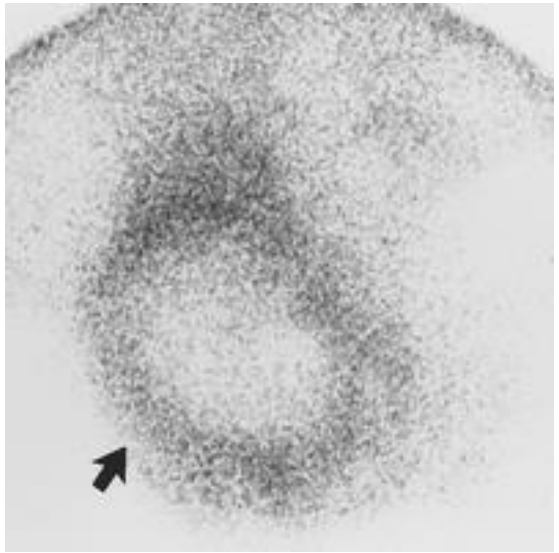
Can be immediate with no confirmation

Investigations

- US doppler

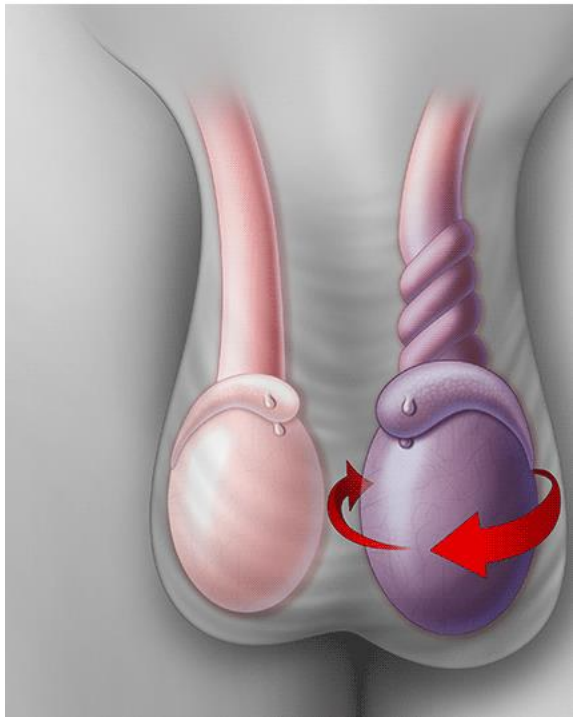


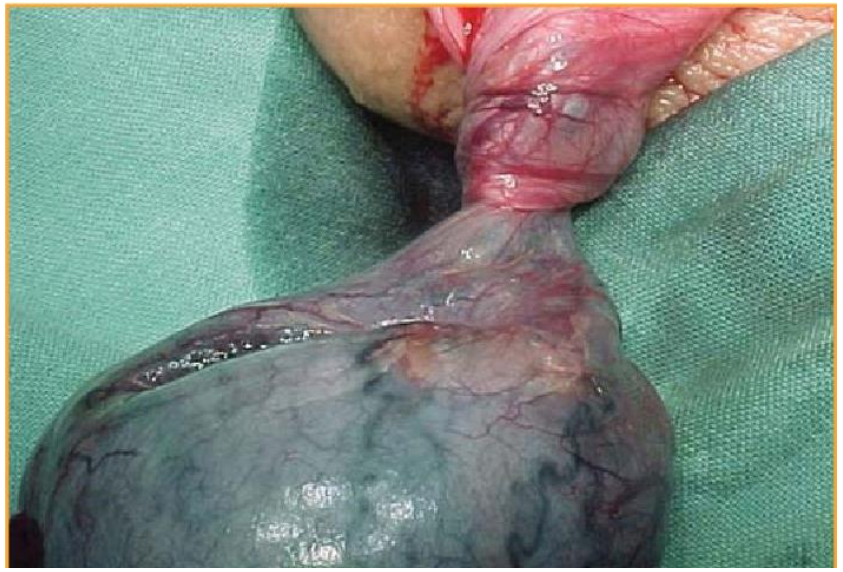
- Nuclear medicine

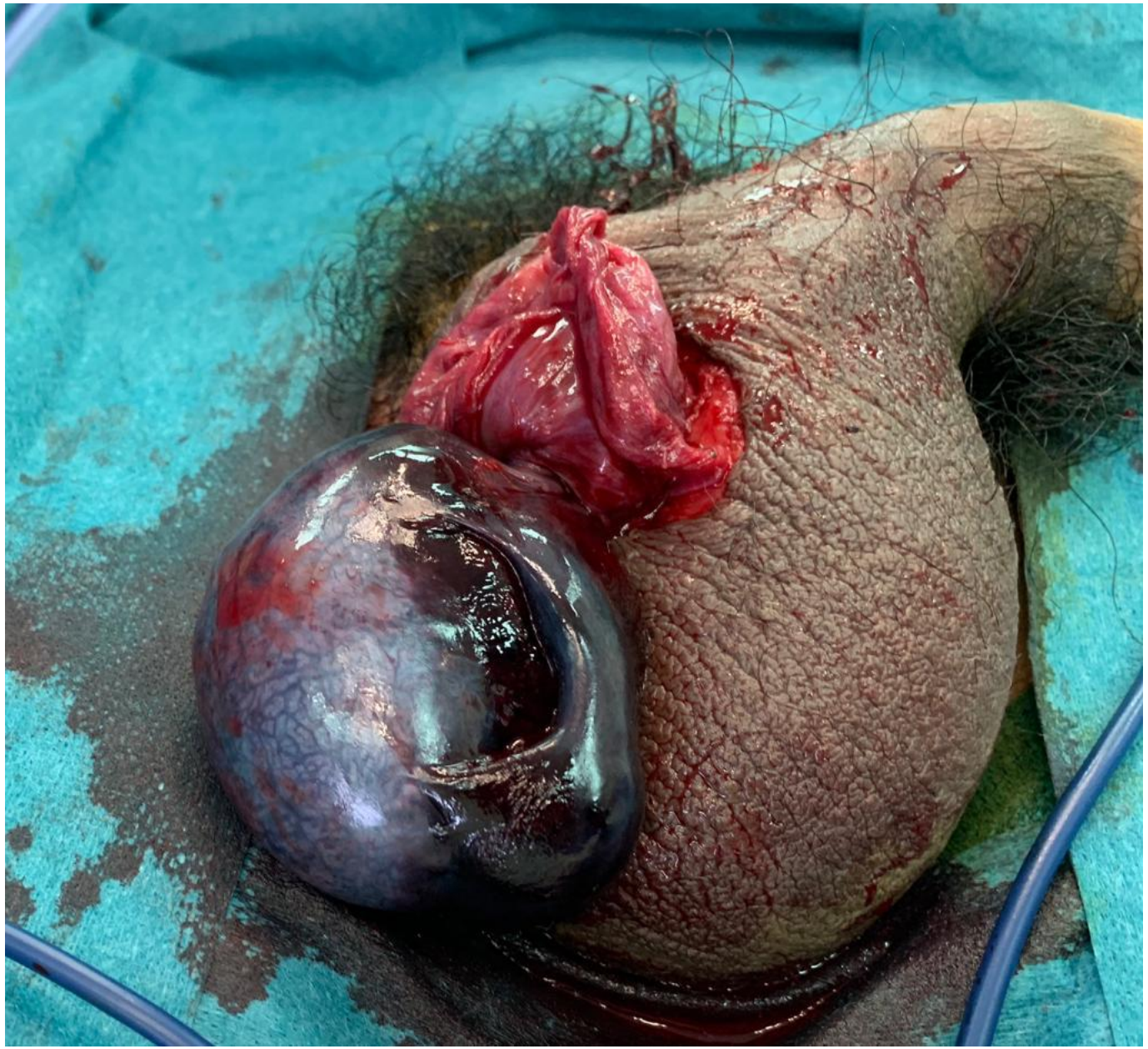


Treatment

- Surgical
- bilateral Orchidopexy
- +_ Orchiectomy







Urethral injury

Case

- A 25-year-old male was involved in MVA. Hemodynamically stable. Seen and assessed by trauma team. ABCDE done. Patient is having pelvic fracture stabilized by external fixation.
- Foley catheter insertion failed.

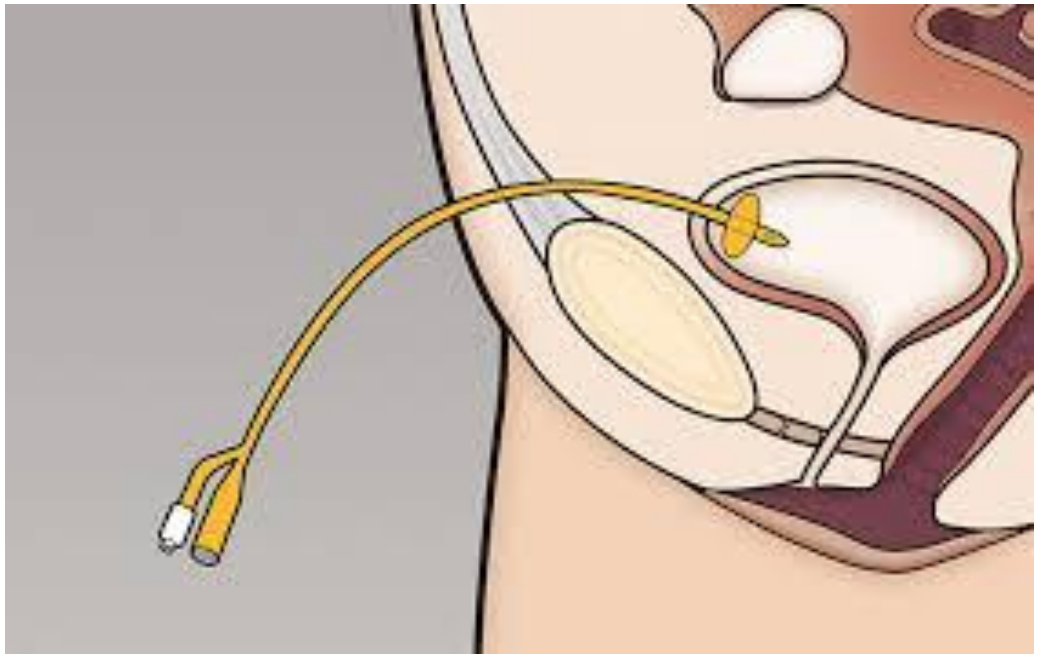
Types

- Anterior
- posterior

Signs

- Urinary retention or palpable bladder
- blood at urethral meatus
- Inability to pass urethral catheter
- high riding prostate
- hematoma

