

AMSER Case of the Month

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48 year old female with knee pain s/p being knocked over by running dog onto cement

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Patient Presentation

- HPI: 48 year old F presents with left knee pain s/p knee twisting and falling when her dog ran into her and knocked her over onto the cement.
- Ambulatory with significant pain
- No LOC, transient confusion
- PMH: Breast cancer, Osteopenia, long term current use of aromatase inhibitors, and obesity
- Past Surgical Hx: Lumpectomy and lymph node biopsy
- Family History: Breast cancer, mother 65
- Social History: Former smoker (quit in 2009) and 12 standard drinks of alcohol/week

Physical Exam

- Vitals: BP 128/87, Pulse 123, RR 20; SpO2 98%, Temp 37.6°C
- Pertinent Exam Findings:
 - Left knee swelling and tenderness, normal range of motion and no obvious deformities, palpable DP and PT pulses

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

Variant 2:

Adult or child 5 years of age or older. Fall or acute twisting trauma to the knee. One or more of the following: focal tenderness, effusion, inability to bear weight. Initial imaging.

Procedure	Appropriateness Category	Relative Radiation Level
Radiography knee	Usually Appropriate	☢
Bone scan with SPECT or SPECT/CT knee	Usually Not Appropriate	☢☢☢
CT knee with IV contrast	Usually Not Appropriate	☢
CT knee without and with IV contrast	Usually Not Appropriate	☢
CT knee without IV contrast	Usually Not Appropriate	☢
MR arthrography knee	Usually Not Appropriate	○
MRA knee without and with IV contrast	Usually Not Appropriate	○
MRA knee without IV contrast	Usually Not Appropriate	○
MRI knee without and with IV contrast	Usually Not Appropriate	○
MRI knee without IV contrast	Usually Not Appropriate	○
US knee	Usually Not Appropriate	○

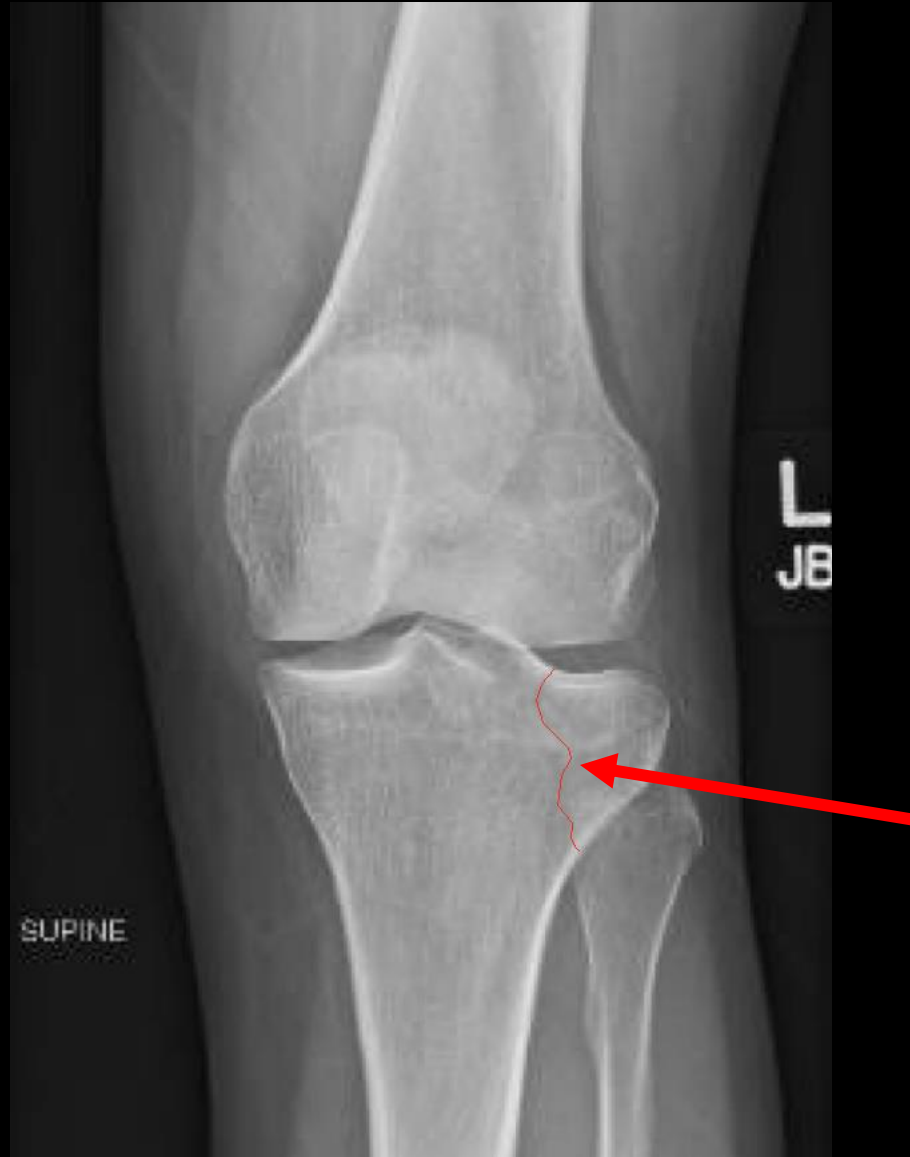
- This imaging modality was ordered by the ER physician

Findings XRAY(Unlabeled)



Findings XRAY (Labeled)

Radiograph demonstrates an acute, minimally displaced lateral tibial plateau fracture.



