

Pelvic Trauma

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Pelvic Trauma

- Pelvis: The most important area of the body
- Pelvic injuries often represent multi-system injuries

Traumatism perivian Ruptură de perete abdominal anterior



Pelvic Fractures

- Mortality 6 to 19%
- If hypotensive, mortality 40 to 50%
- 60% due to MVAs
- 30% due to falls
- 65% of deaths due to hemorrhage

Immediate Sequelae of Pelvic Trauma

- Massive hemorrhage
- Bony disruption of pelvis
- Vascular interruption (major and minor)
- Urologic injury
- Bowel and vaginal tears or perforations
- Neurologic injury

Hemipelvictomie dreapta posttraumatică



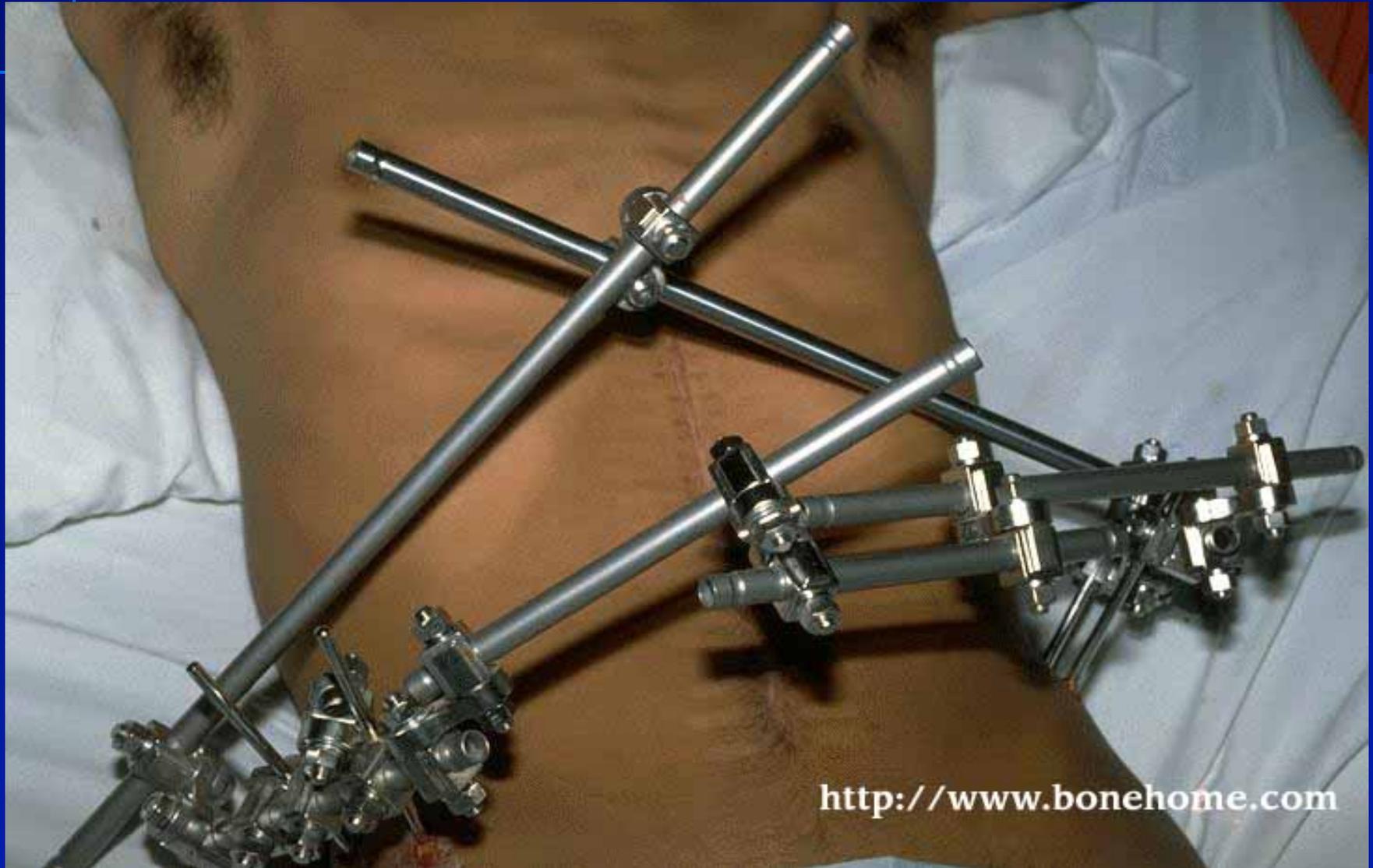
Massive Hemorrhage

- Major cause of death from pelvic fracture (60 to 80%)
- 50 to 60% of deaths due primarily to pelvic fracture occur within first nine hours of hospital admission
- Degree of hemorrhage dependent on fracture type; truly massive in large posterior fractures
- Retroperitoneum can accommodate large amount of blood and problem compounded with open fracture
- Operative treatment seldom if ever indicated unless major vascular injury uncontrolled after angiography

Pelvic Fracture: Initial Exam

- Local palpation – assess gross instability
- Both hips – associated hip fx common
- Blood at meatus (elicit by “milking” along the urethra first) – mandates urethrogram and cystogram – Do not pass foley first!
- Careful neuro exam
- Vaginal / rectal exam – if mucosa violated, patient must go to OR for diverting colostomy
- Early external fixator may be needed for unstable fx

