Bone and cartilage tumors

رابط قناة ترجمة ملا زم قسم الا شعة اضغط هنا

What is tumor ?

is an abnormal growth of cells or tissues in the body.

- Tumors are not always cancerous, but they result from cells dividing uncontrollably or not dying when they should.

What are the types of tumors?

Benign , malignancy and pre-malignant tumors.

Feature	Benign Bone Tumor	Malignant Bone Tumor
Margins	Well-defined, smooth borders	Poorly defined, irregular, or permeative margins
Zone of Transition	Narrow (sharp transition between lesion and normal bone)	Wide (gradual or indistinct transition)
Cortical Involvement	Cortex usually intact or mildly expanded	Cortical destruction or breakthrough common
Periosteal Reaction	Absent or smooth, solid type	Interrupted, spiculated, or “sunburst” type; may form Codman’s triangle
Bone Expansion	Slow, uniform expansion	Rapid, irregular expansion with cortical erosion
Matrix Mineralization	Often homogeneous (well-organized calcification)	Heterogeneous or amorphous mineralization
Soft Tissue Involvement	Usually absent	Often present — soft tissue mass formation
Growth Rate	Slow	Rapid and aggressive
Pain	Often mild or absent	Usually severe and progressive
Example	Osteochondroma, Enchondroma	Osteosarcoma, sarcoma, Chondrosarcoma

What are the causes of tumors?

- **Genetic mutations**: Damage to DNA in cells.
- **Exposure to carcinogens**: Tobacco, radiation, chemicals, etc.
- **Chronic inflammation**: Long-term irritation in tissues.
- **Inherited conditions**: Family history of cancer.
- **Viruses or infections**: HPV (human papillomavirus) and Epstein-Barr virus.

what are the Symptoms of Tumors?

Benign tumors: May cause no symptoms unless large enough to compress nearby structures.

Malignant tumors: Symptoms depend on the location but may include:

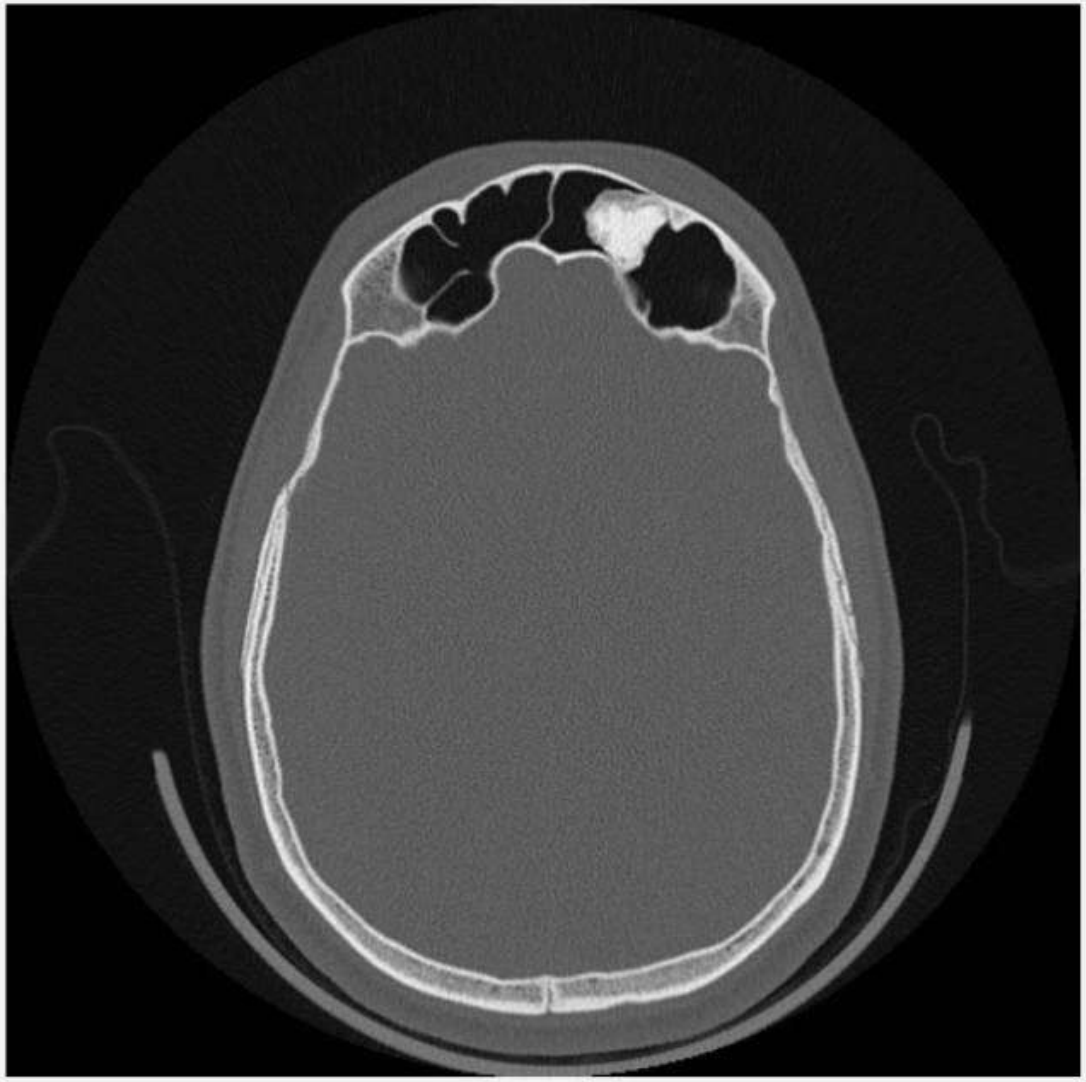
- Pain, swelling, or a lump.
- Fatigue and weight loss.
- Changes in function of the affected organ.

