Upper limb tumours

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Overview

- MCQs
- Tumour Basics
- Common tumours
  - Bone
  - Soft tissue
- Considerations specific to Upper Limb tumours
- Proximal humeral resection/reconstruction
- Cases
- MCQ answers
MCQs
1: The most common primary tumour that occurs in the bones of the hand is which of the following?

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C. Chondrosarcoma
D. Enchondroma
E. Epithelioid sarcoma
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E. The approach should not violate a compartment that is not already occupied by the lesion
Tumour Basics

Definition:

- Mass of tissue formed as a result of abnormal excessive and inappropriate proliferation of cells, growth of which occurs indefinitely regardless of the mechanisms that control normal cellular proliferation.
Tumour Basics

History/Examination

- **Pain**
  - Persistent, night, analgesia

- **Swelling/mass**

- **Rate of progression**

- **Age**
  - Young – Benign Vs Ewings / osteosarcoma
  - 40-60 – Chondrosarcoma / haemopoetic tumours
  - 70s – Metastasis / osteosarcoma / myeloma / lymphoma

- **Neurologic symptoms**

- **Previous malignancy / radiotherapy / +ve FH**
Tumour Basics

Imaging: Image whole bone affected

- What is the effect of the lesion on the bone?
  - Zone of transition / margin
  - Slow growing – narrow / sclerotic
  - Rapid growing – permeative / codmans triangle / sunray spiculation

- What is the effect of the bone on the lesion?
- Is the lesion solitary or multiple?
- Where in the bone is the lesion
Tumour Basics

Imaging: Other studies
Characterising and Staging tumour
- CXR
- USS
- Bone Scan
- CT/MRI
- Others eg PET Scan

Bloods
- Ca^{2+}, ALP
- PSA, Electrophoresis, Urine
  Bence-Jones
Tumour Basics

Biopsy
- Ideally surgeon who will perform resection
- Performed through muscle
- **Don’t** expose Neurovascular bundles
- Stay within compartment
- Longitudinal *not* transverse incision
- **Don’t** lift skin/tissue flaps
- Send sample for culture
- Meticulous haemostasis
- Fresh Vs Fixed

Needle (Jamshedi/Trucut/Islam) Vs Open Vs Excisional
Tumour Basics

Staging

- Why?
  - Prognostic / Guide treatment & adjuvant therapies

- Enneking
  - Grade (From Biopsy):
    - Low (G1) Vs High (G2) grade
  - Site (From local imaging):
    - Intracompartmental (T1) Vs Extracompartmental (T2)
  - Metastasis (From staging CT):
    - No Mets (M0) Vs Mets (M1)
## Tumour Basics

<table>
<thead>
<tr>
<th>Stage</th>
<th>Grade</th>
<th>Site</th>
<th>Metastasis</th>
</tr>
</thead>
<tbody>
<tr>
<td>IA</td>
<td>G1</td>
<td>T1</td>
<td>M0</td>
</tr>
<tr>
<td>IB</td>
<td>G1</td>
<td>T2</td>
<td>M0</td>
</tr>
<tr>
<td>IIA</td>
<td>G2</td>
<td>T1</td>
<td>M0</td>
</tr>
<tr>
<td>IIB</td>
<td>G2</td>
<td>T2</td>
<td>M0</td>
</tr>
<tr>
<td>III</td>
<td>Any</td>
<td>Any</td>
<td>M1</td>
</tr>
</tbody>
</table>

Plus graph sarcoma.org Ch 1
Tumour Basics

Tumour Excision

Diagram sarcoma.org Ch 1
Common Bone Tumours

**Osteosarcoma** – Malignant spindle cell tumour

- Bimodal age distribution
- Distal femur (50%) & Prox Humerus (25%)
- X-ray – lytic/sclerotic, permeative margins, Codmans triangle, sunray spiculation
- ≈10% have lung mets at presentation
- Survival ↑ with adjuvant/neoadjuvant chemotherapy
- Poor prognosis if develops in Pagetic bone
Common Bone Tumours

**Chondrosarcoma** – Malignant cartilage tumour

- 4\textsuperscript{th}/5\textsuperscript{th} Decade
- M>F
- X-ray – patchy calcification:
  - Popcorn appearance,
  - endosteal scalloping
- Often slow growing with late metastasis
- Not chemo/radiosensitive
Common Bone Tumours

**Ewings** – Malignant small round blue cell tumour

- Assoc with (11:22) chromosome translocation
- Occurs in kids (median age 13)
- Mainly femoral / tibial diaphysis
- Often have soft tissue invasion leading to Onion skin appearance on x-ray
- Assoc systemic upset – ↑ESR, ↑Temp, pain
- Neoadjuvant Chemo highly effective in ↓tumour bulk
Common Bone Tumours

**Giant cell tumour** – Benign but aggressive tumour

- 80% occur in the mature skeleton
- Varied behaviour
  - Latent vs active vs aggressive
- Pathology: Multinucleated giant cells & stomal cells
- Epiphyseal abutting subchondral bone
- Treatment: excision preserving joint / reconstruction
Common Bone Tumours

**Enchondroma** – Benign Cartilage tumour

- Islands of persistent cartilage in metabolysis due to defective endochondral ossification
- Lesions in hand/feet – benign
- Lesions in pelvis/long bones more concerning
- **Single Vs Multiple (Olliers) Vs + Haemangiomas (Maffuccis)**
Common Bone Tumours

Osteochondroma (Exostosis) – Benign bone surface tumour

- Commonest benign bone tumour
- Solitary Vs Multiple (Diaphyseal aclasis)
- Bone stalk with cartilage cap
- Should stop growing when parent bone stops growing
- Low risk of malignant change
- Concern if ↑size or cap >1cm
Common Bone Tumours

- Osteosarcoma
- Chondrosarcoma
- Ewings
- Enchondroma
- Osteochondroma

- Osteosarcoma
- Chondrosarcoma
- Ewings
- Enchondroma
- Osteochondroma
- GCT

- GCT
- Enchondroma

Diagram showing areas of the skeleton with common bone tumours.
Common Bone Tumours

Metastasis
- Lung, Breast, Prostate, Kidney, Thyroid

Principles:
- Control pain
- Control mass of deposits
- Treat fractures
- Treat $\uparrow$Ca$^{2+}$
- Prophylactic stabilisation
## Soft Tissue Tumours

### Soft Tissue Sarcomas in upper limb

<table>
<thead>
<tr>
<th>Tumour Type</th>
<th>UL (%)</th>
<th>LL (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malignant fibrous histiocytoma</td>
<td>40</td>
<td>31</td>
</tr>
<tr>
<td>Liposarcoma</td>
<td>15</td>
<td>25</td>
</tr>
<tr>
<td>Synovial Sarcoma</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Malignant PNST</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Leiomyosarcoma</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Fibrosarcoma</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Epithelioid sarcoma</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>11</td>
<td>20</td>
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Soft Tissue Tumours

- **Benign “lumps and bumps”**
  - Synovium : Ganglia, GCT tendon sheath, PVNS
  - Fat : Lipoma
  - Vascular : AV malformations, Haemangiomas, Glomus tumour
  - Fibrous tissue : Fibroma, Fibromatosis
  - Neural : Schwanoma, Neurofibroma
  - Others : Post traumatic conditions, epidermal cysts, CMC Boss
Considerations specific to UL STS

- UL Vs LL
  - Smaller lesions at presentation
  - Less likely to be deep to or involving the investing fascia
  - Higher rate of unplanned excision before referral
  - Tumours of different histological types
  - Higher rate of local recurrence
    - ?Related to:
      - Histological type
      - Unplanned excisions
      - Anatomy
      - Use of adjuvant modalities
Considerations specific to UL STS

- Preservation of function is key consideration
  - Less likely to amputate
  - Preference for WLE and reconstruction
- Treatment of 2ndry boney metastasis
  - UL not weight bearing
  - Can therefore consider use of conservative measures
  - eg protection in sling, immobilisation for fractures etc
Proximal humeral reconstruction

84 yo male
Pathological fracture
1. Most likely diagnosis?
2. What next?
Reconstruction
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Acknowledgements

- MCQs adapted from:
  - Review questions in Orthopaedics, Wright JM et al
    - Lippincott Williams and Wilkins

- Please look at www.Sarcoma.org for further information. There is a link to a free online text book (on the left hand side of the main page) from which the majority of the information for this talk was taken and a lot of the pictures (which I unfortunately cannot put in to the uploaded version) also came form this resource