What urological problems bring patients to The Emergency?

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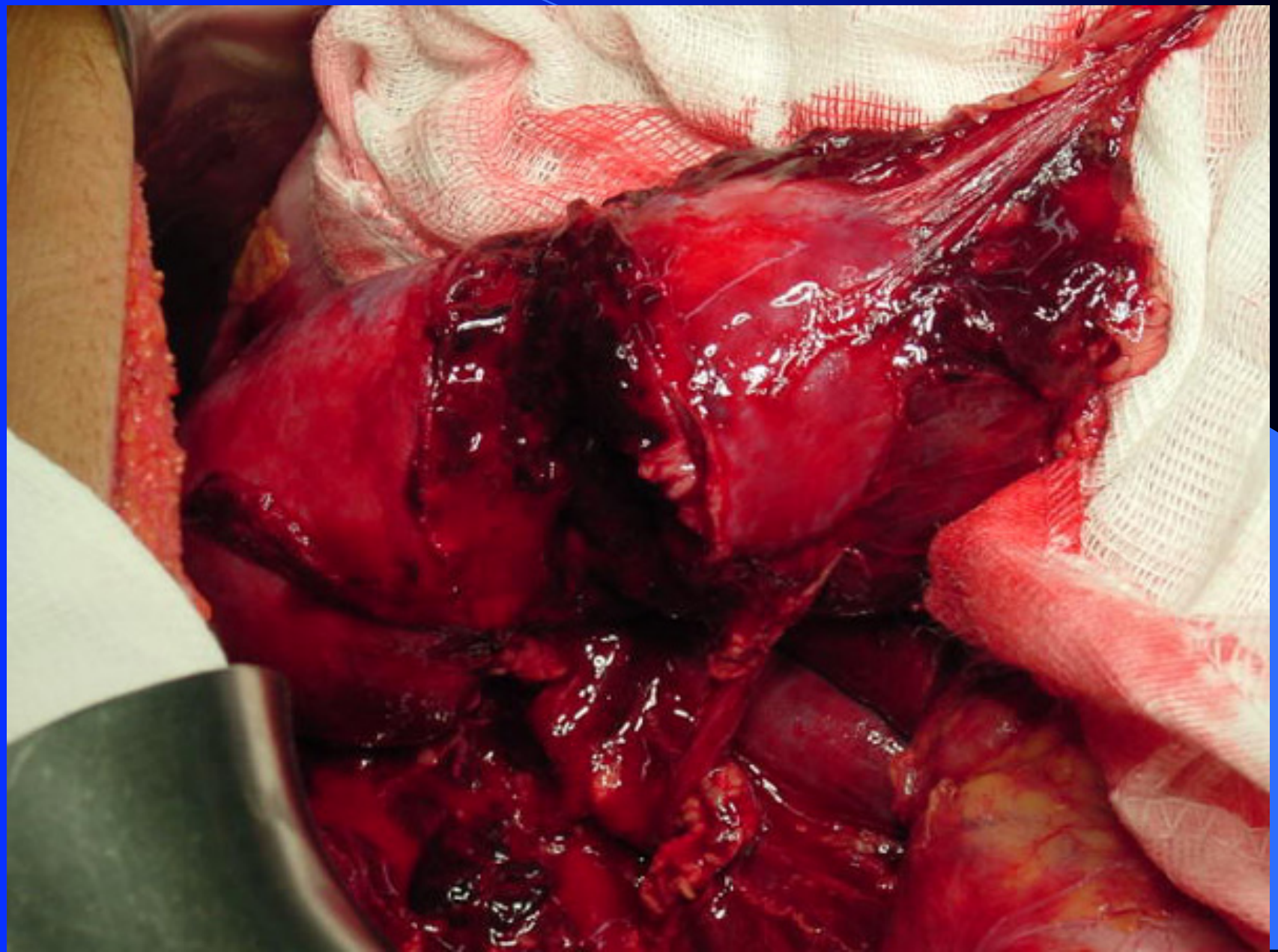
Traumatic Urological Emergencies

- **Traumatic**

  - Renal Trauma
  - Ureteral Injury
  - Bladder Trauma
  - Urethral Injury
  - External Genital Injury

Renal Injuries



Renal Injuries

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

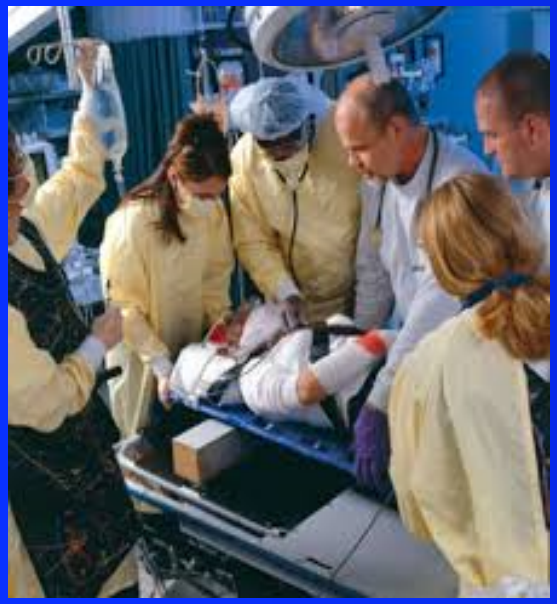
- Mechanisms and cause:
  - Blunt
    - direct blow or acceleration/ deceleration (road traffic accidents, falls from a height, fall onto flank)
  - Penetrating
    - knives, gunshots, iatrogenic, e.g., percutaneous nephrolithotomy (PCNL)

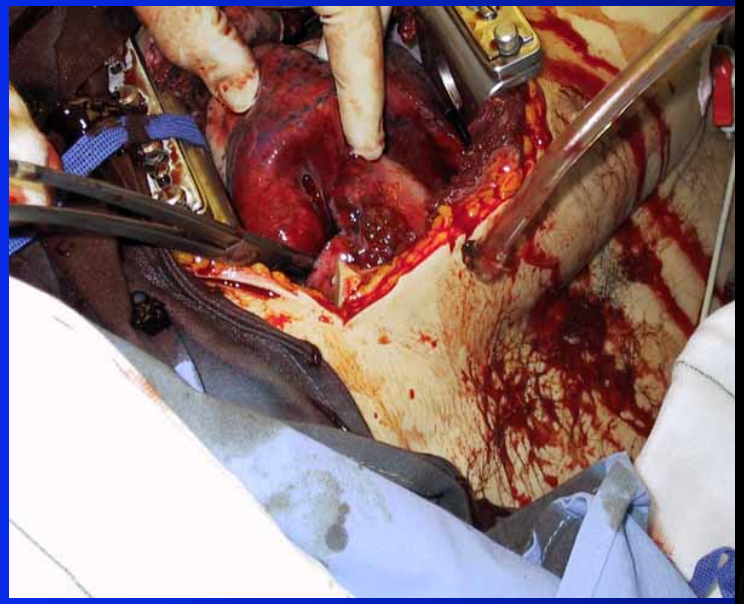
- **Indications for renal imaging:**
  - Macroscopic haematuria
  - Penetrating chest, flank, and abdominal wounds
  - Microscopic [>5 red blood cells (RBCs) per high powered field] or dipstick
  - Hypotensive patient (SBP <90mmHg)
  - A history of a rapid acceleration or deceleration
  - Any child with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

- What Imaging Study?

