QUESTION 56

A 19yo woman presents with intermittent knee pain following a netball injury. An X-ray of her knee is shown.

The most likely diagnosis is:

A. Aneurysmal bone cyst  
B. Plasmacytoma  
C. Ewing sarcoma  
D. Osteomyelitis  
E. Osteogenic sarcoma

Plasmacytoma (associated with multiple myeloma) is not going to occur in a 19yo woman. Aneurysmal bone cysts do not look like this – see below. Osteomyelitis may appear like this but seems unlikely unless there has been some surgery/penetrating injury. So the options are really Ewing sarcoma or osteogenic sarcoma...

<table>
<thead>
<tr>
<th></th>
<th>Ewing's Sarcoma</th>
<th>Osteosarcoma</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td>Primitive neuroectodermal tumour</td>
<td>Connective tissue tumour</td>
</tr>
<tr>
<td><strong>Bones</strong></td>
<td>Femur, tibia, humerus, pelvis</td>
<td>Femur, proximal tibia, proximal humerus</td>
</tr>
<tr>
<td><strong>Location</strong></td>
<td>Diaphysis &gt;&gt; Metaphysis</td>
<td>Metaphysis</td>
</tr>
</tbody>
</table>
| **Appearance** | Moth eaten → confluent over time  
Codman’s triangle | Radiodense and radiolucent areas  
Codman’s triangle |
<table>
<thead>
<tr>
<th>Periosteum</th>
<th>Displaced, onion peel</th>
<th>Lifting of cortex, rim of new bone formation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epidemiology</td>
<td>Children and adolescents only</td>
<td>Most common type of bone tumour &lt;15yrs of age (but still uncommon) Bimodal distribution</td>
</tr>
<tr>
<td>Clinical Features</td>
<td>Weeks-months of pain +/- swelling</td>
<td>Months of localised pain – onset often after injury May be soft tissue mass</td>
</tr>
<tr>
<td></td>
<td>Worse with exercise</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Worse at night</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10-20% constitutional symptoms</td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td>Surgical and chemotherapy</td>
<td>Surgical and chemotherapy</td>
</tr>
<tr>
<td>Prognosis</td>
<td>No mets = 70-80% long term survival</td>
<td>No/limited mets = 66% long term survival</td>
</tr>
<tr>
<td></td>
<td>Diffuse mets = 10% long term survival</td>
<td>Diffuse mets = 20% long term survival</td>
</tr>
</tbody>
</table>

![Diagram of proximal femoral epiphysis](image)

- Greater trochanteric apophysis
- Lesser trochanteric apophysis
- Diaphysis
- Metaphysis
- Distal femoral epiphysis
Osteosarcoma (from UTD)

Anteroposterior radiograph of femur shows cortical thickening (with Codman triangles [solid arrows] superiorly and inferiorly) that is eroded by a broad-based soft-tissue mass, with involvement of the underlying preexisting cortex (open arrow). Perpendicular periosteal reaction extends into the soft-tissue mass (arrowheads).
Ewing’s Sarcoma (from UTD) Plain radiograph of a Ewing’s sarcoma of the distal left tibia in a 9-year-old girl, demonstrating extensive cortical destruction.

Although the Xray in the question doesn’t really look like either of these it has the appearance of an osteogenic sarcoma with areas of radiolucency and radiodensity. It is also in the metaphysis which is the most common location for osteosarcomas. Correct answer is E.

DDx

- Subacute osteomyelitis
  - Presents similarly
  - Raised ESR, fever
  - May be a soft tissue mass
- Eosinophilic granuloma
- Giant cell tumour of bone
- Lymphoma
- Malignant fibrous histiocytoma of bone
- Acute leukaemia
- Metastasis (esp. neuroblastoma in younger people)
- Chondrosarcoma
Plasmacytoma

- Tumours composed of plasma cells
- Histologically identical to those seen in multiple myeloma
- Mean age of presentation is 55yrs
- Can be bone lesion or extra-medullary
- Most common in vertebrae, can occur in limbs but rarely distally
- Multiple myeloma develops eventually in 50-60% of pts with solitary plasmacytoma

Aneurysmal Bone Cyst

- Expansile osteolytic lesion
- Contains blood filled cystic cavities
- Generally arise from pre-existing bone tumour (often benign tumours)
- Present with pain