

Chronic Knee Pain after Partial Meniscectomy

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Focused patient history and workup

- 52 year old male
- Chronic medial right knee pain since partial meniscectomy 9 years ago
- Pain worse after sitting for prolonged periods and has painful popping and catching of right knee
- Has had moderate relief with steroid and HA injections
- TTP right medial joint line but otherwise normal physical exam without loss of range of motion, deformity, instability, or effusion

List of imaging studies

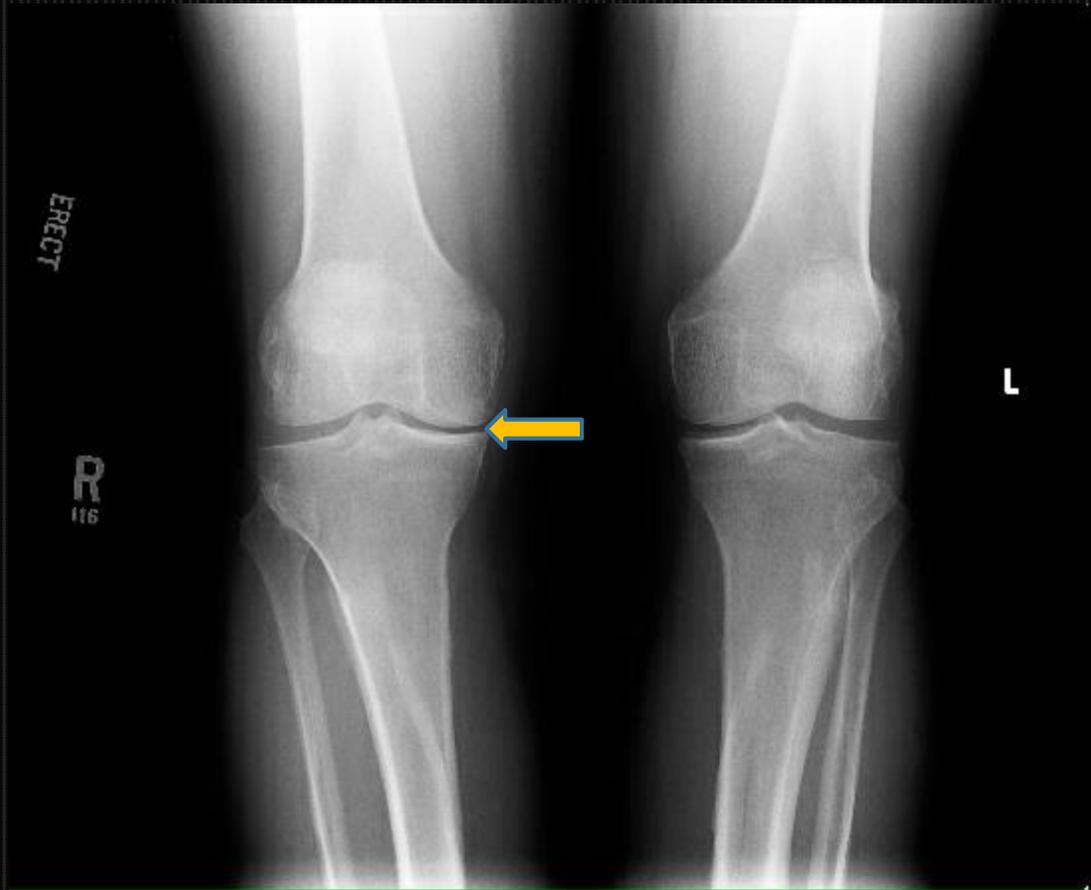
- AP X-rays of both knees
- Sunrise view X-rays of both knees
- Lateral view X-ray of right knee
- Tunnel view X-ray of right knee
- MRI w/o contrast of right knee

AP view of both knees



Medial joint space narrowing of right knee with sclerosis. Preserved joint space of left knee. Otherwise negative x-ray

AP view of both knees



Medial joint space narrowing of right knee with sclerosis. Preserved joint space of left knee. Otherwise negative x-ray

Sunrise view of both knees



Bilateral patellofemoral osteophytes

Sunrise view of both knees



Bilateral patellofemoral osteophytes

Lateral and Tunnel view of right knee



No fractures,
dislocations,
lesions, effusions



No loose bodies
in the joint space,
medial joint
space narrowing
and osteophytes

Lateral and Tunnel view of right knee



No fractures,
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MRI R Knee w/o contrast-T2 FS weighted coronal



The body of the medial meniscus is blunted consistent with prior partial meniscectomy. Loss of articular cartilage with subchondral bone marrow edema-like signal

MRI R Knee w/o contrast-T2 FS weighted coronal



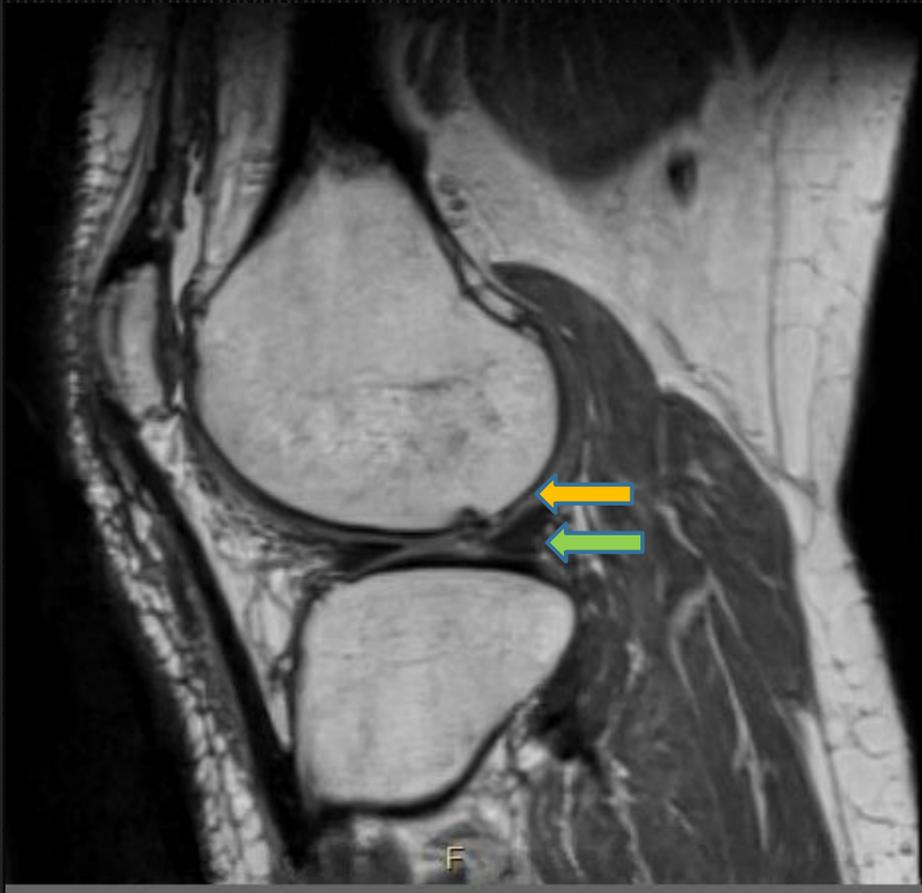
The body of the medial meniscus is blunted consistent with prior partial meniscectomy. Loss of articular cartilage with subchondral bone marrow edema-like signal

MRI R Knee w/o contrast-PD weighted Sagittal



Complete loss of the weight-bearing region articular cartilage. Large posterior horn with intermediate signal, raises possibility of superimposed tear.