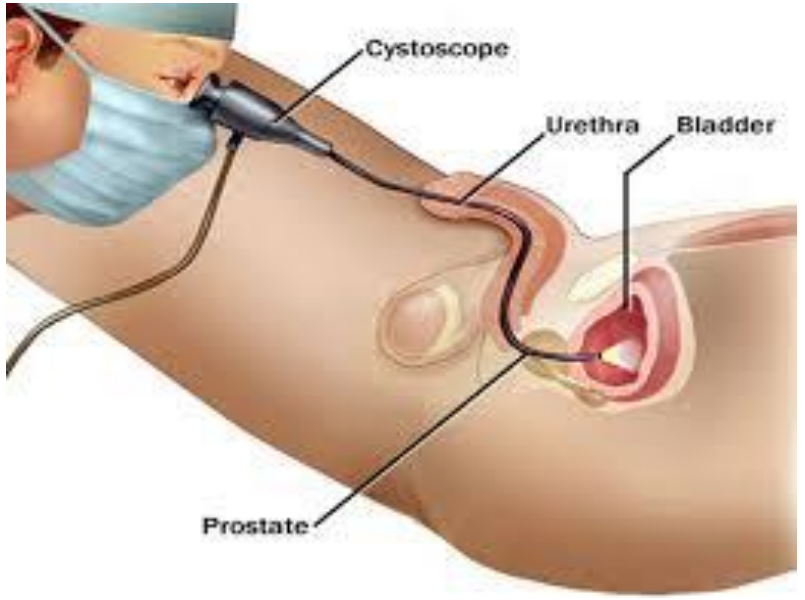
Suprapubic catheter

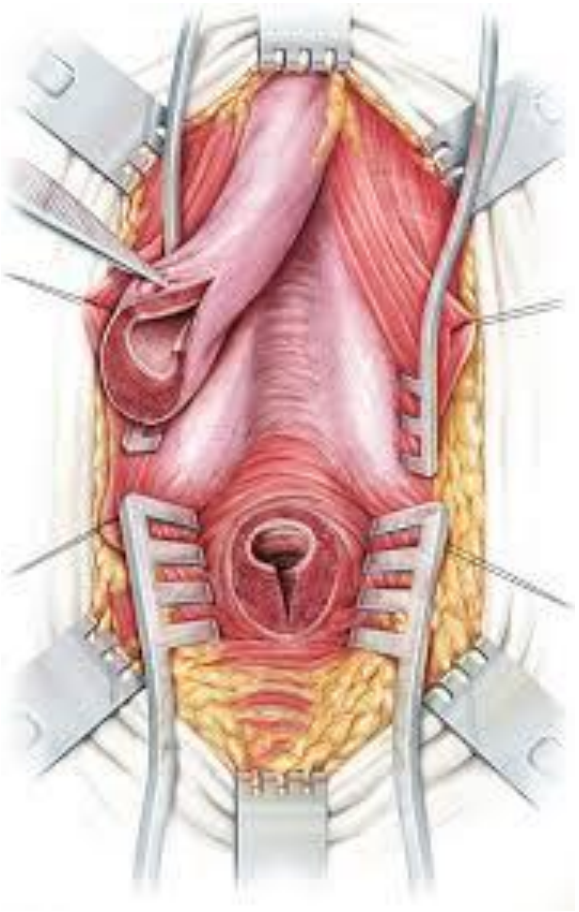


- Next?

Definitive Treatment

- Realignment





- Urethroplasty

Penetrating injury

Penetrating Anterior Urethral Injuries:

generally managed by surgical debridement and repair

Bladder injury

Types

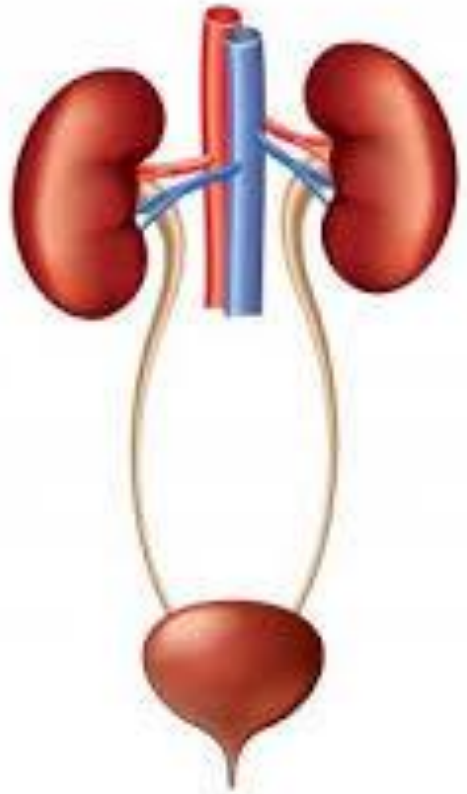
- Intra-peritoneal
- Extra-peritoneal

Case

- A 25-year-old male was involved in MVA. Hemodynamically stable. Seen and assessed by trauma team. ABCDE done. Patient is having pelvic fracture stabilized by external fixation.
- Patient having hematuria

Hematuria

- Upper tract imaging > later
- Bladder imaging > cystogram



- Next?

