AMSER Case of the Month
June 2021
Left Index Finger Bone Lesion

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Patient Presentation

- HPI: 35-year-old female referred for orthopedic evaluation due to atraumatic left index finger pain and swelling for several months. Previous evaluation at an urgent care center revealed a “bone lesion”. No history of prior significant hand injuries. No numbness, weakness, or paresthesias.

- PMHx: Depression, seasonal allergies, hypertension

- ROS: Negative

Physical Exam

- Slight erythema and edema surrounding the left index proximal phalanx with significant tenderness to palpation
- Painful passive range of motion of the index metacarpophalangeal joint, with reduced strength on active flexion and extension
- Intact perfusion, with no evidence of neurovascular compromise
- No other musculoskeletal abnormality identified

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What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

Variant 1: **Suspect primary bone tumor. Initial imaging.**

Procedure	Appropriateness Category	Relative Radiation Level
Radiography area of interest	Usually Appropriate	Varies
CT area of interest with IV contrast	Usually Not Appropriate	Varies
CT area of interest without and with IV contrast	Usually Not Appropriate	Varies
CT area of interest without IV contrast	Usually Not Appropriate	Varies
FDG-PET/CT whole body	Usually Not Appropriate	☢☢☢☢
MRI area of interest without and with IV contrast	Usually Not Appropriate	O
MRI area of interest without IV contrast	Usually Not Appropriate	O
Bone scan whole body	Usually Not Appropriate	☢☢☢
US area of interest	Usually Not Appropriate	O

These imaging modalities were ordered by the physician

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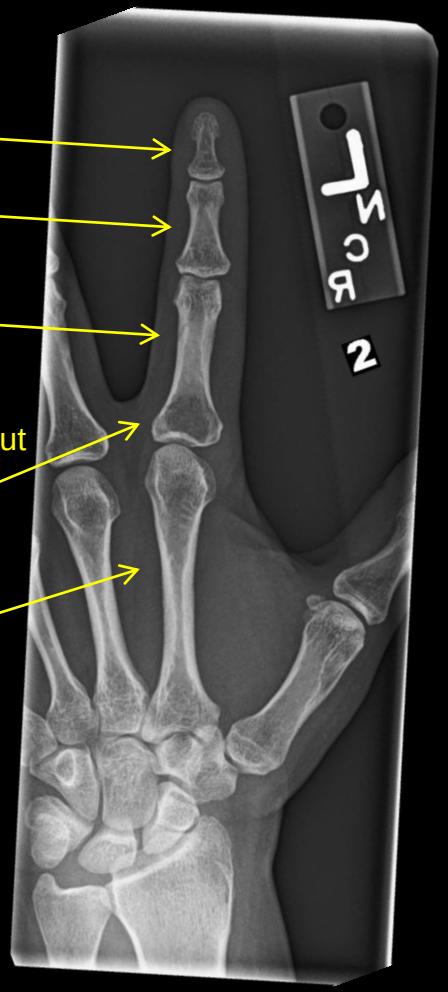
Index Finger Radiographs

