
بسم الله الرحمن الرحيم

- *دکتر عمادالدین موعودی*
- ا ر و ل و ژ ی س ت – ا ر و ا ن ک و ل و ژ ی س ت
- *دانشیار - عضو هییت علمی دانشگاه علوم پزشکی بابل*

Genitourinary trauma

Epidemiology

- 10% of admission to a trauma service
- If injury to GU system diagnosed ,multi-organ injury is the rule
- 80% result from blunt trauma
- Common mechanisms :
  - motor vehicle collisions
  - falls from height
  - direct blows from assault , sporting events
- Most common injured organ : kidney
- Most rare injured organ : ureter

Renal trauma

Anatomy

- Retroperitoneal
- Adjacent to T11-L4 vertebrae
- Upper poles protected by ribs so lower poles more commonly injured
- Right kidney inferior to left & more commonly injured
- Kidney mobile , hilum more fixed

Renal trauma

- History : nature of trauma
- Examination : PR BP RR flank bruising rib Fx
- Lab data : CBC, serum chemistry profile, U/A
- Imaging indications :

  gross hematuria

  acceleration & deceleration

  Microhaematuria + SBP < 90 mmHg

  Microhaematuria in pediatric patients

Hematuria

- Microscopic
- Macroscopic
- Degree of hematuria

What imaging study?

- The hemodynamically stable or unstable patient
- CT scan as the imaging study of choice

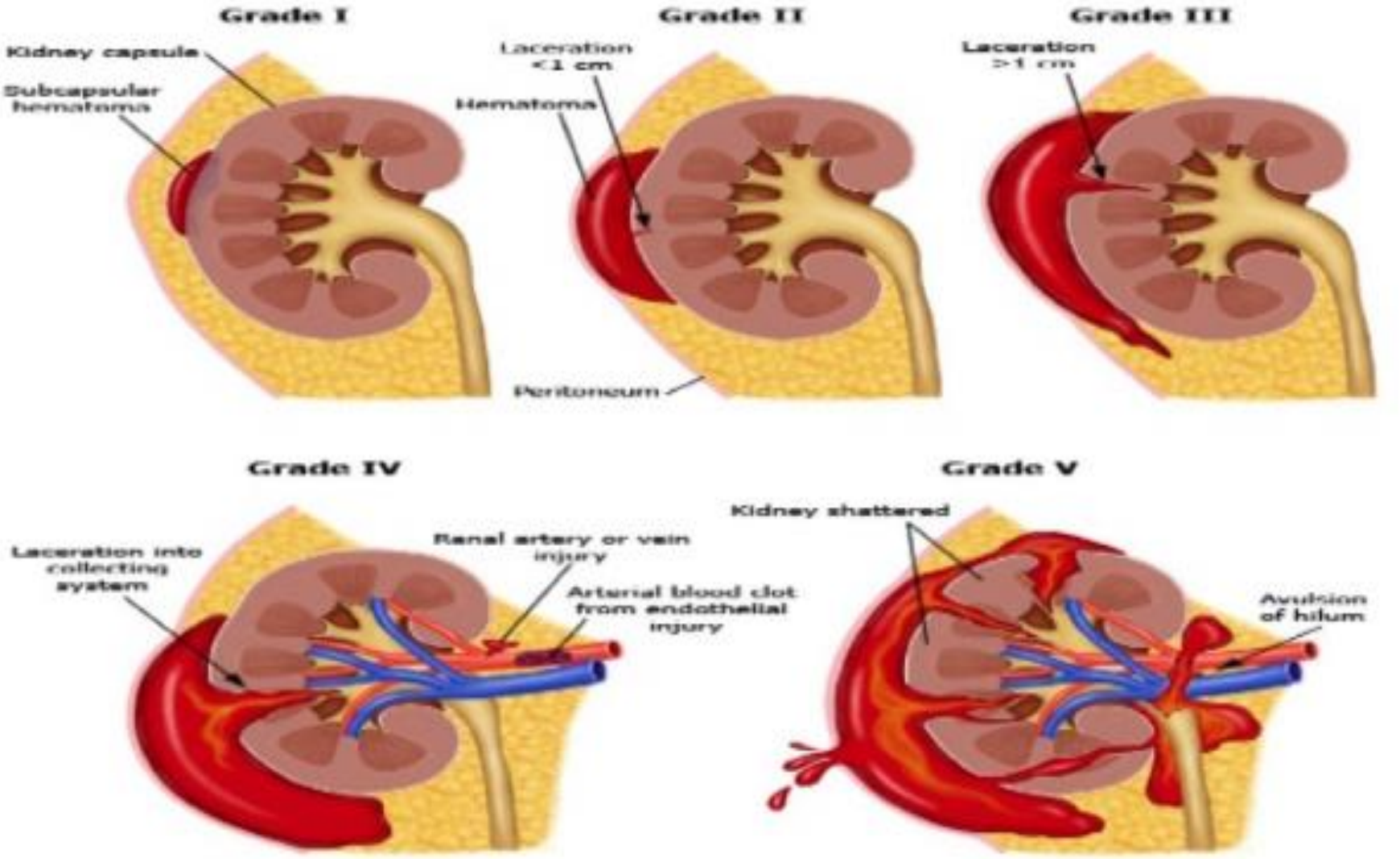
  Arterial-venous phase

  Secretory phase
- Ultrasound
- IVU
- On-table IVU

Renal Injury Grading Scale

grading	contusion	hematoma	laceration	vascular
Grade 1	+	Subcapsular Non expanding	–	–
Grade 2		Peri-renal Non expanding	Cortical < 1 cm	
Grade 3			cortical > 1cm	
Grade 4			extravasation	Segmental Partial thrombosis
Grade 5			Shattered kidney	Renal pedicle avulsion