Fixator extern



<http://www.bonehome.com>

Fixator extern



Fixator extern Ganz



Centura de stabilizare *London*



Centura de stabilizare *London* aplicată



***London* aplicata**

Pliere în vederea efectuării



Banda de stabilizare

Geneva



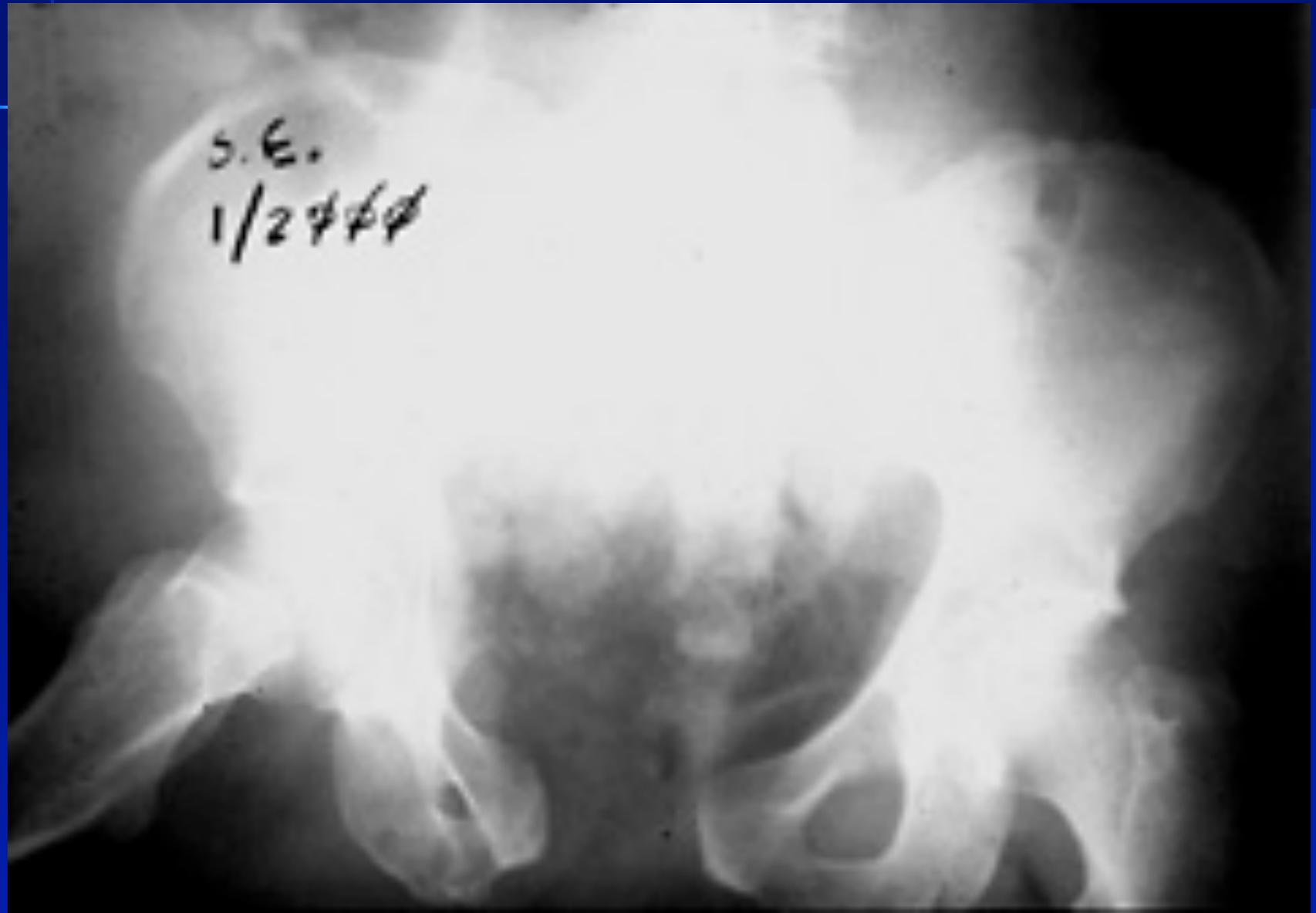
Banda de stabilizare *Geneva* aplicată



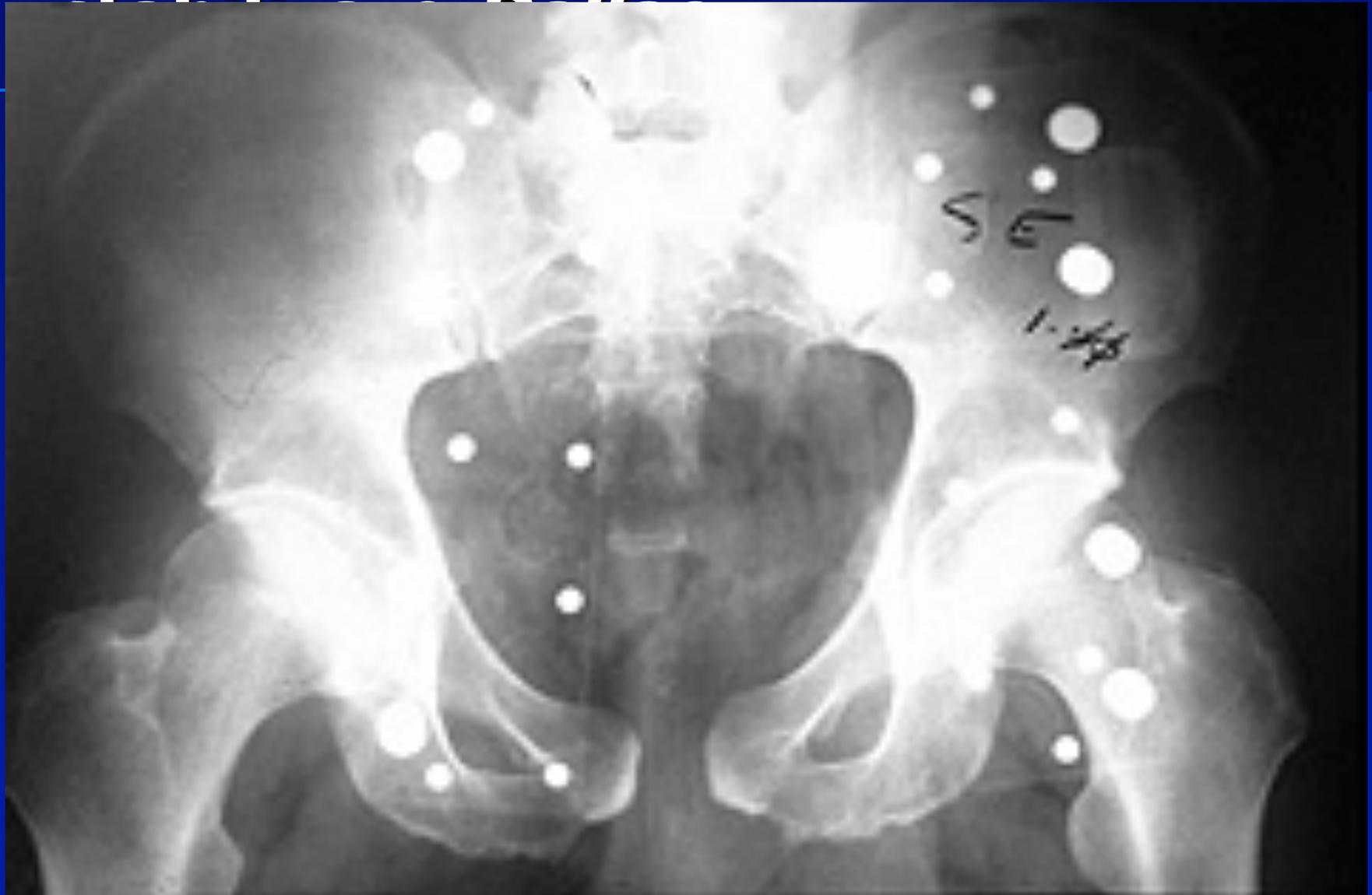
Bandă de stabilizare *Dallas*



Radiografie în incidență AP Înainte aplicării benzii de



Radiografie în incidență AP După aplicarea benzii de



Pelvic Fractures: Radiology

- AP view shows most fxs
- Inlet view – shows inward fx displacement
- Outlet view
- Tangential view – good for sacral fx and sacroiliac (SI) separation
- Computed tomography (CT) – more accurate for posterior arch and acetabular fxs

Pelvic Fractures: Diagnostic Peritoneal Lavage (DPL)

- Usually required to quickly R/O intra-abdominal bleeding as cause for shock or hypotension
- False positive rate higher than for isolated intraperitoneal injury
- Should use supraumbilical open approach

M.A.S.T. (P.A.S.G.)

