Acetabular Fractures in the Non-Geriatric Patient

Dane Brodke, MD — 9/27/25

Disclosures

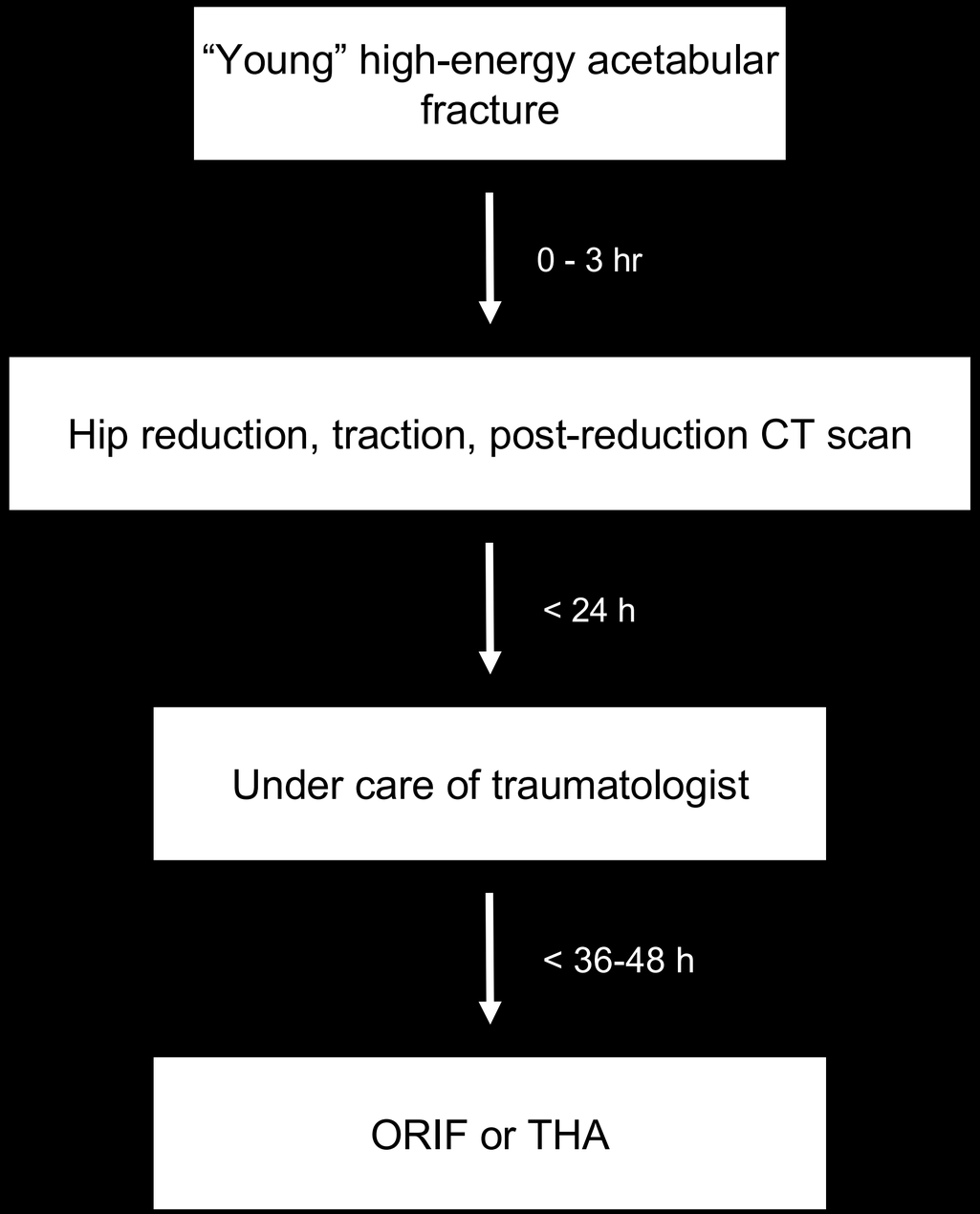
- I have no relevant financial relationships to disclose.

43M s/p rollover MVC

- HR 74, BP 167/98
- Lactate 1.9
- GCS 15

Outline

- Approach to management
  - Triage
  - Timing
  - Nonoperative v ORIF v THA
- Technical aspects of ORIF
  - Combining approaches
  - Lateral traction devices
  - Reduction sequencing


“Young” high-energy acetabular fracture
0 - 3 hr
Hip reduction, traction, post-reduction CT scan
< 24 h
Under care of traumatologist
< 36-48 h
ORIF or THA

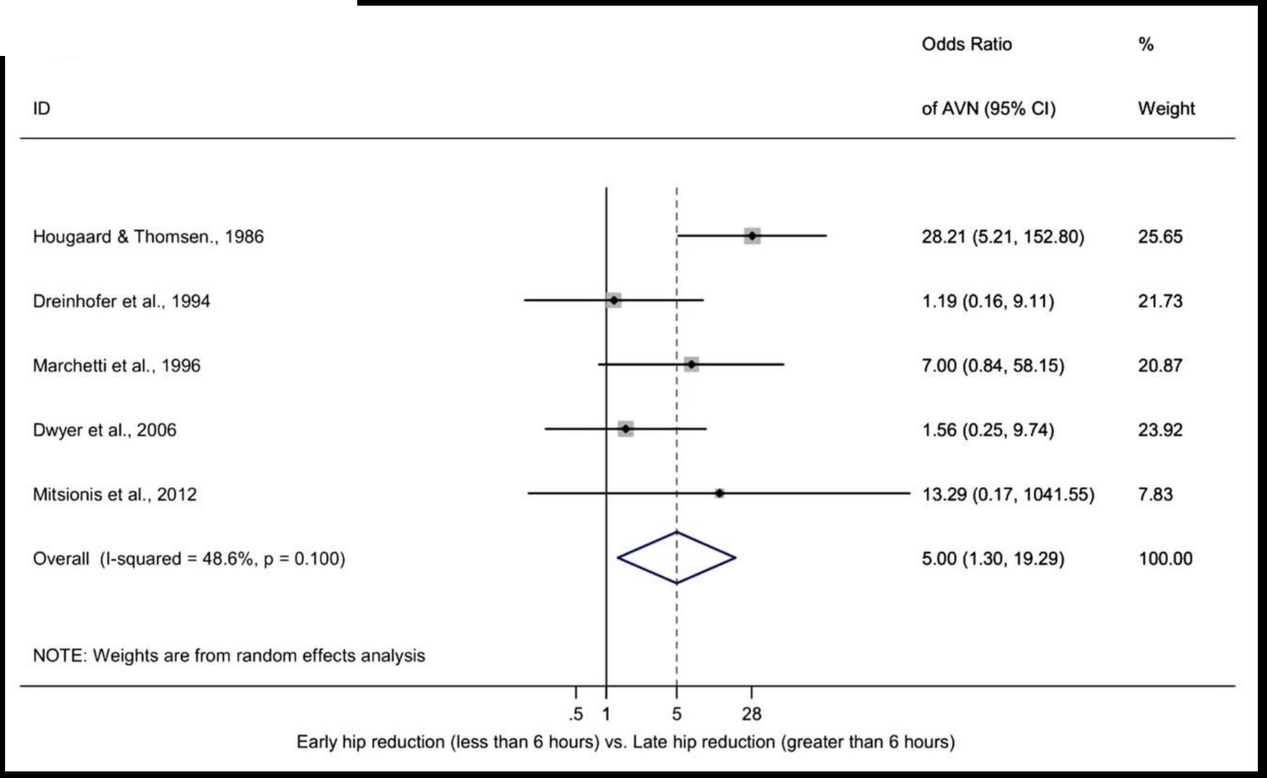
Eur J Orthop Surg Traumatol (2017) 27:1109–1116
DOI 10.1007/s00590-017-1988-7

ORIGINAL ARTICLE • HIP - TRAUMA

Late versus early reduction in traumatic hip dislocations: a meta-analysis

Ghalib Ahmed[1] · Salman Shiraz[1] · Muhammad Riaz[1,2] · Talal Ibrahim[1]

- Meta-analysis of 5 studies, 236 dislocations
- Osteonecrosis: 36% late (>6h) vs. 8% early (<6h)
- Early reduction ↓ risk 5-fold



ORIGINAL ARTICLE

Early Definitive Stabilization of Unstable Pelvis and Acetabulum Fractures Reduces Morbidity

Heather A. Vallier, MD, Beth Ann Cureton, BS, Charles Ekstein, BS, F. Parke Oldenburg, MD, and John H. Wilber, MD

The Journal of **TRAUMA®** *Injury, Infection, and Critical Care* • Volume 69, Number 3, September 2010

- 645 pts with unstable pelvic/acetabular fractures
- Early fixation <24h (n=233) vs late >24h (n=412)
- Complications 12% v 20% (infxn, pulm, DVT, sepsis, MOF, death)
- Pulmonary 9% vs 18%
- ARDS 3.4% vs 8.3%; Pneumonia 6% vs 11%
- ICU stay 8.1 vs 9.9 days (p=0.03)