MRI R Knee w/o contrast-PD weighted Sagittal



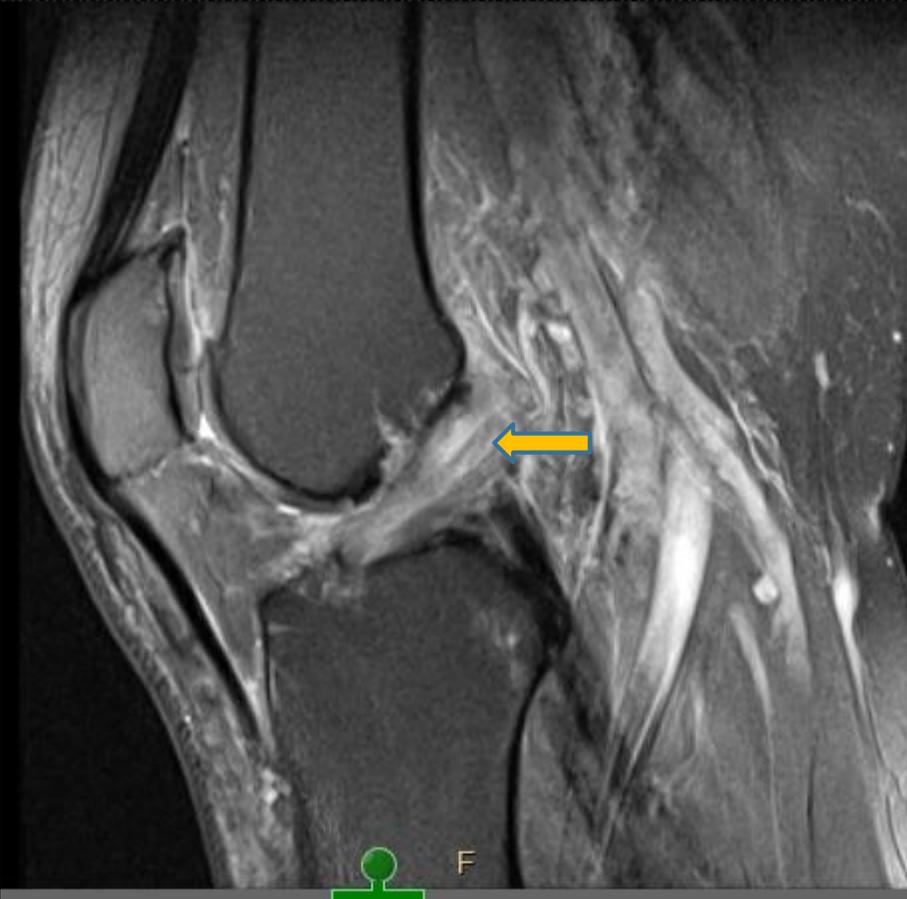
Complete loss of the weight-bearing region articular cartilage. Large posterior horn with intermediate signal, raises possibility of superimposed tear.

MRI R Knee w/o contrast-T2 FS weighted Sagittal



Thickened ACL with near fluid-bright high T2 signal proximally, suggesting small partial tear in the setting of mucoid degeneration.

