BLADDER INJURIES

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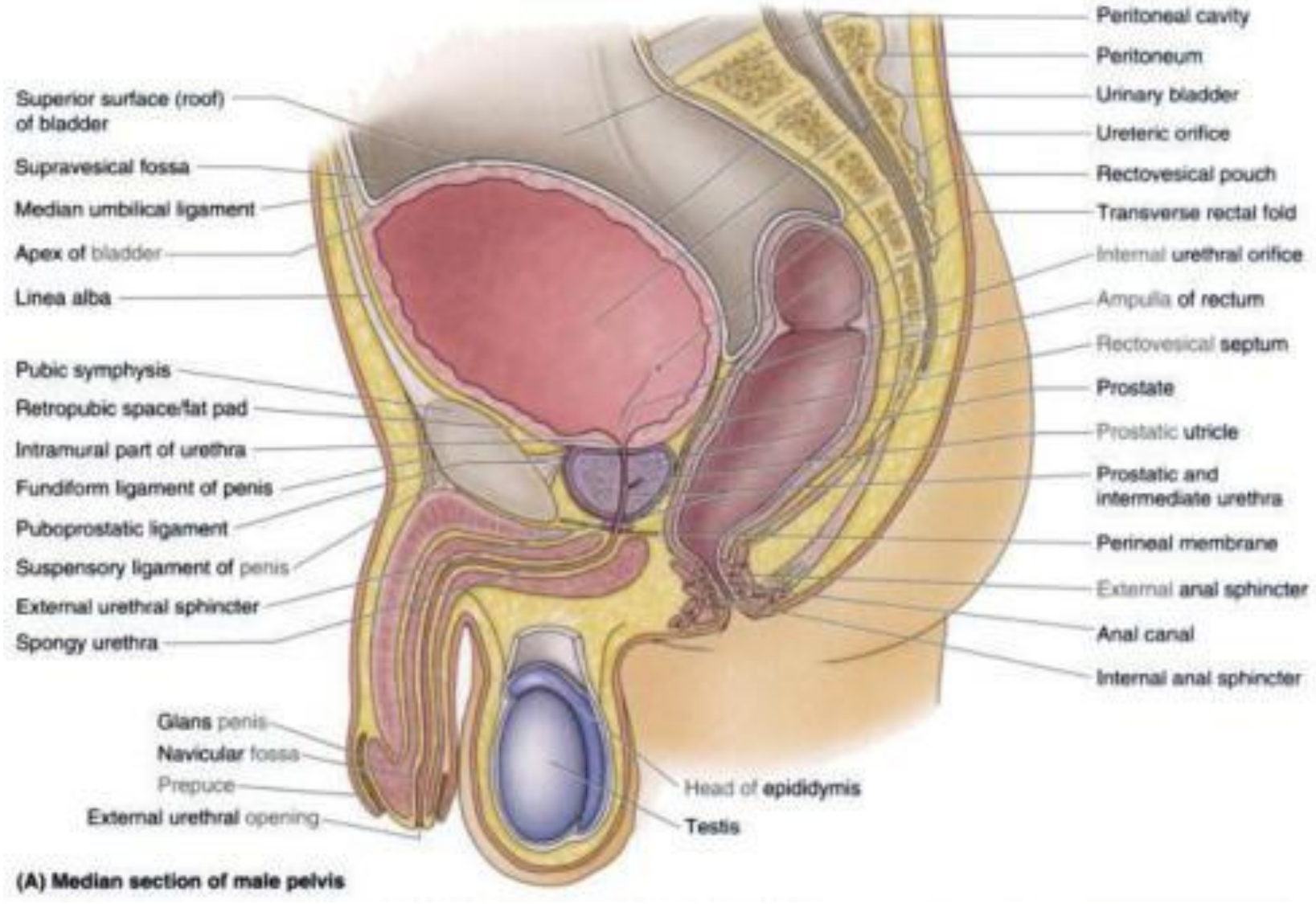
INTRODUCTION

Bladder injuries occur most often from external force and are often associated with pelvic fractures. (About 15% of all pelvic fractures are associated with concomitant bladder or urethral injuries.)