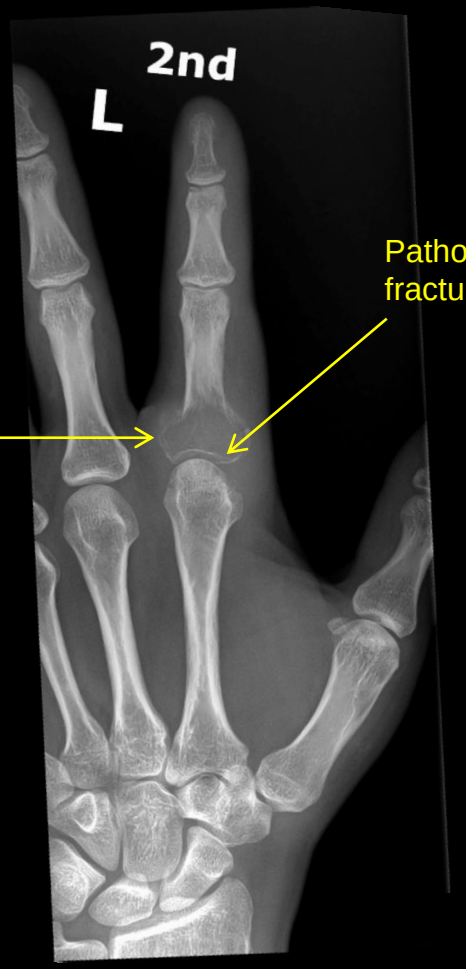
August 2020

September 2020

Index Finger Radiographs



August 2020



September 2020