- Inflation may be helpful to control bleeding from pelvic fx (inflate abdominal compartment and leg compartments)
- If unable to stabilize patient within 2 hrs of application and suspected arterial bleeder present, then go to angiography
- If left on too long: risk of compartment syndrome in legs

Angiography

- Indicated when hypovolemia persists and other sources of bleeding ruled out
- Consider early for posterior arch fx's (associated with greater bleeding)
- Allows Rx by vasopressin infusion or transcatheter embolization (wire coils or autologous clot) of bleeding vessel(s)

Classification of Pelvic Fractures

STABLE

Fracture of individual bones – no break in the pelvic ring

Avulsion fractures

anterior superior iliac spine

anterior inferior iliac spine

ischial tuberosity

Fracture of the pubis or ischium (around the obturator foramen)

Fracture of the wing of the ilium (Duverney's fracture)

Fracture of the sacrum

Fracture of the coccyx

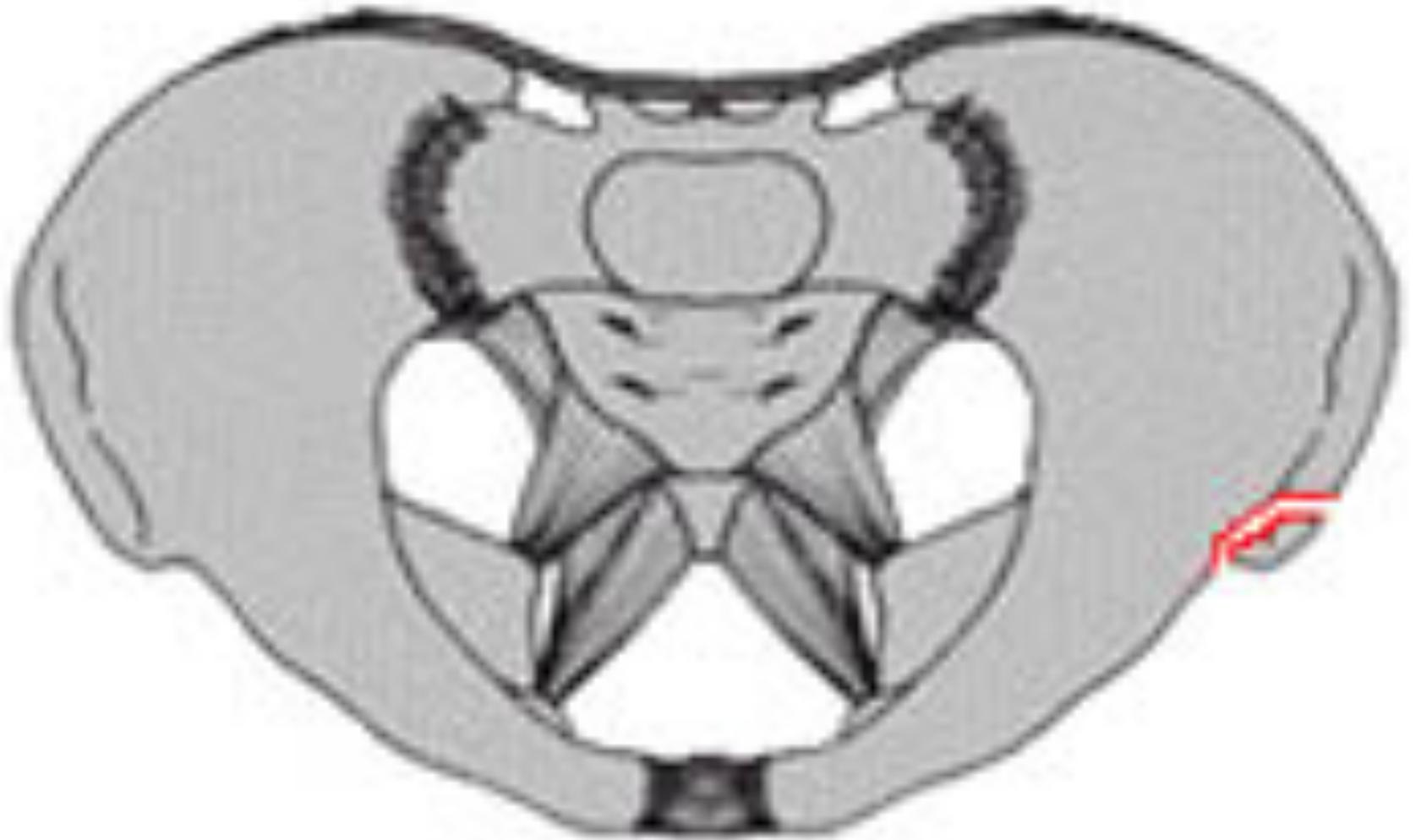
Single break in the pelvic ring

Fracture of the two ipsilateral rami

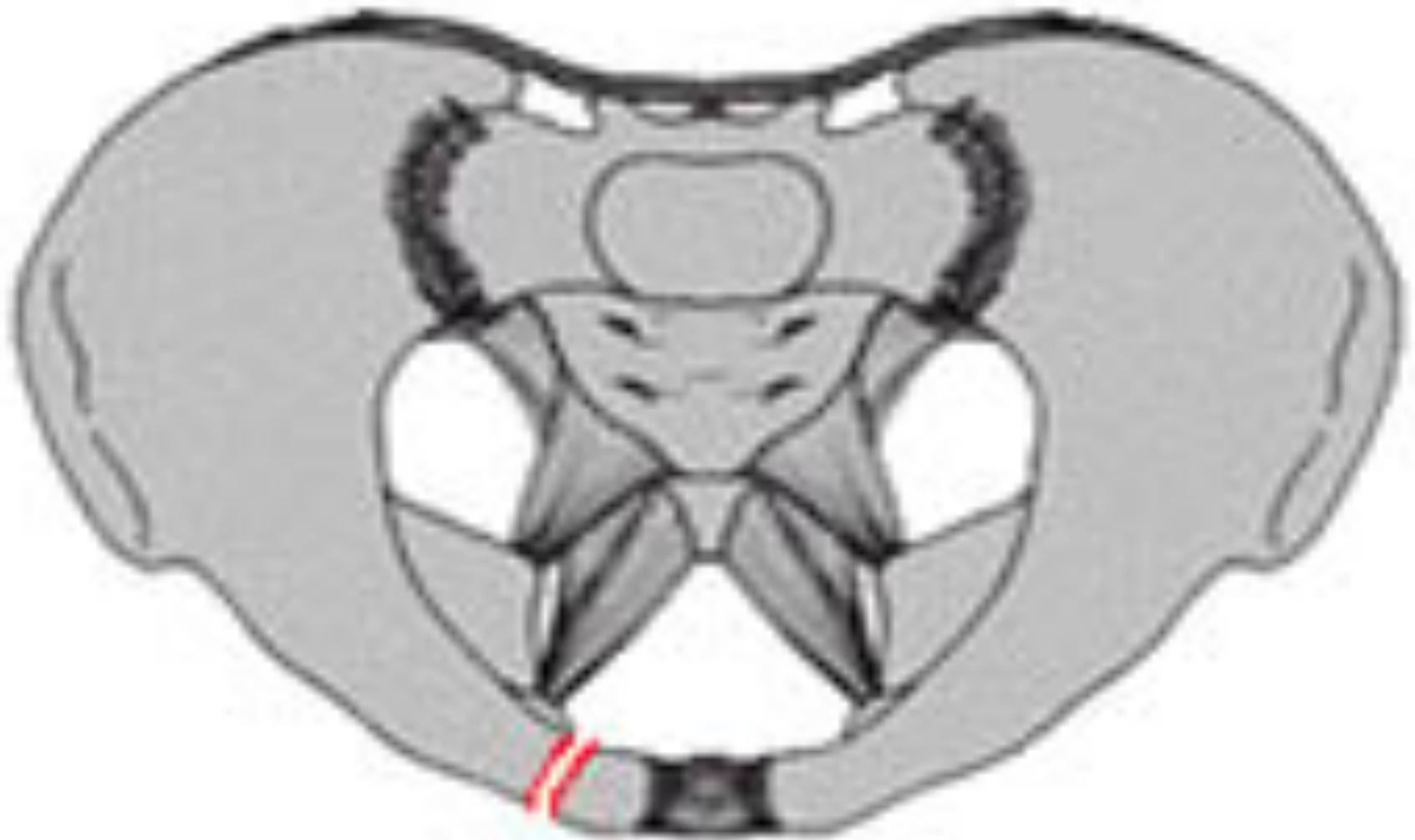
Fracture near or subluxation of symphysis pubis