IVU:

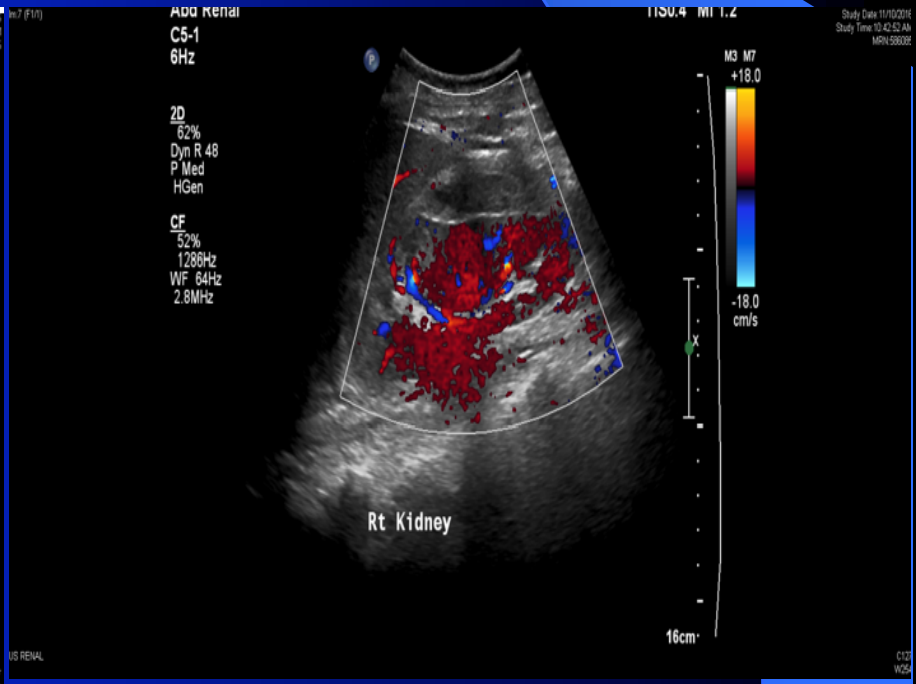
-Replaced by the contrast- enhanced CT
-On-table IVU if patient is transferred immediately to the operating theatre without having had a CT scan and a retroperitoneal hematoma is found,





Spiral non contrast CT: does not allow accurate staging

- **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.