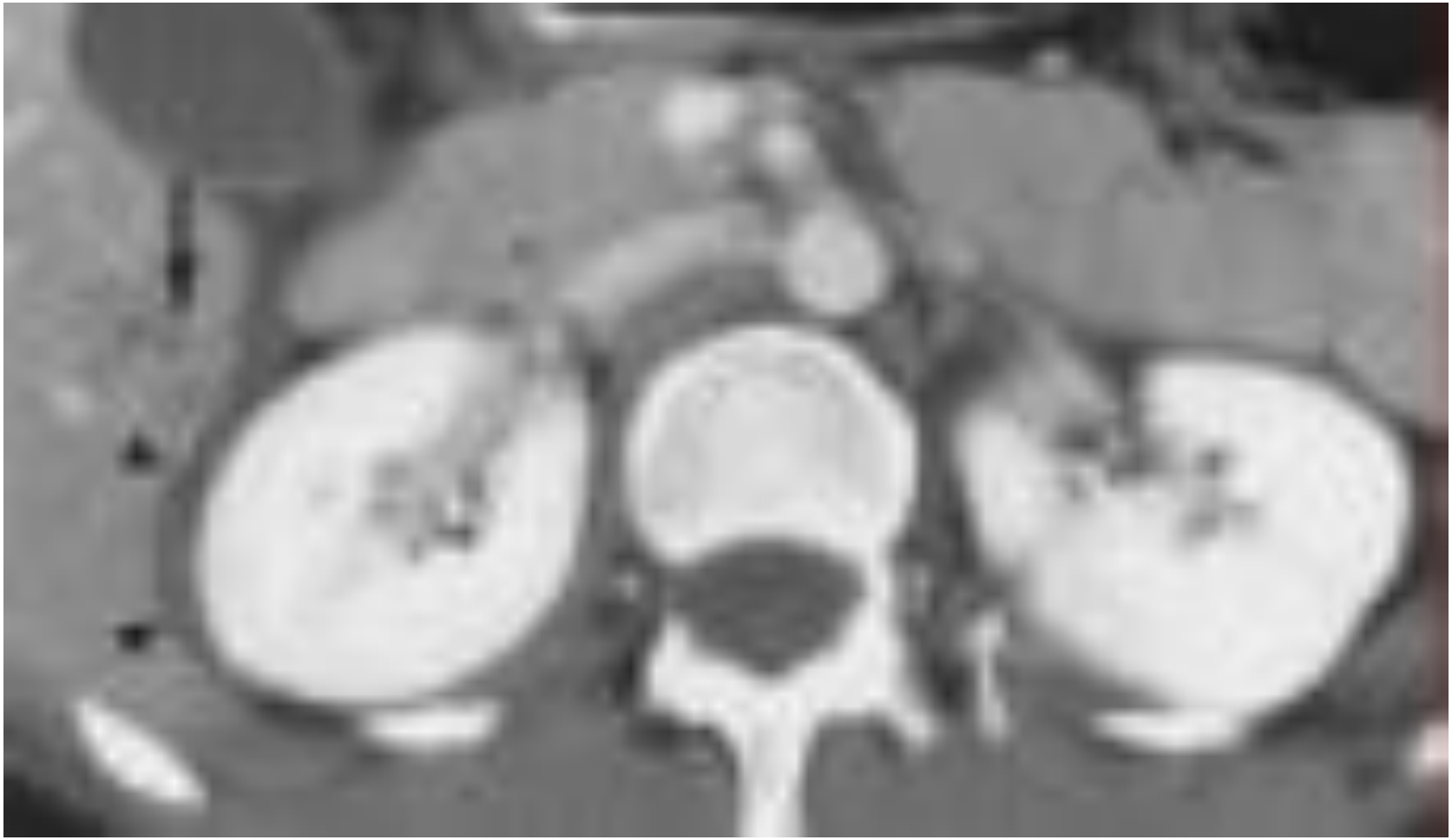
Renal Injury Grading Scale



CT grade 1

CT Scan grade 1

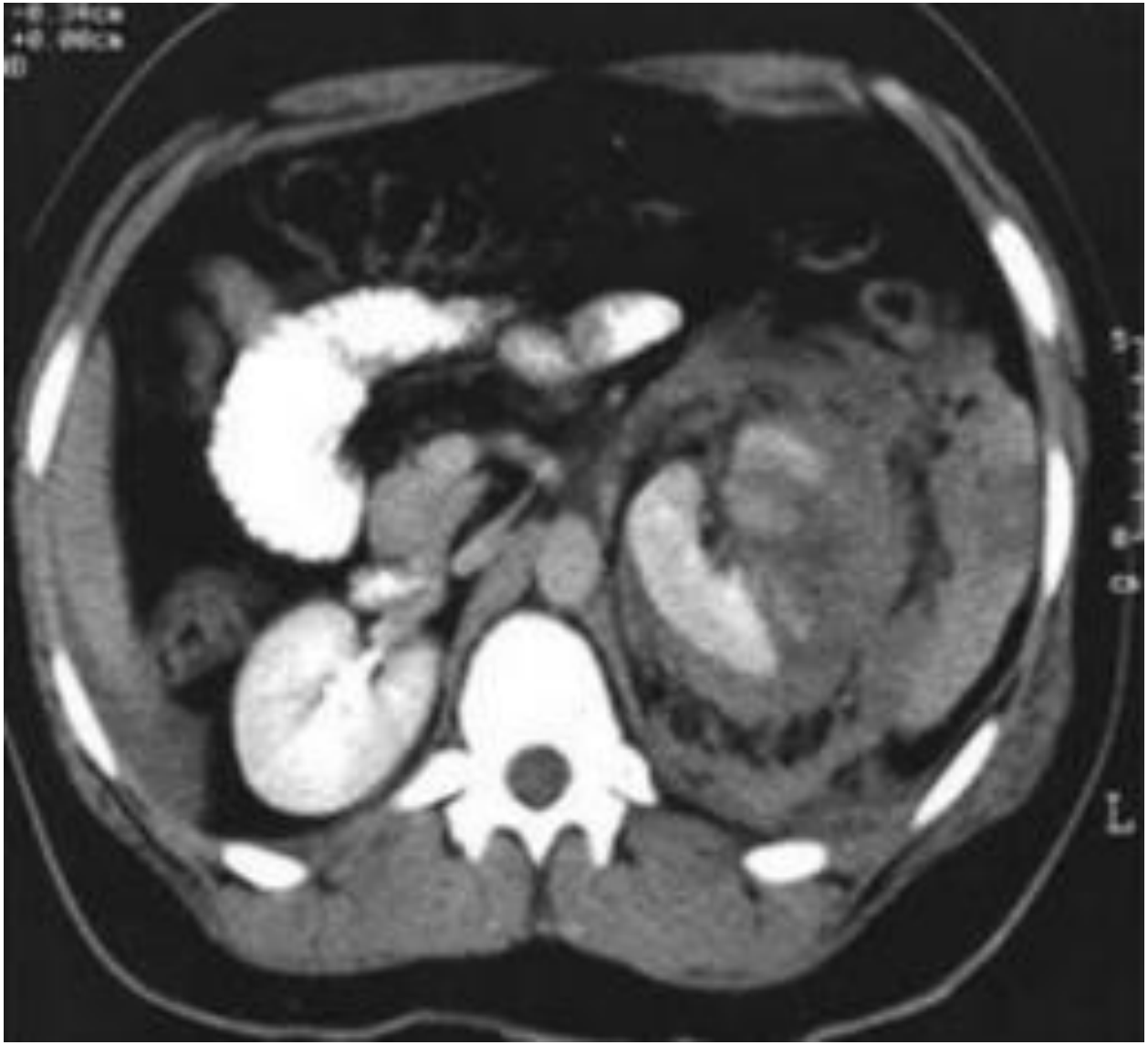
CT grade 2



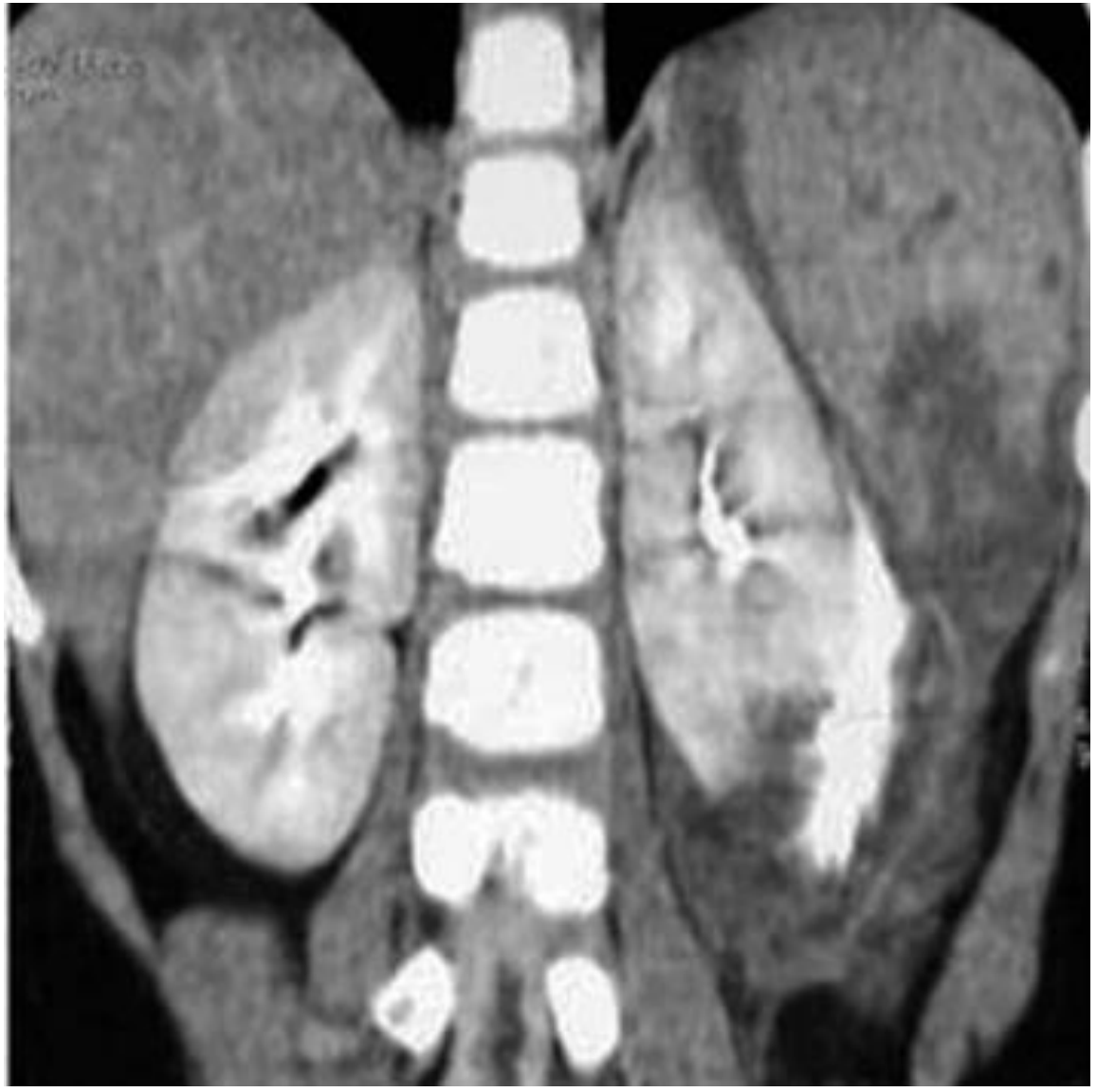
CT grade 3

CT grade 3

CT Scan grade 4



CT Scan grade 4



CT grade 5 shattered kidney

CT grade 5 avascular

CT grade 5

Treatment

- Conservative (non-operative)
- Surgical exploration

Complications of renal injury

- Early
  - Delayed bleeding
  - Urinoma
  - Abscess
  - AV fistulae
- Late
  - ↓ renal function
  - HTN