What Imaging Should We Order Next?

Select the applicable ACR Appropriateness Criteria

Variant 5:

Adult or child 5 years of age or older. Fall or acute twisting trauma to the knee. Tibial plateau fracture on radiographs. Suspect additional bone or soft-tissue injury. Next study.

Procedure	Appropriateness Category	Relative Radiation Level
MRI knee without IV contrast	Usually Appropriate	O
CT knee without IV contrast	Usually Appropriate	☢
Bone scan with SPECT or SPECT/CT knee	Usually Not Appropriate	☢☢☢
CT knee with IV contrast	Usually Not Appropriate	☢
CT knee without and with IV contrast	Usually Not Appropriate	☢
MR arthrography knee	Usually Not Appropriate	O
MRA knee without and with IV contrast	Usually Not Appropriate	O
MRA knee without IV contrast	Usually Not Appropriate	O
MRI knee without and with IV contrast	Usually Not Appropriate	O
US knee	Usually Not Appropriate	O

- This was the next study ordered

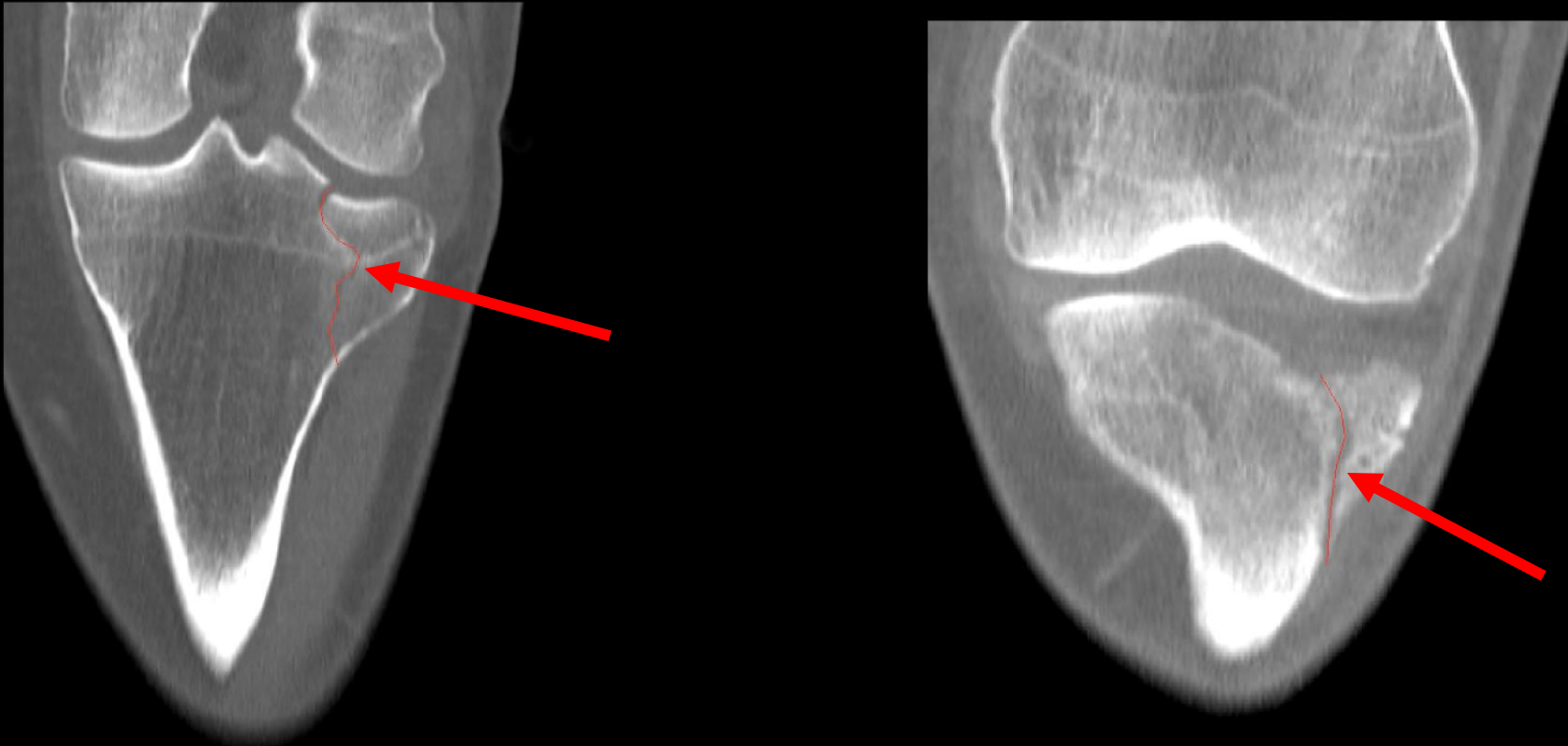
Findings (Unlabeled)

CT scan of knee w/o contrast, bone window



Findings CT (Labeled)

CT scan of knee w/o contrast, bone window



CT knee without contrast (bone window) demonstrates a lateral tibial plateau fracture involving the anterior plateau with approximately 4–5 mm articular depression.