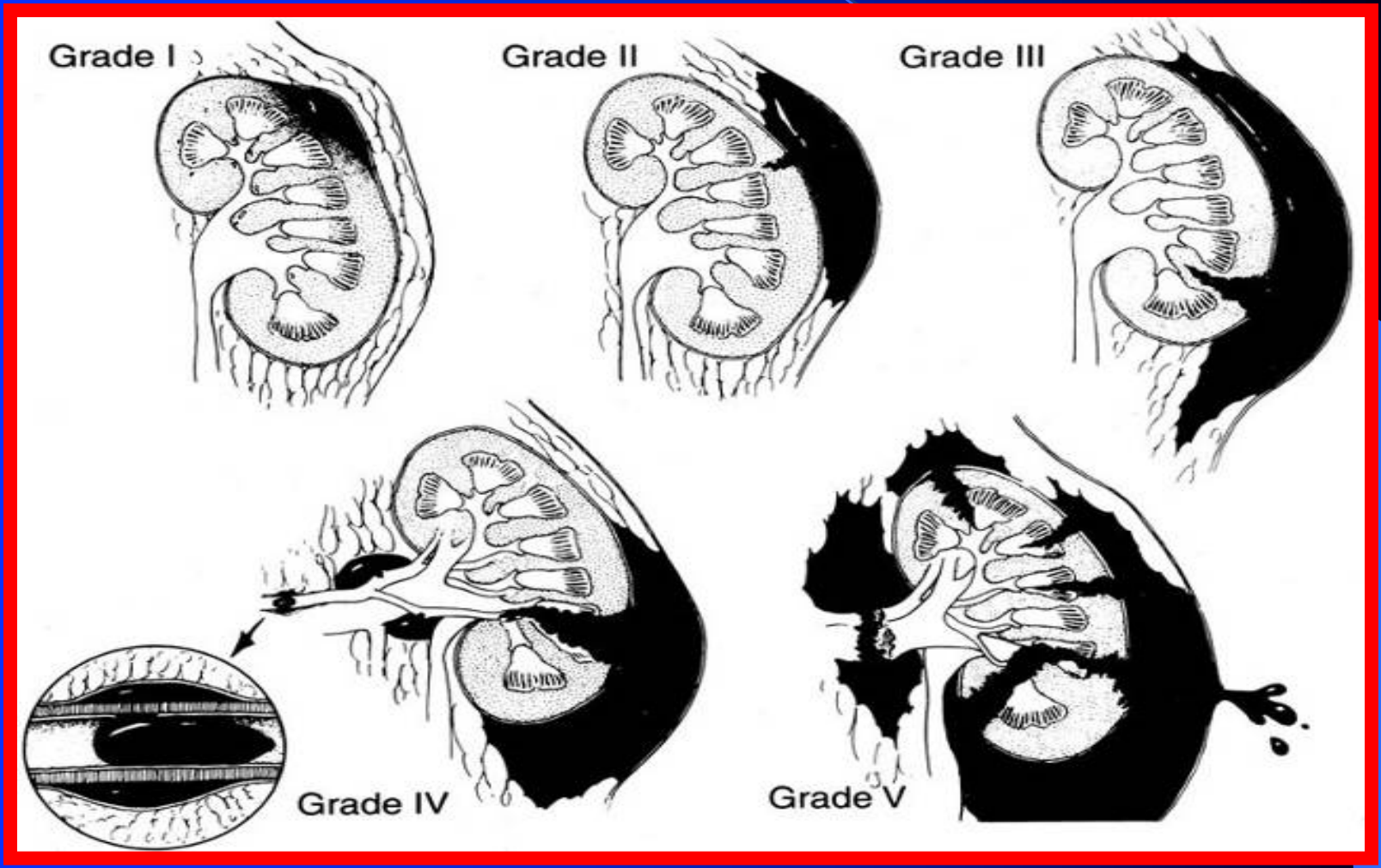


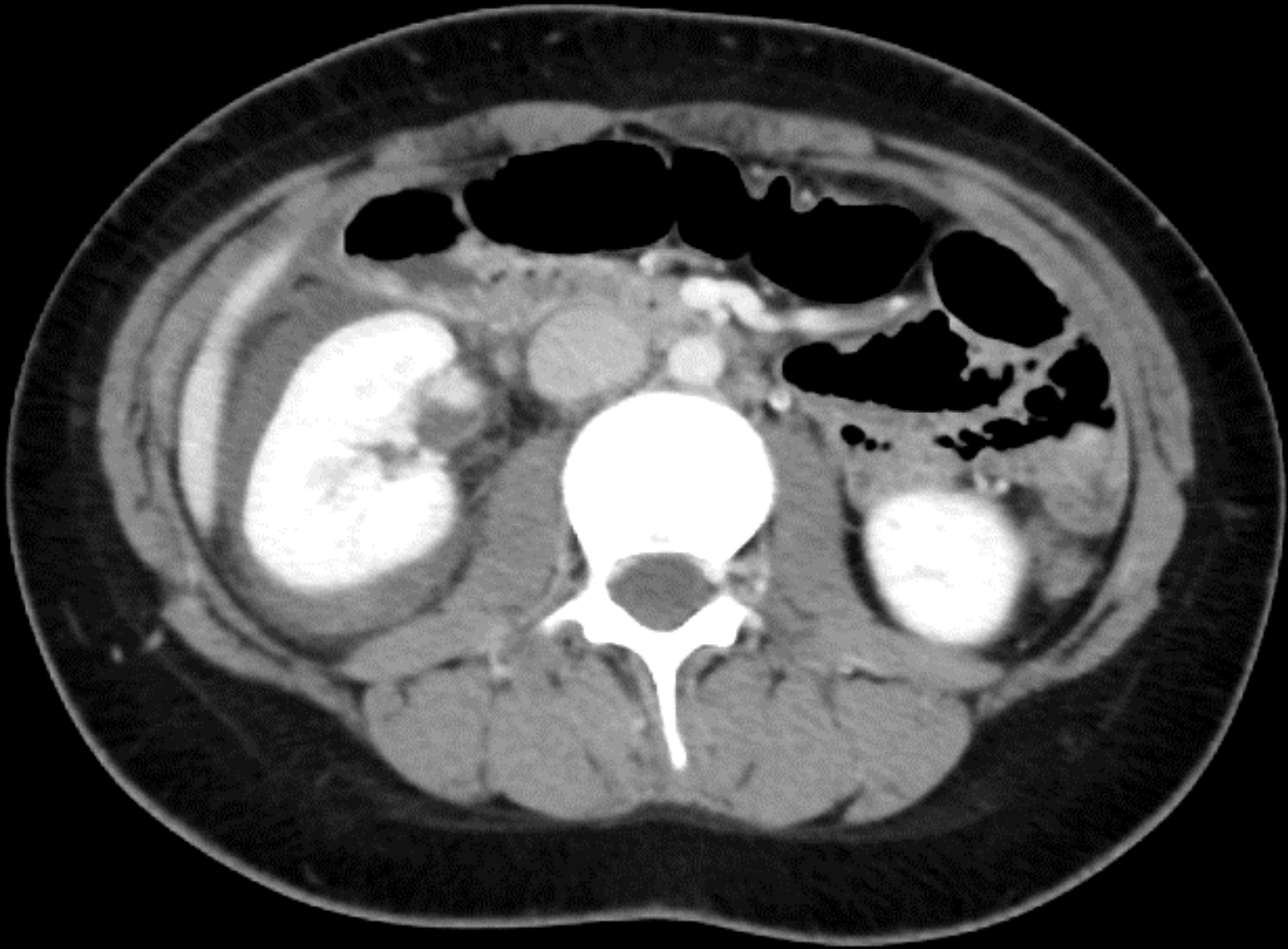
Contrast-enhanced CT:

the imaging study of choice

Accurate
Rapid
Images other intra-abdominal structures

- Staging (Grading):