Bladder trauma

Anatomy

- Empty bladder is a pelvic organ & protected by pelvic bones
- full bladder is a abdominal organ
- Peritoneum covers superior surface of bladder

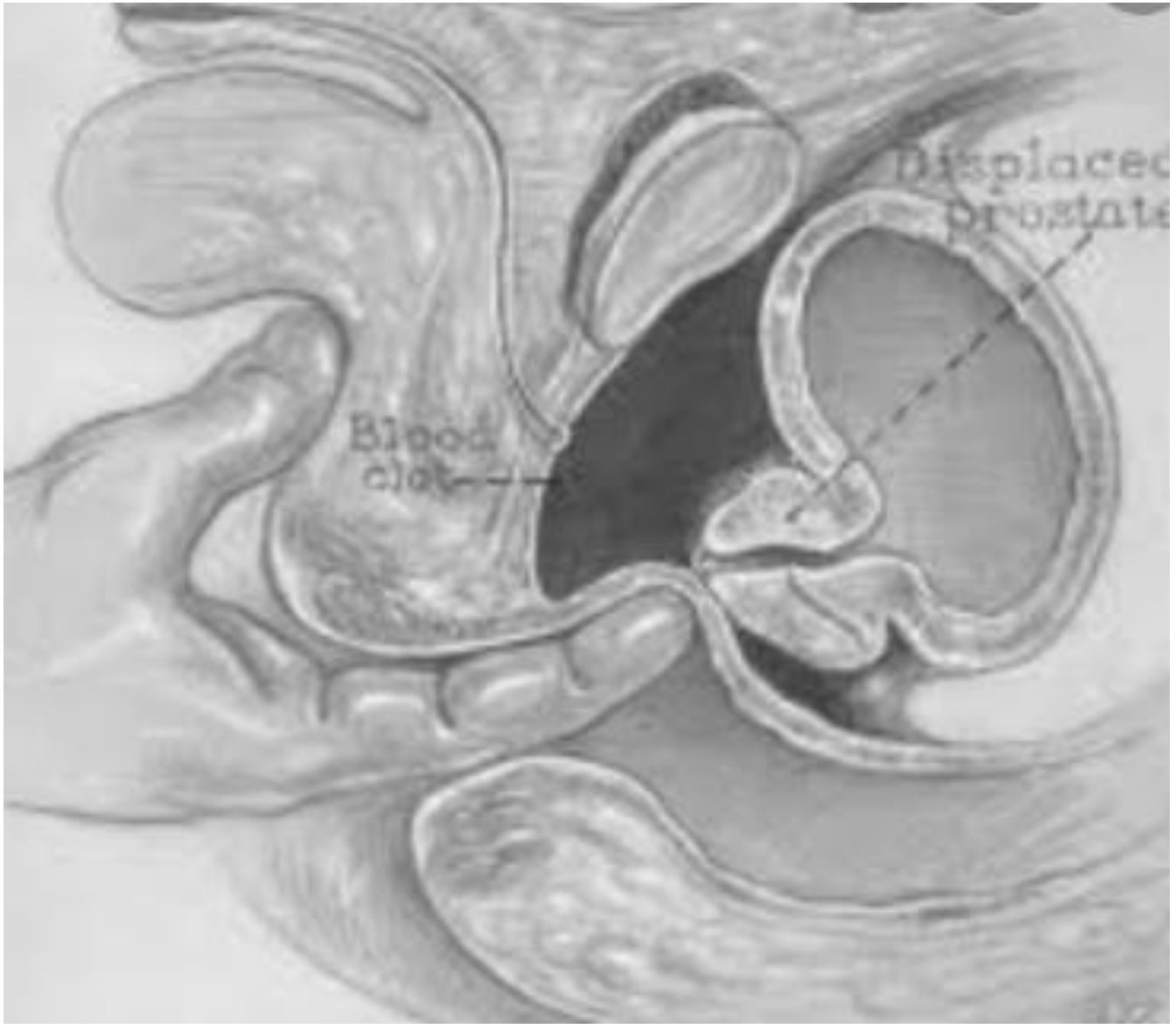
Mechanisms of injury

- Blunt trauma : up to 85%
- 70-95% of bladder injuries →pelvic Fx
- 6-10% of pelvic Fx →bladder injury
- Penetrating trauma : up to 15%
- Iatrogenic

Clinical manifestations

- Gross hematuria
- Microscopic hematuria
- Difficulty voiding
- Suprapubic pain &tenderness
- Pelvic Fracture + Gross hematuria

