Bone tumors

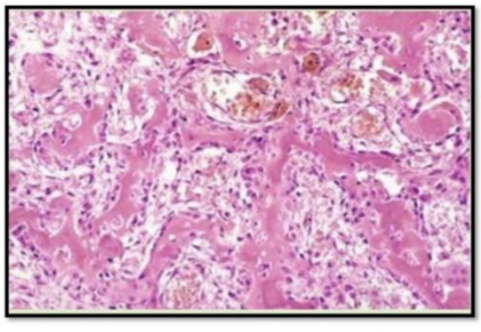
-Primary bone tumors are rare
-Benign tumors are more exist than malignant tumors
-First 3 decades mostly have benign lesions; adults more to be malignant
-The treatment aims to optimize survival while maintaining function
-Age & location help narrow diagnosis possibilities
-S&S: asymptomatic, pain, pathological fracture

BONE-FORMING TUMORS

-General features for:

Osteoid osteoma (more common)	Osteoblastoma
< 2 cm	> 2 cm
Young men	Posterior vertebrae; no rim of bone reaction by radiology
Femur & tibia; nidus with surrounding bone reaction	Pain unresponsive to aspirin
Severe nocturnal pain (PGE2) relieved by aspirin & NSAIDS	Treated by curetting
Treated by: radiofrequency ablation or surgery	

We can compare them by radiology

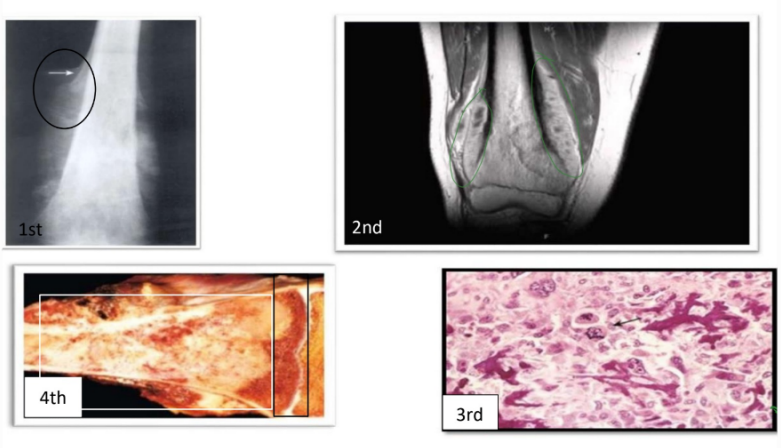


Histologically, both of them look like reactive bone with some hemorrhage and reactive giant cells, you don't see atypia.

OSTEOSARCOMA

-It is the most common primary malignant tumor of bone
-75% adolescents between (10-20) ; another peak in older (55-65) (secondary osteosarcoma, because they occur on top of a predisposing condition like **Puget disease**)
-At the **Metaphysis** of long bones (**distal femur & proximal tibia**)
-**Causes**: Bone pain and pathologic fracture
-**appears as**: large destructive and infiltrative lesions with Codman triangle
*Codman triangle is not specific for osteosarcomas
-Genetic abnormalities: mutations in RB gene, TP53 gene, CDKN2A (p16 & p14), MDM2 & CDK2.

-**FEATURES:**
-started in the medulla of the bone and infiltrate the surrounding tissue elevating the periosteum (the angle between actual bone and the periosteum is called Codman's triangle.)
-the skeletal muscles are infiltrated by this tumor.
-**histologically**: we saw malignant osteoid haphazard abnormal mitosisand atypia of the osteoblast.
-**TREATMENT**: Multimodality approach (MDTeam):
• 1. Neoadjuvant chemotherapy 2. Surgery 3. Chemotherapy and radiation.
If there is Hematogenous spread it goes to **lungs**.



OSTEOCHONDROMA:

-**benign exostoses** (benign cartilaginous tumor composed of benign bone covered by benign cartilage)
-part of **multiple hereditary exostoses (MHE)**:characterized by EXT1, EXT2 gene mutations.
• may have rare transformation to **chondrosarcoma (**in cases when they are MHE).
-appears as if he is looking at a normal articular piece of bone.

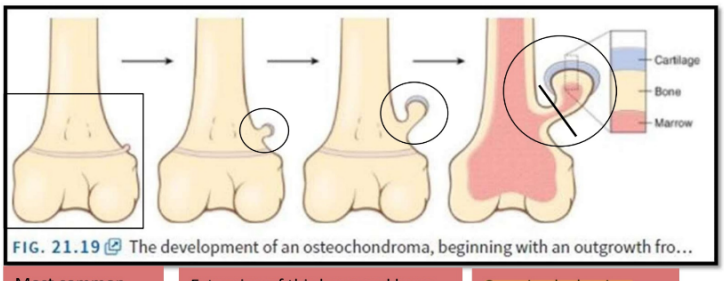


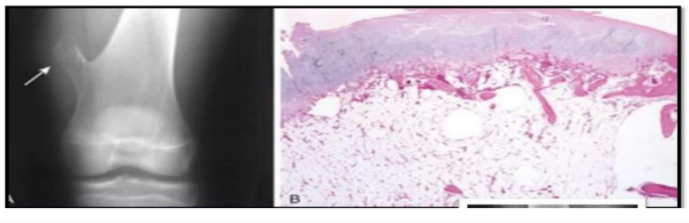
FIG. 21.19 The development of an osteochondroma, beginning with an outgrowth fro...

Most common location, around the cartilaginous plate

Extension of this bone and bone marrow goes out

Covering by benign cartilage, so if you cut there, what you will see, normal cartilage, normal periosteum, normal marrow

OSTEOCHONDROMA:



They cause pain and pathological fractures

This is a case of MHE

CHONDROMA (ENCHONDROMA):

• **Benign hyaline cartilage tumors** with endochondral origin; medullary enchondroma or cortical chondroma

-In **hands and feets**

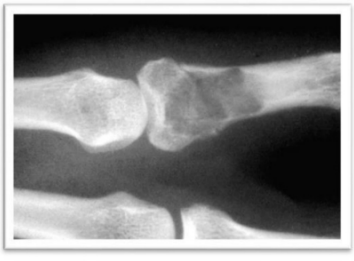
-Multiple enchondromas: Ollier disease

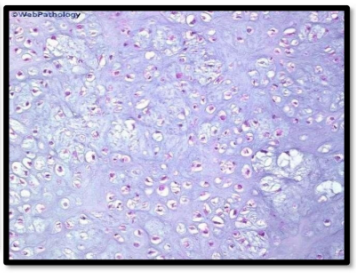
-Maffucci syndrome: multiple enchondromas + skin hemangiomatosis

• IDH1 & IDH2 gene mutations

-**Histologically**: benign cartilage, No atypia.

-cartilaginous appearance on x-ray.



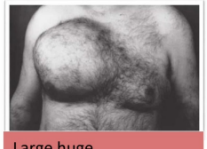


CHONDROSARCOMA:

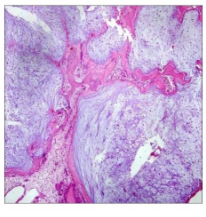
-Malignant tumors producing malignant cartilage

-**Appears as**: large masses around the shoulder, the pelvis, the ribs

-**Genes**: EXT, IDH1, IDH2, COL2A1, CDKN2A



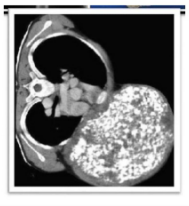
Large huge chondrosarcoma of the ribs.



Histologically, it's malignant lobulated cartilage, this is probably grade 1 to 2, because I can still see the cartilaginous differentiation is obvious → low grade tumor.

Huge chondrosarcoma in the diaphysis of the humerus, there's Codman triangle, the tumor is infiltrating into the bone marrow and outside of the soft tissue elevating the periosteum.

The second half of the pic, the gross specimen which when it was removed, characteristic cut surface of cartilaginous, it's large and infiltrating the soft tissue and the medulla bone.



Probably CT scan, where huge mass with a cartilaginous morphology on imaging, this is called bubble soap appearance.

دعواتكم

- علا الأحدب

تحت في جدول

COMMON BONE TUMORS TABLE:

Category	Behavior	Tumor Type	Common Locations	Age (yr)	Morphology
Cartilage forming	Benign	Osteochondroma	Metaphysis of long bones	10–30	Bony excrescence with cartilage cap
—	—	Chondroma	Small bones of hands and feet	30–50	Circumscribed hyaline cartilage nodule in medulla
—	Malignant	Chondrosarcoma (conventional)	Pelvis, shoulder	40–60	Extends from medulla through cortex into soft tissue, chondrocytes with increased cellularity and atypia
Bone forming	Benign	Osteoid osteoma	Metaphysis of long bones	10–20	Cortical, interlacing microtrabeculae of woven bone
—	—	Osteoblastoma	Vertebral column	10–20	Posterior elements of vertebra, histology similar to osteoid osteoma
—	Malignant	Osteosarcoma	Metaphysis of distal femur, proximal tibia	10–20	Extends from medulla to lift periosteum, malignant cells producing woven bone
Unknown origin	Benign	Giant cell tumor	Epiphysis of long bones	20–40	Destroys medulla and cortex, sheets of osteoclasts
—	—	Aneurysmal bone cyst	Proximal tibia, distal femur, vertebra	10–20	Vertebral body, hemorrhagic spaces separated by cellular, fibrous septae
—	Malignant	Ewing sarcoma	Diaphysis of long bones	10–20	Sheets of primitive small round cells