AMSER Case of the Month October 2024

32-year-old female with enlarged left leg mass

Jason Peng, MS3, Cooper Medical School of Rowan University

Nathan Law, MD, PGY-3, Cooper University Hospital

Mark DiMarcangelo, DO, MS, FACR, FAOCR, Cooper University Hospital

Cooper University Health Care

Cooper Medical School of Rowan University

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Patient Presentation

HPI: A 32-year-old female presents as a direct admit from orthopedics for further evaluation of 3/10 left knee pain and mass that's been ongoing for the past 4 months. Pain is exacerbated with repetitive movement and flexion of her left knee and relieved with Tylenol.

PMHx: Intermittent left leg stiffness since 2016 (7 years); Denies prior Hx of oncological disease in herself or family.

Surgical Hx: None

ROS: 10 systems reviewed and negative as per HPI

Patient Presentation

Vitals: BP 112/78; Pulse 84; Temp 98.1; Resp 18; SPO2 100

Physical Exam:

- Constitutional: (-) NAD, lying in bed, AAO x 3
- MSK: (+) Mild left leg swelling posterior to the knee, limited ROM with active flexion of the knee. (-) Sensory intact.
- Skin: (-) Normal

Pertinent Labs

CBC w/ diff:
- Hgb: 13.6 g/dL
- RBC: 4.36 10*6/uL
- WBC: 5.11 10*3/uL

CMP:
- ALP: 75 U/L

Inflammatory:
- ESR: 6 mm/h
- CRP: <0.30 mg/dL

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

Variant 2: **Nonsuperficial (deep) soft tissue mass. Initial imaging.**

Procedure	Appropriateness Category	Relative Radiation Level
Radiography area of interest	Usually Appropriate	Varies
US area of interest	May Be Appropriate	O
CT area of interest with IV contrast	May Be Appropriate	Varies
CT area of interest without and with IV contrast	May Be Appropriate	Varies
CT area of interest without IV contrast	May Be Appropriate	Varies
US area of interest with IV contrast	Usually Not Appropriate	O
Image-guided biopsy area of interest	Usually Not Appropriate	Varies
Image-guided fine needle aspiration area of interest	Usually Not Appropriate	Varies
MRI area of interest without and with IV contrast	Usually Not Appropriate	O
MRI area of interest without IV contrast	Usually Not Appropriate	O
FDG-PET/CT area of interest	Usually Not Appropriate	☢☢☢☢

This imaging modality was ordered by the orthopedic surgeon.

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Findings (unlabeled)

Findings (labeled)

Lateral Radiograph

Sagittal CT

Axial CT

Large ossified mass in the posterior distal femur measuring 5.3 x 6.4 x 8.8cm with some intramedullary extension (white arrows). Findings are concerning for a ossific lesion arising in the soft tissues.

What Imaging Should We Order Next?

Select the applicable ACR Appropriateness Criteria

Variant 5: **Suspect primary bone tumor. Lesion on radiographs. Indeterminate or aggressive appearance for malignancy. Next imaging study.**

Procedure	Appropriateness Category	Relative Radiation Level
MRI area of interest without and with IV contrast	Usually Appropriate	O
MRI area of interest without IV contrast	May Be Appropriate	O
CT area of interest without and with IV contrast	May Be Appropriate (Disagreement)	Varies
CT area of interest without IV contrast	May Be Appropriate	Varies
FDG-PET/CT whole body	May Be Appropriate	☢☢☢☢
Bone scan whole body with SPECT or SPECT/CT area of interest	May Be Appropriate	☢☢☢
Bone scan whole body	Usually Not Appropriate	☢☢☢
CT area of interest with IV contrast	Usually Not Appropriate	Varies
Radiography skeletal survey	Usually Not Appropriate	☢☢☢
US area of interest	Usually Not Appropriate	O

This imaging modality was ordered by the orthopedic surgeon.