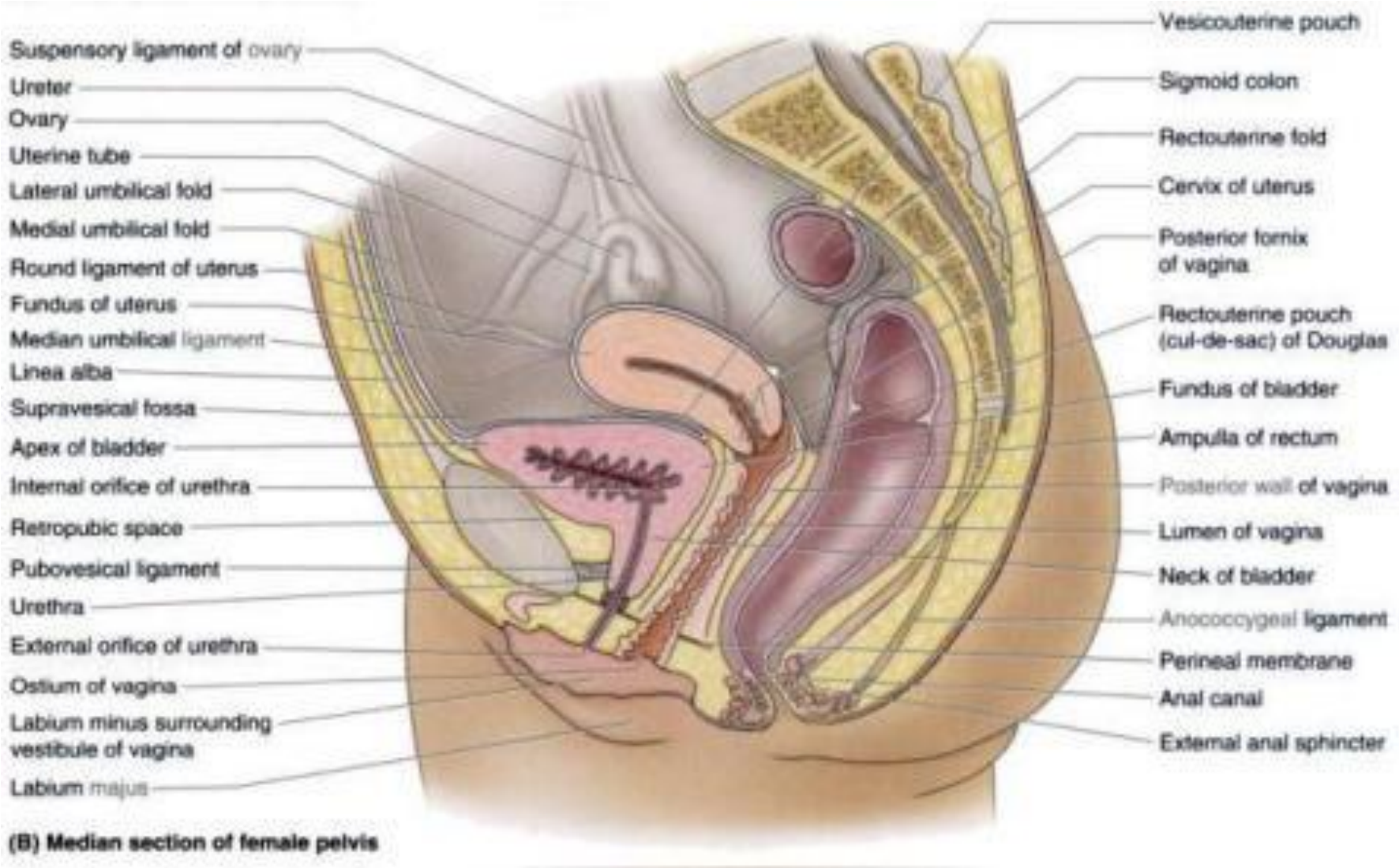
Iatrogenic injury may result from gynecologic and other extensive pelvic procedures as well as from hernia repairs and transurethral operations.

MALE U.B



(A) Median section of male pelvis

FEMALE U.B



(B) Median section of female pelvis

PATHOGENESIS AND PATHOLOGY

The bony pelvis protects the urinary bladder very well. When the pelvis is fractured by blunt trauma, fragments from the fracture site may perforate the bladder. These perforations usually result in extraperitoneal rupture. If the urine is infected, extraperitoneal bladder perforations may result in deep pelvic abscess and severe pelvic inflammation.

When the bladder is filled to near capacity, a direct blow to the lower abdomen may result in bladder disruption. This type of disruption is ordinarily intraperitoneal. Since the reflection of the pelvic peritoneum covers the dome of the bladder, a linear laceration will allow urine to flow into the abdominal cavity. If the diagnosis is not established immediately and if the urine is sterile, no symptoms may be noted for several days. If the urine is infected, immediate peritonitis and acute abdomen will develop.

So we have two types of perforation:

1- Intraperitoneal perforation: the peritoneum overlying the bladder is breached, allowing urine to escape into the peritoneal cavity.

2- Extraperitoneal perforation: the peritoneum is intact and urine escapes the space around the bladder, but not into the peritoneal cavity.

MAKING THE DIAGNOSIS

During endoscopic urological operations (e.g. TURT, cystolitholapaxy), the diagnosis is usually obvious on visual inspection alone- a dark hole is seen in the bladder and loops of bowel may be seen on the other side. No further diagnostic tests are required.

In cases of trauma, the classical triad of symptoms and signs suggesting a bladder rupture is:

- Suprapubic pain and tenderness.
- Difficulty or inability in passing urine.
- Haematuria.

Additional signs:

- Abdominal distension.
- Absent bowel sounds (indicating an ileus from urine in the peritoneal cavity).

These symptoms and signs are an indication for a retrograde cystogram.

LABORATORY FINDINGS

Catheterization usually is required in patients with pelvic trauma but not if bloody urethral discharge is noted. Bloody urethral discharge indicates urethral injury, and a urethrogram is necessary before catheterization. When catheterization is done, gross or, less commonly, microscopic hematuria is usually present. Urine taken from the bladder at the initial catheterization should be cultured to determine whether infection is present.