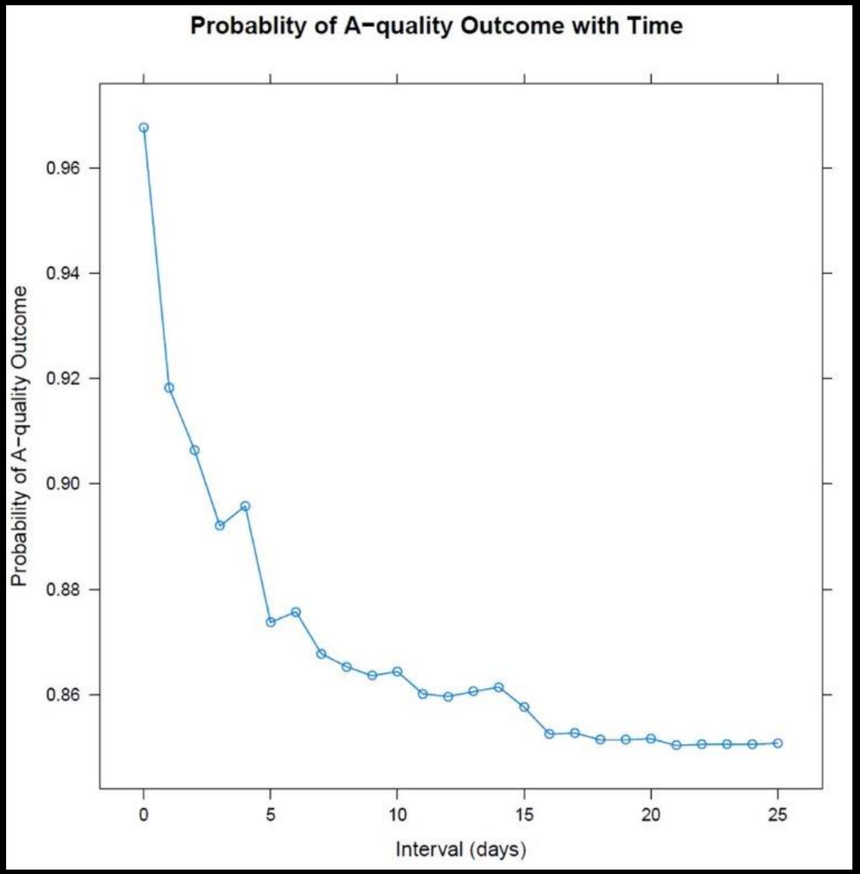
ORIGINAL ARTICLE

Achieving Anatomic Acetabular Fracture Reduction—When is the Best Time to Operate?

Steven K. Dailey, MD, Caleb T. Phillips, PhD,† Joseph M. Radley, MD,‡ and Michael T. Archdeacon, MD, MSE**

J Orthop Trauma • Volume 30, Number 8, August 2016

- 650 ORIF: 85% anatomic, 11% imperfect, 4% poor
- Odds of anatomic reduction ↓ 12% per day of delay
- Conclusion: perform ORIF ASAP once stable

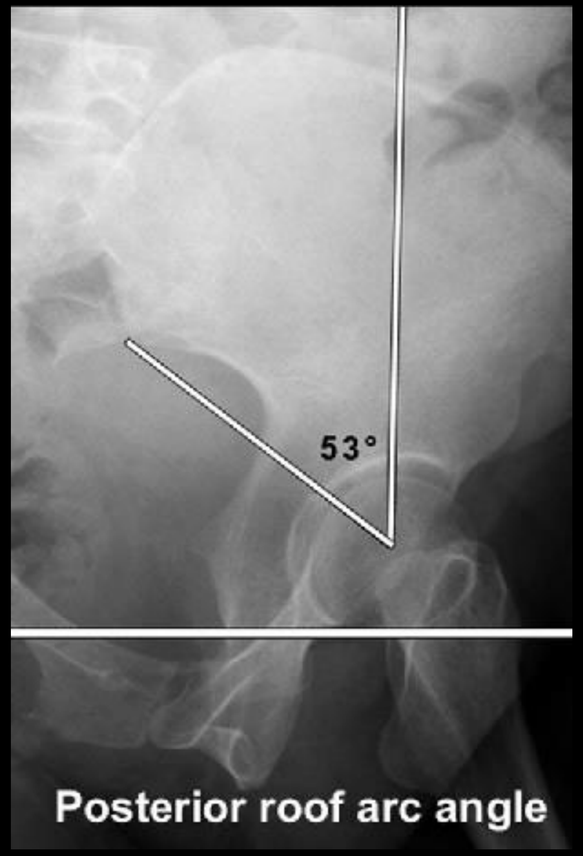


Long-Term Survival of the Native Hip After a Minimally Displaced, Nonoperatively Treated Acetabular Fracture

John Clarke-Jenssen, MD, Annette K.B. Wikerøy, MD, Olav Røise, MD, PhD, Stein Arne Øvre, MD, PhD, and Jan Erik Madsen, MD, PhD

Investigation performed at the Oslo University Hospital, Oslo, Norway

- 494 acetabular fx: 48% non-op (step <2, comorbid)
- 104 pt w 12 yr f/u, 1º outcome: THA
- 94% survival, 89% good/excellent HHS
- Failure
  - 2mm step: HR 5
  - Post roof arc <45º



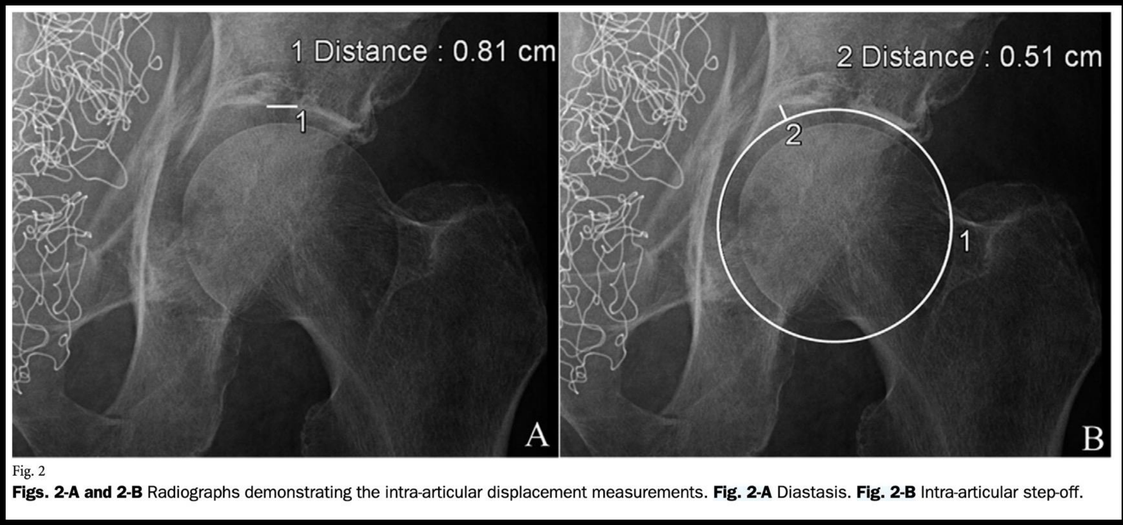


Fig. 2

Figs. 2-A and 2-B Radiographs demonstrating the intra-articular displacement measurements. **Fig. 2-A** Diastasis. **Fig. 2-B** Intra-articular step-off.