Diagnosis

- Imaging: X-ray, MRI, CT scans, or ultrasounds to locate and assess the tumor.
- Biopsy: A sample of the tumor is examined under a microscope to determine if it’s benign or malignant.

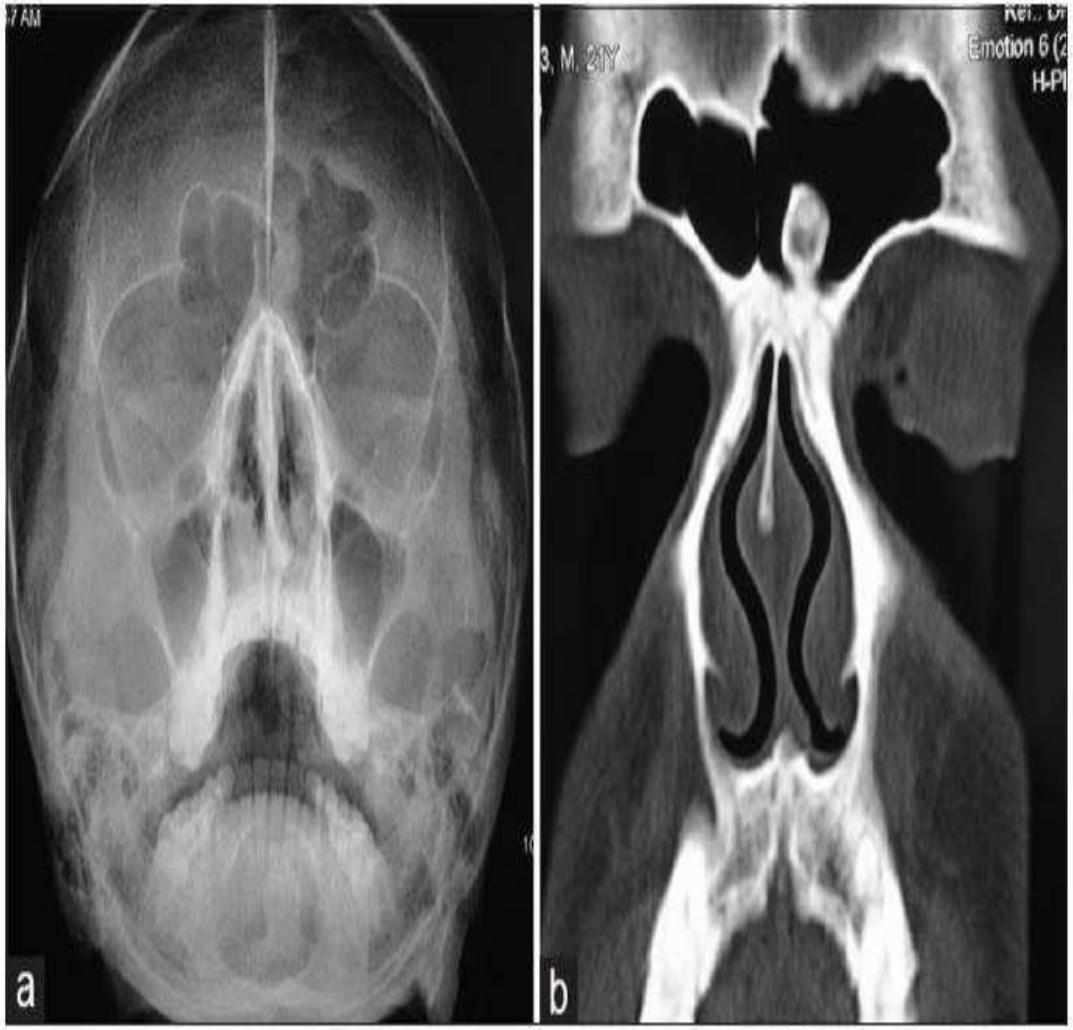
Bone Tumors

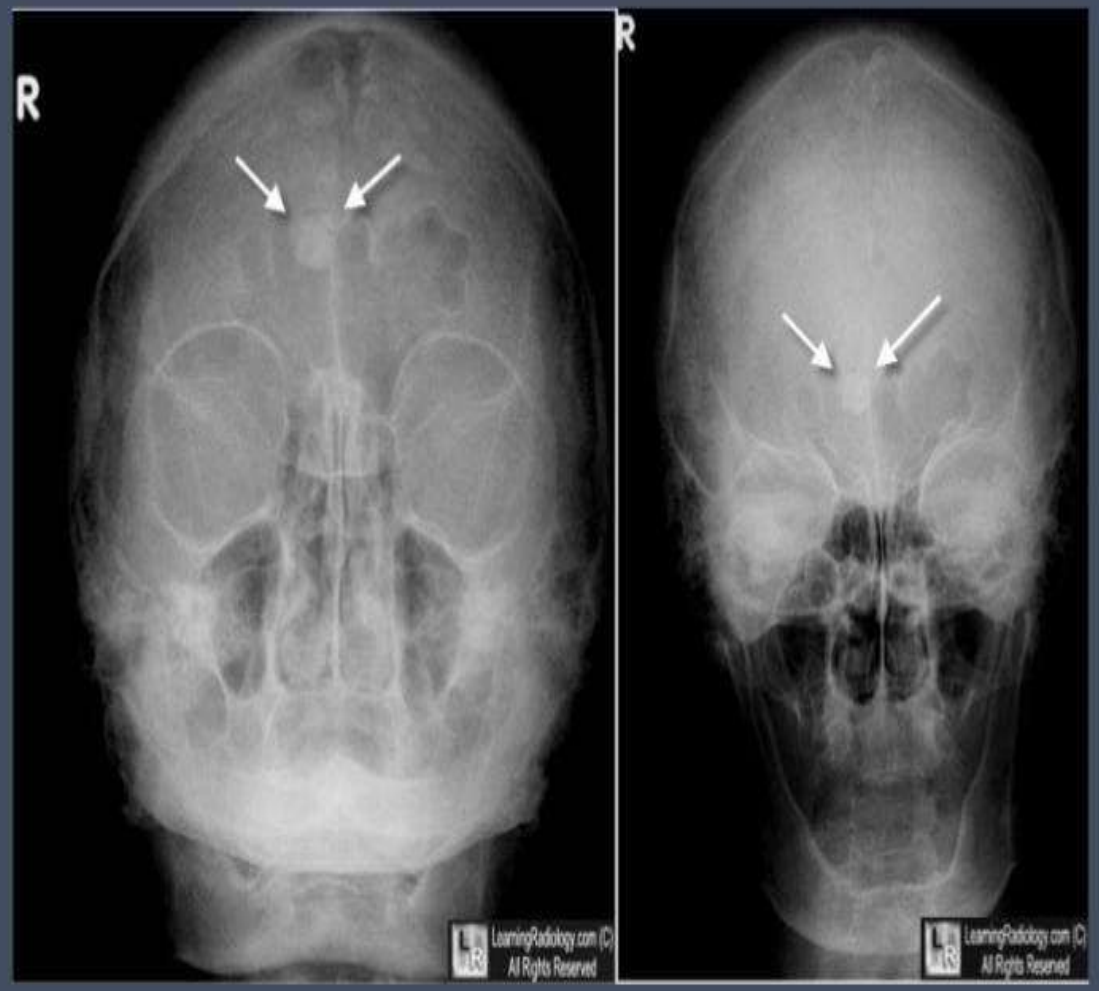
- Osteoma : is a benign, slow-growing tumor composed of mature, compact, or cancellous bone. It typically arises from membranous bones, such as the skull and facial bones. Osteomas are usually asymptomatic but may cause symptoms depending on their size and location.