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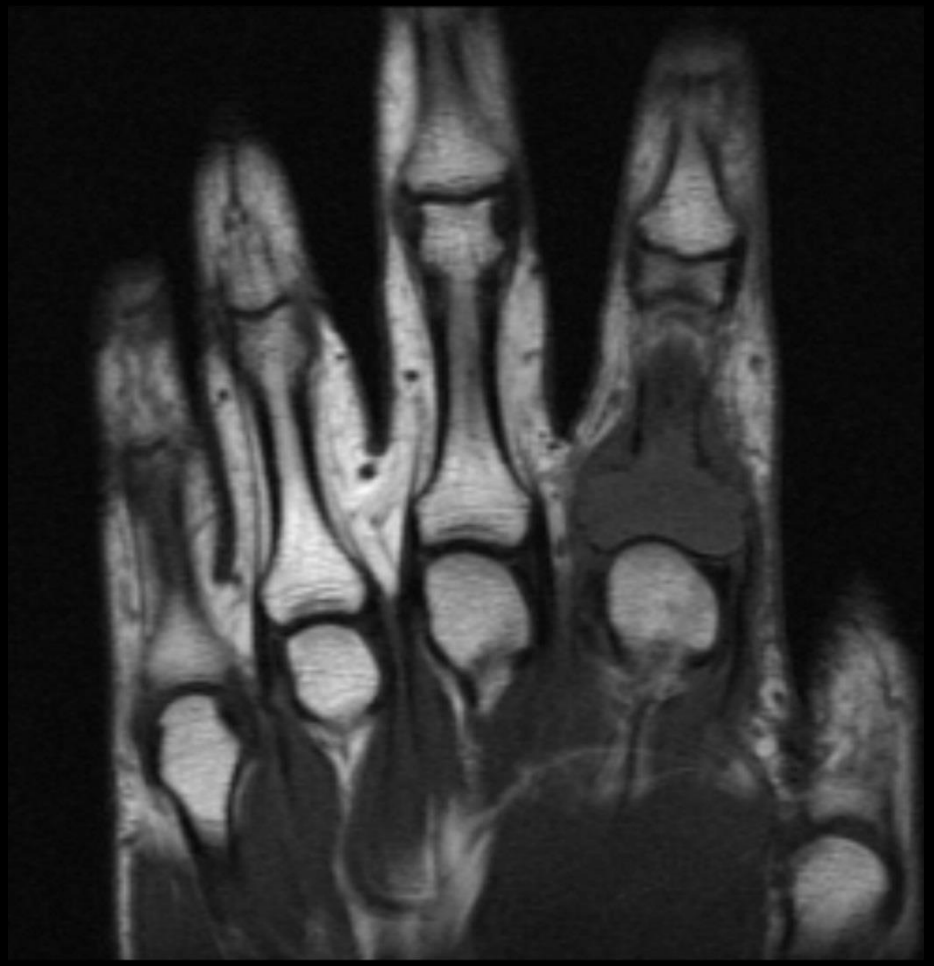
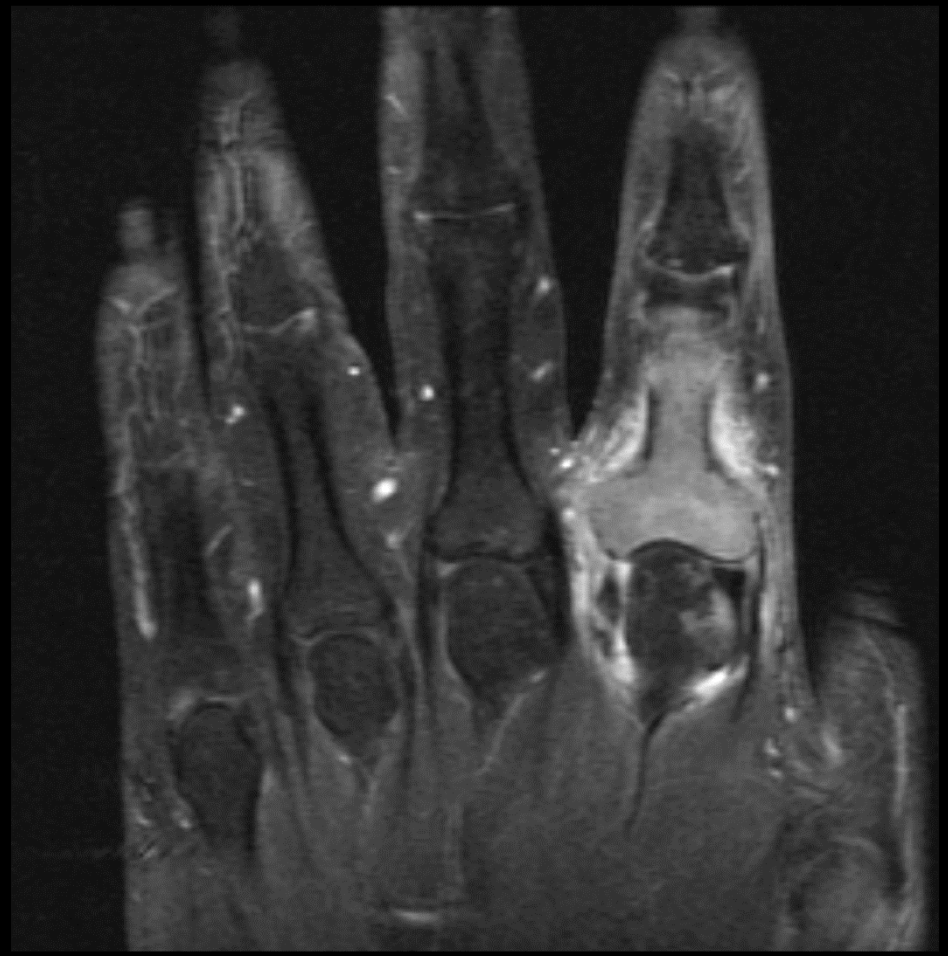
MRI