Research Article

Fixation Versus Acute Total Hip Arthroplasty for Acetabular Fracture: A Cost-Effectiveness Analysis

Ben Kelley, MD
Dane J. Brodke, MD, MPH
Alexander Upfill-Brown, MD
Sai K. Devana, MD
Erik Mayer, MD
Brendan Shi, MD
Bailey Mooney, MD
Akash Shah, MD
Christopher Lee, MD

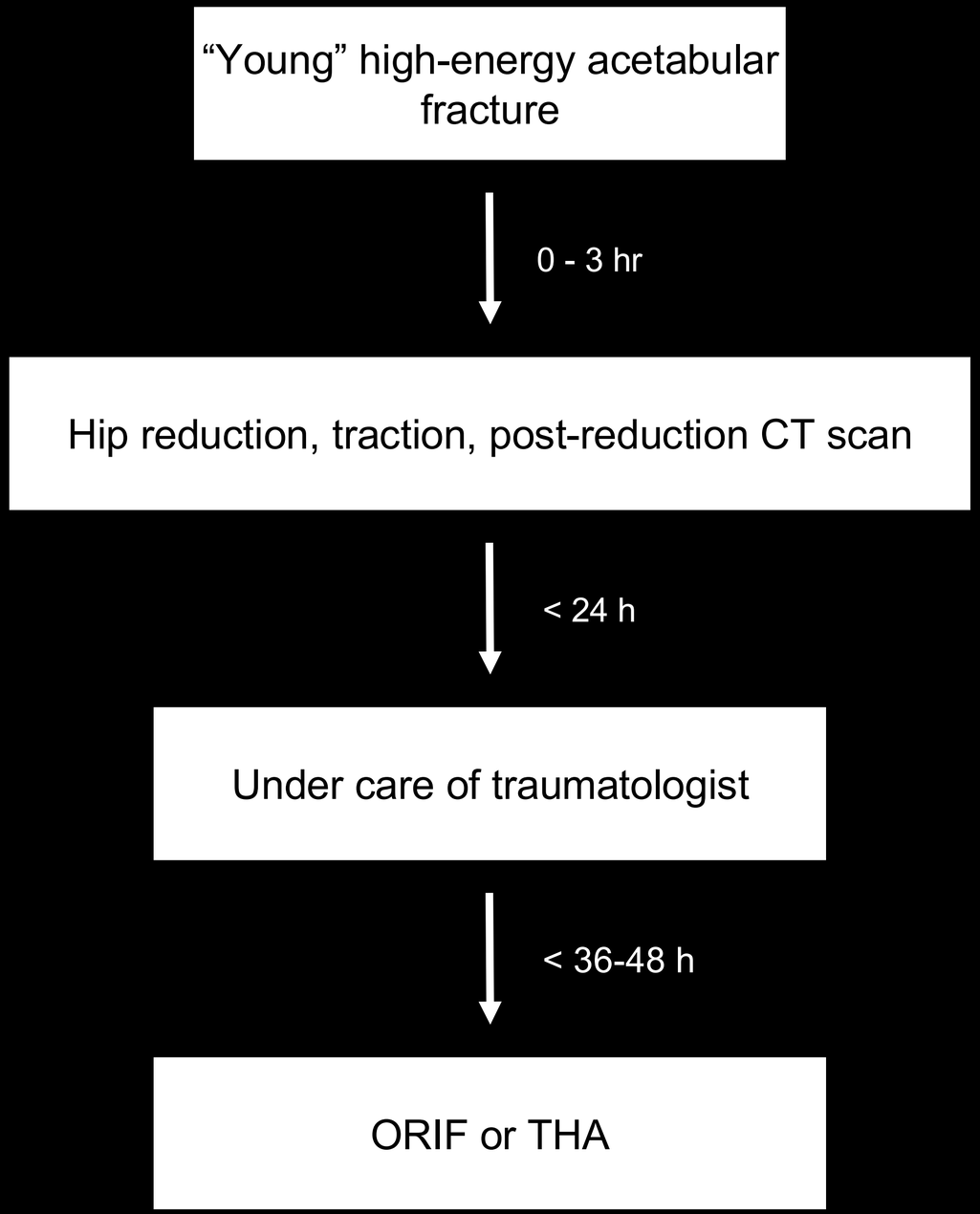
ABSTRACT

Objectives: The optimal treatment of acetabulum fractures in elderly patients is unknown. The purpose of this study was to review outcomes of open reduction and internal fixation (ORIF) or acute total hip arthroplasty (aTHA) and to determine the age threshold based on treatment using a cost-effectiveness decision model.

Methods: The PubMed database was queried for clinical English language studies from 2002 to 2022 (N > 10), of acetabular fracture

J Am Acad Orthop Surg. 2025 Aug 6. doi: 10.5435/JAAOS-D-24-00853.

- Systematic review of 30 studies, age 50+ w acetabular fractures → cost-effectiveness analysis
- ORIF: 20% conversion, 12% mortality
- aTHA: 5% revision, 11% mortality
- ORIF cost-effective ≤67 yrs, aTHA ≥68 yrs


“Young” high-energy acetabular fracture
0 - 3 hr
Hip reduction, traction, post-reduction CT scan
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ORIF or THA

Technical factors

ORIGINAL ARTICLE

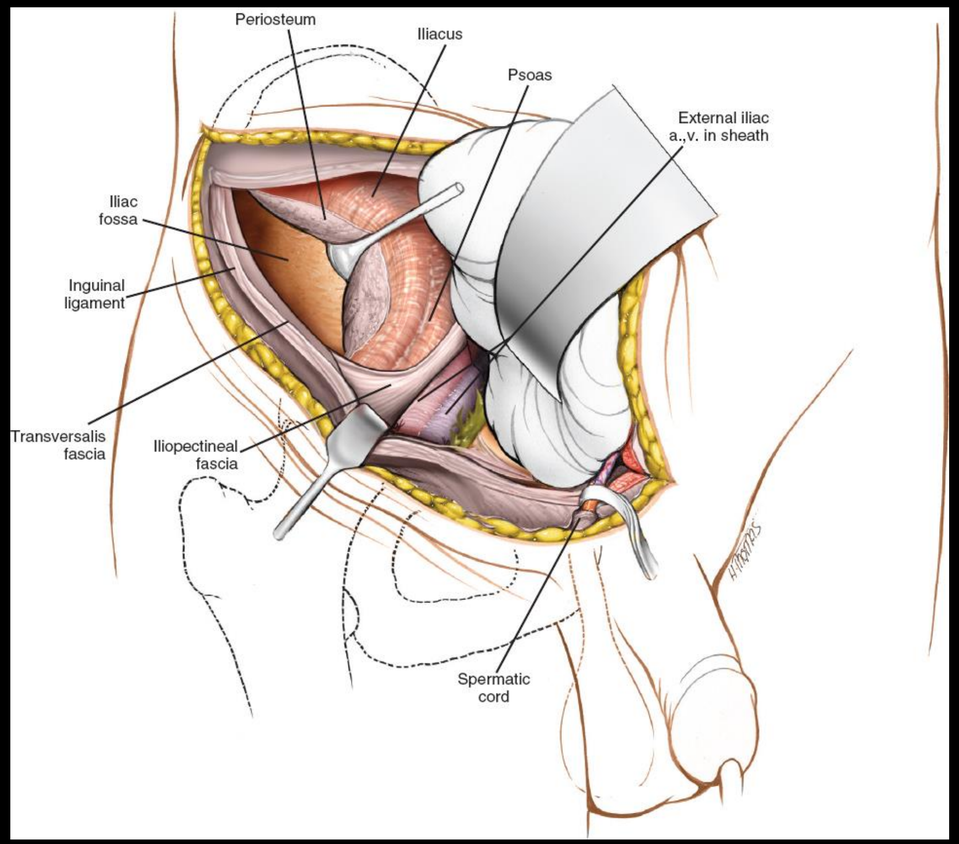
Risk Factors for Conversion to Total Hip Arthroplasty After Acetabular Fractures Involving the Posterior Wall

Reza Firoozabadi, MD, MA, Benjamin Hamilton, MD,† Paul Toogood, MD,‡ Milton "Chip" Routt, MD,§ and Dave Shearer, MD‡*

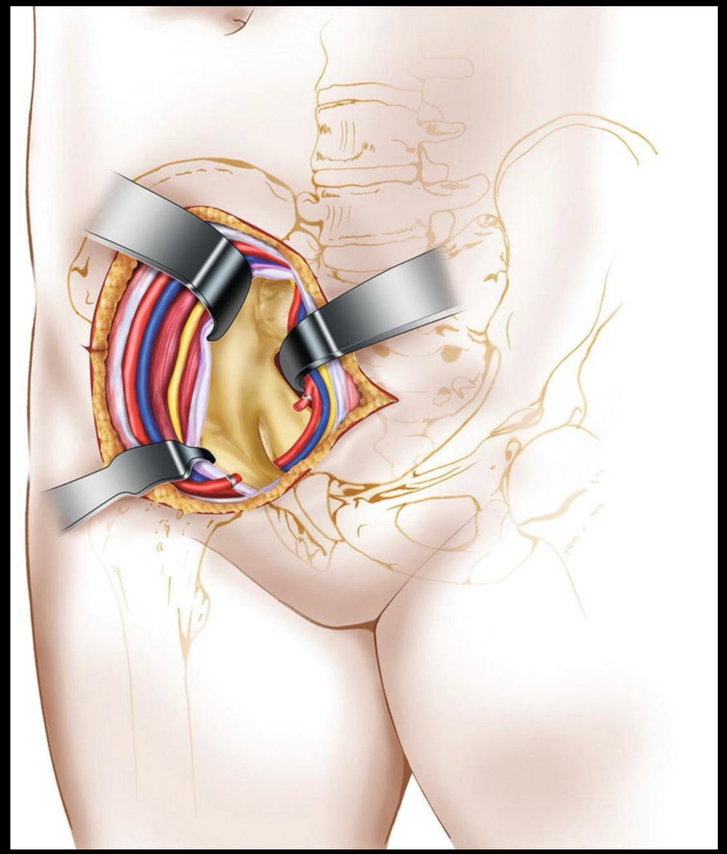
J Orthop Trauma • Volume 32, Number 12, December 2018

- 65 pts, posterior wall ORIF, min 4 yr, mean 7 yr f/u
- THA: 17% 9 yr
- Poor reduction = strongest predictor (post-op CT):
  - <1 mm → 0%, 1–4 mm → 10%, ≥4 mm → 54%
- 5 severe features → 50% THA (vs 11% if ≤4):
  - dislocation, wall comminution (>3 fragments), femoral head lesion, acetabular impaction, loose bodies

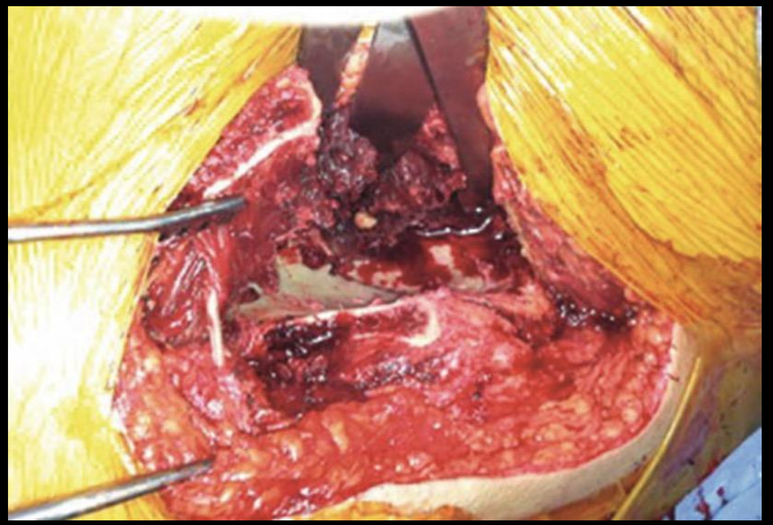
Anterior approach options



Ilioinguinal



AIP



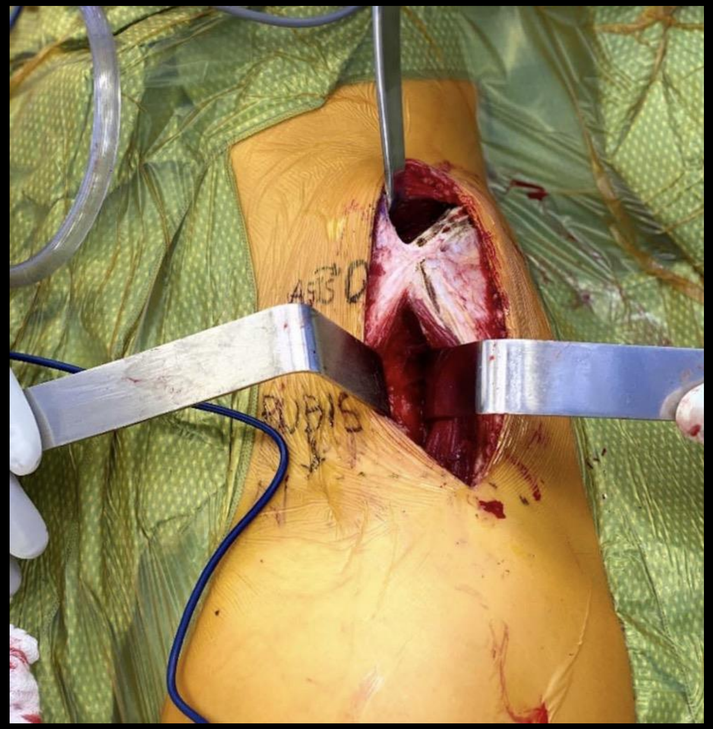
Lateral window (++)

Gardner MJ, ed. *Master Techniques in Orthopaedic Surgery: Fractures*. Fourth edition. Wolters Kluwer; 2021.

A Modified Levine Approach for Exposure of the Anterior Column, Anterior Wall, and Sacroiliac Joint: A Surgical Technique and a Case Series

Yohan Jang, DO, Walter Virkus, MD, and Todd Mckinley, MD

(*J Orthop Trauma* 2021;35:e517–e520)



Do I need to a combined approach?

Postoperative surgical site infection following acetabular fracture fixation

Takashi Suzuki [a], Steven J. Morgan [a], Wade R. Smith [b], Philip F. Stahel [a], Syed A. Gillani [a], David J. Hak [a,*]

[a] Department of Orthopaedic Surgery, Denver Health Medical Center, University of Colorado School of Medicine, 777 Bannock Street, Denver, CO 80204, USA
[b] Department of Orthopaedic Surgery, Geisinger Medical Centre, 100 North Academy Avenue, Danville, PA 17822, USA

Injury. 2010 Apr;41(4):396-9.

- 326 acetabular ORIF
- SSI 5.2%, 82% within 4 wk
- Most common bug Staph aureus
- Risk factors: ↑BMI, ICU stay, Morel-Lavallée lesion

Approach	N	SSI %
Posterior	157	1%
Anterior	113	6%
Combined	55	15%
Extended Iliofemoral	1	0%

Do I need to a combined approach?

Posterior wall fractures associated with both-column acetabular fractures can be skilfully ignored

Kyun-Ho Shin , Jae-Hyuk Choi , Seung-Beom Han*

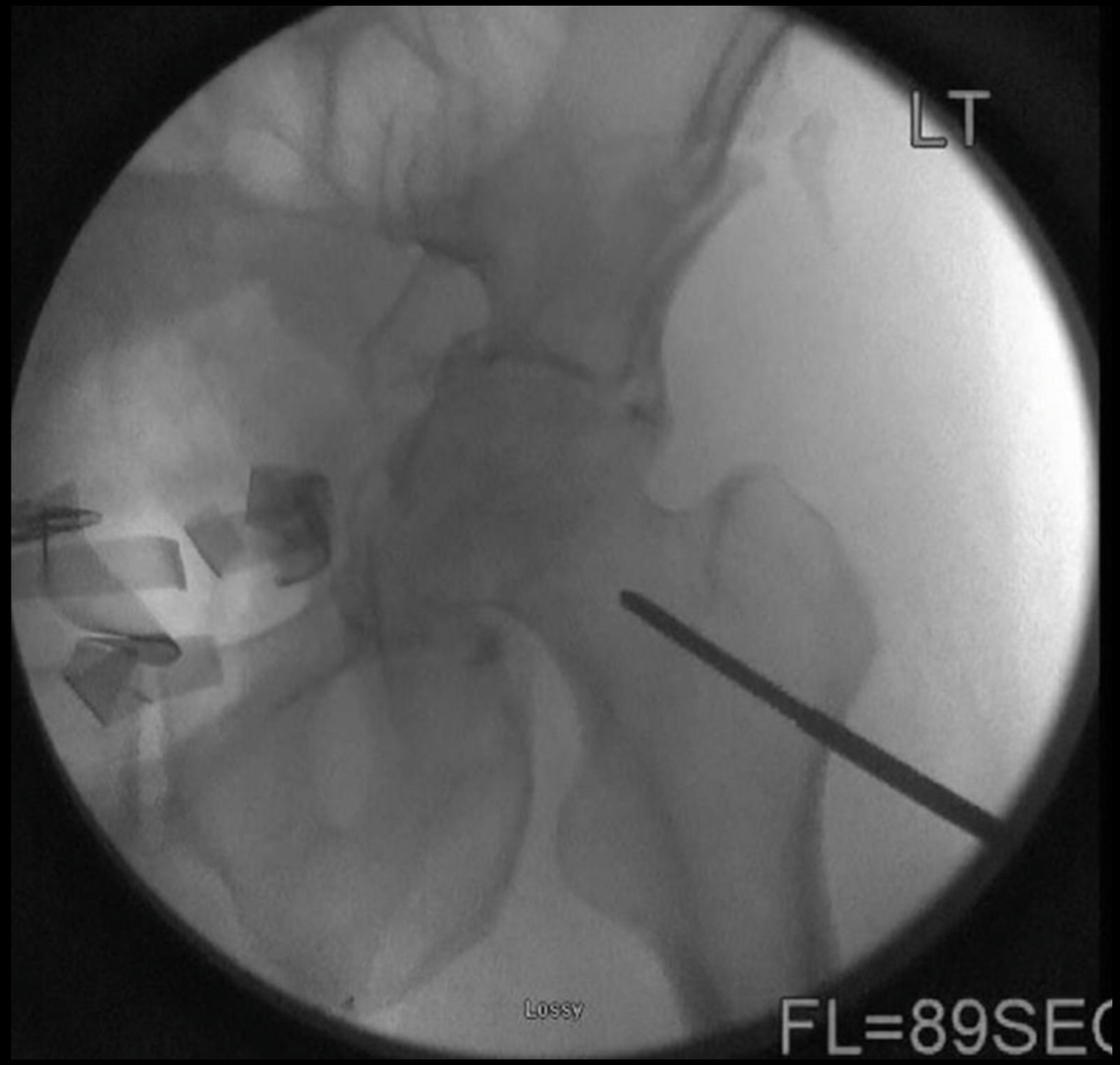
Department of Orthopaedic Surgery, Anam Hospital, Korea University College of Medicine, 73, Inchon-ro, Sungbuk-gu, Seoul 02841, South Korea

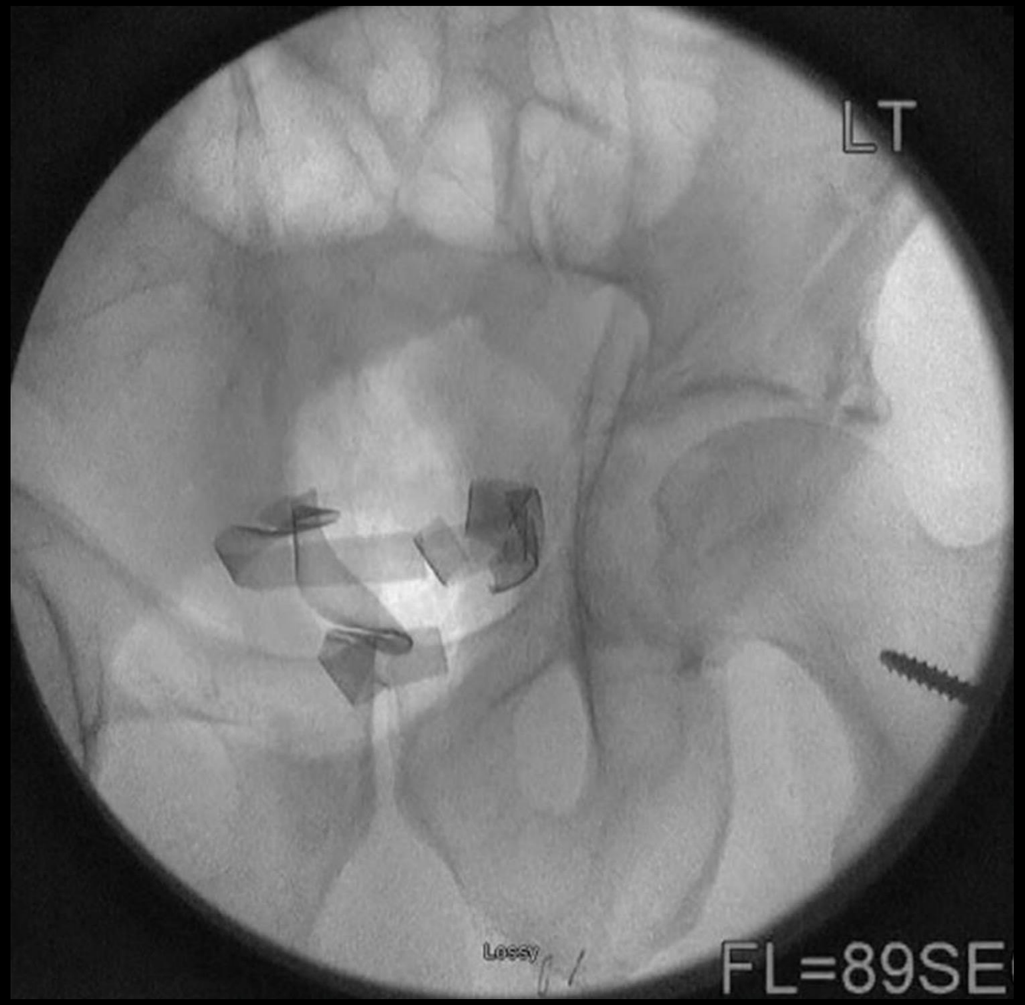
Orthop Traumatol Surg Res. 2020 Sep;106(5):885-892.

- 49 pts w/ both-column acetabular fx
- Min. 1 yr, mean 3 yr follow-up
- 29 no PW, 20 PW
- PW fx ignored (17/20)
  - Fragment attached via labrum/capsule
  - Hip joint congruent after columns fixed
  - Step-off <2 mm and gap <3 mm

Outcome	No PW (n=29)	PW (n=20)
Anatomic reduction	69%	65%
Poor PTOA grade	10%	10%
HHS	89 ± 67	90 ± 7
THA conversion	2 (7%)	1 (5%)

Lateral traction





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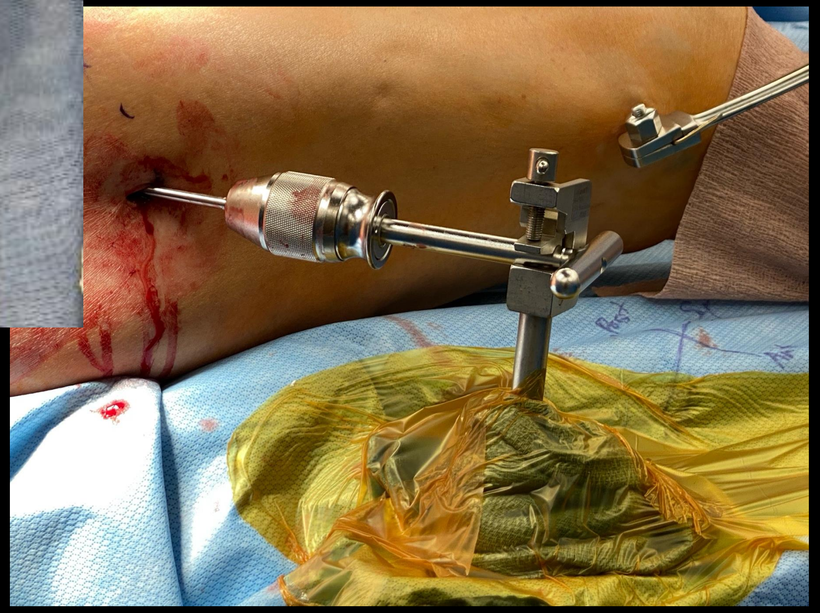
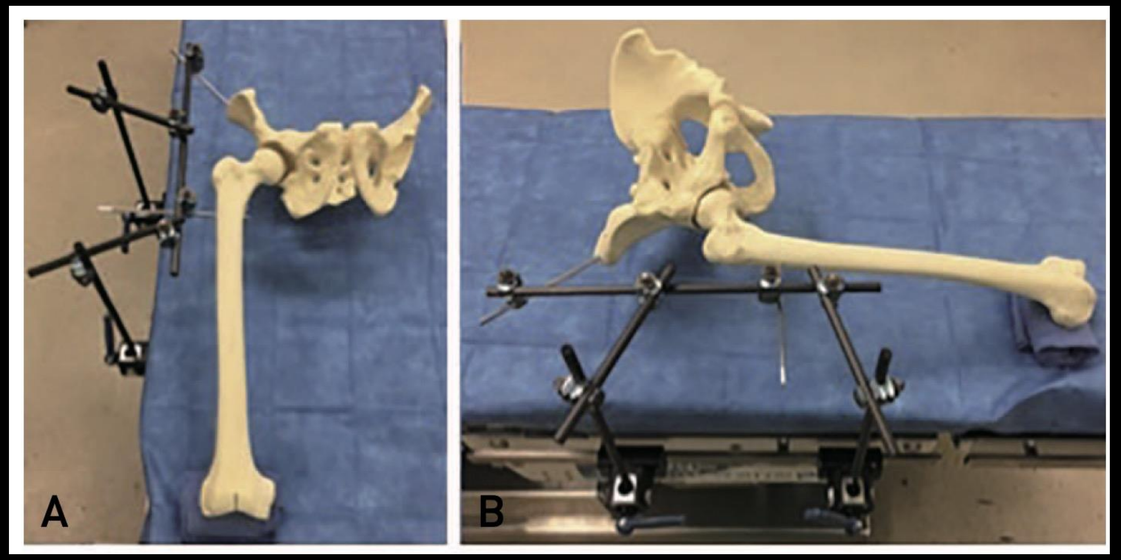
Lateral traction options



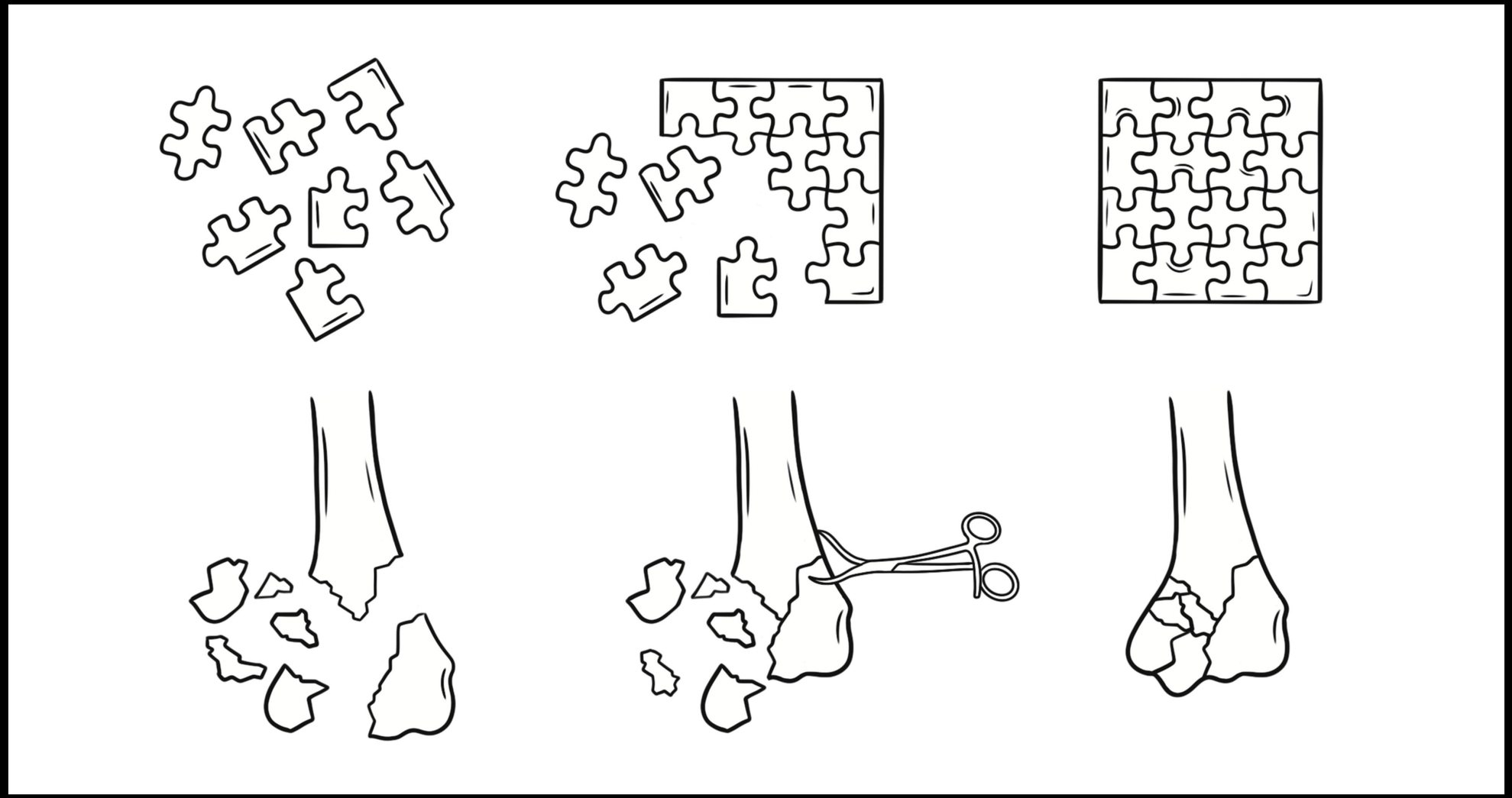
Greenberg retractor

OSI lateral traction bracket

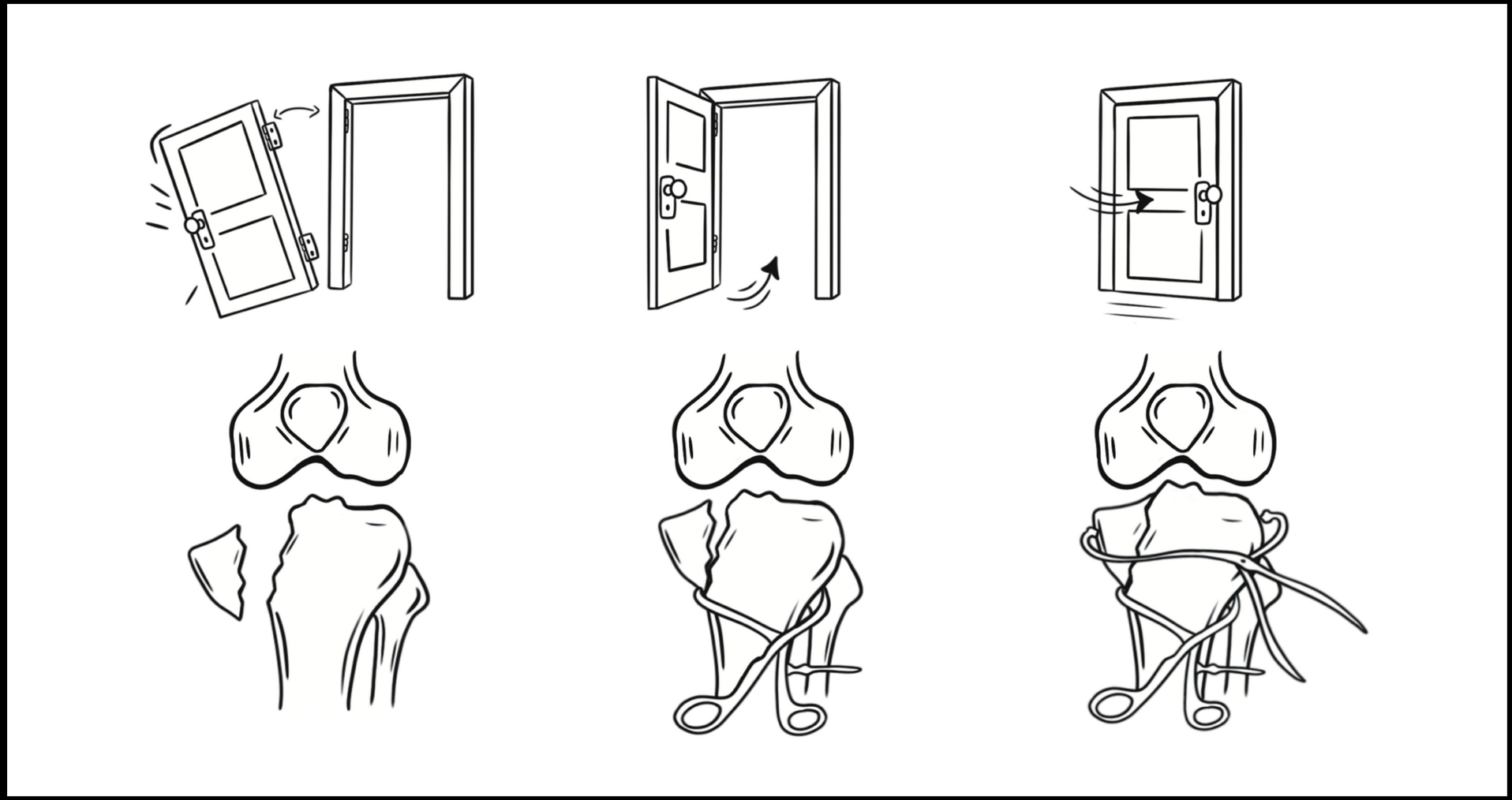


Ex fix - Romanelli. *Hip Pelvis*. 2020

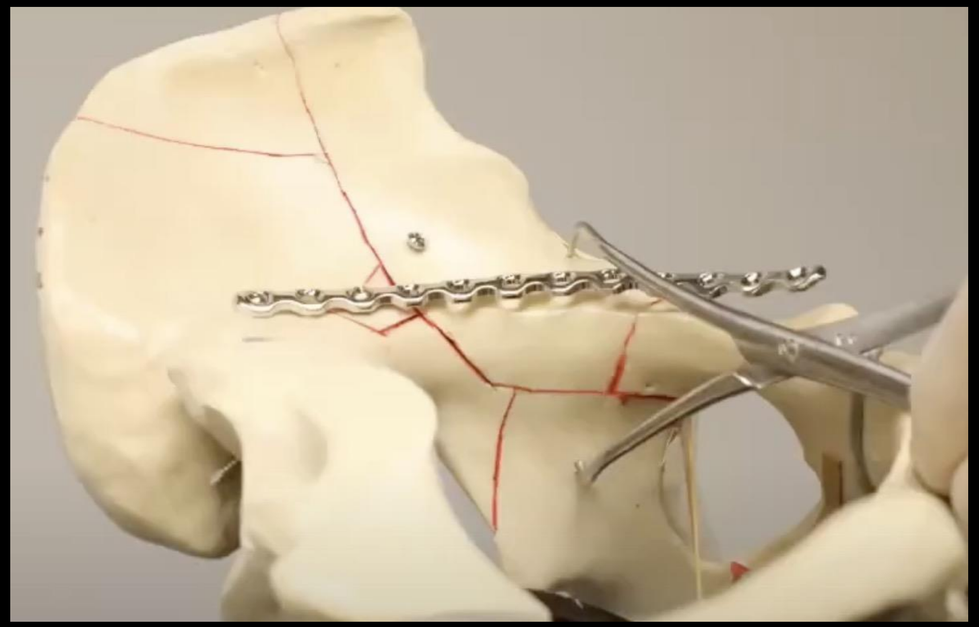
Reduction sequence - “The puzzle”