Single axial CT of the head without contrast shows a well defined, calcified mass within the left frontal sinus.

Figure 2: (a) X-ray paranasal sinuses showing osteoma in the left frontal sinus with the left bony spur, (b) computed tomography showing small osteoma in the left frontal sinus.





Osteoma of the Frontal Sinus. Two frontal views of the skull demonstrate an incidental rounded, sclerotic lesion growing into the right frontal sinus (white arrows).

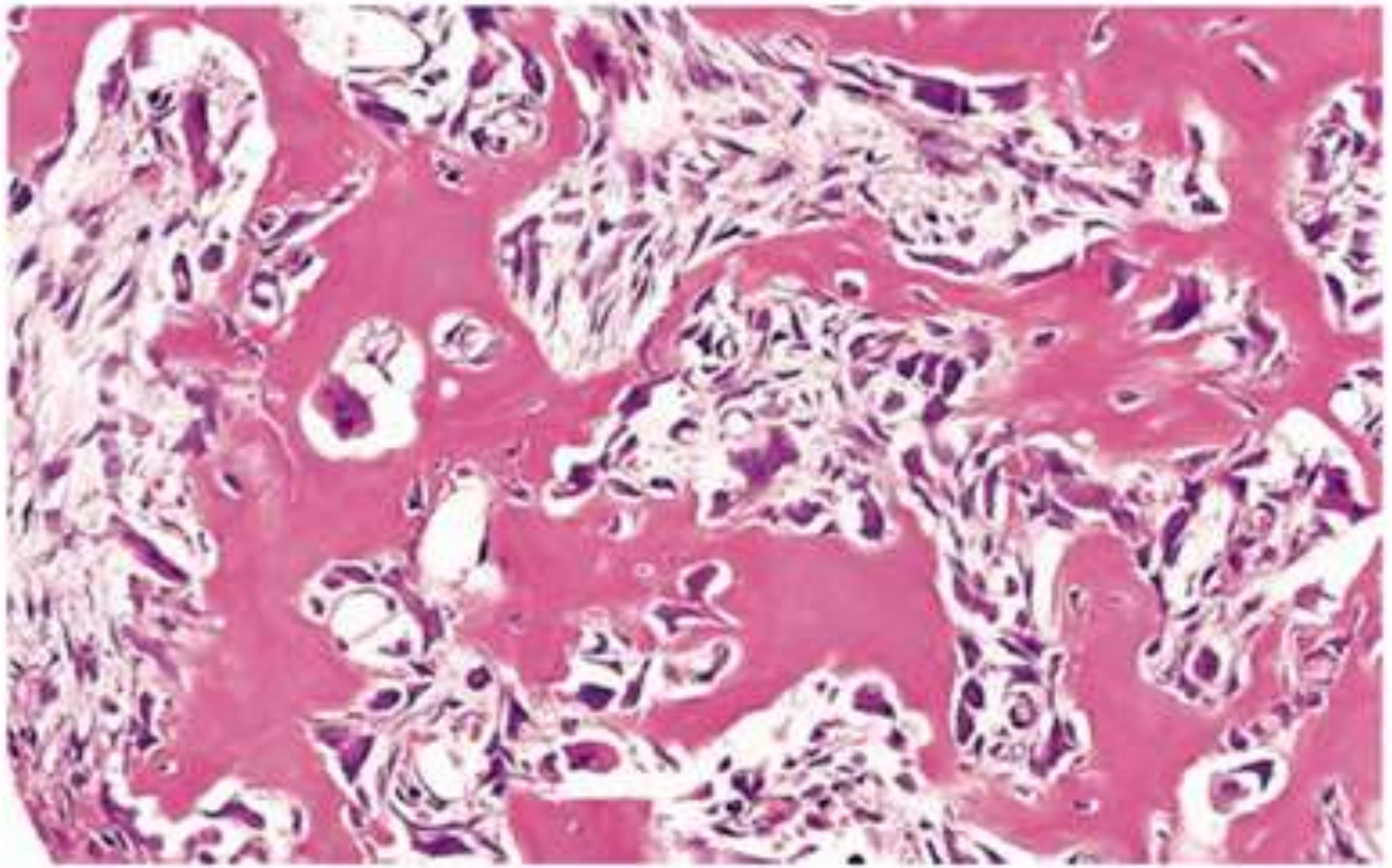
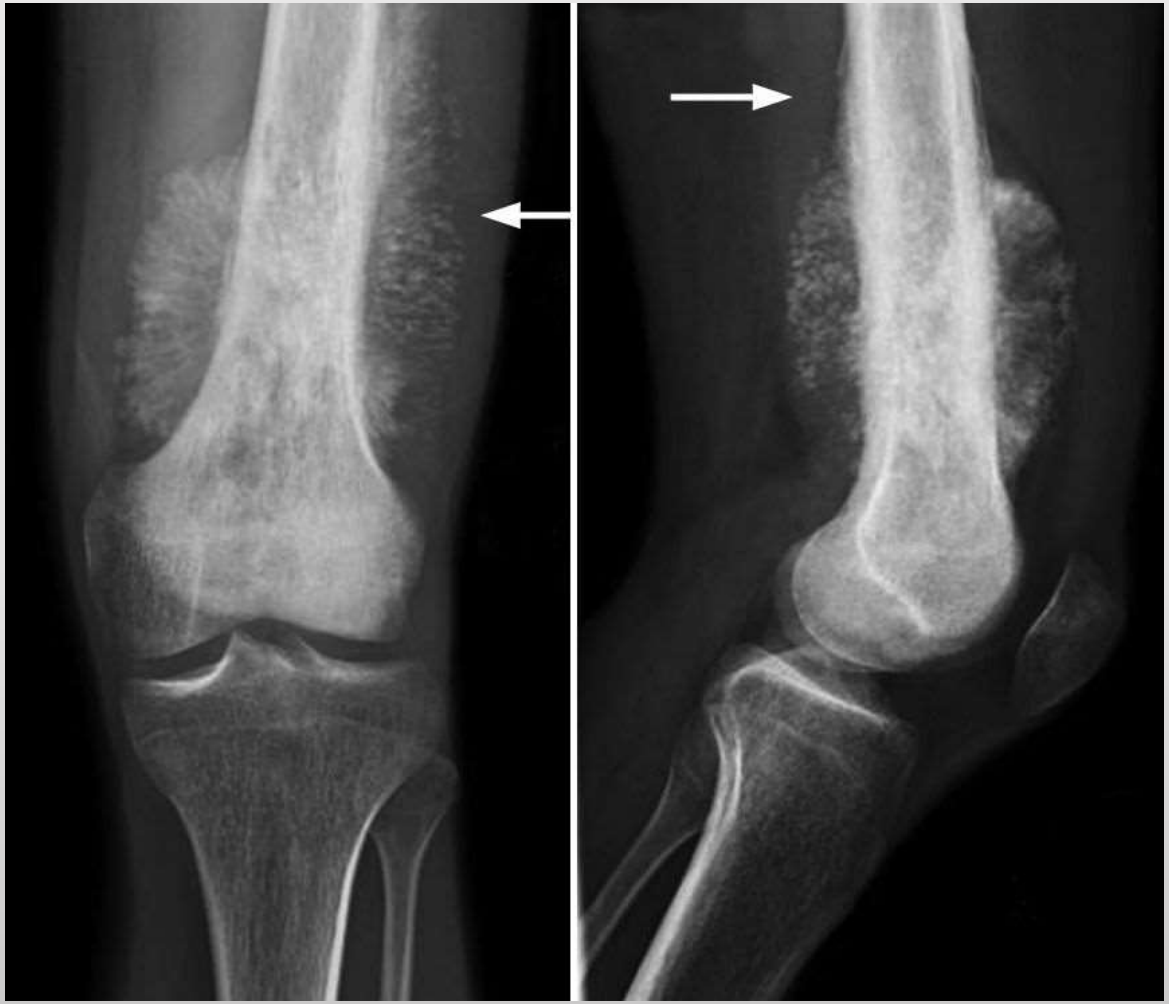