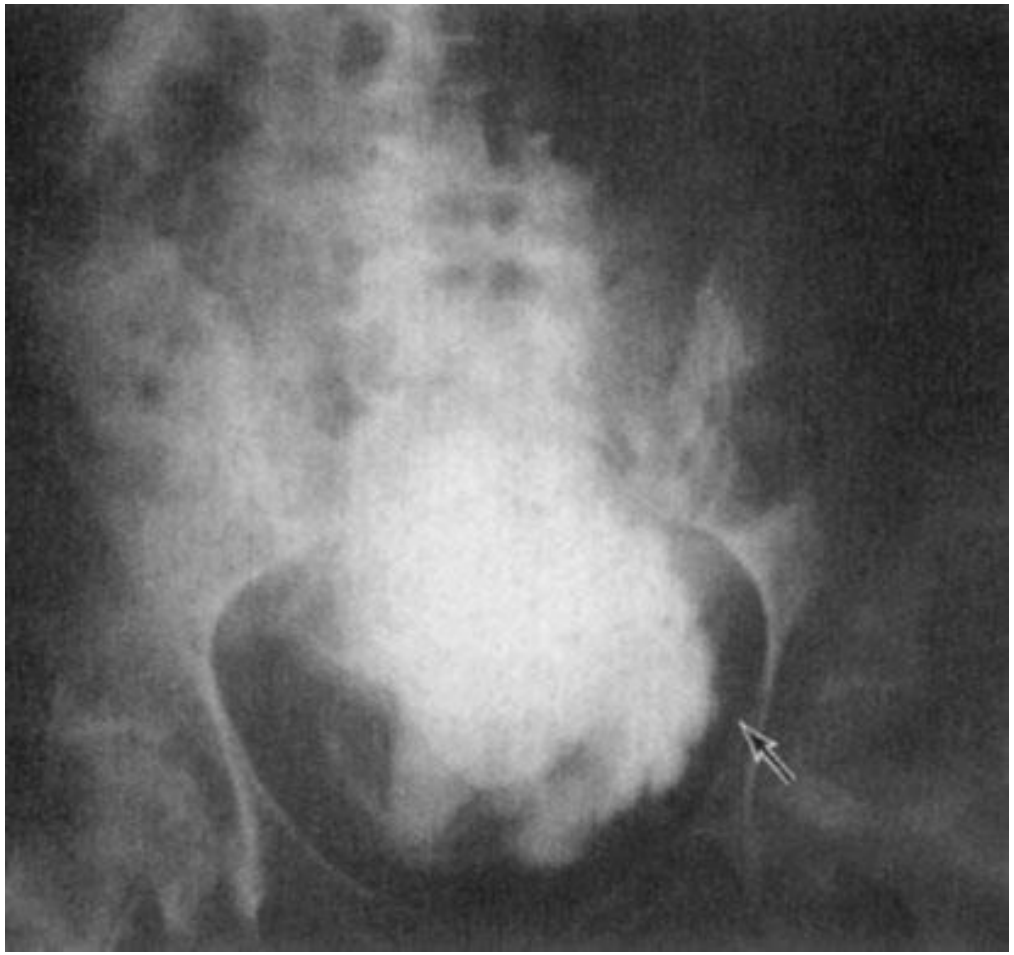
X-RAY FINDINGS

A plain abdominal film generally demonstrates pelvic fractures. There may be haziness over the lower abdomen from blood and urine extravasation. A CT scan should be obtained to establish whether kidney and ureteral injuries are present.

RETROGRADE CYSTOGRAM

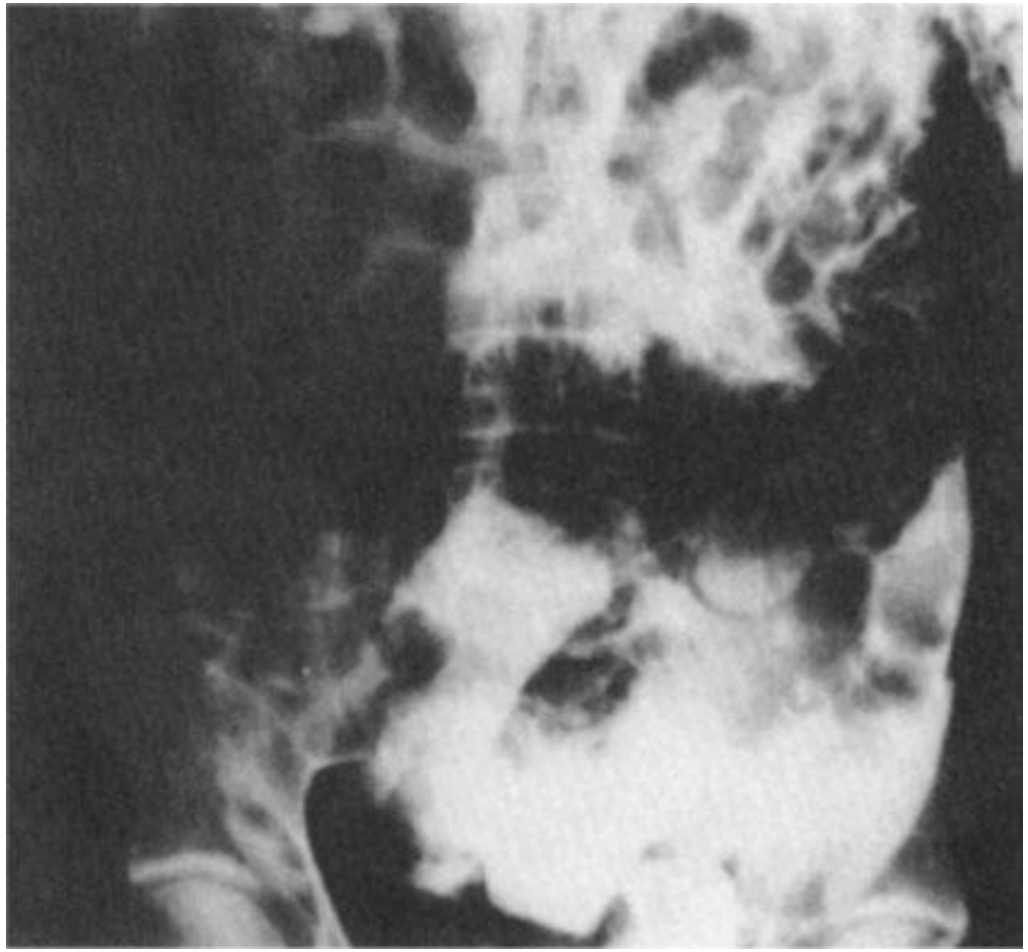
Bladder disruption is shown on cystography. The bladder should be filled with 300-400 mL of contrast material and a plain film of the lower abdomen obtained. Contrast medium should be allowed to drain out completely, and a second film of the abdomen should be obtained. The drainage film is extremely important, because it demonstrates areas of extraperitoneal extravasation of blood and urine that may not appear on the filling film.

