

AMSER Case of the Month

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Knee Pain

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Patient Presentation

- **HPI:** 12yo male presents to outpatient family medicine clinic with complaints of bilateral (L>R) knee pain and stiffness. Pain has been present for past 1 year. Recent episode where patient needed to be carried to car after snowboarding due to pain. Pain worsens after physical exercise and improves with rest.
- **PMHx:** No significant past medical history or past surgical history
- **Vitals:** AFVSS

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

Variant 1: Adult or child greater than or equal to 5 years of age. Chronic knee pain. Initial imaging.

Procedure	Appropriateness Category	Relative Radiation Level
Radiography knee	Usually Appropriate	⊕
Image-guided aspiration knee	Usually Not Appropriate	Varies
CT arthrography 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	○
MRI knee without and with IV contrast	Usually Not Appropriate	○
MRI knee without IV contrast	Usually Not Appropriate	○
Bone scan knee	Usually Not Appropriate	⊕⊕⊕
US knee	Usually Not Appropriate	○
Radiography hip ipsilateral	Usually Not Appropriate	⊕⊕⊕

This imaging modality was ordered by the Family Medicine Physician

Findings (unlabeled)



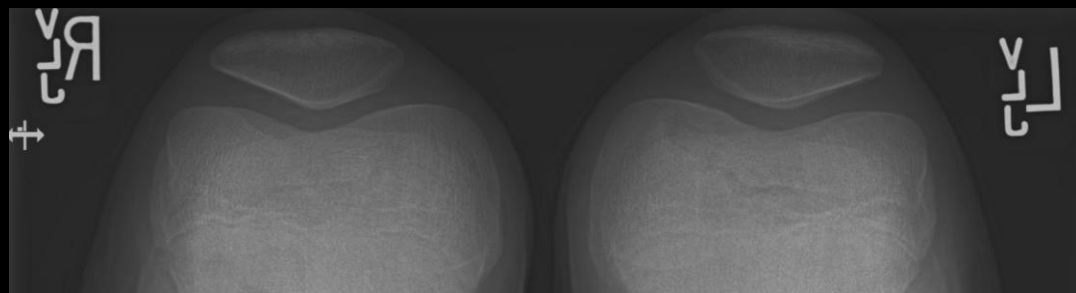
Knee AP Weightbearing



Knee L Lateral

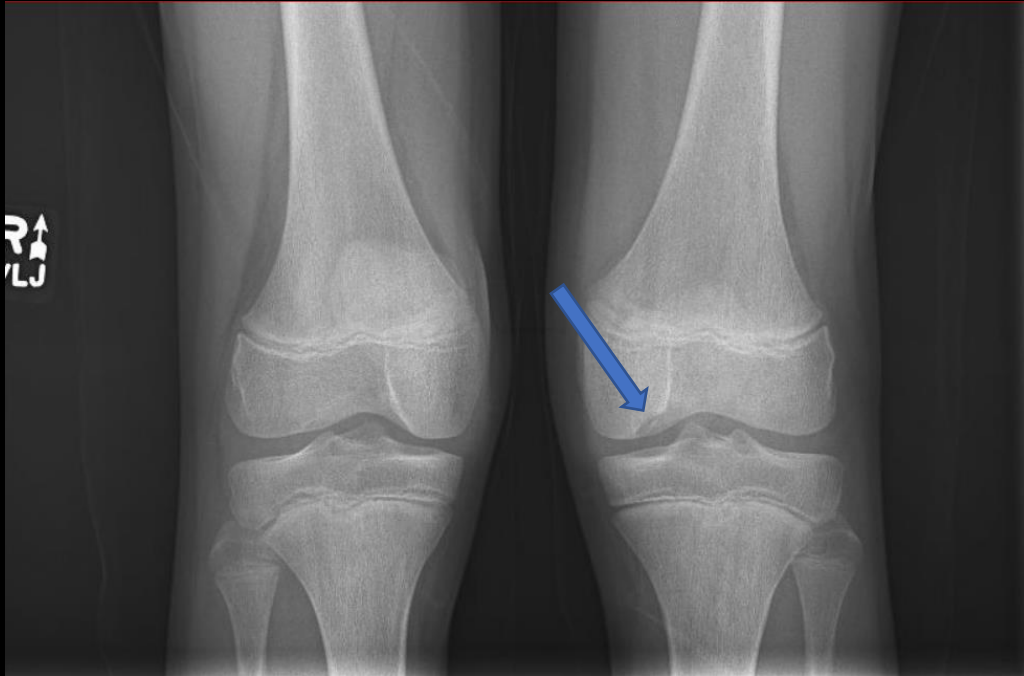


Knee R Lateral

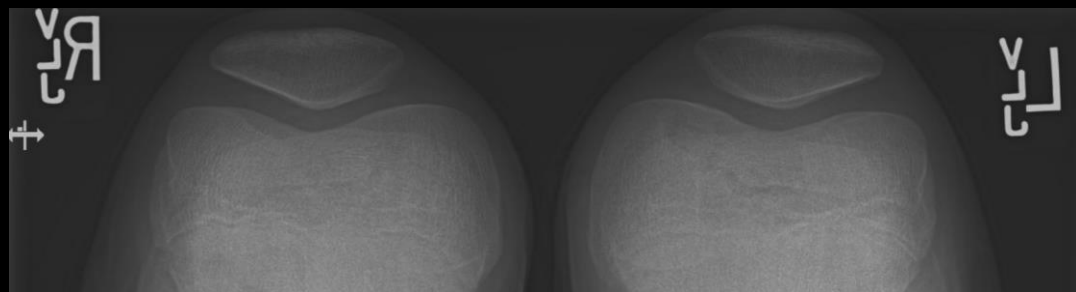


Knee Sunrise

Findings (labeled)

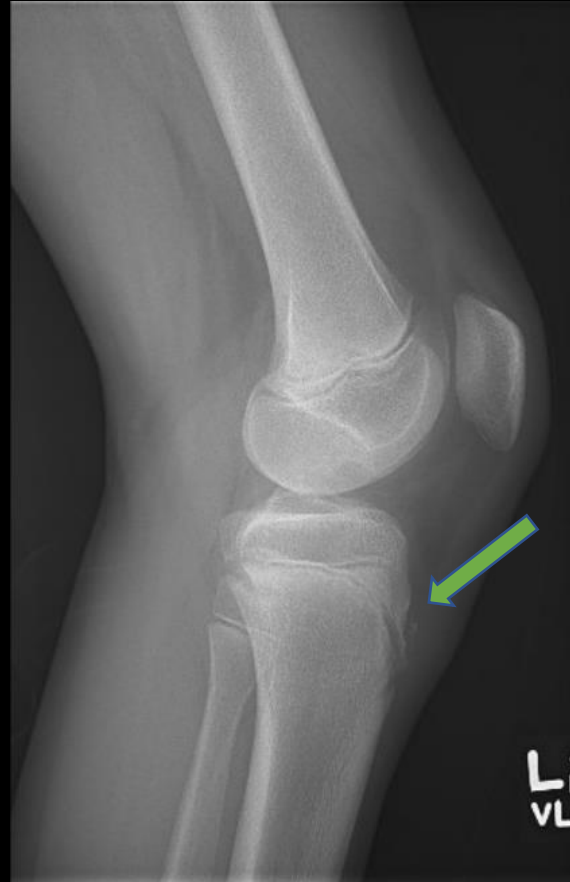


Knee AP Weightbearing



Knee Sunrise

(→) Osteochondrial Lesion of the left medial femoral condyle



Knee L Lateral



Knee R Lateral

(→) Fragmentation of the b/l tibial tuberosities with overlying soft tissue swelling

Final Dx:

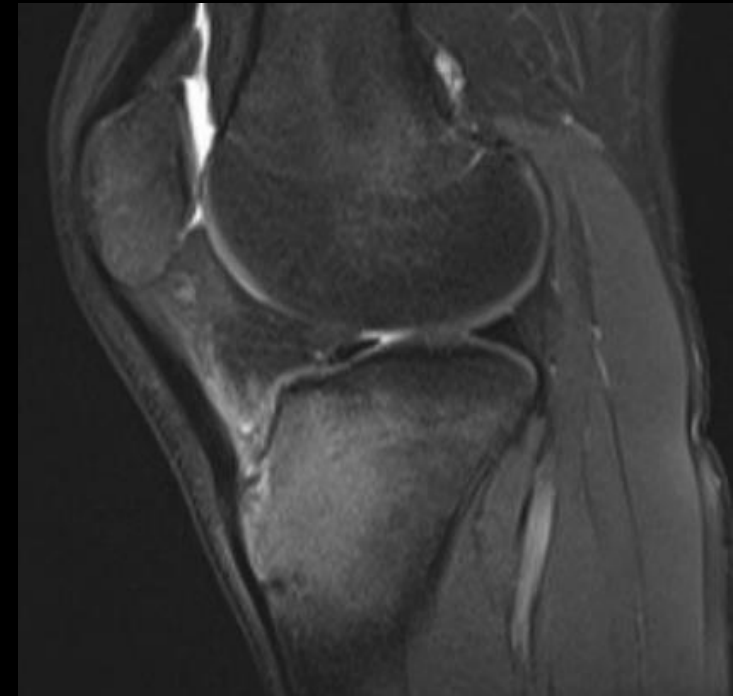
- 1) Bilateral Osgood-Schlatter Disease
- 2) Suspected Osteochondritis Desiccans

Osgood-Schlatter Disease

- Osgood-Schlatter Disease is defined as osteochondrosis or traction apophysitis of the tibial tubercle
 - Caused by repeated stress injury (e.g. jumping) on secondary ossification center of the tibial tuberosity during apophyseal maturation
- Most commonly presents as anterior knee pain around the tibial tubercle in pediatric patients (boys aged 12-15yrs)
 - History of pain during sports (basketball, volleyball, soccer, sprinters)
 - Bilateral in 20-30% of cases

Osgood-Schlatter Disease

- Diagnosis is clinical with an enlarged tibial tubercle tender to palpation
 - Pain elicited on resistance to knee extension
- Lateral knee radiograph will reveal irregularity and fragmentation of the tibial tubercle
 - MRI is not indicated, but will show soft tissue swelling, thickening of inferior patellar tendon, and fragmentation of ossification center
- Treated non-operatively with NSAIDs, ice, activity modification
 - Self-limiting, but commonly will not fully resolve until growth has halted



Sagittal T2 image showing edema around inferior patellar tendon and tibial tuberosity in Osgood Shlatter Disease.

(Kadirhan Ö et al. *Current Research in MRI*. 2022)

Osteochondritis Dissecans

- Osteochondritis Dissecans is an idiopathic, focal, lesion of the articular cartilage and subchondral-bone that can cause instability or detachment of a bone fragment and overlying articular cartilage
- Bimodal distribution:
 - Juvenile form (open physes; 10-15yrs) – hereditary, traumatic
 - Adult Form – vascular
- Knee is the most common location (70% of knee lesions in medial femoral condyle)
 - Also seen in capitellum of humerus, talus

Osteochondritis Desiccans

- Usually detected by radiograph, but MRI required for diagnosis
 - MRI shows size and stability of lesion, degree of cartilaginous injury, presence of loose body
- Management dependent on bone age
 - Pediatric patient with stable lesions and open physes > activity modification and bracing
 - Instability, failed non-operative management, impending physal closure > arthroscopy and subchondral drilling
- Prognosis of juvenile form correlates with age (younger patients with open physes more successfully treated non-operatively)
- Adult form commonly develops into osteoarthritis