High riding prostate



Imaging

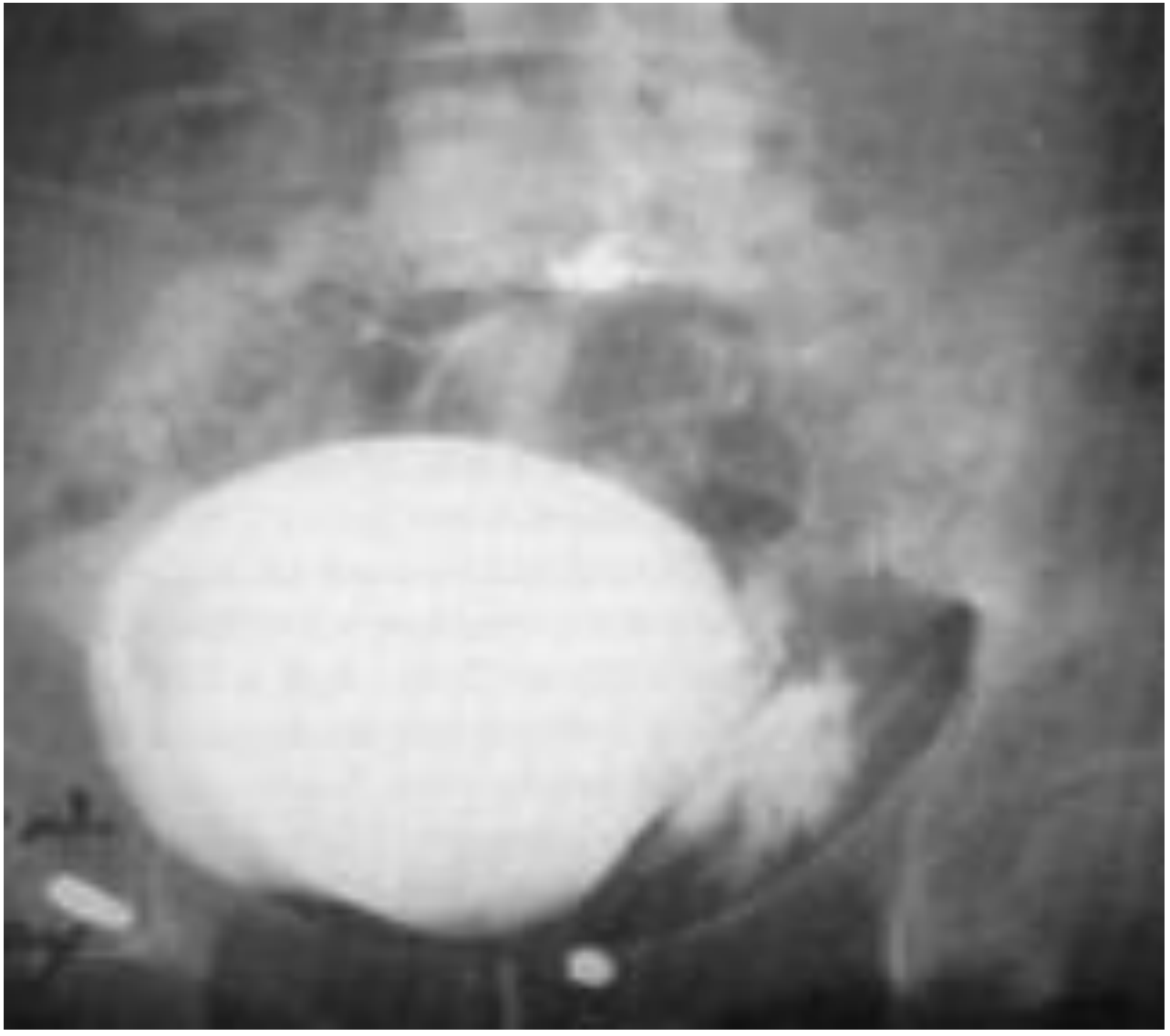
- Retrograde cystography : X ray
  CT
- R/O urethral injury
- Indications :
  pelvic Fx + hematuria
  blunt trauma in proximity to
  bladder + gross hematuria
  Penetrating trauma in proximity to the bladder or associated with hematuria