With intraperitoneal extravasation, free contrast medium is visualized in the abdomen, highlighting bowel loops



Extraperitoneal perforation

Extravasation (at *arrow) seen outside the bladder in the pelvis* on cystogram.



Intraperitoneal perforation

Cystogram shows contrast surrounding loops of bowel.

COMPLICATIONS

A **pelvic abscess** may develop from extraperitoneal bladder rupture; if the urine becomes infected, the pelvic hematoma becomes infected too. Intraperitoneal bladder rupture with extravasation of urine into the abdominal cavity causes delayed **peritonitis**. Partial **incontinence** may result from bladder injury when the laceration extends into the bladder neck.

TREATMENT

1- Extraperitoneal bladder rupture:

Extraperitoneal bladder rupture can be successfully managed with urethral catheter drainage only. (Typically 10 days will provide adequate healing time.) Large blood clots in the bladder or injuries involving the bladder neck should be managed surgically. As the bladder is opened in the midline, it should be carefully inspected and lacerations closed from within. Polyglycolic acid or chromic absorbable sutures should be used. Extraperitoneal bladder lacerations occasionally extend into the bladder neck and should be repaired meticulously. Fine absorbable sutures should be used to ensure complete reconstruction so that the patient will have urinary control after injury. Such injuries are best managed with indwelling urethral catheterization and suprapubic diversion.

So bladder drainage with a urethral catheter for 10 to 14 days followed by a cystogram to confirm the perforation has healed is enough for extraperitoneal bladder rupture.

Indications for surgical repair of extraperitoneal bladder rupture:

- If you have opened the bladder to place a suprapubic cahteter for a urethral injury.
- A bone spike protruding into the bladder on CT.
- Associated rectal or vaginal perforation.
- Where the patient is undergoing open fixation of a pelvic fracture, the bladder can be simultaneously repaired.

2- Intraperitoneal bladder rupture:

Intraperitoneal bladder ruptures should be repaired via a transperitoneal approach after careful transvesical inspection and closure of any other perforations. The peritoneum must be closed carefully over the area of injury. The bladder is then closed in separate layers by absorbable suture. All extravasated fluid from the peritoneal cavity should be removed before closure. At the time of closure, care should be taken that the suprapubic cystostomy is in the extraperitoneal position.

PROGNOSIS

With appropriate treatment, the prognosis is excellent. The suprapubic cystostomy tube can be removed within 10 days, and the patient can usually void normally. Patients with lacerations extending into the bladder neck area may be temporarily incontinent, but full control is usually regained. At the time of discharge, urine culture should be performed to determine whether catheter-associated infection requires further treatment.

THANK YOU