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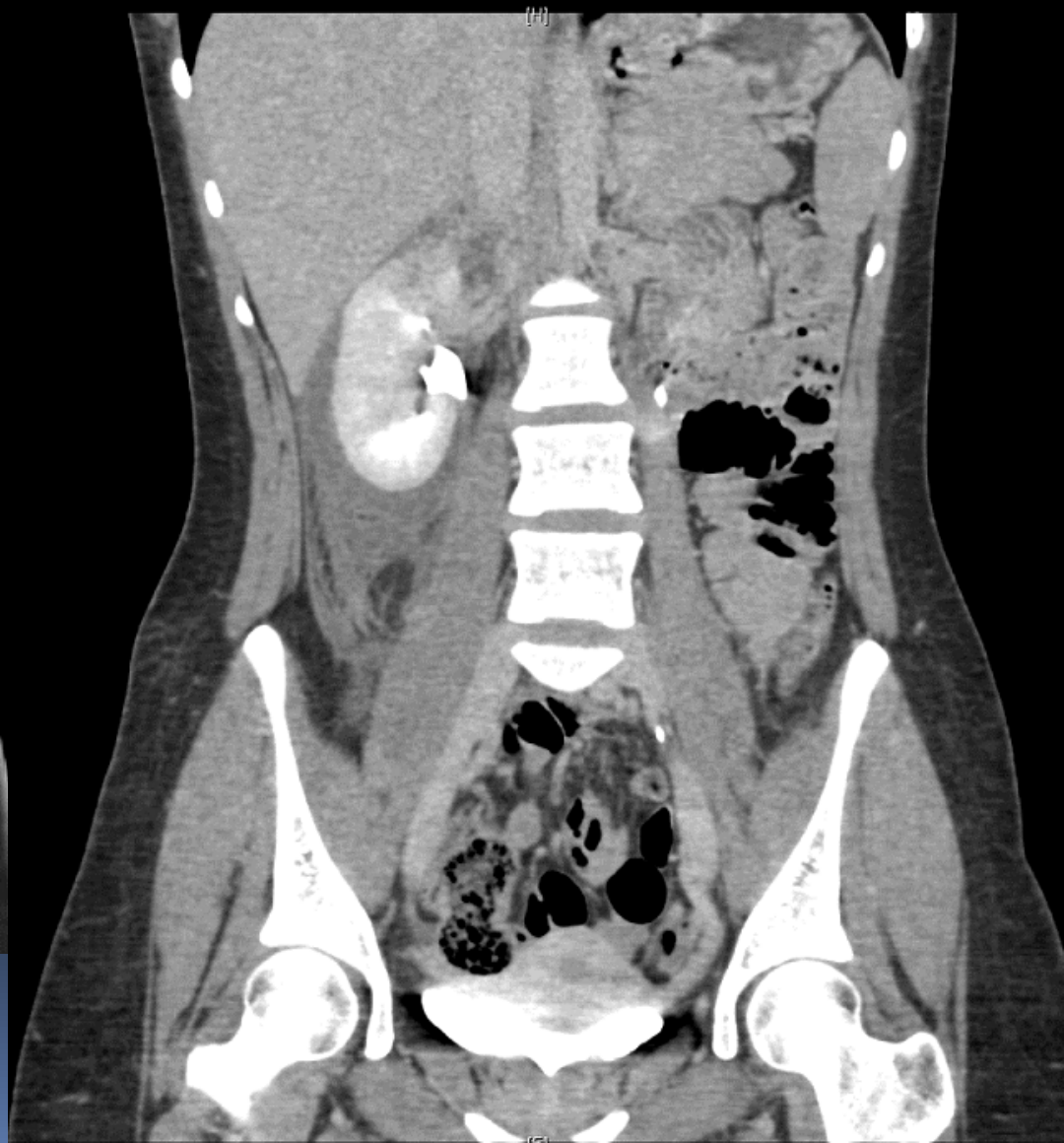
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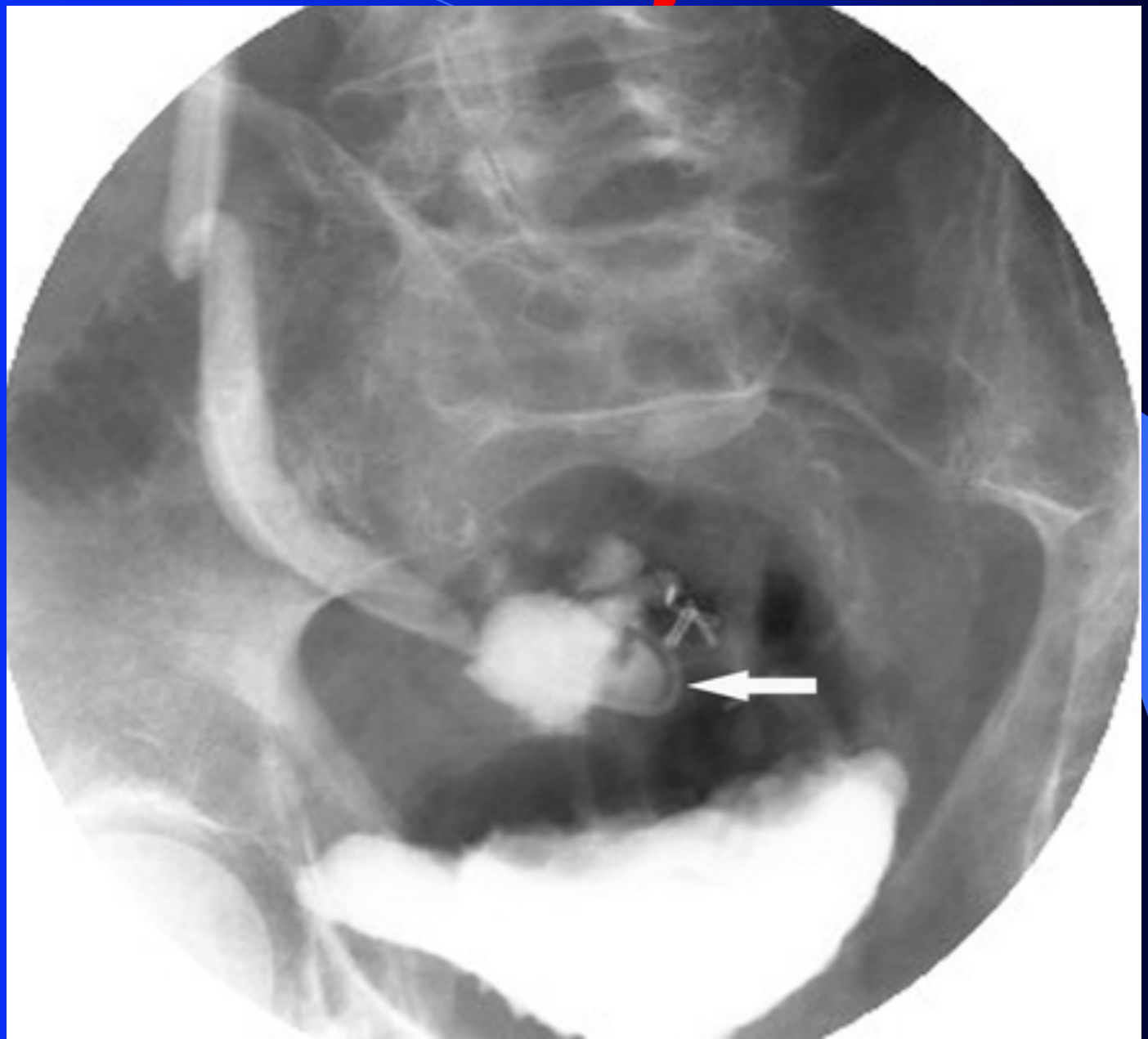
- **Management:**
  - Conservative:
    - Over 95% of blunt injuries
    - 50% of renal stab injuries and 25% of renal gunshot wounds (specialized center).
  - Include:

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

- **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

Ureteral Injuries



Ureteral Injuries…

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

- Causes and Mechanisms:
  - External Trauma
  - Internal Trauma

Ureteral Injuries…

- 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 Injuries…

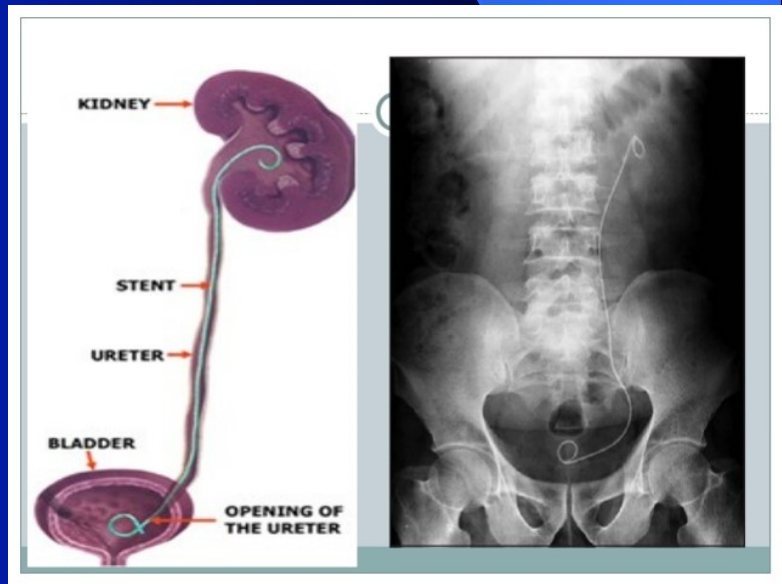
- Internal Trauma
  - Uncommon, but is more common than external trauma
  - Surgery:
    - Hysterectomy, oophorectomy, and sigmoidcolectomy
    - Caesarean section
    - Ureteroscopy
    - Aortoiliac vascular graft replacement
    - Laparoscopic
    - Orthopedic operations