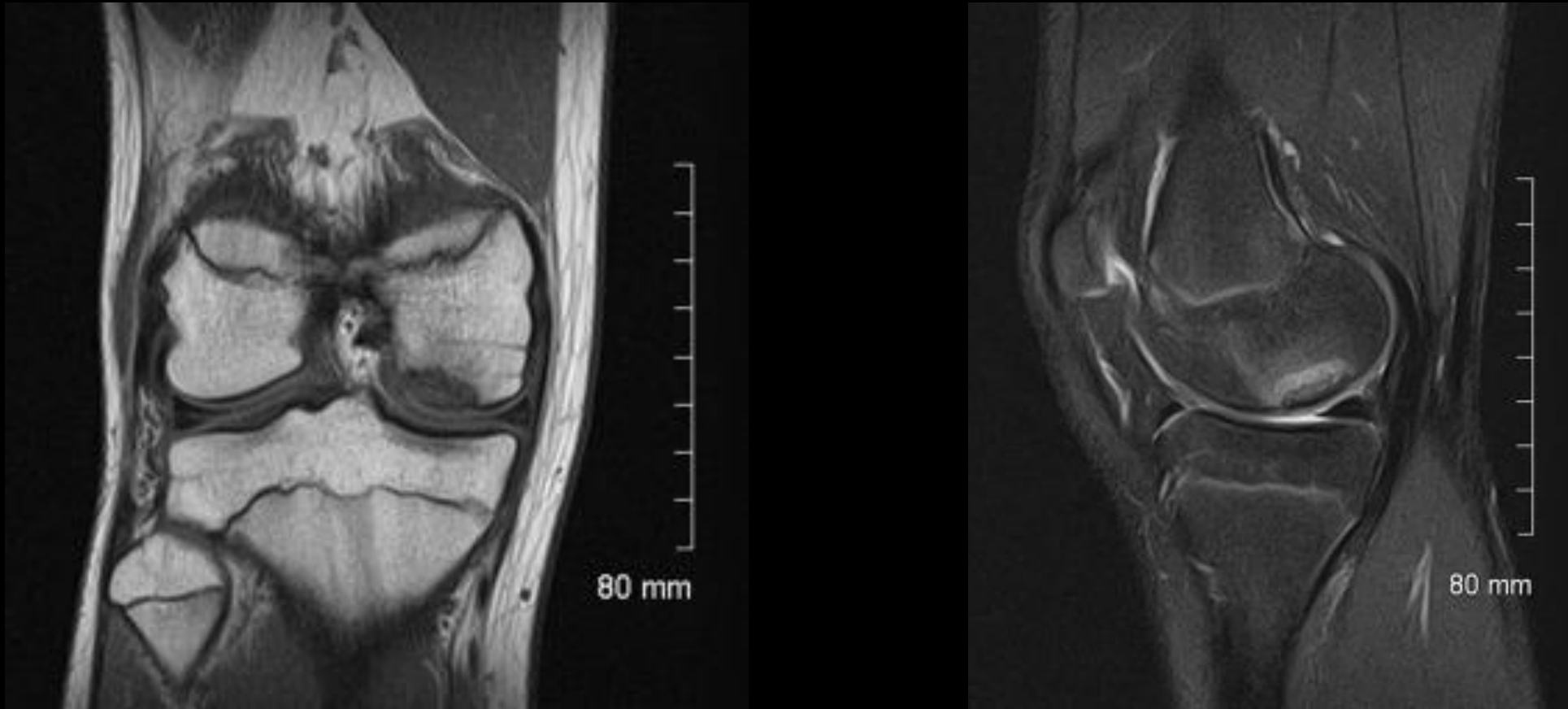
Osteochondritis Dissecans

Variant 3: Adult or child greater than or equal to 5 years of age. Chronic knee pain. Initial knee radiograph demonstrates osteochondritis dissecans (OCD), loose bodies, or history of cartilage or meniscal repair. Next imaging procedure.

Procedure	Appropriateness Category	Relative Radiation Level
MRI knee without IV contrast	Usually Appropriate	0
CT arthrography knee	May Be Appropriate	⊕
CT knee without IV contrast	May Be Appropriate	⊕
MR arthrography knee	May Be Appropriate (Disagreement)	0
US knee	Usually Not Appropriate	0
Image-guided aspiration knee	Usually Not Appropriate	Varies
CT knee with IV contrast	Usually Not Appropriate	⊕
CT knee without and with IV contrast	Usually Not Appropriate	⊕
MRI knee without and with IV contrast	Usually Not Appropriate	0
Bone scan knee	Usually Not Appropriate	⊕⊕⊕
Radiography hip ipsilateral	Usually Not Appropriate	⊕⊕⊕

This imaging modality was recommend by Radiology for further evaluation

Osteochondritis Dessicans



Left: T1 Coronal sequence showing low signal fragment within the subchondral bone; **Right:** T2 Sagittal sequence showing heterogeneous low signal from the fragment within the subchondral bone in Osteochondritis Dessicans

(Accadbled F et al. *Orthop Traumatol Surg Res*, 2018)

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