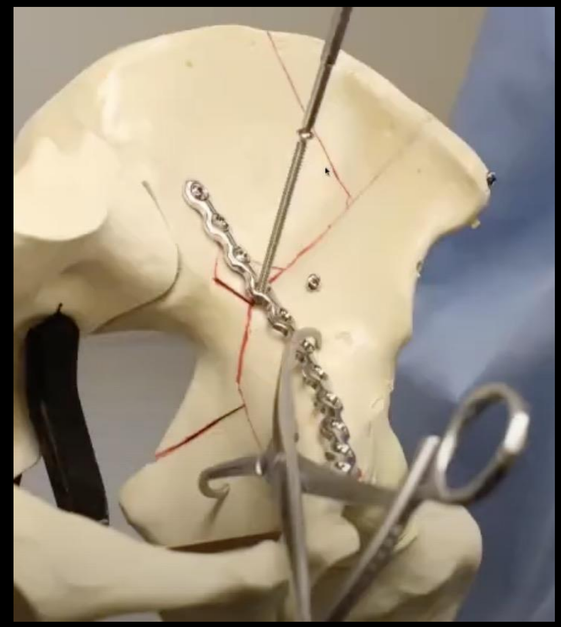


Reduction sequence - “The door”

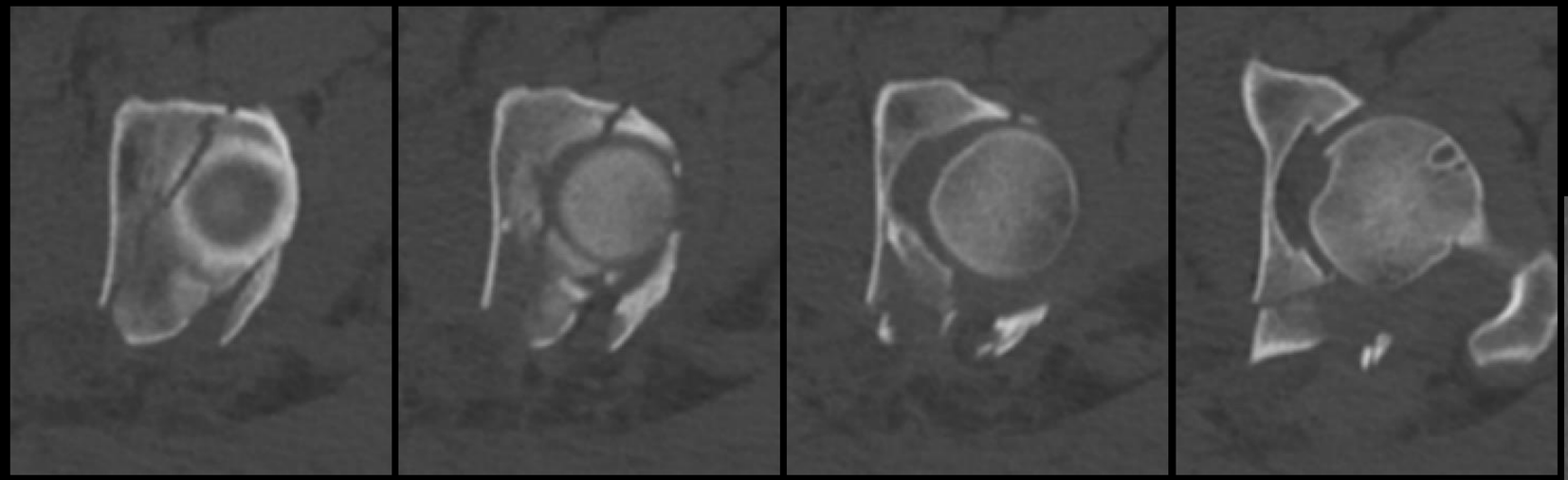


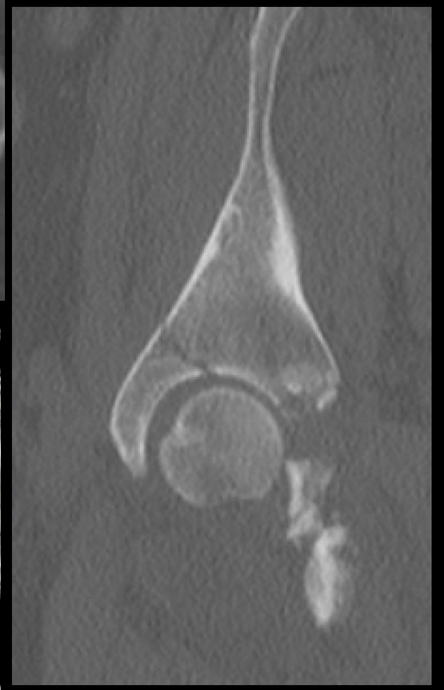
Both column reduction sequence

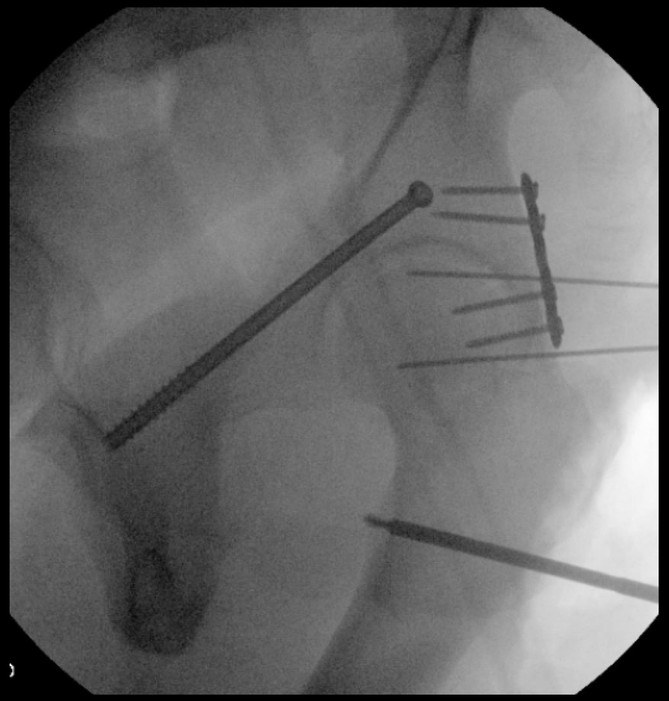


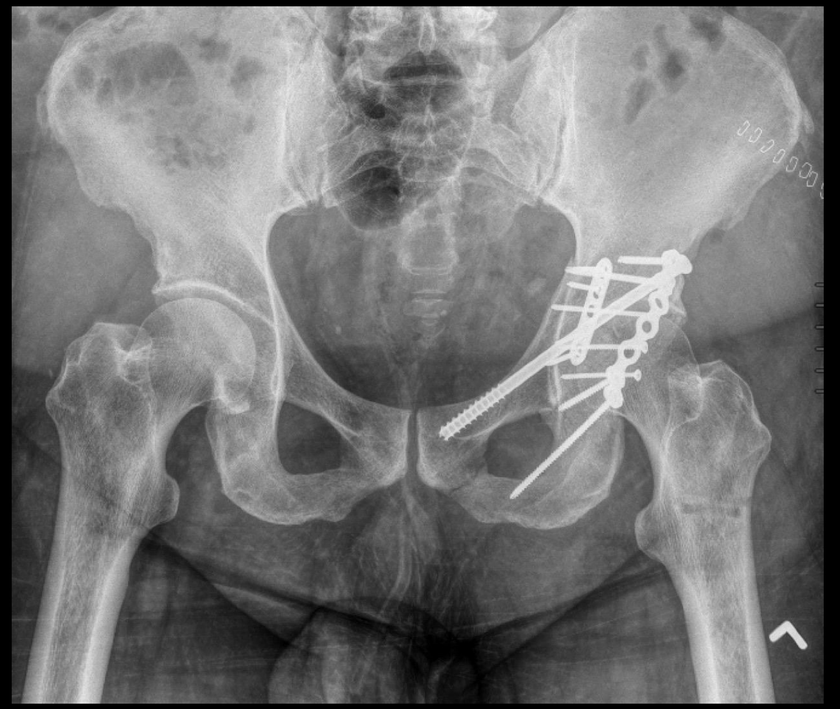
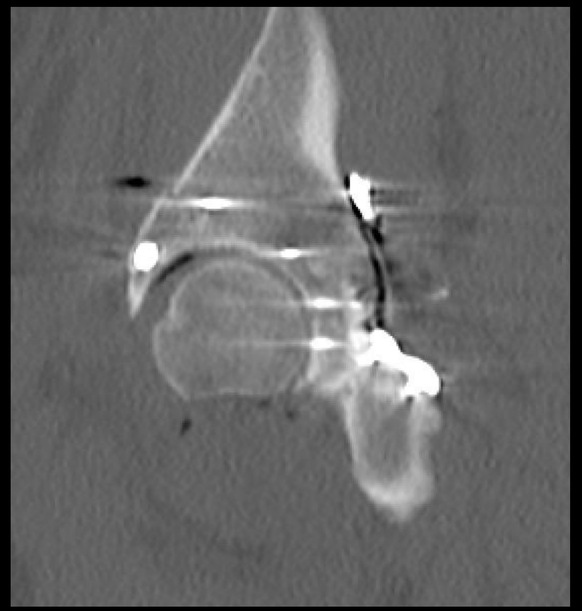