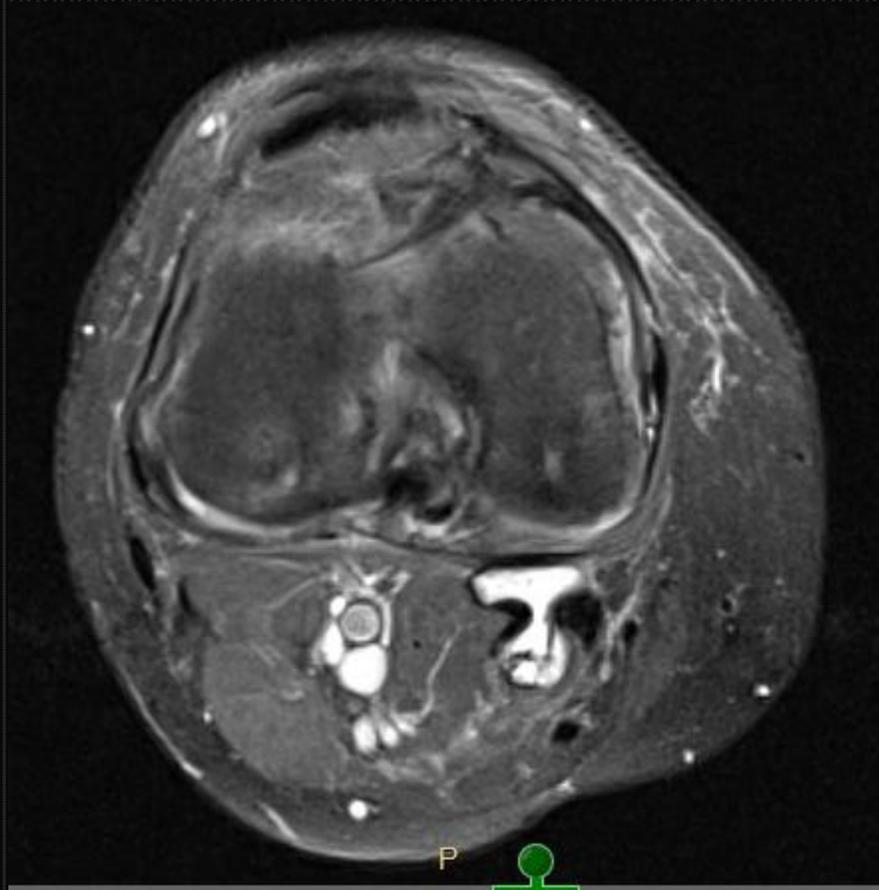
MRI R Knee w/o contrast-T2 FS weighted Sagittal



Thickened ACL with near fluid-bright high T2 signal proximally, suggesting small partial tear in the setting of mucoid degeneration.

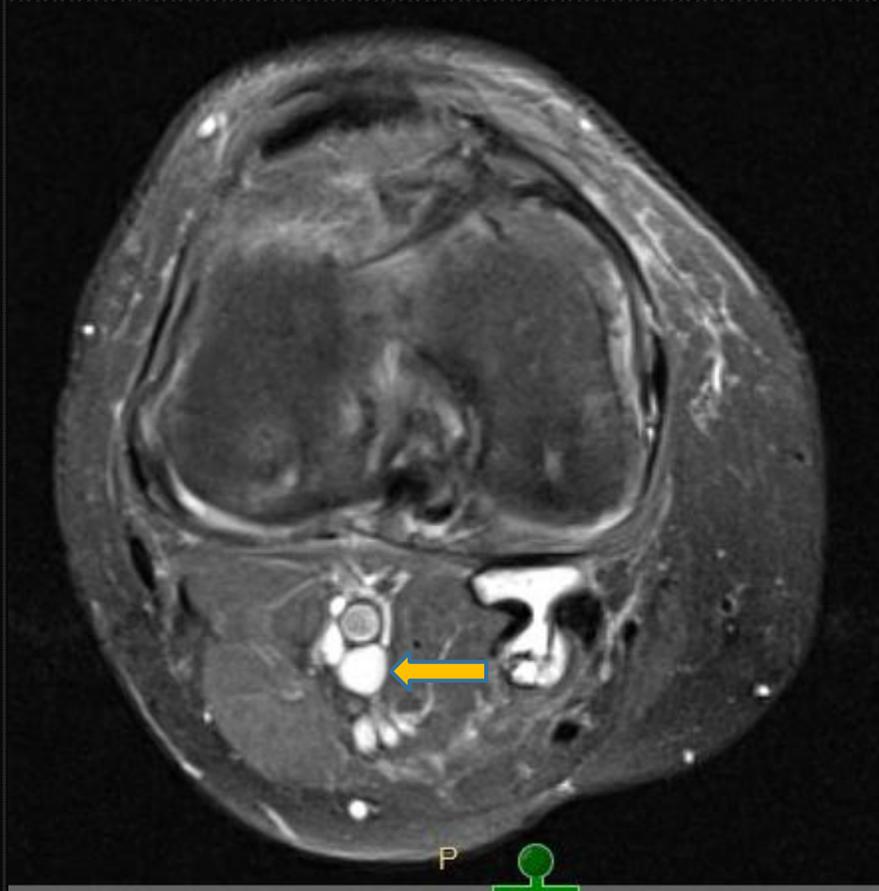
MRI R Knee w/o contrast-T2 FS weighted Axial