Fracture near or subluxation of sacroiliac joint

antero-superioară prin avulsie

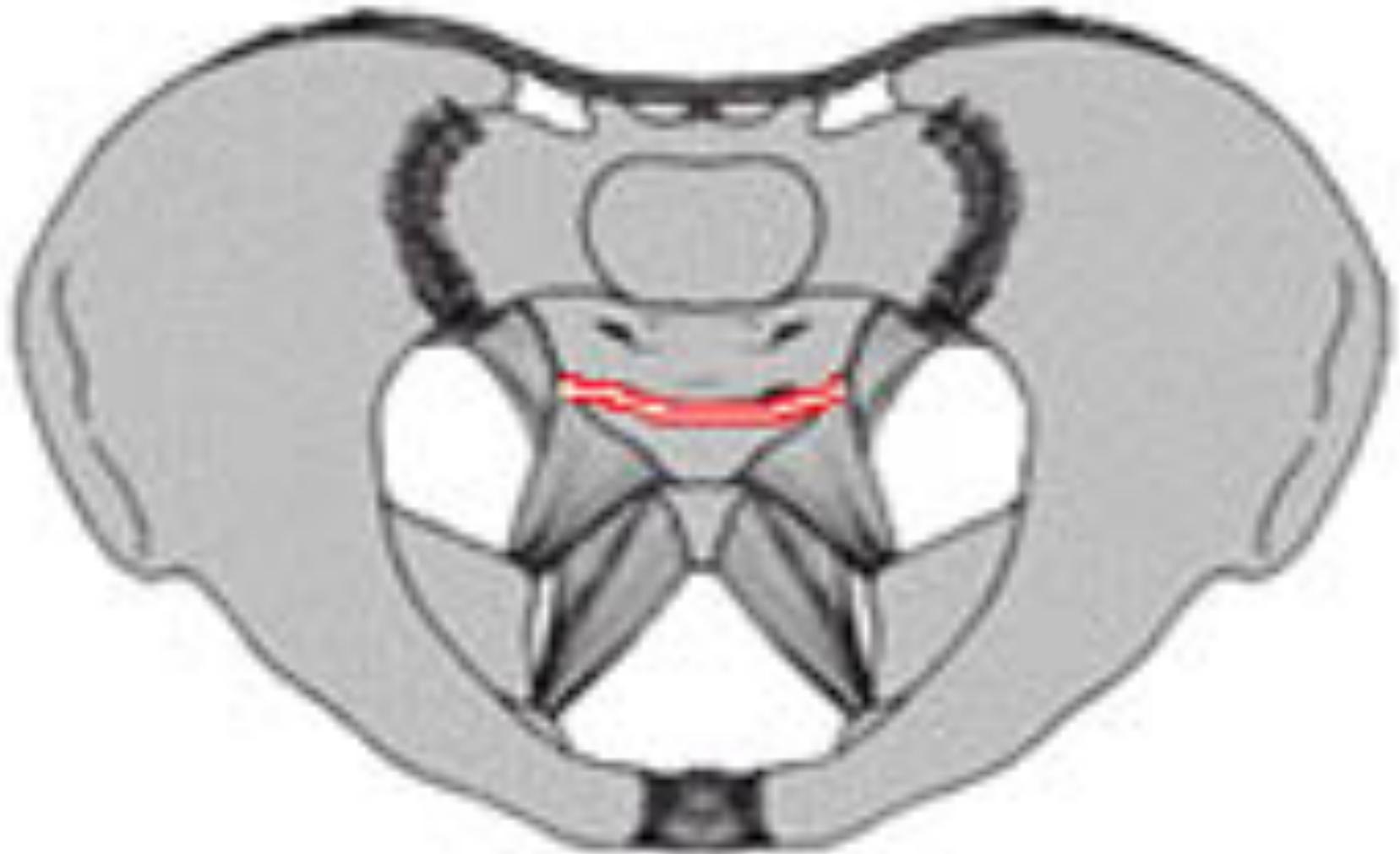


Fractura de ram pubian cu minimă deplasare Stabilă

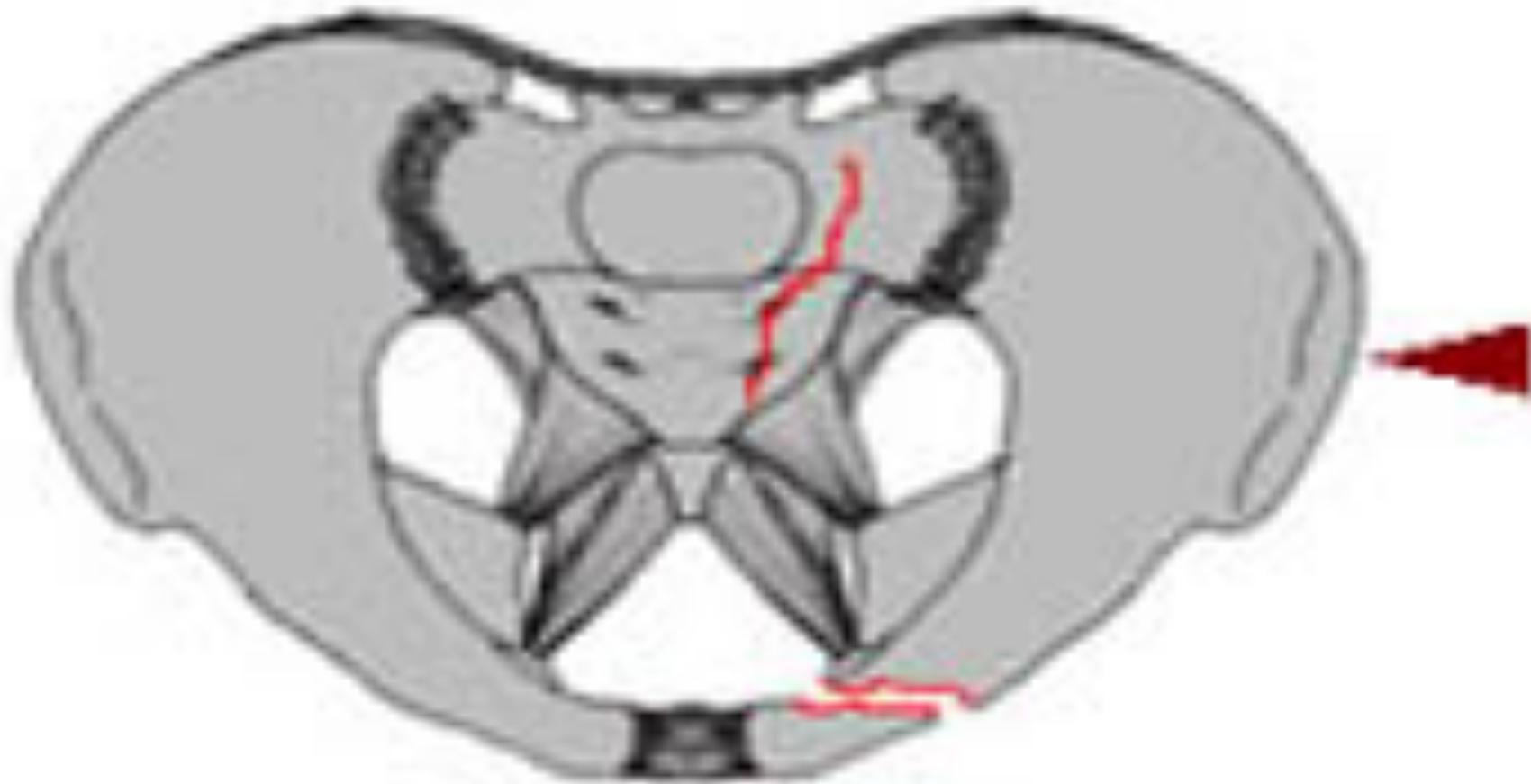


Fractura transversa de sacru sau coccis

Stabilă



ipsilaterală de ram pubian



Classification of Pelvic Fractures (con't.)

UNSTABLE – DOUBLE BREAKS IN THE PELVIC RING

Double vertical fracture or dislocation of the pubis
(straddle fx)

Double vertical fracture or dislocation of the pelvis
(Malgaigne's fx)

Severe multiple fractures (including sacral fracture)

FRACTURES OF THE ACETABULUM

Undisplaced

Displaced