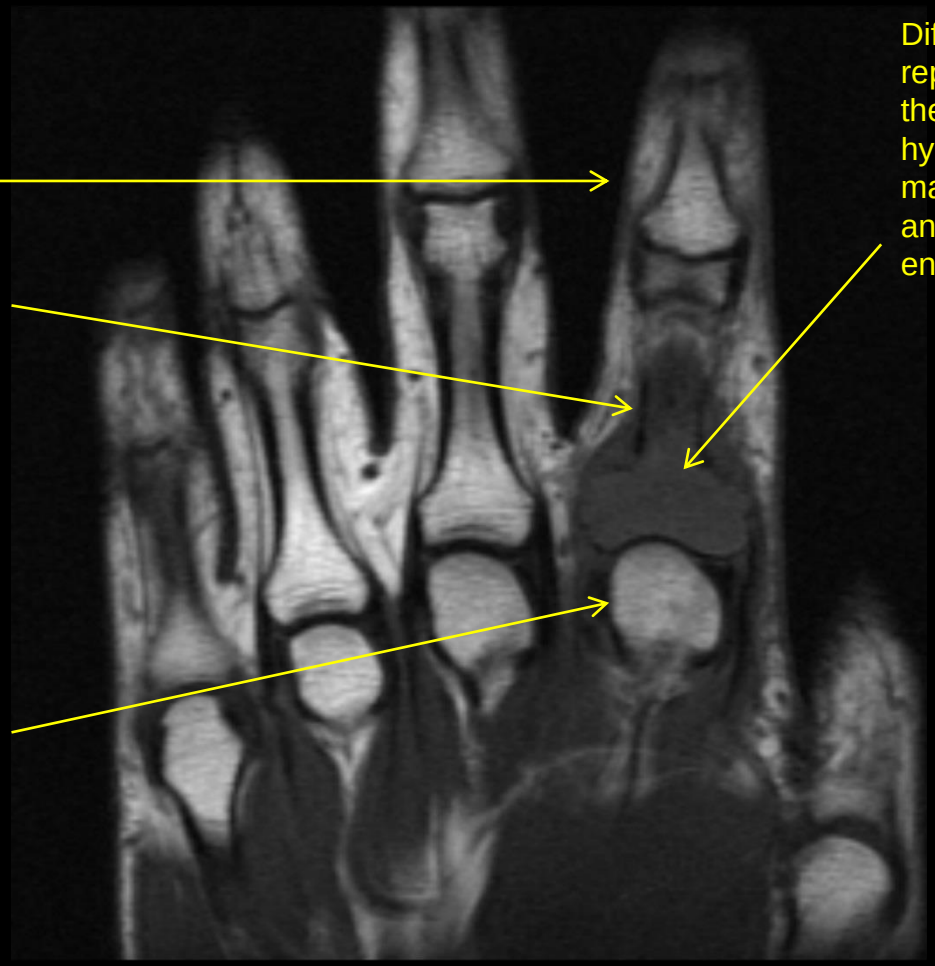


Coronal T1



Post-Contrast Coronal
T1 Fat Saturated

MRI

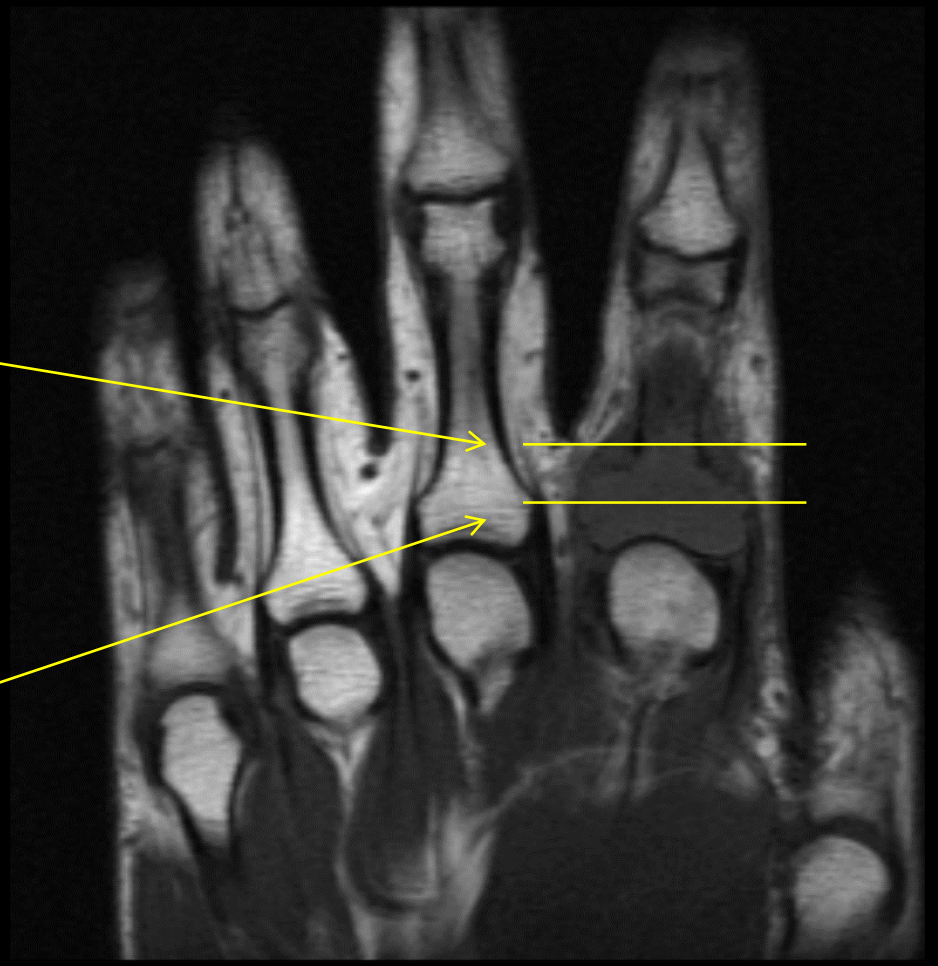


Coronal T1

Post-Contrast Coronal