Small popliteal cyst



MRI R Knee w/o contrast-T2 FS weighted Axial

Small popliteal cyst



Typical patient treatment¹

- Initial treatment involves rest, ice, quadriceps strengthening, unloading brace
- In setting of osteoarthritis, treatment to maximize osteoarthritis is recommended
- Restriction of motion, knee locking, concurrent ACL tear are indications for surgery
- This patient is currently being evaluated for repeat partial meniscectomy

Imaging Algorithm²

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	☼
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	○
Tc-99m bone scan knee	Usually Not Appropriate	☼ ☼ ☼
US knee	Usually Not Appropriate	○
Radiography hip ipsilateral	Usually Not Appropriate	☼ ☼ ☼

Imaging Algorithm²

Variant 4:

Adult or child greater than or equal to 5 years of age. Chronic knee pain. Initial knee radiograph demonstrates degenerative changes or chondrocalcinosis. Next imaging procedure.

Procedure	Appropriateness Category	Relative Radiation Level
MRI knee without IV contrast	May Be Appropriate	0
Aspiration knee	May Be Appropriate (Disagreement)	Varies
CT knee without IV contrast	May Be Appropriate	⊗
MRI knee without and with IV contrast	Usually Not Appropriate	0
US knee	Usually Not Appropriate	0
CT arthrography 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	0
Tc-99m bone scan knee	Usually Not Appropriate	⊗ ⊗ ⊗
Radiography hip ipsilateral	Usually Not Appropriate	⊗ ⊗ ⊗

Imaging discussion

- Should have at least a frontal projection radiograph, a tangential patellar view, and a lateral knee view.³
- Standing positions are preferred to supine because they more accurately show weight bearing cartilage loss.³
- MRI without IV contrast is appropriate when used to evaluate for potential surgical candidacy.⁴