Pelvic Avulsion Fractures

- Anterior superior iliac spine avulsion – sartorius
- Anterior inferior iliac spine avulsion – rectus femoris
- Ischial tuberosity avulsion – hamstrings
- Rx: analgesics, rest, may need temporary use of crutches; ORIF rarely only for professional athletes

Coccygeal Fractures

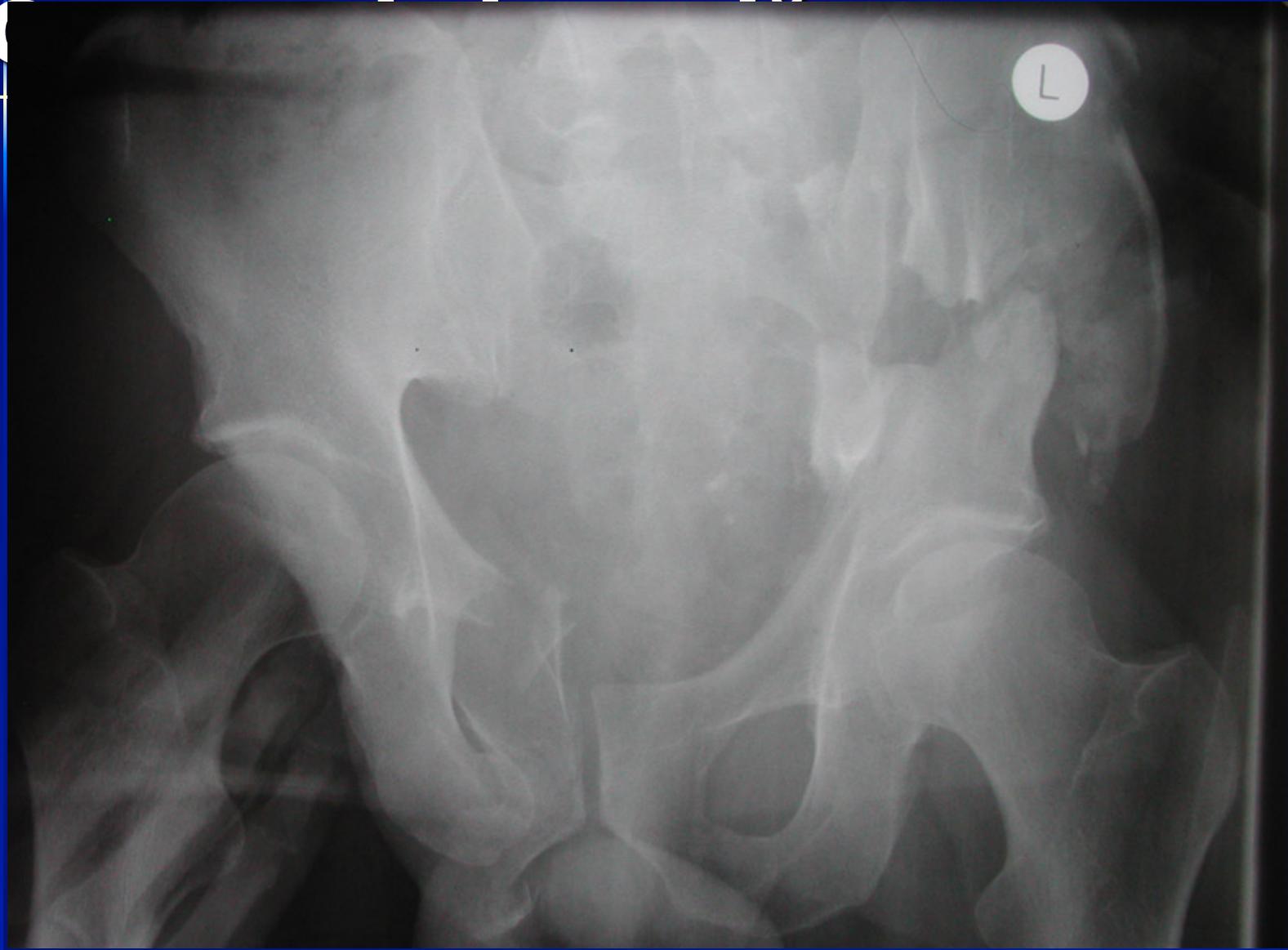
- Usually caused by fall in sitting position
- May be caused by childbirth
- No need to reduce transrectally since reduction usually not maintained due to muscle pull
- Rx: analgesics, stool softeners, sacral dough-nut; consider coccygectomy if severe persistent pain (usually if > 1 month)