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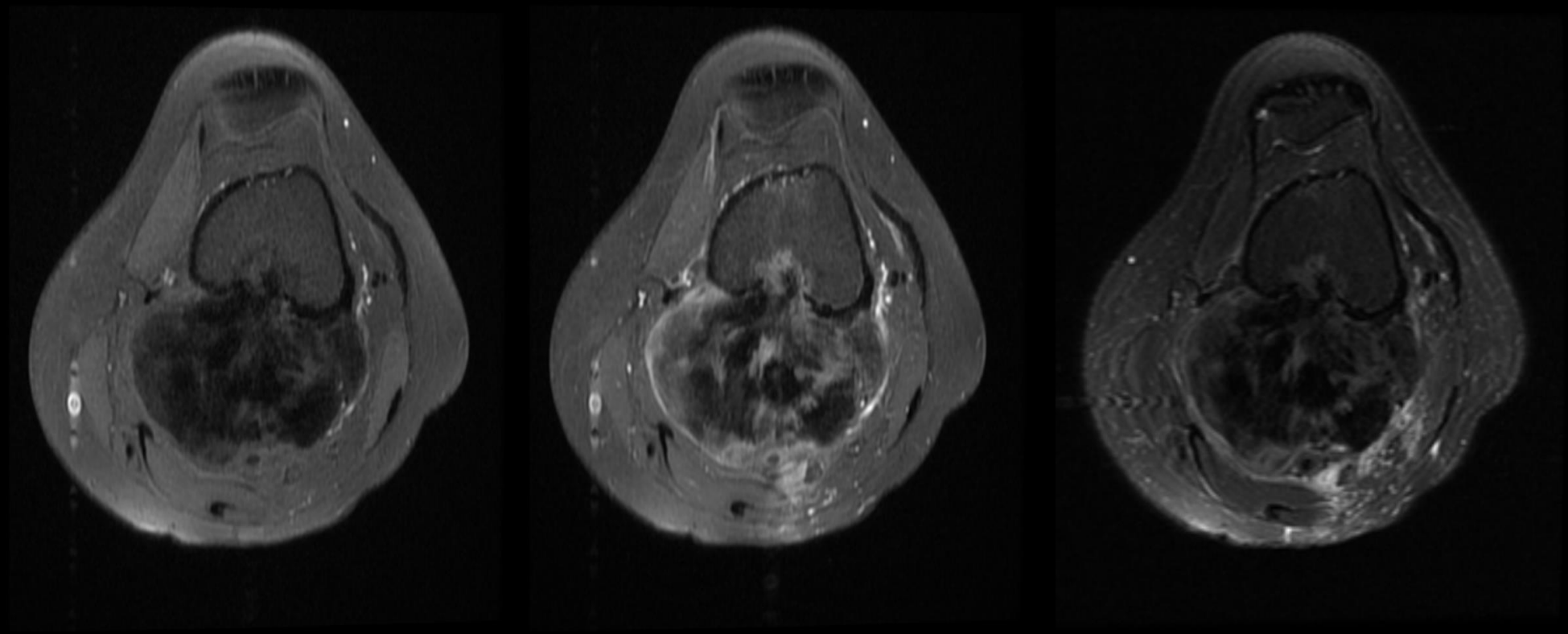
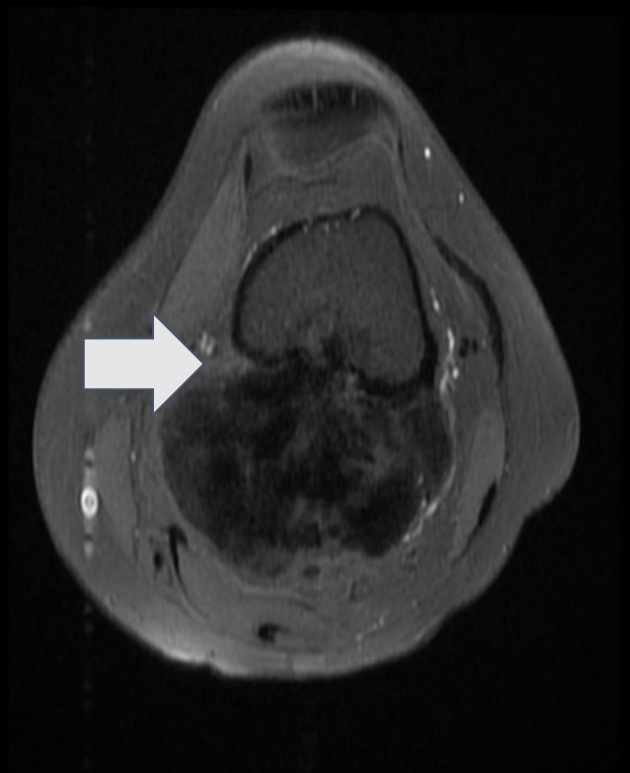
Findings (unlabeled)