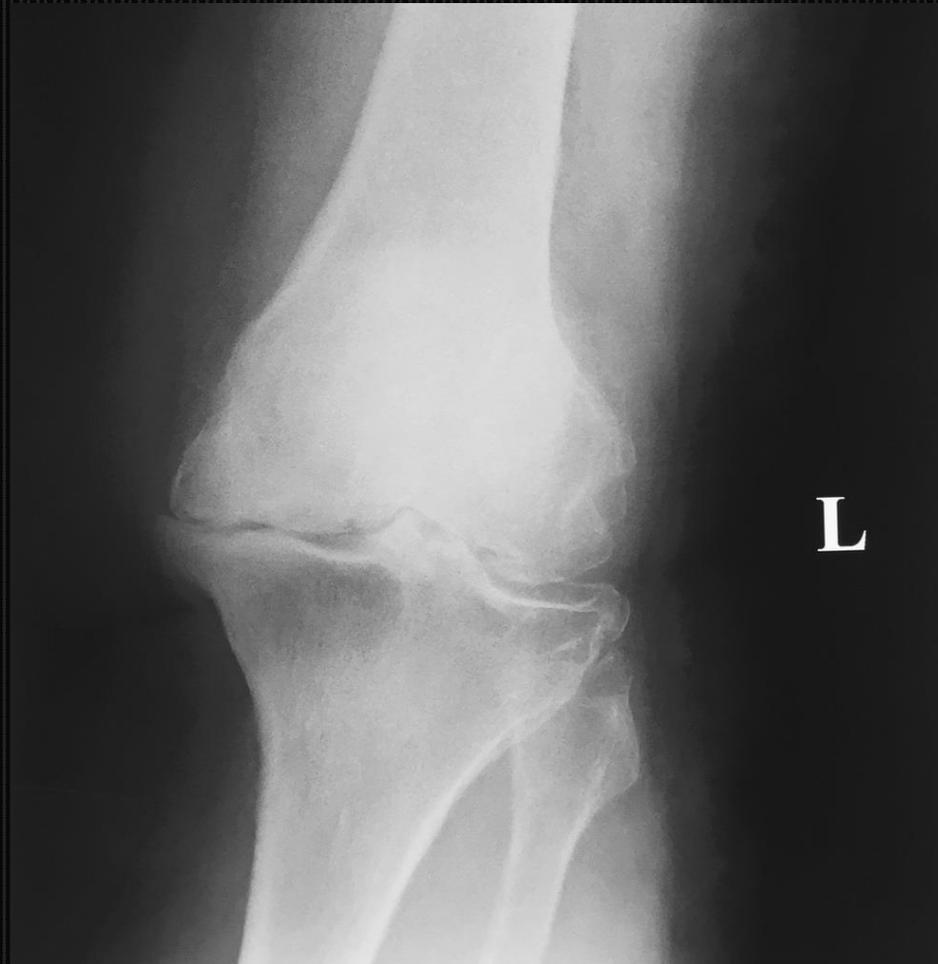
Radiation Exposure and Cost

	Radiation Exposure	Cost
X-ray knee	0.001 mSv ⁵	\$36-\$580+ ⁶
MRI knee w/o contrast	0	\$634-\$2,935+ ⁷

Sensitivity and Specificity

- MRI has 95% sensitivity and 81% specificity for medial meniscal tears and 85% sensitivity and 93% specificity for lateral meniscal tears.⁸
- With arthroscopy used as a gold standard, MRI was able to detect OA with 69% sensitivity and 93% specificity.⁹
- With arthroscopy used as a gold standard, X-ray had a wide range of sensitivities (3-95%) and specificities (60-100%) for detecting OA.¹⁰