T1 Fat Saturated

MRI

Axial Proton Density



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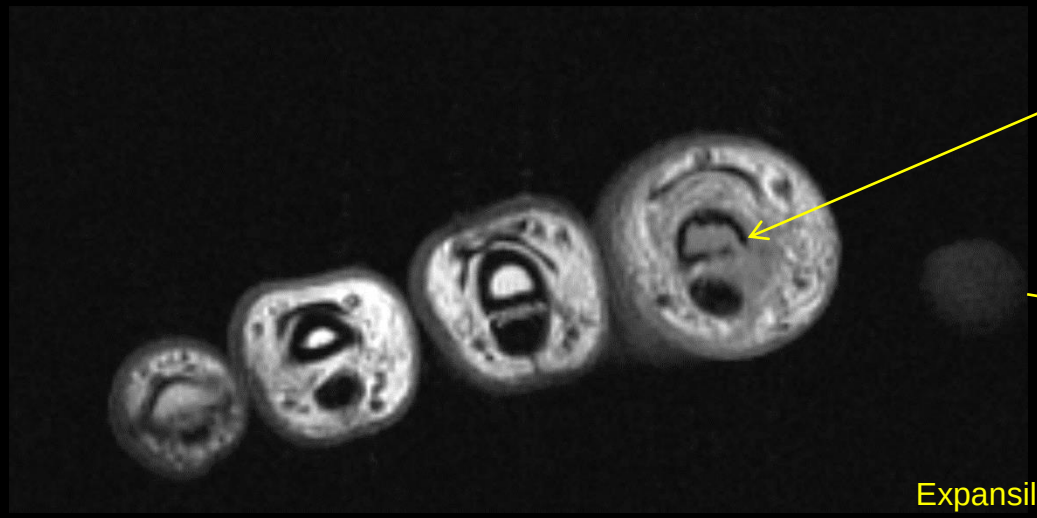
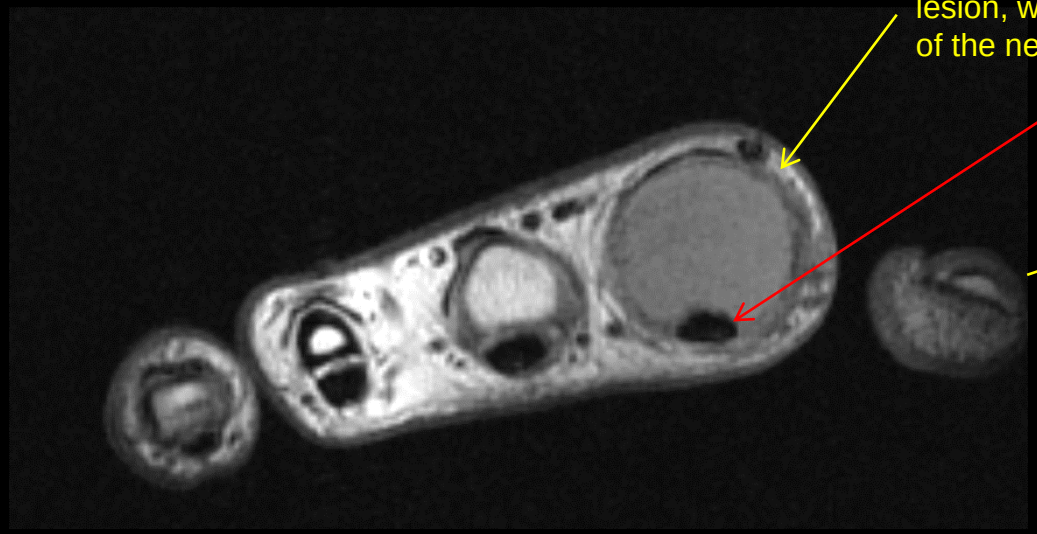
MRI