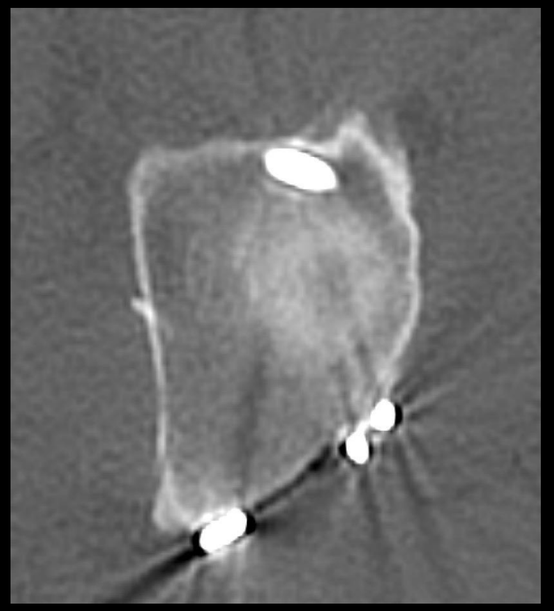
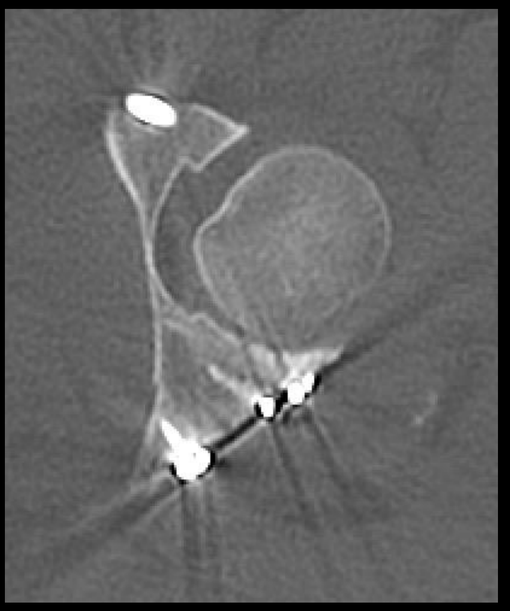
43M s/p rollover MVC

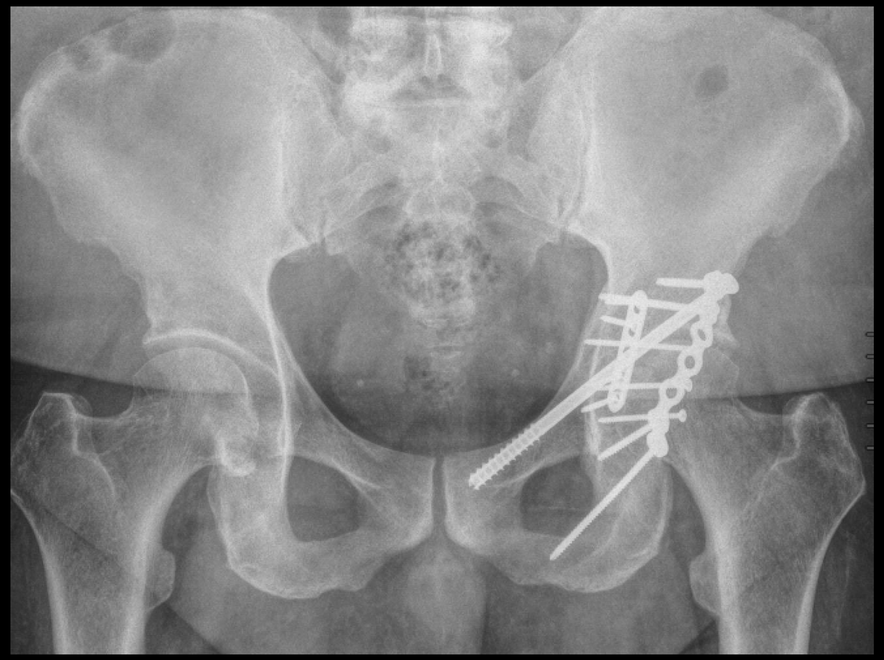


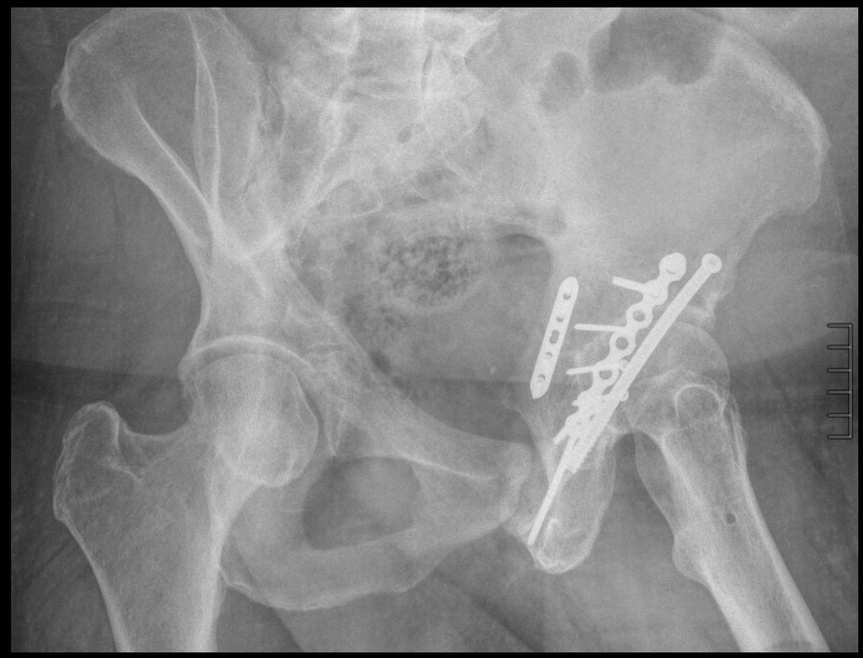


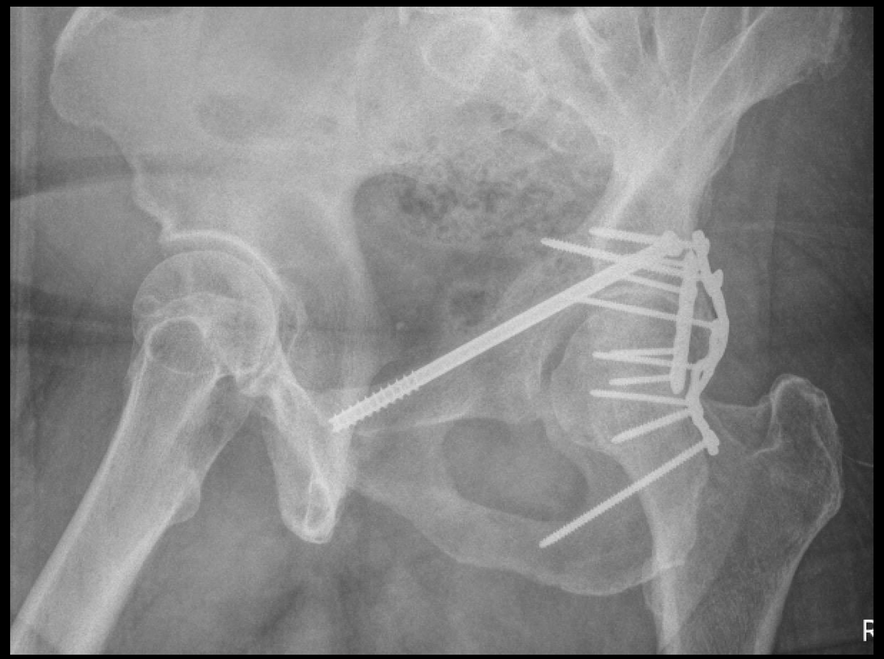








Conclusion

- Early hip reduction ↓ osteonecrosis
- ORIF outcomes best with early surgery and anatomic reduction
- Step-off ≤2 mm or roof arc >45° → consider non-op
- Consider THA ≥ ~68 yrs
- Combined approaches can ↑ SSI, may not need
- Use traction, sequencing, and meticulous technique for best outcomes