Ureteral Injuries…

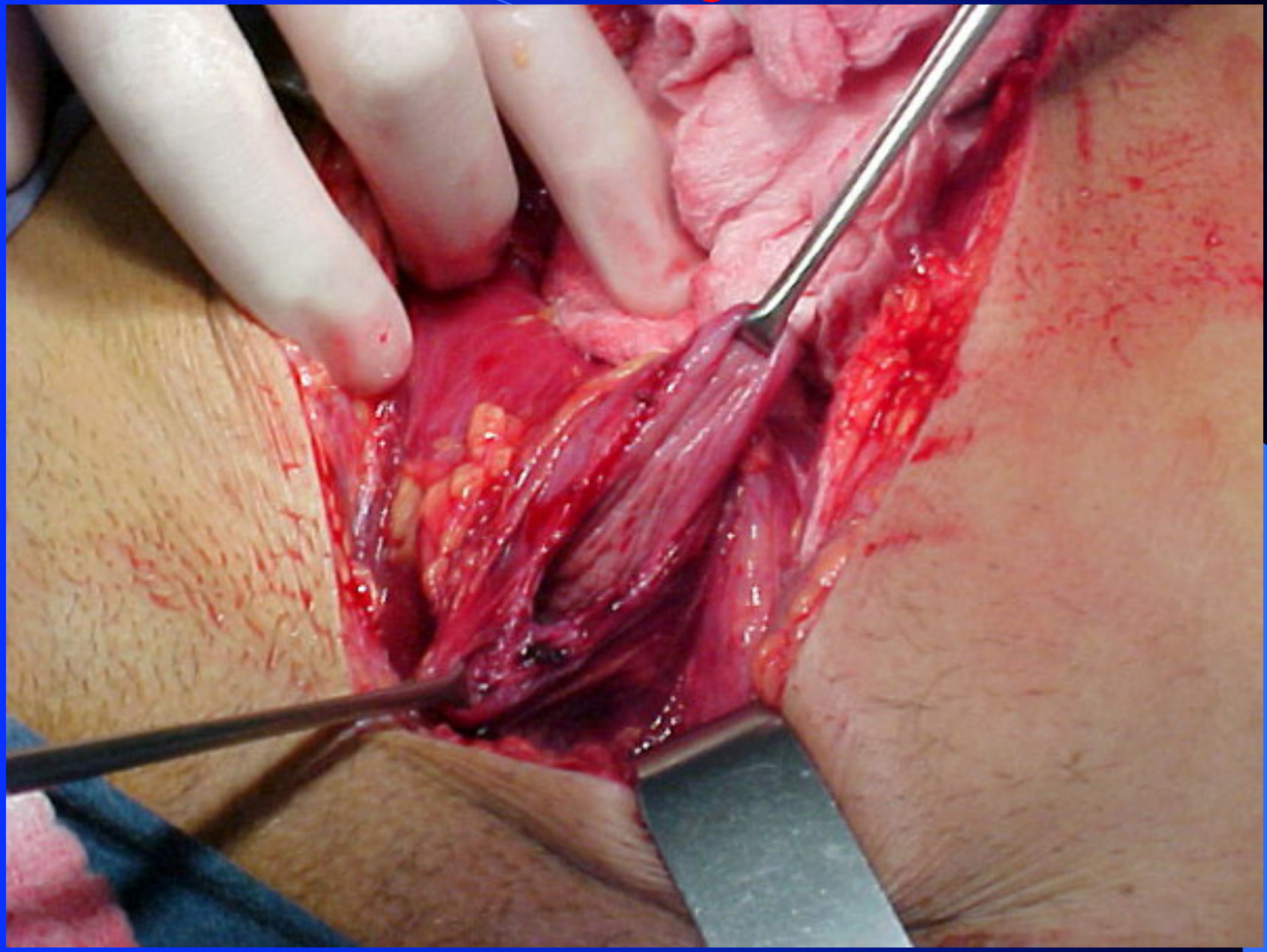
- **Diagnosis:**
  - Requires a high index of suspicion
  - Intra-operative:
  - Late:
    1. An ileus: the presence of urine within the peritoneal cavity
    2. Prolonged postoperative fever or overt urinary sepsis
    3. Persistent drainage of fluid from abdominal or pelvic drains, from the abdominal wound, or from the vagina.
    4. Flank pain if the ureter has been ligated
    5. An abdominal mass, representing a urinoma
    6. *Vague abdominal pain*

Ureteral Injuries…

- **Treatment options:**
  - JJ stenting
  - Primary closure of partial transaction of the ureter
  - Direct ureter to ureter anastomosis
  - Re-implantation of the ureter into the bladder using a psoas hitch or a Boari flap
  - Trans uretero-ureterostomy
  - Auto-transplantation of the kidney into the pelvis
  - Replacement of the ureter with ileum
  - Permanent cutaneous ureterostomy
  - Nephrectomy



Bladder Injuries



Bladder Injuries…

- **Causes:**
  - Iatrogenic injury
    - Transurethral resection of bladder tumor (TURBT)
    - Cystoscopic bladder biopsy
    - Transurethral resection of prostate (TURP)
    - Cystolitholapaxy
    - Caesarean section, especially as an emergency
    - Total hip replacement (very rare)

Bladder Injuries…

- Penetrating trauma to the lower abdomen or back
- Blunt pelvic trauma—in association with pelvic fracture or ‘minor’ trauma in a drunkard patient
- Rapid deceleration injury seat belt injury with full bladder in the absence of a pelvic fracture
- Spontaneous rupture after bladder augmentation

Bladder Injuries…

- **Types of Perforation:**

A) intra-peritoneal perforation

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

B) extra-peritoneal perforation

The peritoneum is intact and urine escapes into the space around the bladder, but not into the peritoneal cavity.

Bladder Injuries…

- **Presentation:**
  - Recognized intra-operatively
  - The classic triad of symptoms and signs that are suggestive of a bladder rupture
    1. Suprapubic pain and tenderness
    2. Difficulty or inability in passing urine
    3. Haematuria

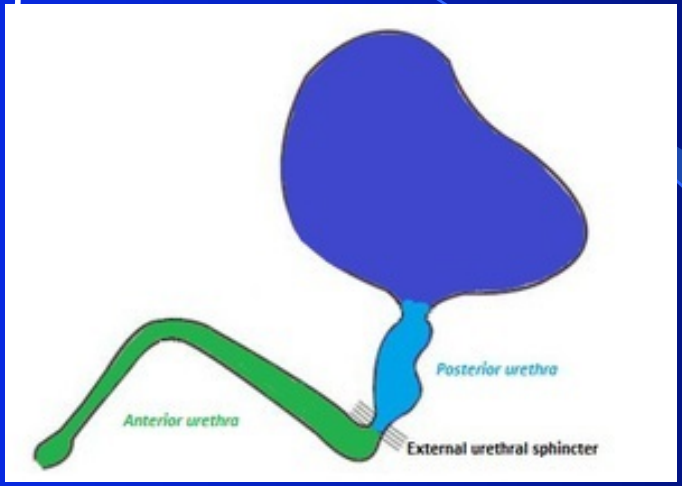
Bladder Injuries…

- **Management:**
  - **Extra-peritoneal**
    - Bladder drainage +++++
    - Open repair +
  - **Intra peritoneal**
    - open repair…why?
      - Unlikely to heal spontaneously.
      - Usually large
      - Leakage causes peritonitis
      - Associated other organ injury.