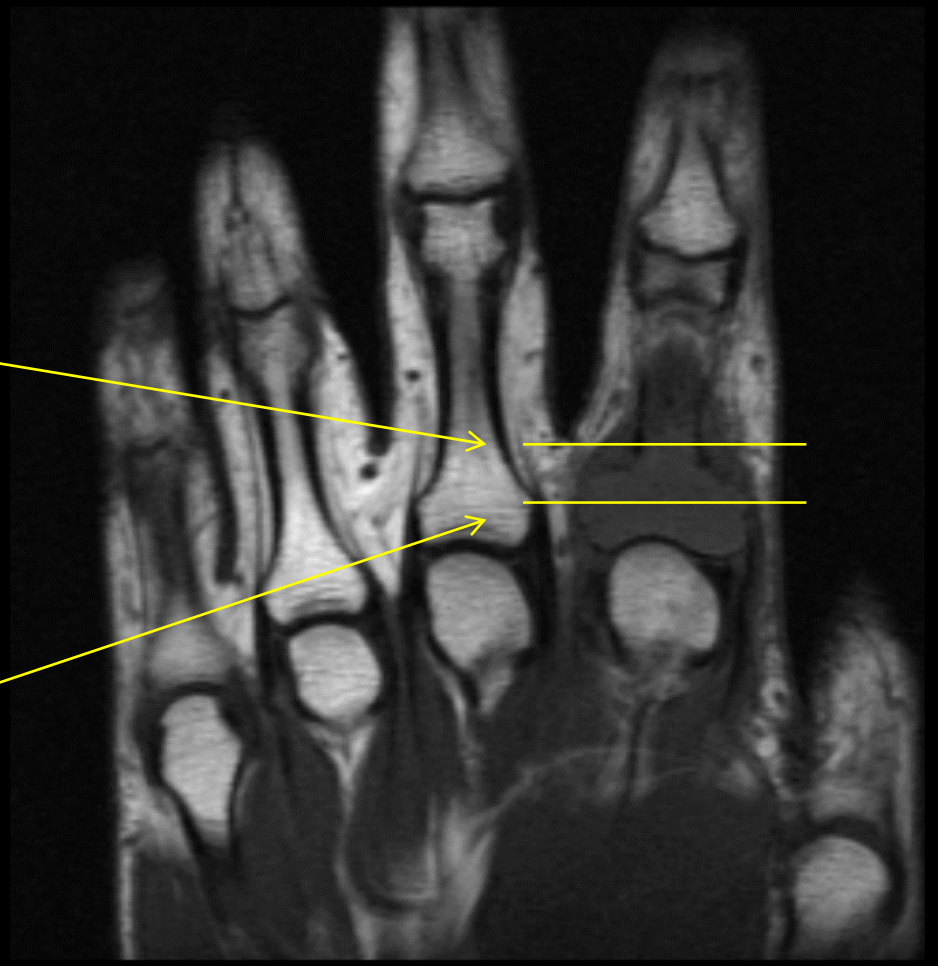
Axial Proton Density





Region of cortical disruption

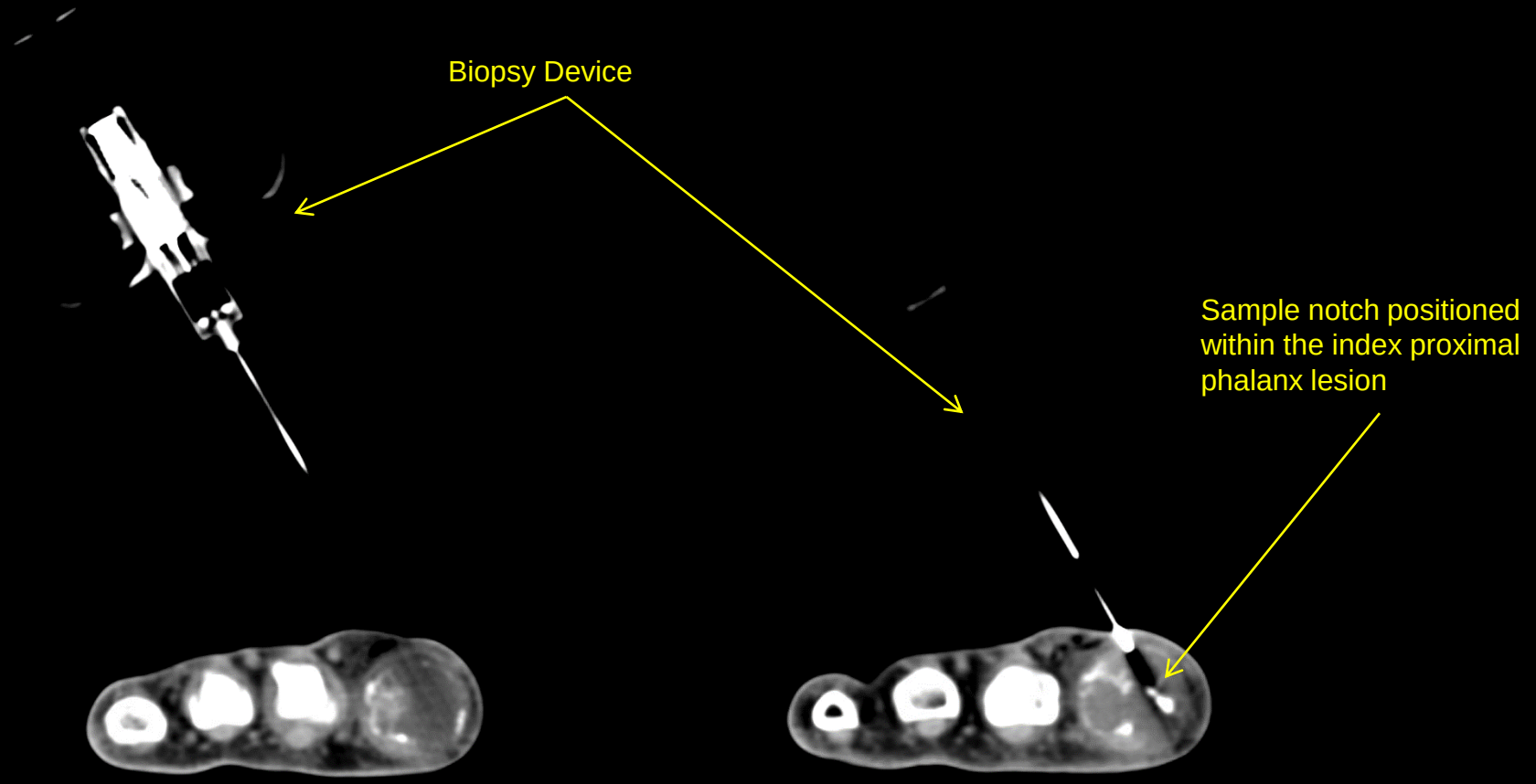
Expansile homogenous lesion, without involvement of the nearby tendon