Final Diagnosis

Minimally displaced intra-articular tibial plateau fracture

Case Discussion

Epidemiology:

- Tibial plateau fractures account for 1-2% of all adult fractures with men being affected at a 3:1 ratio compared to woman
- 10.3 per 100,000 people annually
- **Lateral plateau** fractures are the most common (70-80%)
 - Bicondylar (10-30%)
 - Medial Plateau (10-20%)

Mechanism:

- **Axial loading combined with varus or valgus stress (vertical force + twisting force)**
- Typically results from high-energy impact to the knee, such as **falls or collisions**.

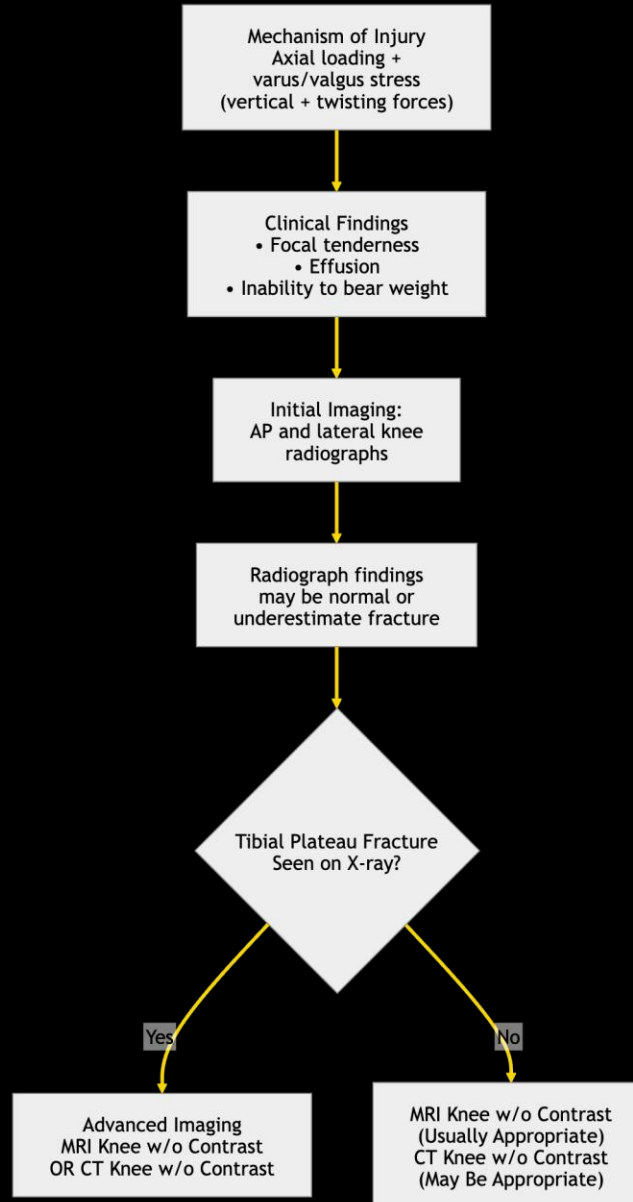
Physical Examination

- **Pain with movement**, often limiting knee exam
- **Focal pain with swelling** and localized bony tenderness
- Compartment syndrome (1.8%-12%)



Case Discussion- Tibial Plateau Fracture Work Up

Knee Injury Axial Loading+ Varus/Valgus ACR Appropriateness Guidelines



ACR Key Points

Radiographs: first-line

CT: improves detection + surgical planning

MRI/CT: Assess for ligamentous injury

Case Discussion: Treatment

- For tibial plateau fractures demonstrating displacement, associated meniscal or ligamentous injury, or articular surface depression/step-off, **orthopedic consultation should be obtained within 48 hours**, as these injuries may require operative management, including internal fixation and open reduction.

Initial management includes:

- Compression, ice application, appropriate analgesia
- Early mobilization as tolerated [as prolonged immobilization (>3 weeks) may result in permanent loss of full joint range of motion.]
- Open Reduction and Internal Fixation (ORIF)

References

- 1. American College of Radiology. ACR Criteria of Appropriateness: Acute Trauma to Knee. Accessed April 13, 2026. <https://acsearch.acr.org/list>
- 2. Knipe H. Tibial plateau fracture. Radiopaedia. Accessed April 13, 2026. <https://radiopaedia.org/articles/tibial-plateau-fracture?lang=us>
- 3. Tarazona D. Kardasheh M. Tibial Plateau Fractures Tibial. Orthobullets. Accessed April 13, 2026. <https://www.orthobullets.com/trauma/1044/tibial-plateau-fractures>
- 4. Davis T. Knee x-rays. Don't Forget the Bubbles. Published 2014. Accessed April 15, 2026. <https://dontforgetthebubbles.com/knee-x-ray-interpretation/>