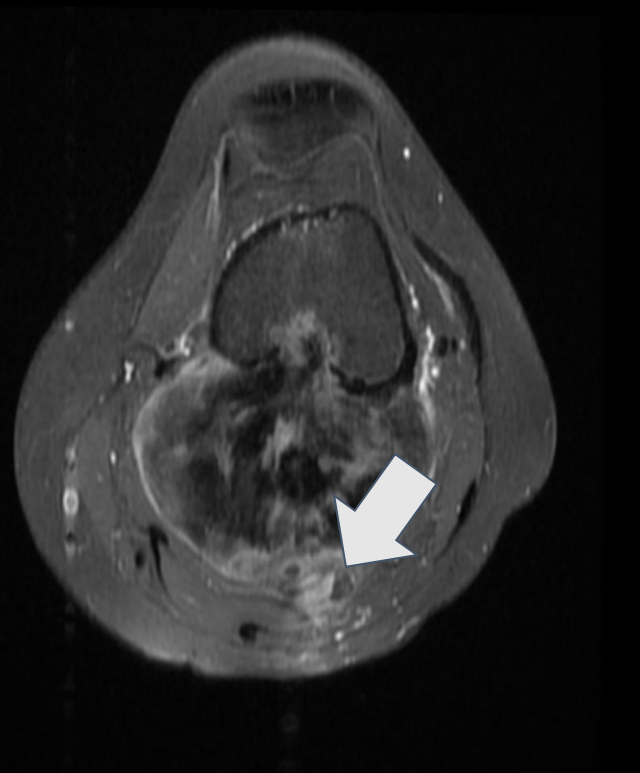


Findings (labeled)

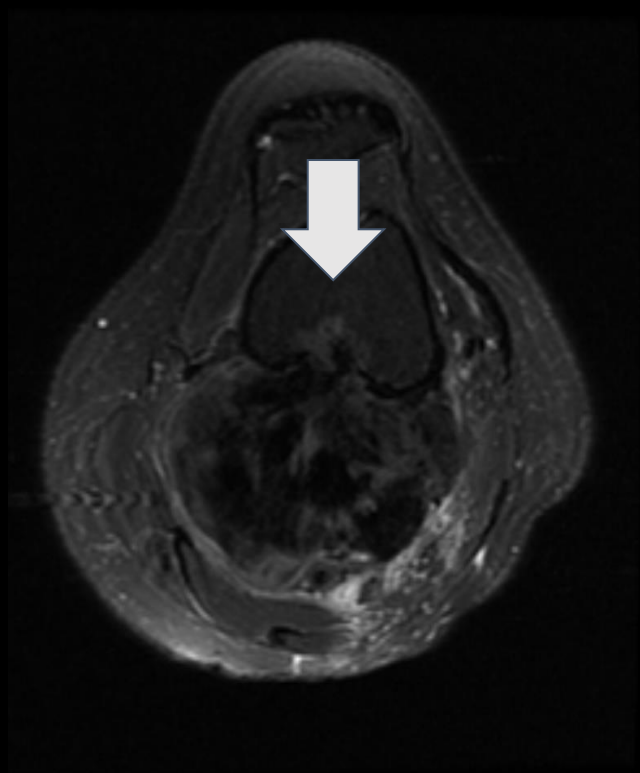
Axial T1



Axial T1 + C



Axial T2



Large paraosseous soft tissue mass, predominantly calcified, in the posterior aspect of the distal femur (arrow on T1), measuring 8.7 x 7 x 3.7 cm with cortical breakthrough and involving the posterior aspect of the distal femur shaft marrow (arrow on T2) over an area measuring 3.3 x 2 x 1.1 cm with enhancement. This area is intimate with the neurovascular bundles (arrow on T1 + C).

Final Dx:

Parosteal Osteosarcoma

Case Discussion

Parosteal Osteosarcoma:

- A rare primary bone malignancy of the periosteum.
- A subtype of surface osteosarcoma. This is a well-differentiated, less aggressive form that accounts for only 4% of cases of osteosarcoma.

Primary Demographic: Common in females, typically in their 30s.

Risk Factors: Radiation therapy, preexisting bone abnormalities, hereditary retinoblastoma, Li-Fraumeni syndrome, Rothmund-Thomson syndrome.

Genetic Markers: Amplification of the CDK4 and MDM2 genes.

Case Discussion

Clinical Presentation:

- A slow-growing mass usually associated with painless swelling. While most cases are painless, some may experience dull aching and tenderness localized at the mass.
- The mass is described as non-lobular, expansile, and exophytic in nature. Often mistaken for benign lesions.
- Associated with mucosal ulceration and decreased joint mobility. Typically not with paresthesias or lymphadenopathy. However, in some cases, a compressive neuropathy can occur.

Differential Diagnosis:

- Cortical desmoid, myositis ossificans, sessile osteochondroma, periosteal chondrosarcoma, periosteal osteosarcoma, high-grade surface osteosarcoma

Parosteal Osteosarcoma

Imaging:

- Radiography: Initial Imaging Study. Most commonly presents at the distal metaphysis of the femur. Will be an exophytic, cauliflower like mass with dense central ossification adjacent to bone.
- CT: assesses for attenuation and homogeneity, lesion margins, and the degree/pattern of enhancement.
- MRI: Assess for soft-tissue mass, medullary canal involvement, and cortical thickening, scalloping, and periosteal reaction. Assess extent of mineralization in the soft-tissue mass. Assess signal intensity of the soft-tissue mass on T1-weighted images. Assess lesion margins and degree of enhancement.
- Bone Scan: Will demonstrate radiotracer uptake.

Management:

- Surgical Resection
- Chemotherapy and radiation generally not needed as the mass is a low grade neoplasm

References:

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