Bladder injury classification

- Extraperitoneal :60-70%
- Intraperitoneal : 15-30%
- Combined : 10%

Normal cystogram

Retrograde cystogram extraperitoneal rupture

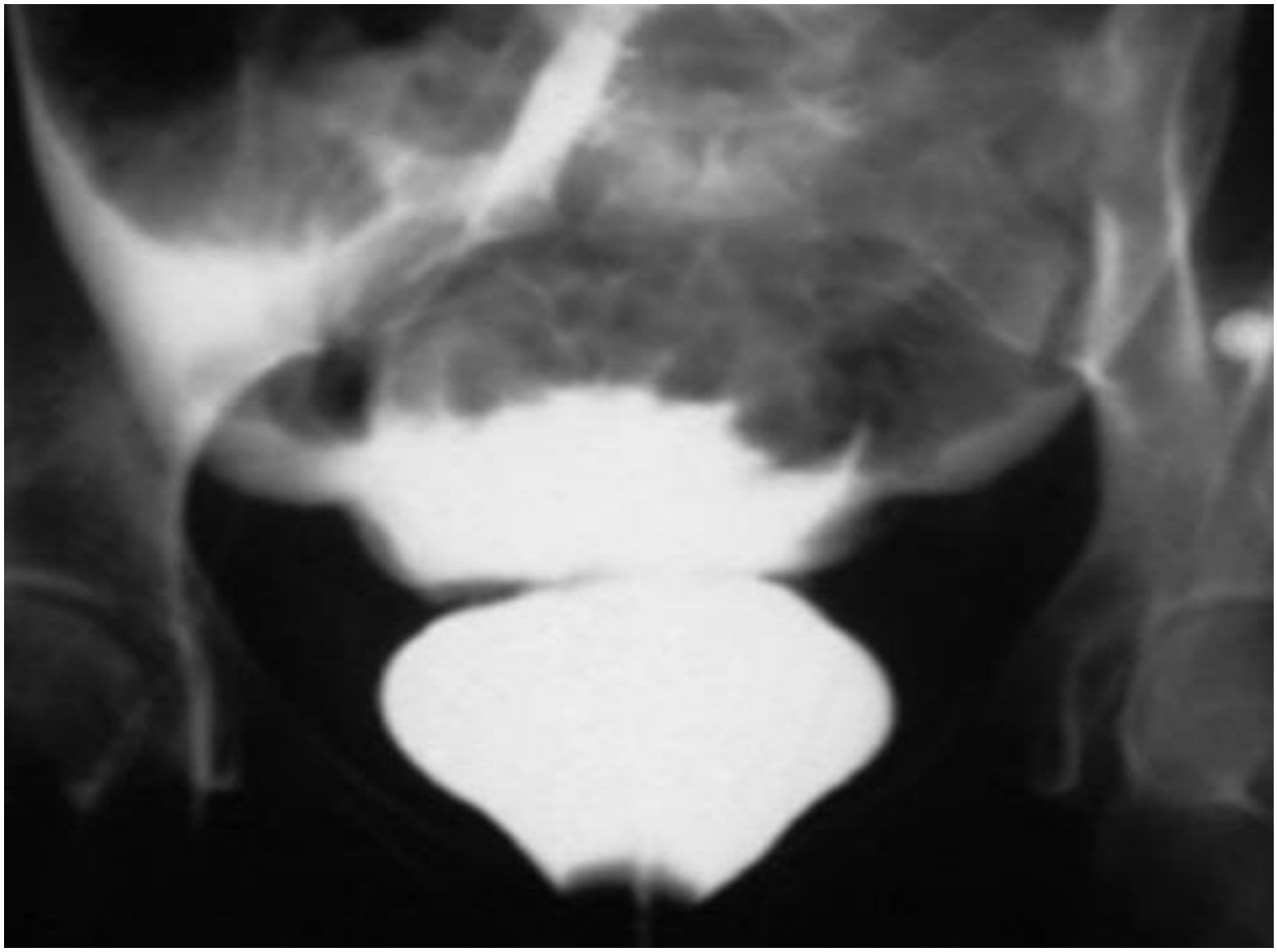


Normal CT cystogram

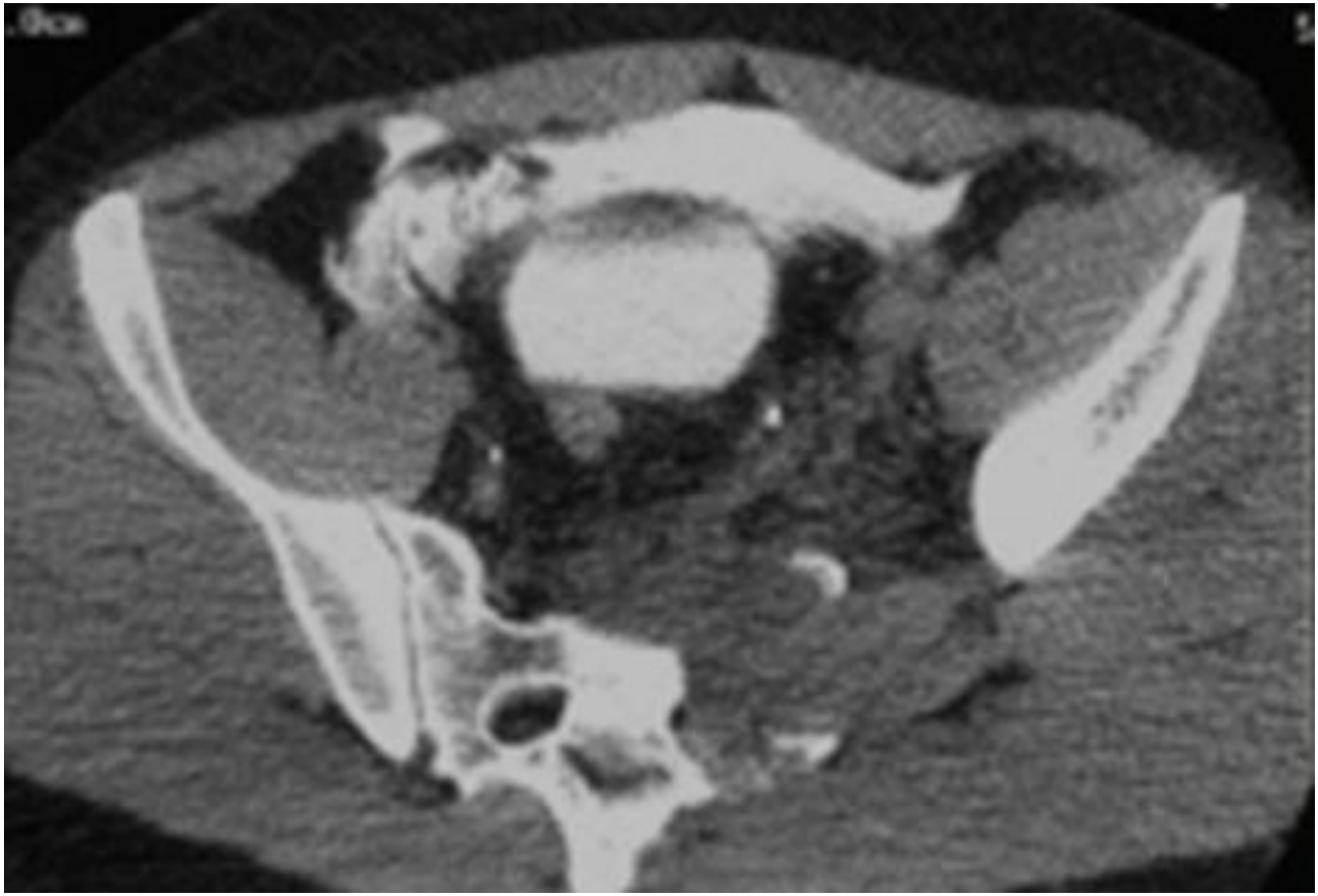
Retrograde cystogram
extraperitoneal rupture