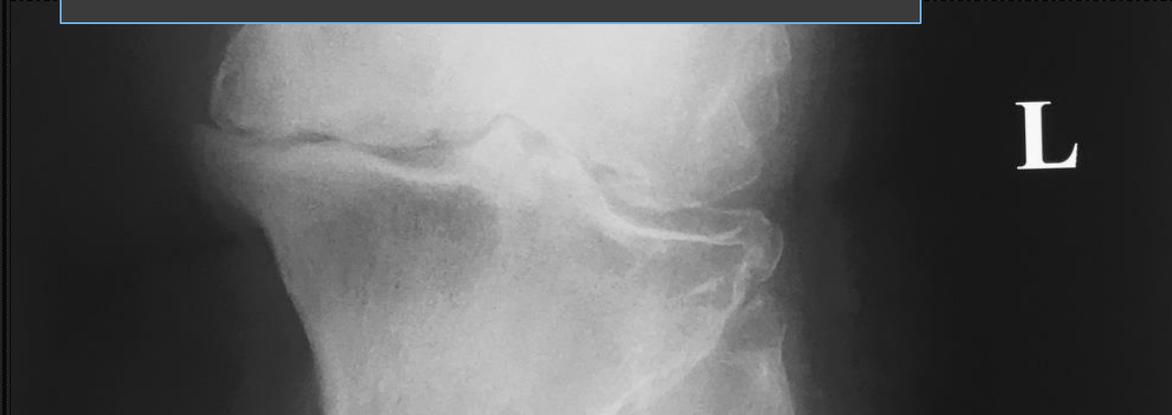
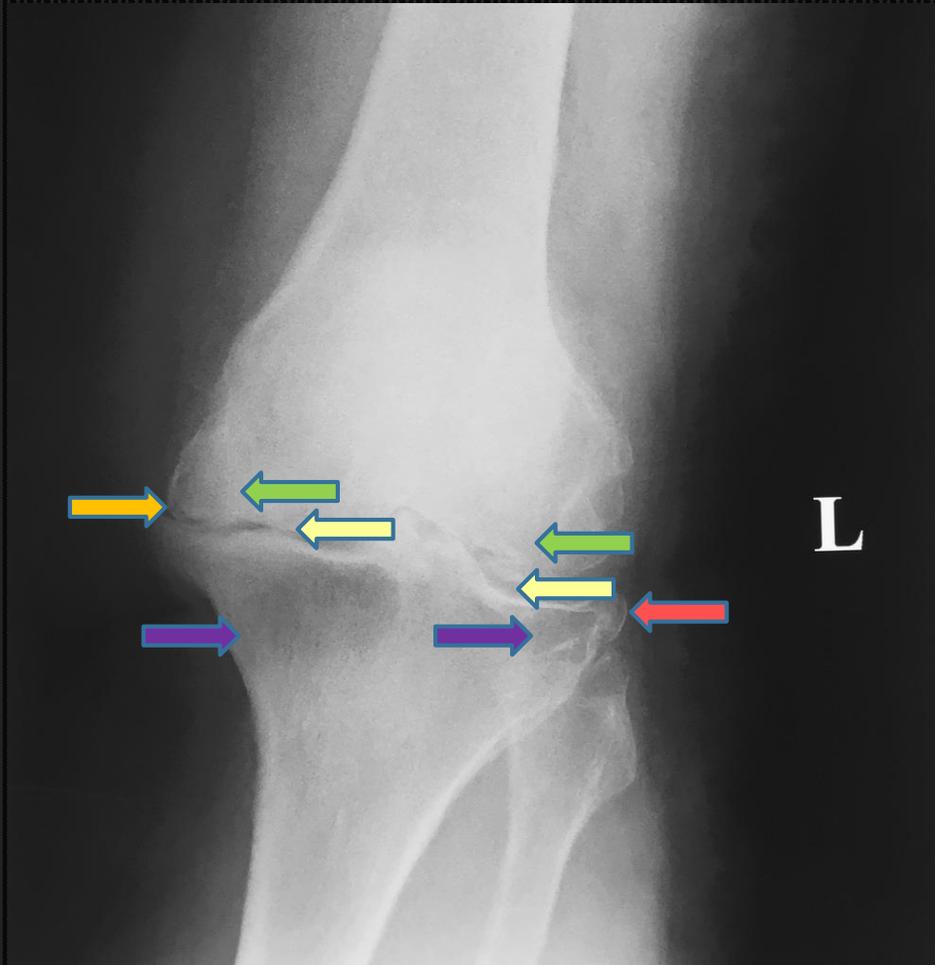
Classic Imaging Findings of OA¹¹



Joint space narrowing <3mm on weight-bearing, subchondral sclerosis, marginal osteophytes, subchondral cysts, altered shape of the femoral condyle and tibial plateau

Classic Imaging Findings of OA¹¹

Joint space narrowing <3mm on weight-bearing, subchondral sclerosis, marginal osteophytes, subchondral cysts, altered shape of the femoral condyle and tibial plateau



Classic Imaging Findings of Meniscal Tear¹²



High intra-meniscal signal extending to at least one articular surface on T₂, distortion of the normal meniscal morphology if no prior surgery

Classic Imaging Findings of Meniscal Tear¹²



High intra-meniscal signal extending to at least one articular surface on T₂, distortion of the normal meniscal morphology if no prior surgery

WrapUp

- First line imaging in chronic knee pain is at least 3 view weight-bearing radiograph
- MRI without IV contrast can be considered even in cases with positive radiograph findings if planning for surgery
- MRI is best way to evaluate for meniscal tears and ligamentous injury

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