Differential Diagnosis

1. Giant cell tumor of bone
2. Enchondroma
3. Aneurysmal bone cyst
4. Simple bone cyst
5. Metastasis
6. Osteomyelitis

CT-Guided Biopsy

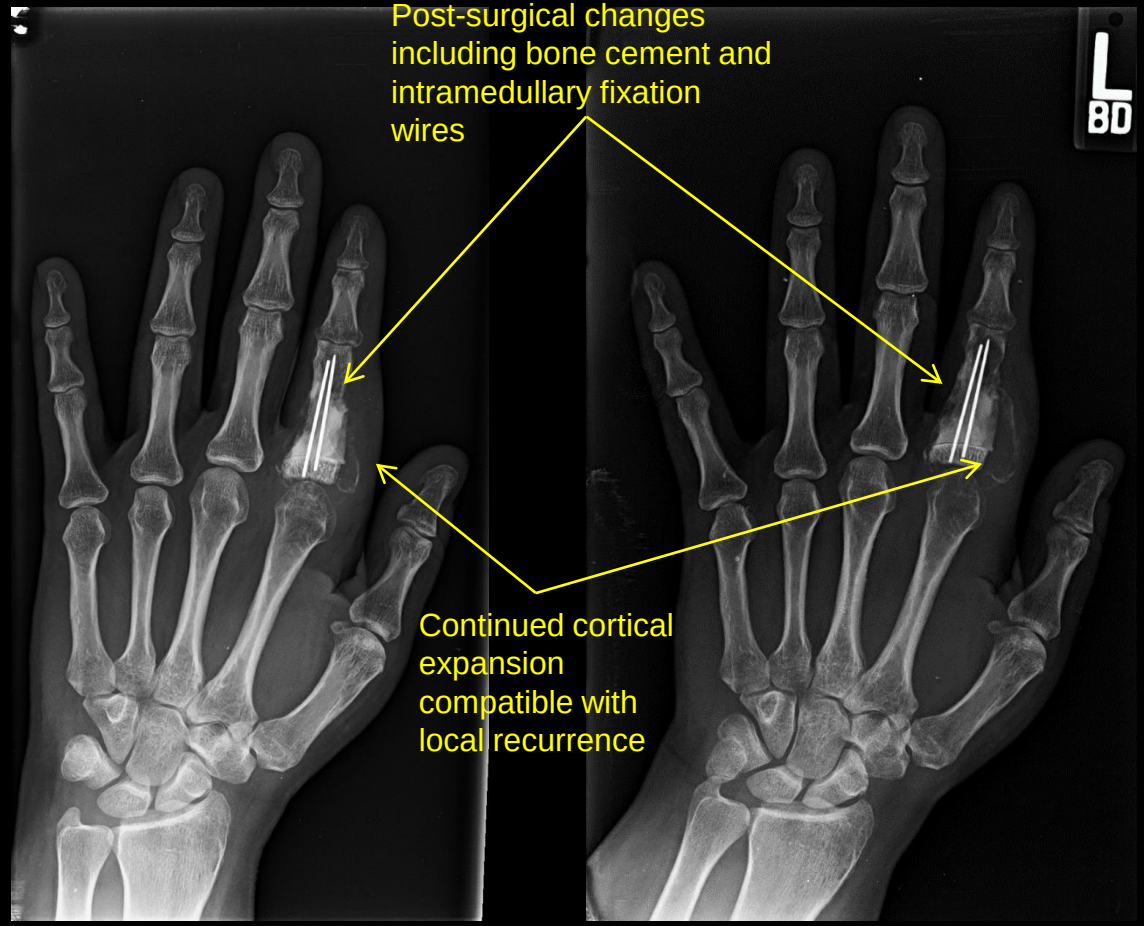


Final Diagnosis:

Giant Cell Tumor of Bone

Discussion

- The patient underwent intralesional curettage with allograft joint reconstruction
- Following intervention, local recurrence was identified on follow-up imaging
- The patient declined resection and is currently undergoing medical therapy