Urethral Injury

Urethral Injuries

- Anterior urethral injuries
- Posterior urethral injuries



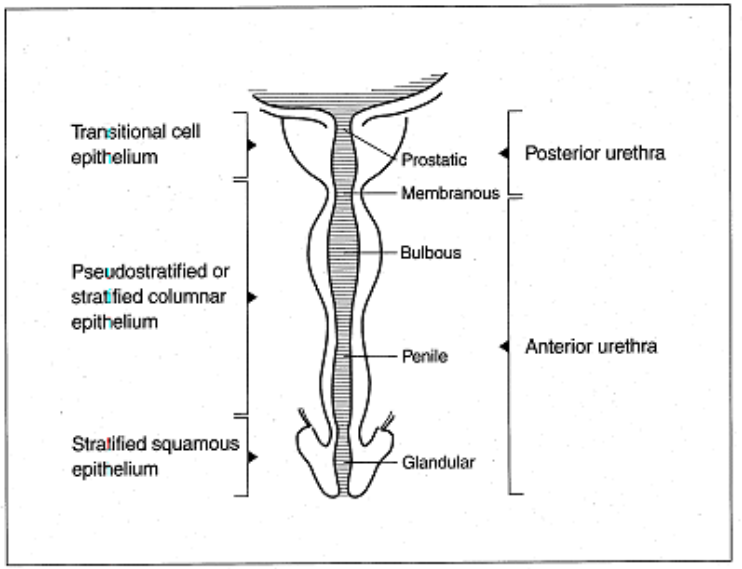
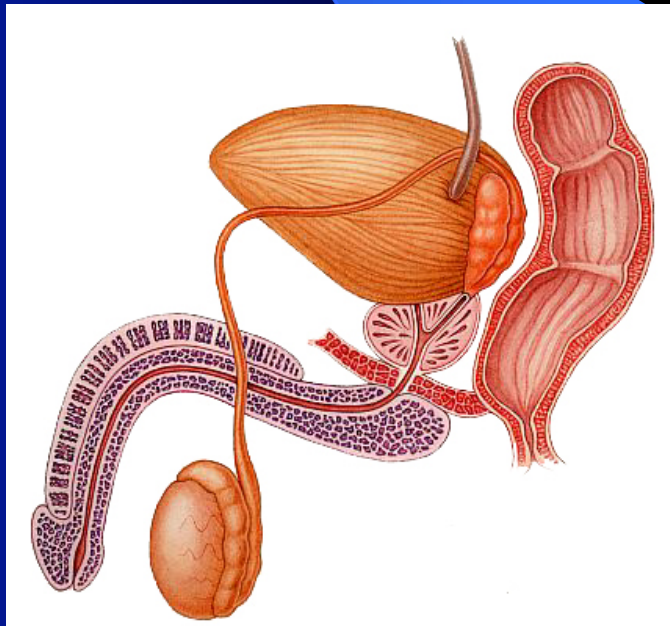
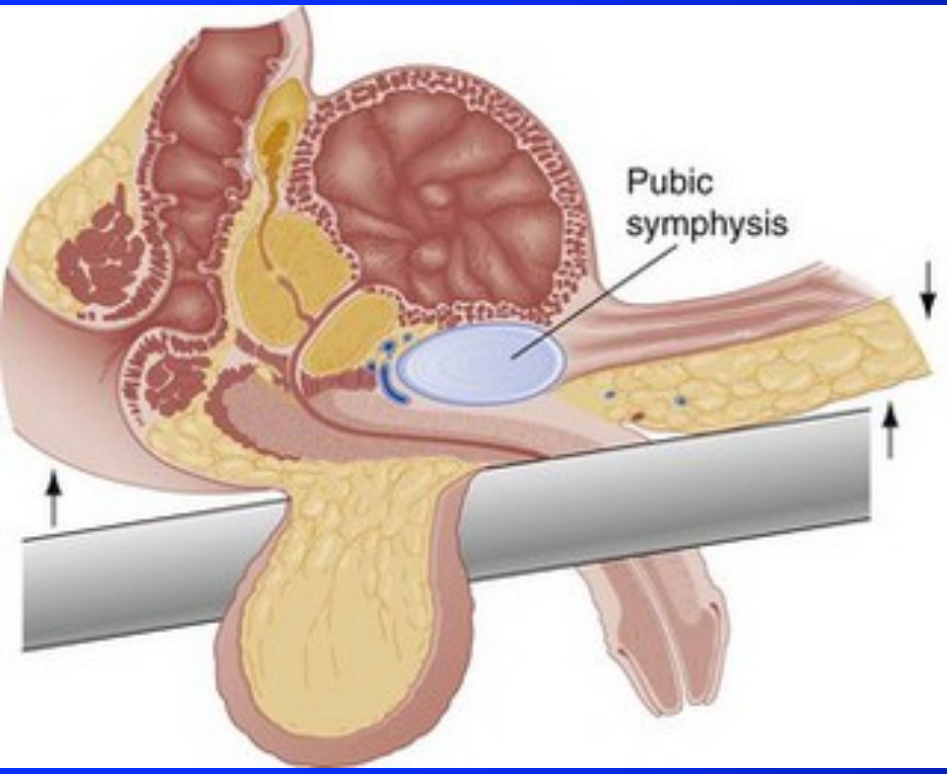