Case

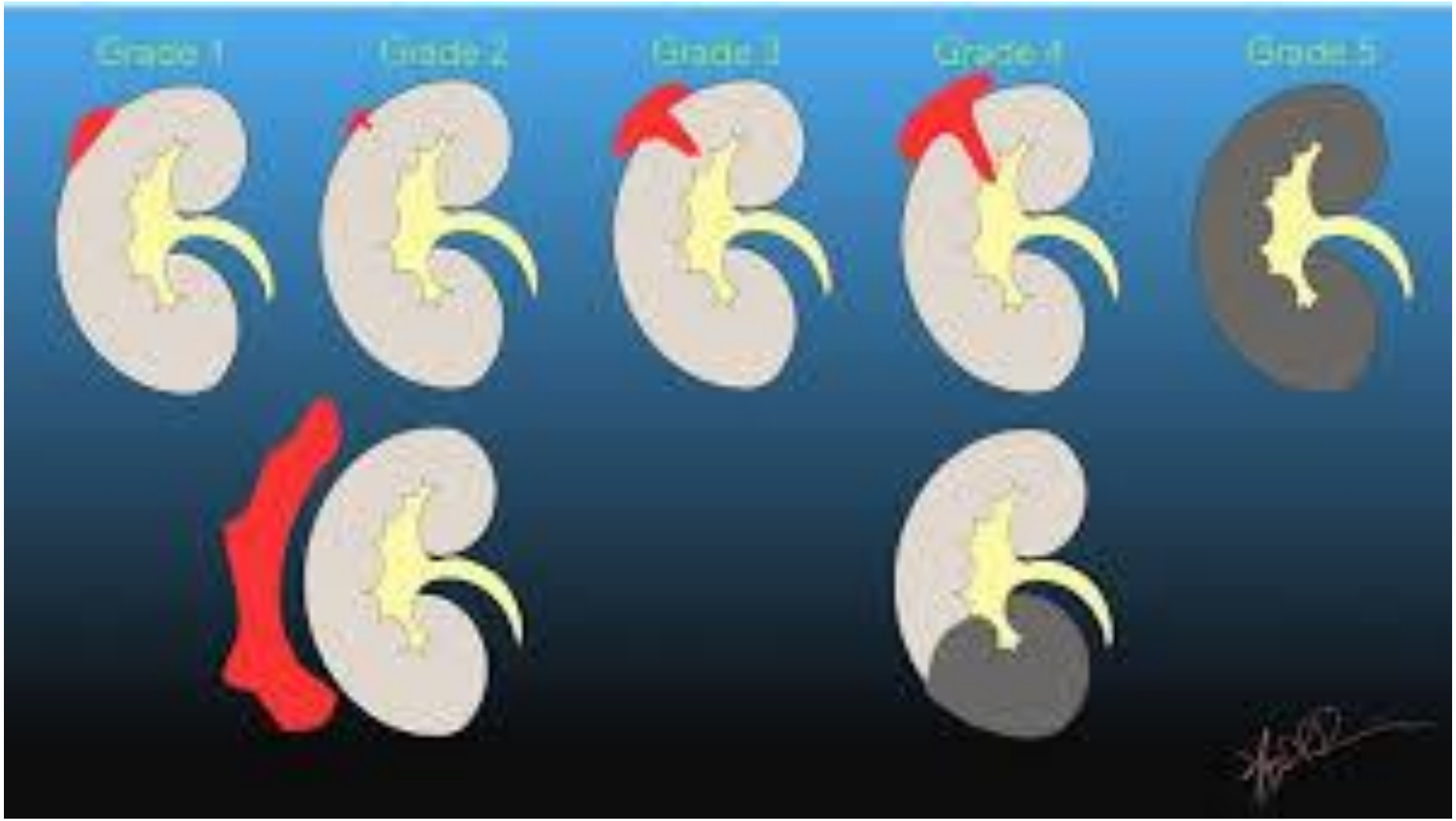
- A 25-year-old male received blow to lower abdomen. Hemodynamically stable. Seen and assessed by trauma team. ABCDE done.
- Patient having hematuria and lower abdominal pain.

- Next?

Renal injury

Case

- A 30-year-old male received a stab to left thoracic region. Hemodynamically stable. Seen and assessed by trauma team. ABCDE done. Left chest tube was inserted.
- Patient having hematuria



- Next?

Indication for renal imaging

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

Triphasic CT (urography)

Phase	Time	Indications
No contrast	-	*Kidney/ureteral stones, arterial calcifications*
Arterial	*20 - 30 sec*	*Abdominal bleeding, aortic aneurysm, arterial stenosis/occlusions, hypervascular liver metastases, pancreas tumors*
Portal venous	*60 - 80 sec*	*Screening, hypovascular liver metastases, abscess formation, venous thrombosis*
Nephrogenic	*80 - 100 sec*	*Kidney tumors, kidney trauma*
Equilibrium /delayed	*6 - 10 min*	*Ureteral obstruction or leaks, characterization of liver tumors*

CT

- Grade?

Conservative management

1. Wide Bore IV line.
2. Bed rest
3. Vital signs monitoring.
4. serial CBC (HCT)
5. F/up US &/or CT.

Case

- Patient developed increase in hematuria. Hb dropped from 11 to 8.

- Next?

Case

- A 30-year-old male received a stab to left thoracic region. Hemodynamically stable. Seen and assessed by trauma team. ABCDE done. Left chest tube was inserted.
- Patient having hematuria

- Next?

Surgical exploration

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

Questions