Sacral Fractures

- Isolated sacral fxs usually transverse (vertical fxs always associated with Malgaigne fx)
- Do not do bimanual reduction via rectum (may cause enlargement of presacral hematoma or conversion to contaminated open fx)
- If neurologic Ss, Rx by surgery
- If no neuro Sx, bed rest, analgesics, sacral corset

stângă

Disjuncție sacro-iliacă stângă



Fractura de aripa iliacă stângă

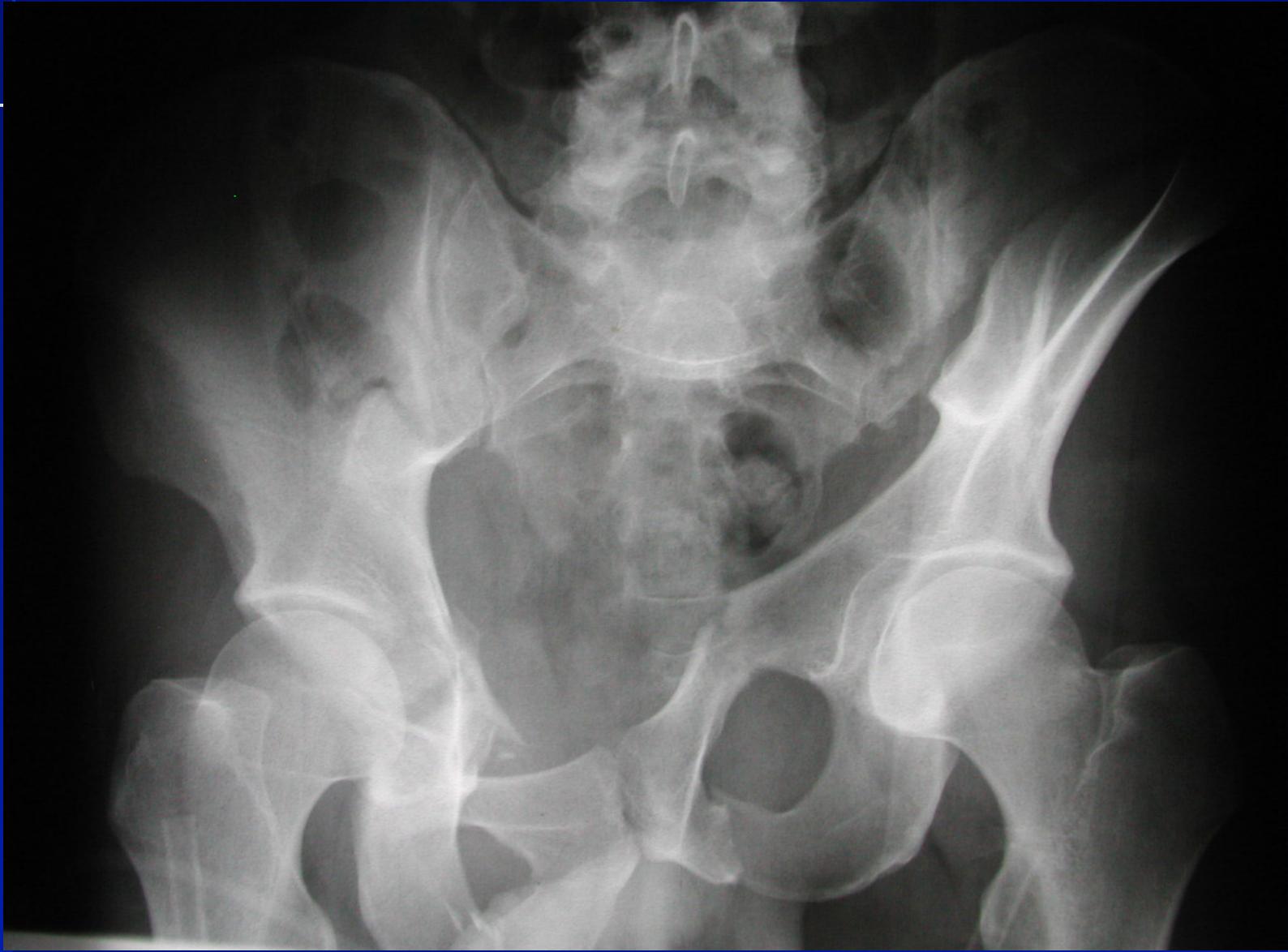
Disjuncție sacro-iliacă stângă

A



Fracturi pelviene multiple

Compresie bilaterală



Fracturi pelviene multiple

Compresie bilaterală

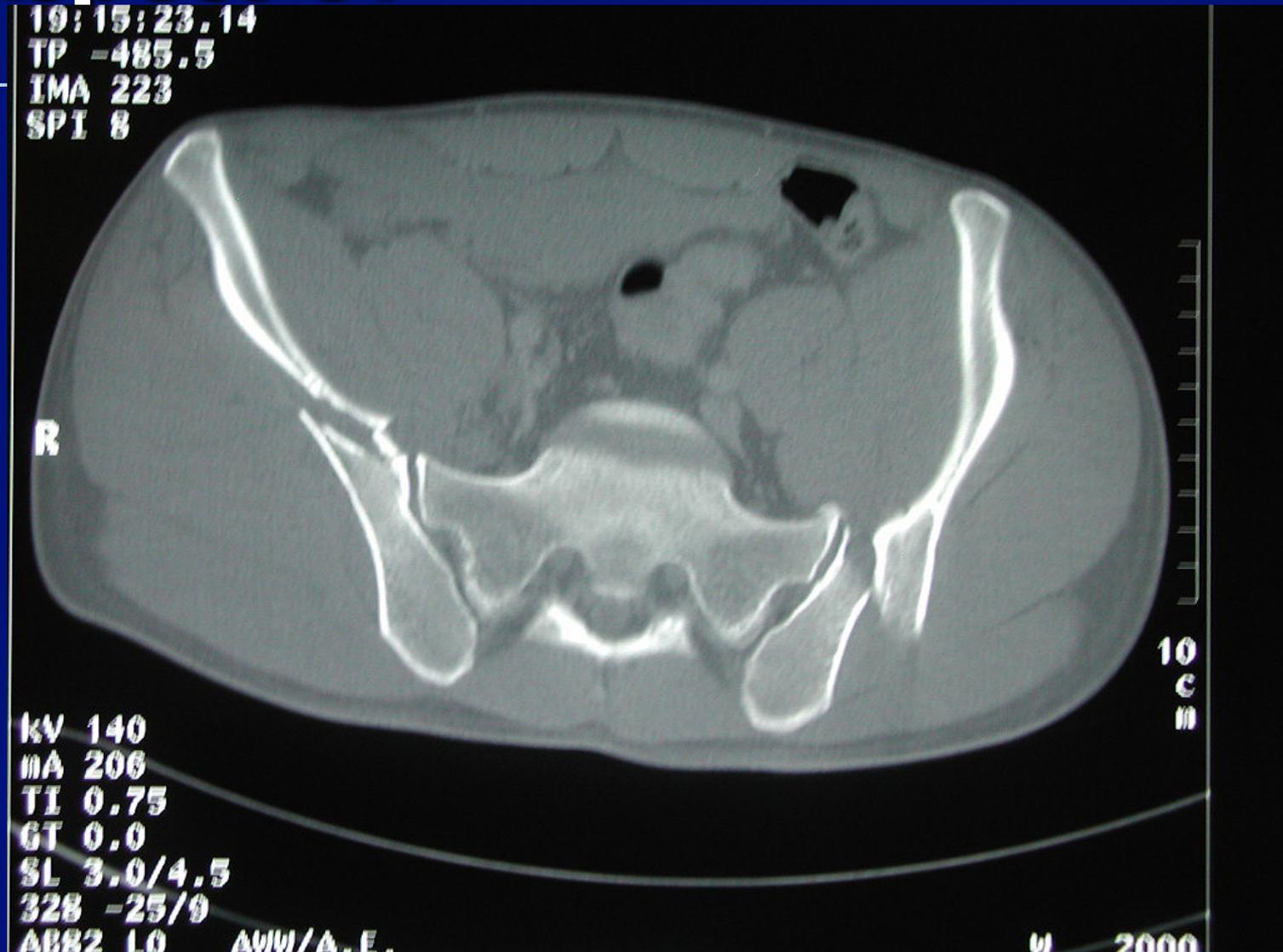
Aspect CT



Fracturi perivierne multiple

Compresie bilaterală

Aspect CT



pubiene

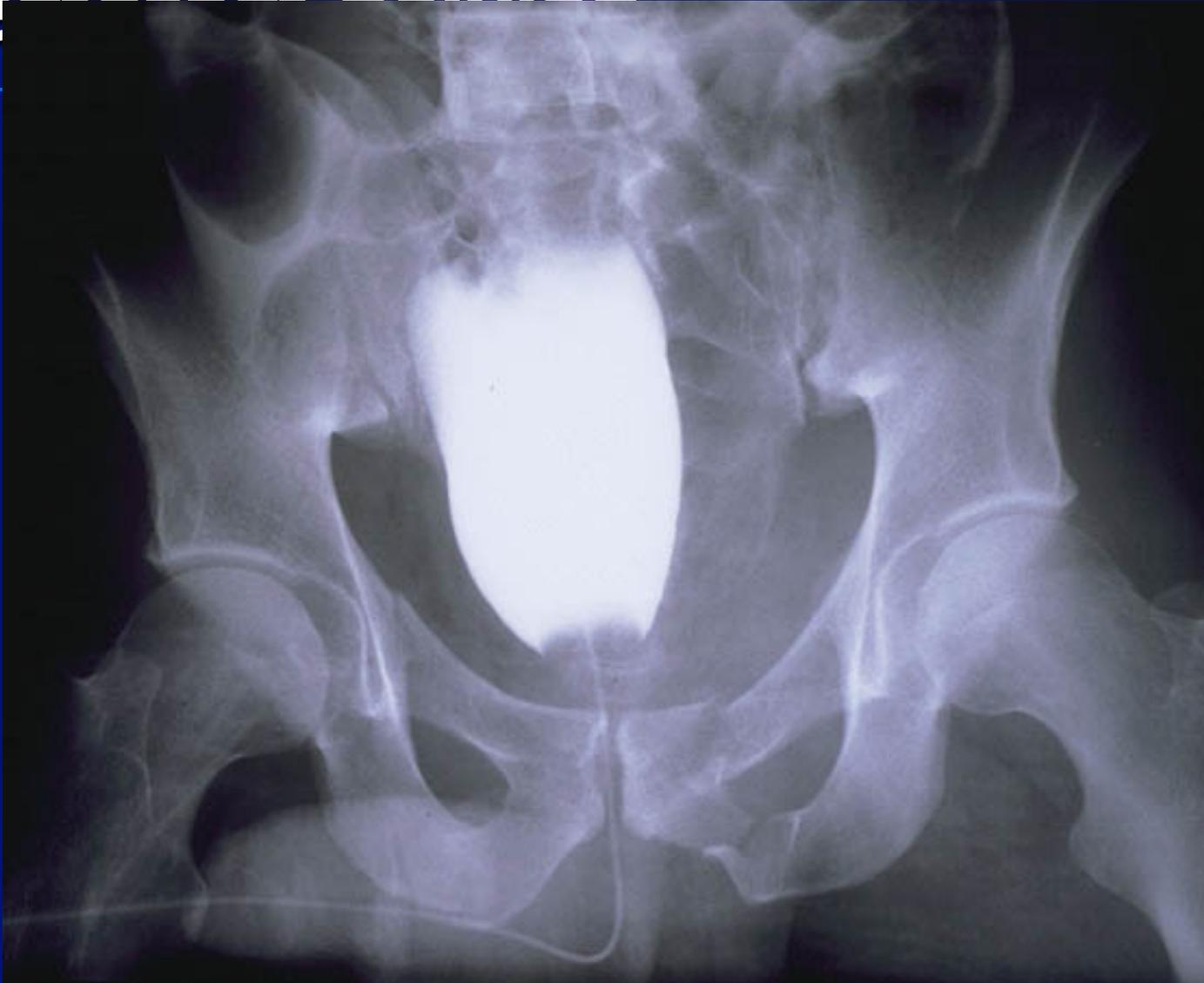
Disjuncție sacro-iliacă stângă

C

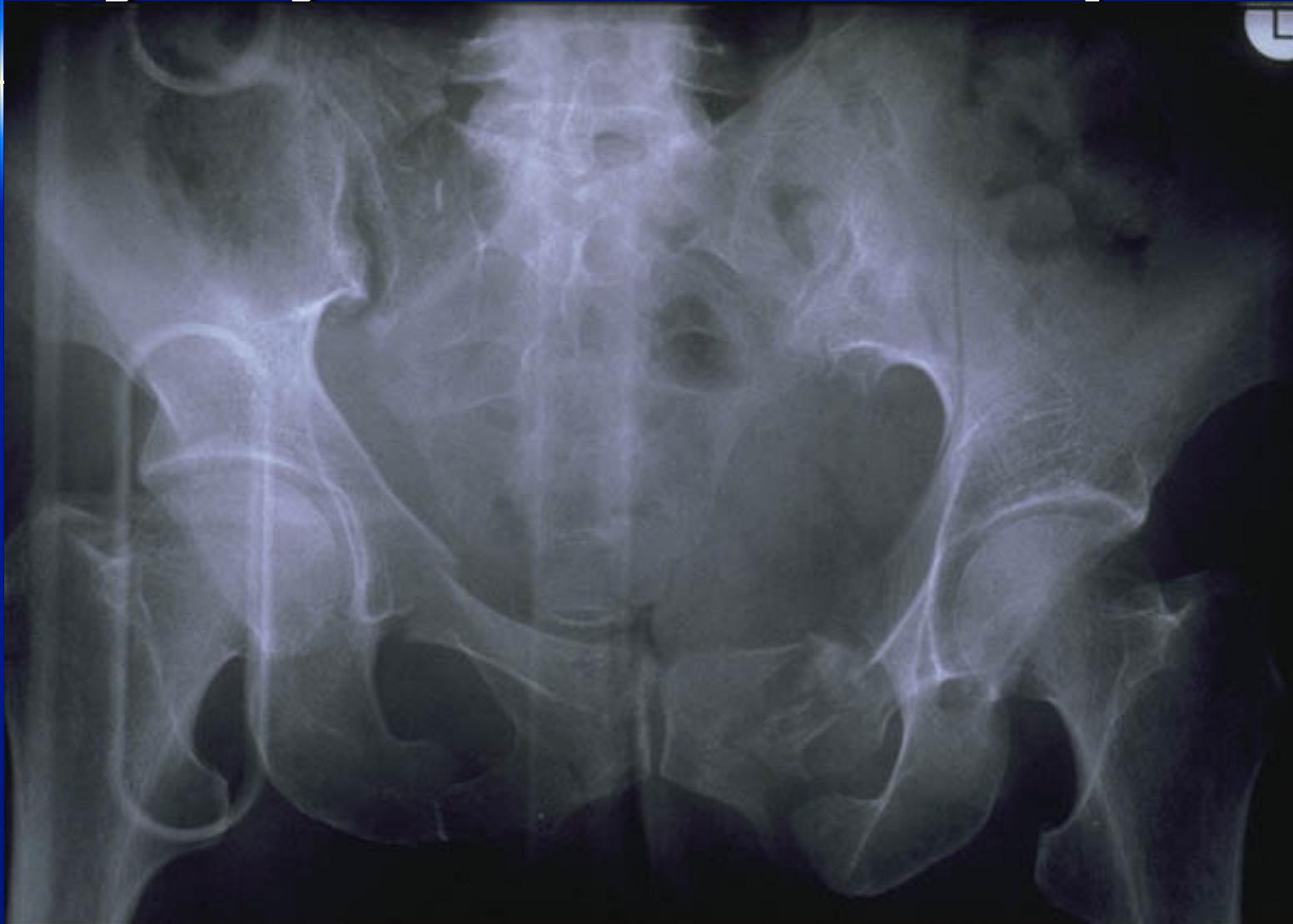


