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
What Imaging Should We Order?
Select the applicable ACR Appropriateness Criteria

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>Relative Radiation Level</th>
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</thead>
<tbody>
<tr>
<td>Radiography area of interest</td>
<td>Usually Appropriate</td>
<td>Varies</td>
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<tr>
<td>CT area of interest with IV contrast</td>
<td>Usually Not Appropriate</td>
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<td>FDG-PET/CT whole body</td>
<td>Usually Not Appropriate</td>
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<tr>
<td>MRI area of interest without and with IV contrast</td>
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<tr>
<td>Bone scan whole body</td>
<td>Usually Not Appropriate</td>
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<tr>
<td>US area of interest</td>
<td>Usually Not Appropriate</td>
<td>Varies</td>
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These imaging modalities were ordered by the physician.
Index Finger Radiographs

August 2020

September 2020
Index Finger Radiographs

Index Distal Phalanx

Index Middle Phalanx

Index Proximal Phalanx

Expansile lucency, without cortical breakthrough abutting the articular surface

Index Metacarpal

Progressive expansion, cortical thinning / permeation, periosteal reaction

Pathologic fracture

August 2020

September 2020
MRI

Coronal T1

Post-Contrast Coronal T1 Fat Saturated
Diffuse expansile replacement of the normal T1 hyperintense, marrow signal, and post contrast enhancement.
MRI

Axial Proton Density
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

Biopsy Device

Sample notch positioned within the index proximal phalanx lesion
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
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 physis (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:


