Benign chondrogenic bone tumors

Ismat Ghanem
Hotel-Dieu de France and Bellevue Medical Center
Saint Joseph University - Beirut
What we know

• Almost never purely cartilaginous
• Bone forming or lytic
• At the bone surface or within
What we know

• Not all exophytic bone lesions are osteochondromas
• Not all endophytic bone tumors are enchondromas
What we know

• Calcifications are indicative
• Not all cartilaginous tumors have calcifications
• Not every bone lesion with calcification is cartilaginous
What we also know

• May be solitary or multiple
• Often asymptomatic
• Radiographic features are usually associated with a high suspicion index for diagnosis
• Biopsy may not be diagnostic!
What we also know

• Location: every bone, any bone segment
• Malignant transformation is possible
• Treatment is rarely indicated
What we think we know: controversies

• Etiopathogenesis
• Best diagnostic tests
• Treatment
What we need to know

• Biologic specific tumor markers
• Subsequent more oriented treatment
Osteochondroma

• Most frequent benign bone tumor
• Exophytic
• Flat or long bones
• Usually metaphysis
Osteochondroma

- Aberrant cartilage foci
- Behave like a physis
- Grows with longitudinal growth
- Stops at the end of growth

![Diagram of bone development with labels for cartilage, bone, and marrow]
Osteochondroma

- Typically second decade
- Cartilage cap
- Bone surface
- Marrow cavity contiguous with medulla
Osteochondroma

• Etiology:
  • Solitary: “Ectopic nests” of skeletal dysplasia or neoplastic mutations
  • Multiple (MHE): involvement of EXT tumor suppression gene resulting in defects of EXT1 and EXT2
Osteochondroma

- **Histology:**
  - Hyaline cartilage matures into underlying mature bone
  - Similar to growth cartilage
Osteochondroma

- Malignant transformation:
  - <1% all osteochondromas
  - <10% MHE
- Sudden pain or enlargement
- Cartilage cap > 2 cm thickness
Osteochondroma

- Differential diagnosis:
  - Bizarre parosteal osteocartilaginous proliferation
  - Parosteal osteosarcoma
  - Dysplasia epiphysialis hemimelica
Osteochondroma

• Treatment:
  • Conservative
  • Surgical excision
  • Increase in size or pain
  • Cosmetic, Neurologic, vascular, orthopedic complications

Don’t leave perichondreum or periosteum behind!
Enchondroma

• Benign hyaline cartilage producing tumor of medullary bone
• Physeal cartilage rests that fail to ossify during growth
• Do not exhibit physis-like growth
Enchondroma

• Etiology:
  • Biologic markers and genetic mutations:
    • Matrix metalloproteinase 1,2,9
    • Ptpn11 deletion
    • .....
Enchondroma

- Asymptomatic in large bones
- Incidental discovery
- Metaphyseal or metadiaphyseal
- Central, Calcifications
Enchondroma

• More symptomatic in short bones
• Mass, pain, fracture
Enchondroma

• Histology:
  • Periphery sharply demarcated from surrounding bone and marrow
  • Purple or blue matrix and low cellularity
Enchondroma

• Differential diagnosis:
  • Periosteal or juxta-cortical chondroma
  • Enchondromatosis (Ollier)
  • Low grade chondrosarcoma
  • Chondroblastic osteosarcoma
Enchondroma

• Treatment:
  • Conservative in most of them
  • Intralesional curettage and grafting in symptomatic lesions
Chondroblastoma

- Benign, matrix producing tumor
- Epiphysis of long bones in young patients
- Lytic with sometimes calcifications
Chondroblastoma

- Rare
- Slow growth
- Sometimes self-limited
Chondroblastoma

• Histology:
  • Fibrochondroid matrix
  • Chicken-wire calcifications
  • Mononuclear cells with nuclear grooves
  • Osteoclast-like giant cells
Chondroblastoma

- Differential diagnosis:
  - Giant cell tumor
  - Chondromyxoid fibroma
  - Clear cell chondrosarcoma
Chondroblastoma

• Treatment:
  • Often conservative and self limited
  • Curettage and grafting if symptomatic and progressive
Chondromyxoid fibroma

- Rare, teens and young adults
- Metaphysis, may extend to epiphysis
- Long and short bones
- Eccentric or central
Chondromyxoid fibroma

• Prognosis and treatment:
  • Conservative, self-limited
  • Curettage curative
  • Recurrence is rare
Thank you