Retrograde cyctogram
intraperitoneal rupture

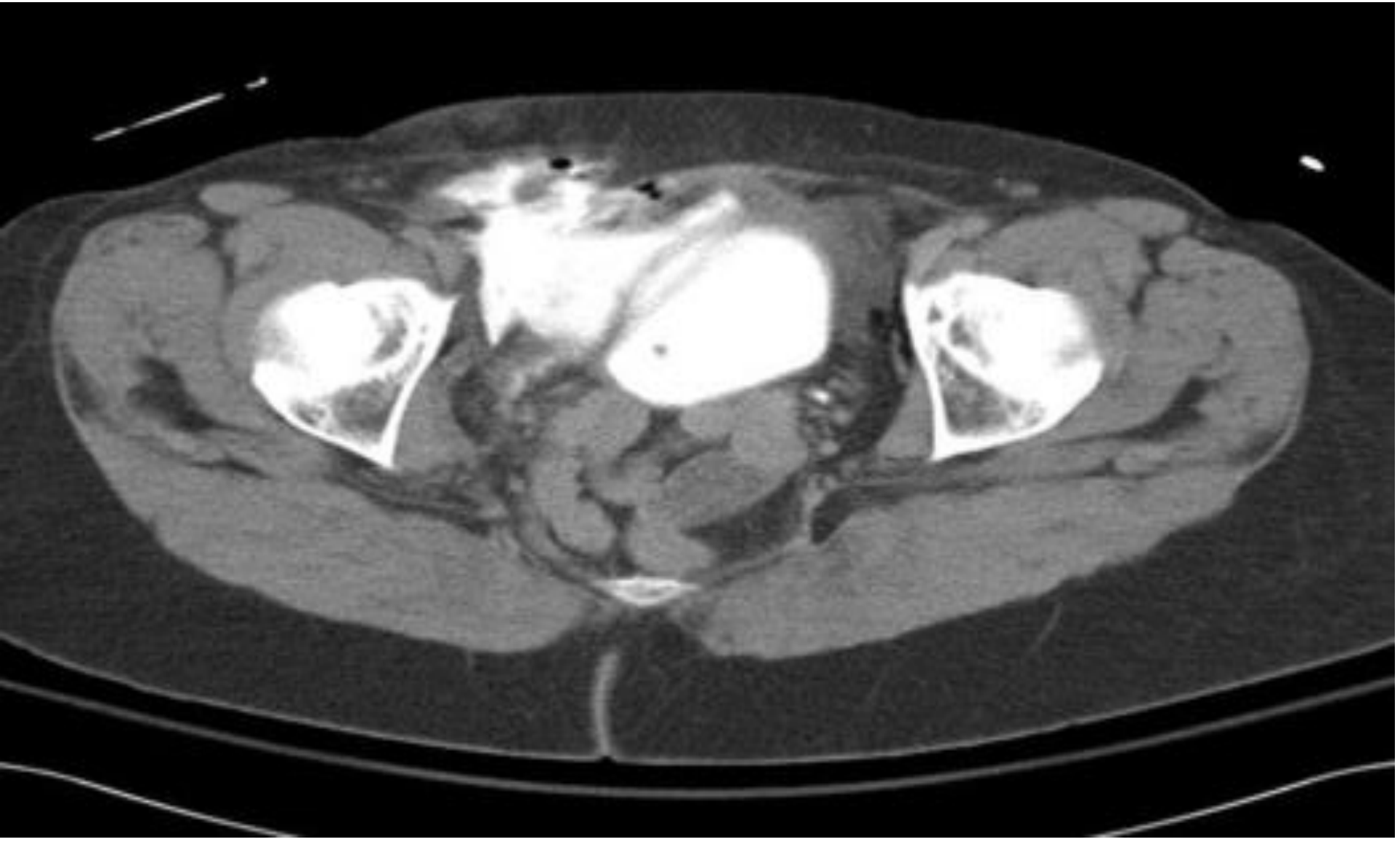
Retrograde cyctogram
intraperitoneal rupture