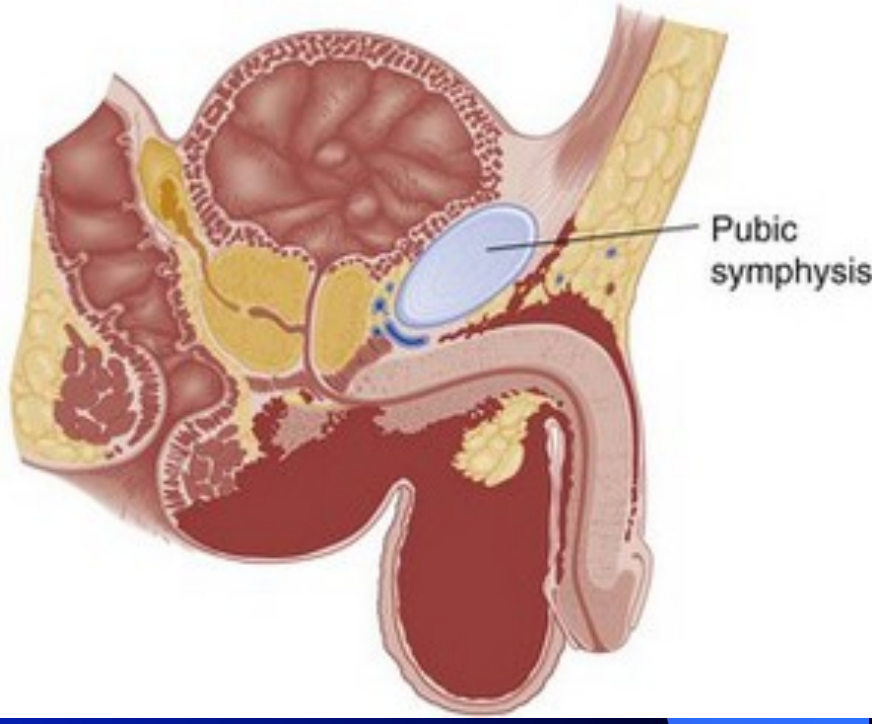
Figure 6: Anatomy of the male urethra, showing histology of the mucosa and anatomic divisions. Adapted, with permission, from Levine R.[22]



Anterior urethral injuries:

- Rare
- Mechanism:
  - The majority is a 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.


Pubic
symphysis


Pubic
symphysis

Anterior urethral injuries…

- **Symptoms and signs:**
  - Meatal Bleeding
  - Difficulty in passing urine
  - Frank haematuria
  - Hematoma may accumulate around the site of the rupture
  - Penile swelling

Anterior urethral injuries…

- **Diagnosis:**
  - Retrograde urethrography (Ascending urethrogram
    - 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 blind insertion of urethral catheterization

    (may be by using cystoscopy and guide wire)
    - Majority can be managed by suprapubic urinary diversion for one week
    - Penetrating partial disruption (e.g., knife, gunshot wound), primary (immediate) repair.

Anterior urethral injuries…

- 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

- Great majority of posterior urethral injuries occur in association with pelvic fractures
- 10% to 20% have an associated bladder rupture
- **Signs:**
  - Blood at the meatus, gross hematuria, and perineal or scrotal bruising.
  - High-riding prostate

POSTERIOR URETHRAL INJURIES…

Classification of posterior urethral injuries

type I:(rare)

stretch injury with intact urethra

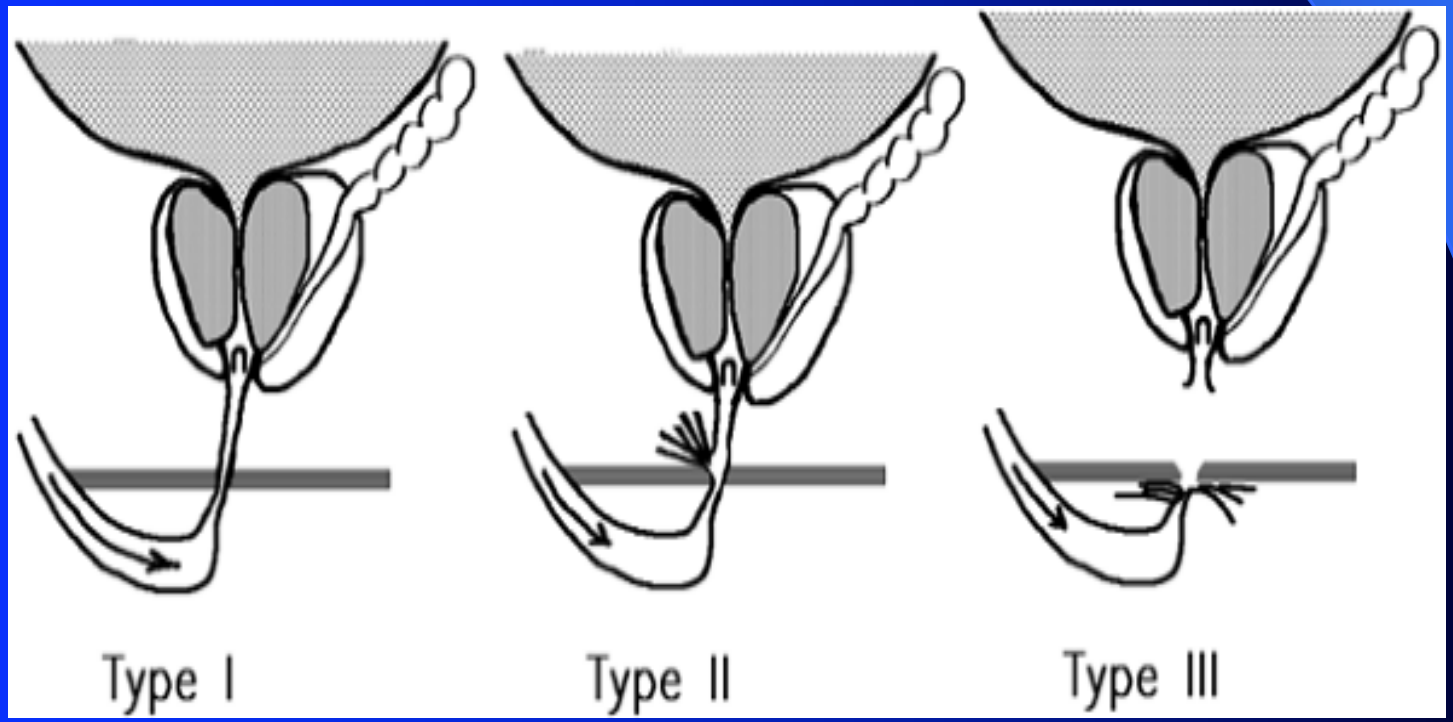
type II : (25%)