2 Weeks Post-Op

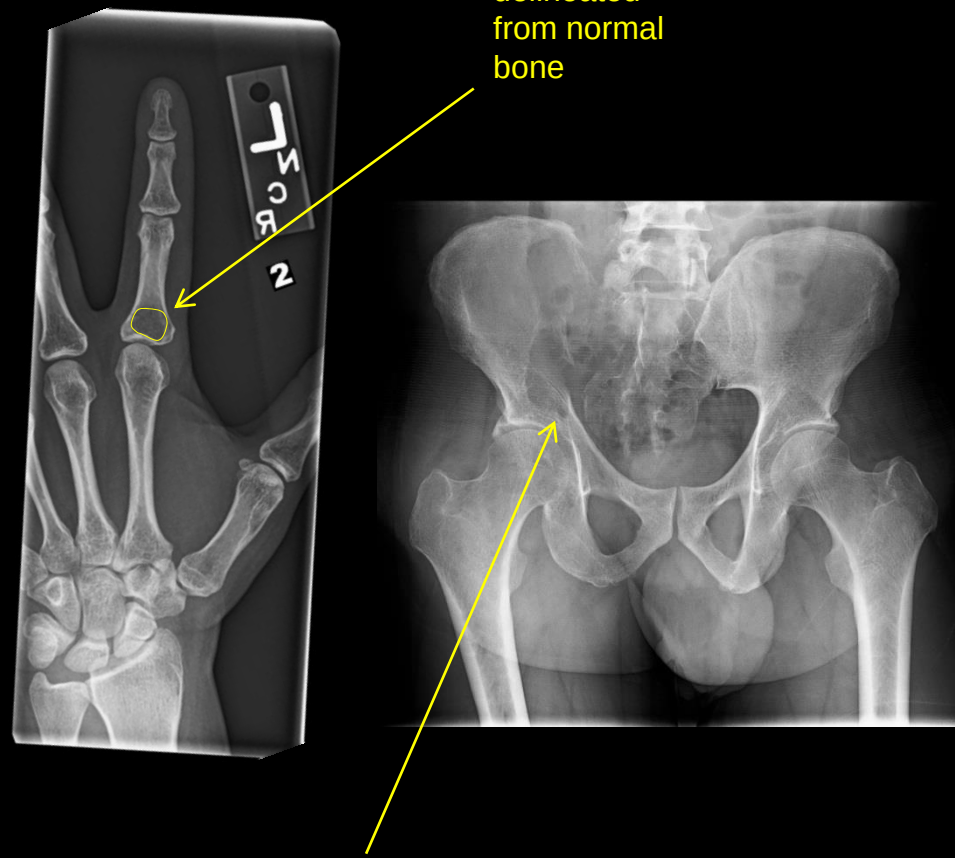
4 Weeks Post-Op

Giant Cell Tumor of Bone (GCTB)

- Epidemiology
  - GCTB accounts for approximately 3-5% of all primary bone tumors and 15-20% percent of all benign bone tumors
  - GCTB is almost exclusively in adults with peak incidence in patients 20s and 30s, with a slight female predominance
  - Most commonly GCTB presents as pain, swelling, limited joint mobility, and occurs most often around the knees
  - Malignancy cannot be determined radiographically or histologically, and is inferred based on recurrence or metastasis

Giant Cell Tumor of Bone (GCTB)

- Diagnosis
  - Grossly, GCTB is a fleshy, reddish tumor, often containing cystic and hemorrhagic areas
  - Classic radiographic criteria:
    - Occur in patients with closed physes (skeletal maturity)
    - Contact the articular surface
    - Positioned eccentrically within the medullary cavity
    - Sharply defined, non-sclerotic “zone of transition” (except in the flat bones of the pelvis or calcaneus)



Giant Cell Tumor of Bone

- Imaging findings
  - CT can better visualize and assess the level of cortical thinning and penetration, along with the presence or absence of mineralization
  - An expansile hypervascular mass with cystic changes is a characteristic finding on MRI
  - On T1-weighted sequences there is low-to-intermediate signal intensity and intermediate-to-high intensity signal on T2-weighted sequences
  - Solid components enhance following administration of gadolinium

Giant Cell Tumor of Bone

- Management
  - Surgery with curetage and packing is the treatment of choice
  - Local recurrence is rare, but may occur in up to 10% of cases
  - For unresectable or recurrent cases, options include radiation therapy, arterial embolization, and systemic therapy including denosumab (monoclonal antibody)
- Prognosis
  - It is difficult to predict clinical course based on clinical, radiographic, or histologic features
  - Wide local excision can reduce recurrence rate
  - In approximately 2-3% of cases distant metastases can occur, most often to the lungs

References:

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