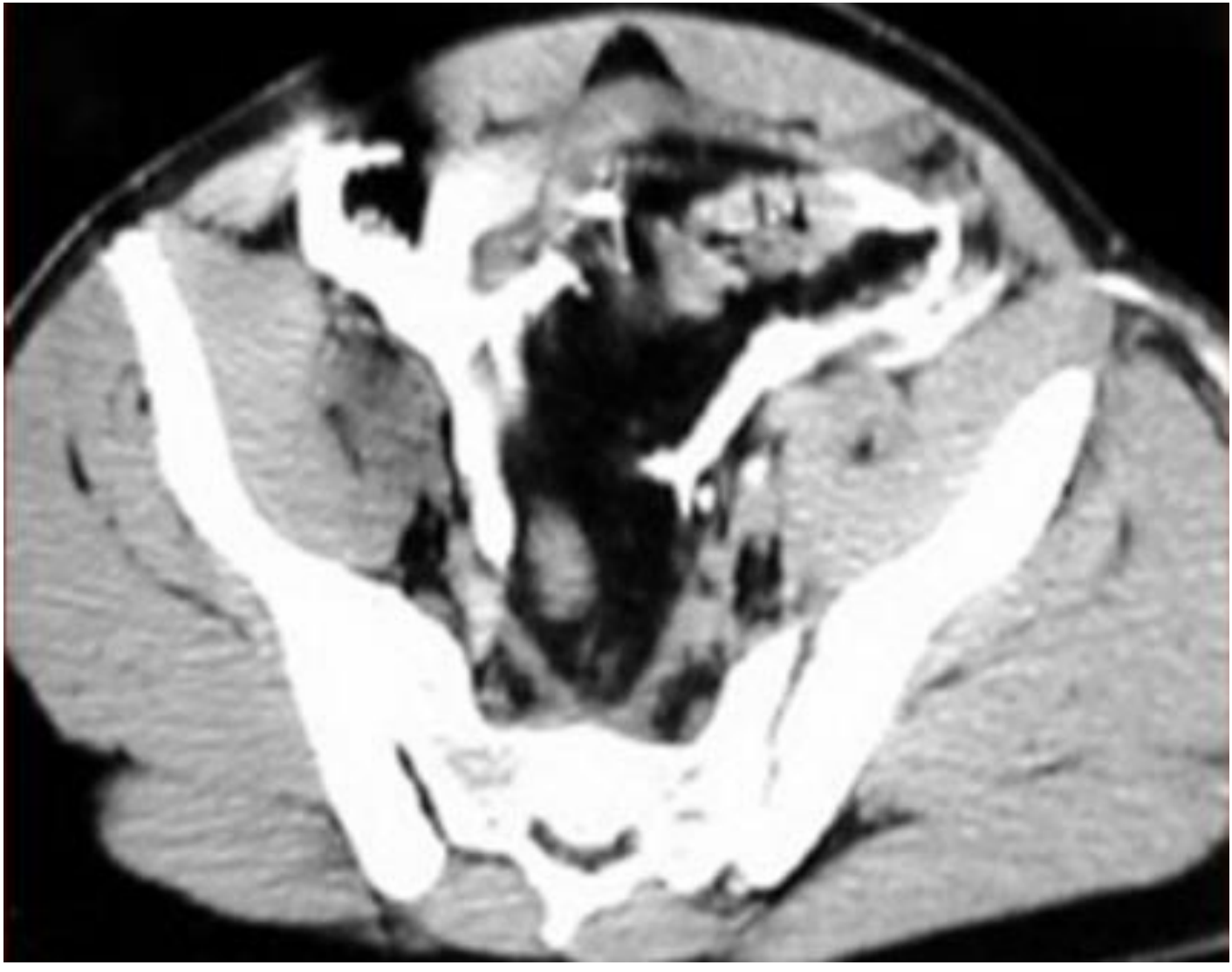
CT cystogram extraperitoneal rupture



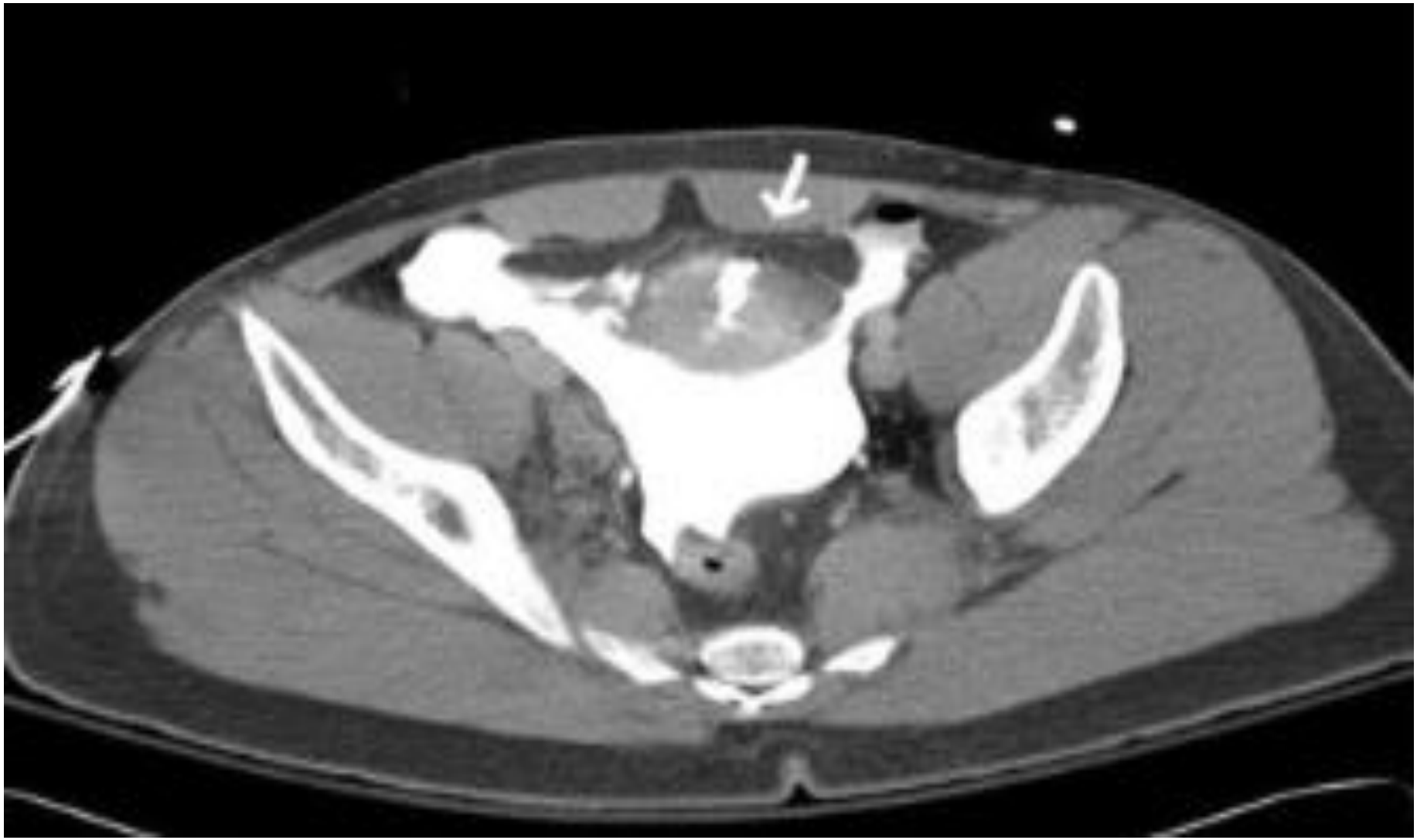
CT cystogram
extraperitoneal rupture



CT cystogram
intraperitoneal rupture



CT cystogram
intraperitoneal rupture



Management

- Intraperitoneal : repair
- Extraperitoneal : urinary drainage

Thank you