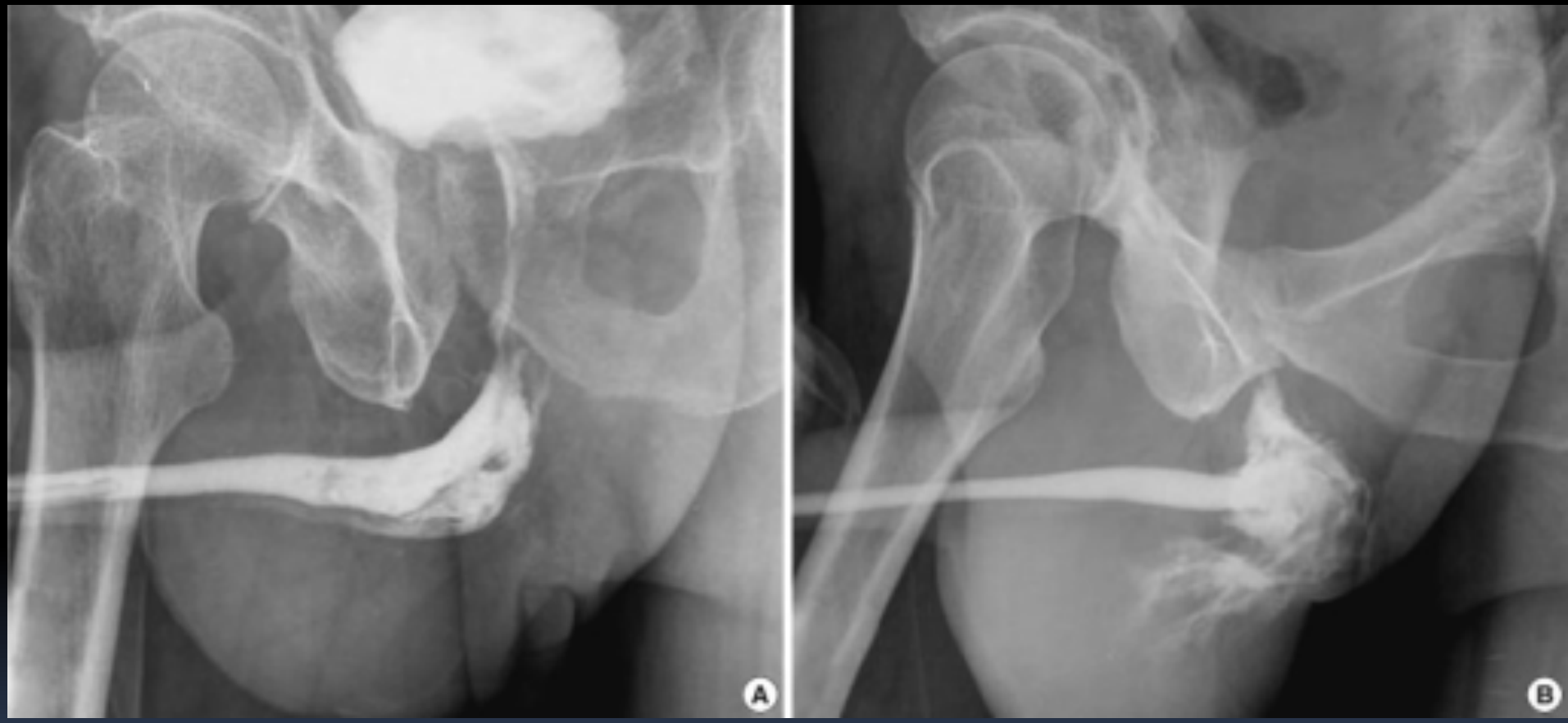
partial tear but some continuity remains)

type III:(75%)

complete tear with no evidence of continuity

In women, partial rupture at the anterior position is the most common urethral injury associated with pelvic fracture.




A
B

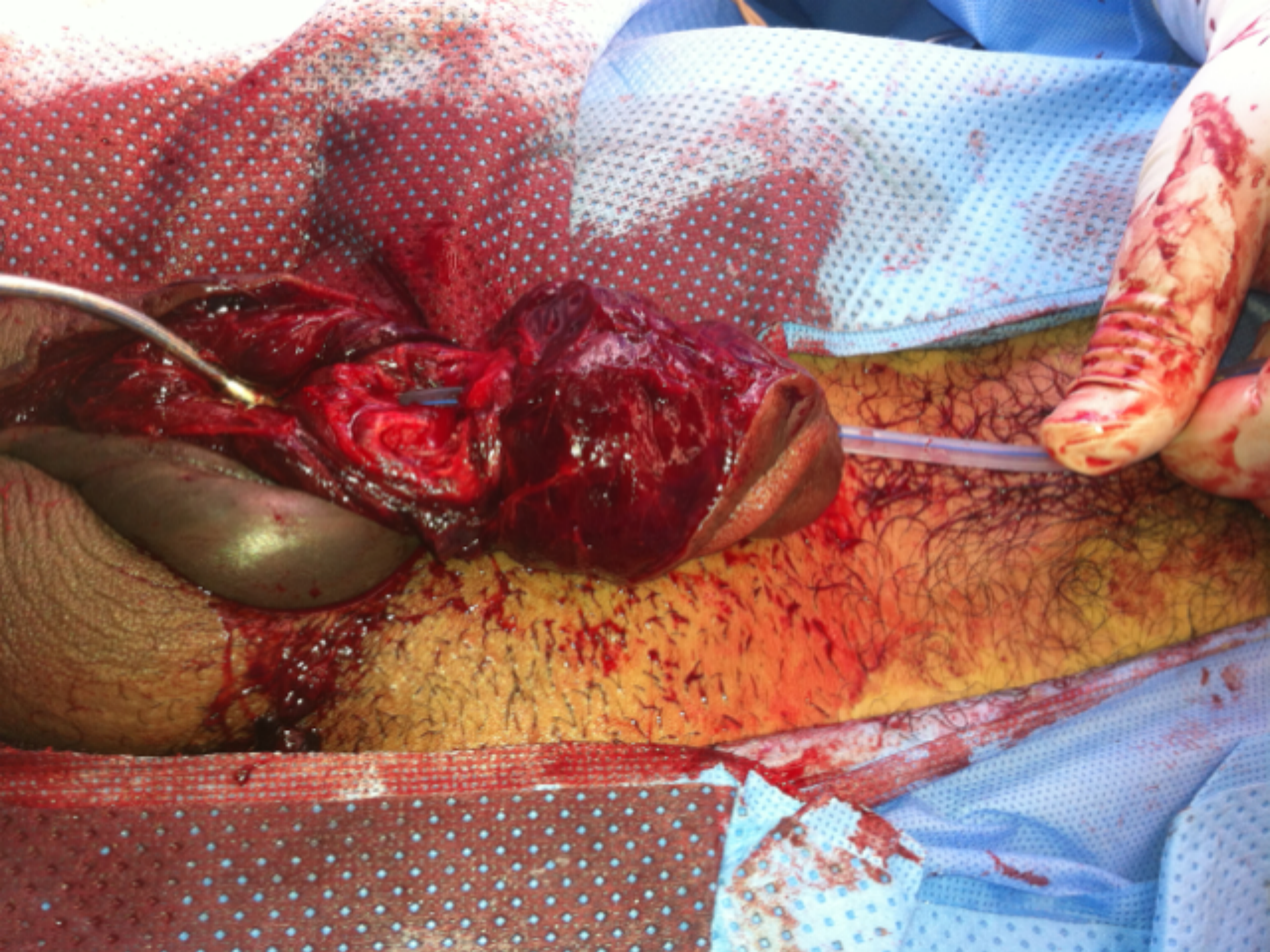
- **Management:**

  - 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 (ED)
    - Initial management with suprapubic *cystotomy and attempting primary repair at 7 to 10 days after injury.*

External Genital injuries

External Genital injuries…

Penile Fracture



- Glans Injury
- Penile amputation and injuries

Scrotal Injuries

Female External genitalia injuries

Managed by Gynecologists unless the urethra is involved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