Contur neregulat al vezicii urinare

Hematom pelvian



**Fracturi ale ambelor ramuri
pubiene
Disjuncție sacro-iliacă dreaptă**



Disjuncție de simfiză pubiană

Disjuncție sacro-iliacă stângă



Disjuncție de simfiza publiană

Disjuncție sacro-iliacă stângă

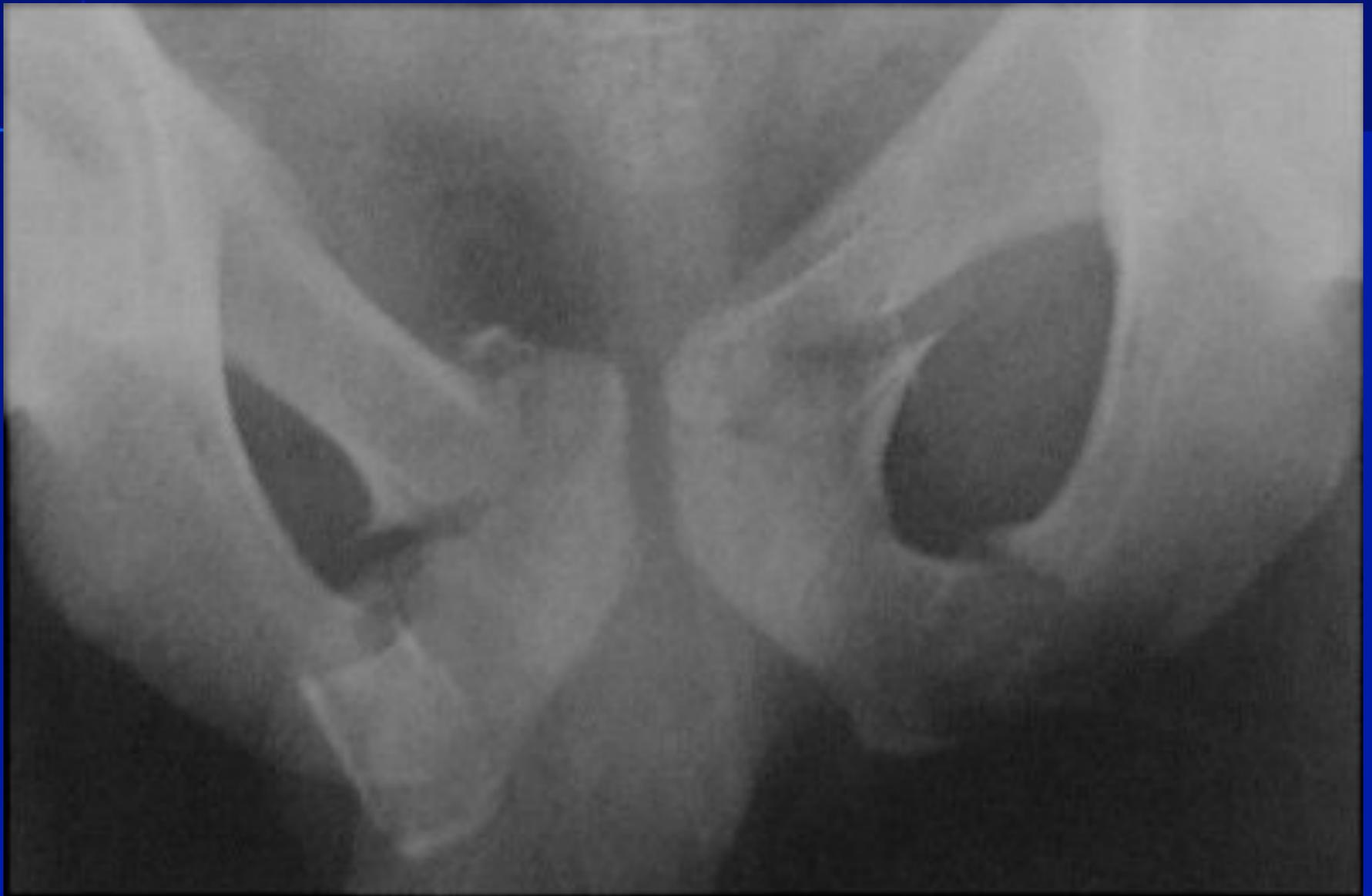
Aspect CT



Straddle Fracture

- Fractures of both pubic rami on both sides or fx of both rami on one side and a symphysis separation
- 1/3 have lower GU tract injury
- 1/3 have abdominal visceral injury

Fractura Straddle



Type II Fractures

- Single break in Pelvic Ring
- Rx: analgesics, initial bed rest, gradual ambulation advanced as tolerated

Type III Fractures

- Double breaks in Pelvic Ring
- Unstable
- Almost all require surgery
- Are one of criteria for referral to a trauma center

Malgaigne Fracture

- Anterior and posterior pelvic ring fracture
- Anterior: both pubic rami
- Posterior: fx ilium, SI joint separation or sacral fx (vertical)

Malgaigne Fracture

- 50% have intra-abdominal injury
- 50% have GU tract injury
- > 25% have head injury
- > 25% have chest injury

Acetabular Fractures

- Posterior lip fx
 - Most common
 - Associated with posterior hip dislocation
- Central or transverse fx
- Fracture of anterior (iliopubic) column
- Fracture of posterior (ilioischial) column (Walther fx)

Pelvic Fractures - Summary

- Assess pelvis as part of secondary survey
- Treat associated injuries
- Consider sequence of fluid support – angiography – M.A.S.T. inflation – surgery (laparotomy or external fixator ± plating) for continued bleeding from pelvic fractures
- Assess for associated injuries to GU tract, rectum, and femurs