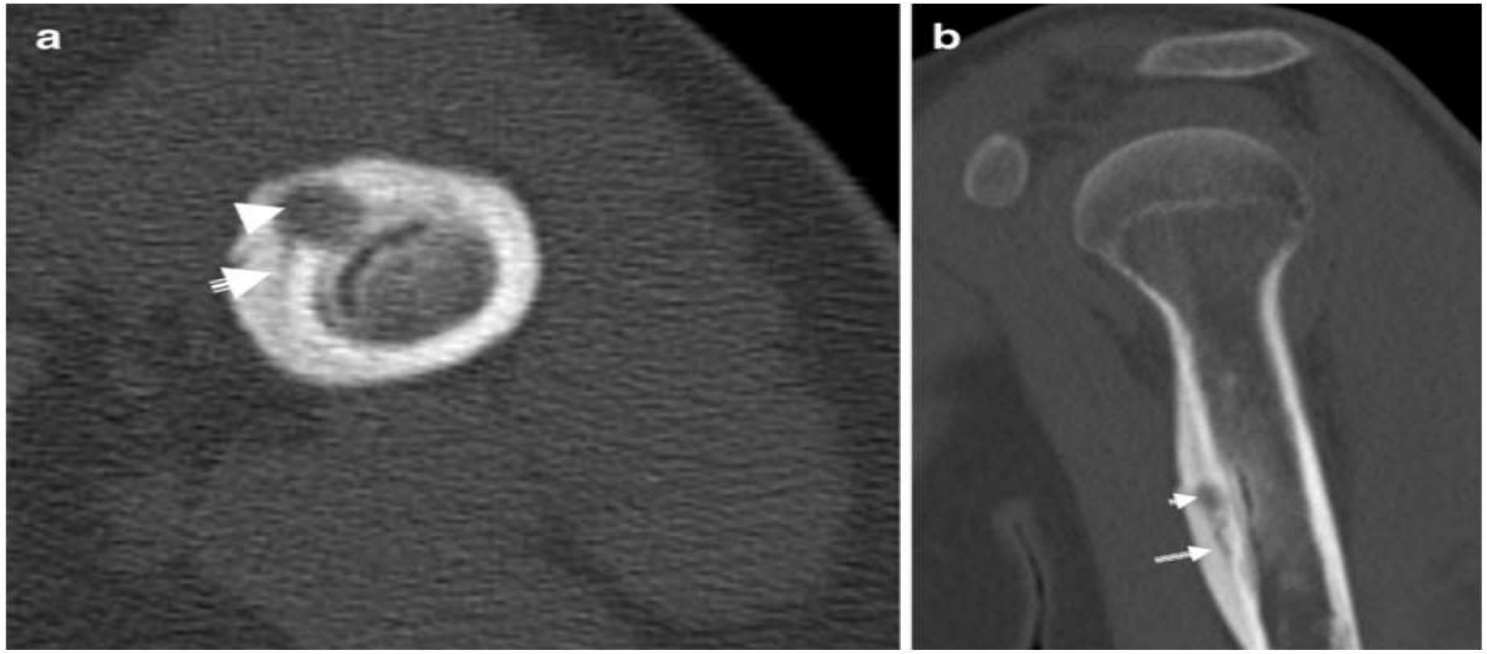
FIG. 19.14 Osteoid osteoma composed of anastomosing trabeculae of woven bone rimmed by osteoblasts and embedded in a hypocellular fibrovascular connective tissue stroma. (From Fletcher CD: *Diagnostic Histopathology of Tumors,* ed 5, Fig. 25.44B, Philadelphia, 2021, Elsevier.)

X-ray of the distal femur showing a poorly defined, aggressive bone lesion with a sunburst periosteal reaction (arrows) and cortical destruction — characteristic features of osteosarcoma, a primary malignant bone tumor commonly seen in adolescents and young adults.

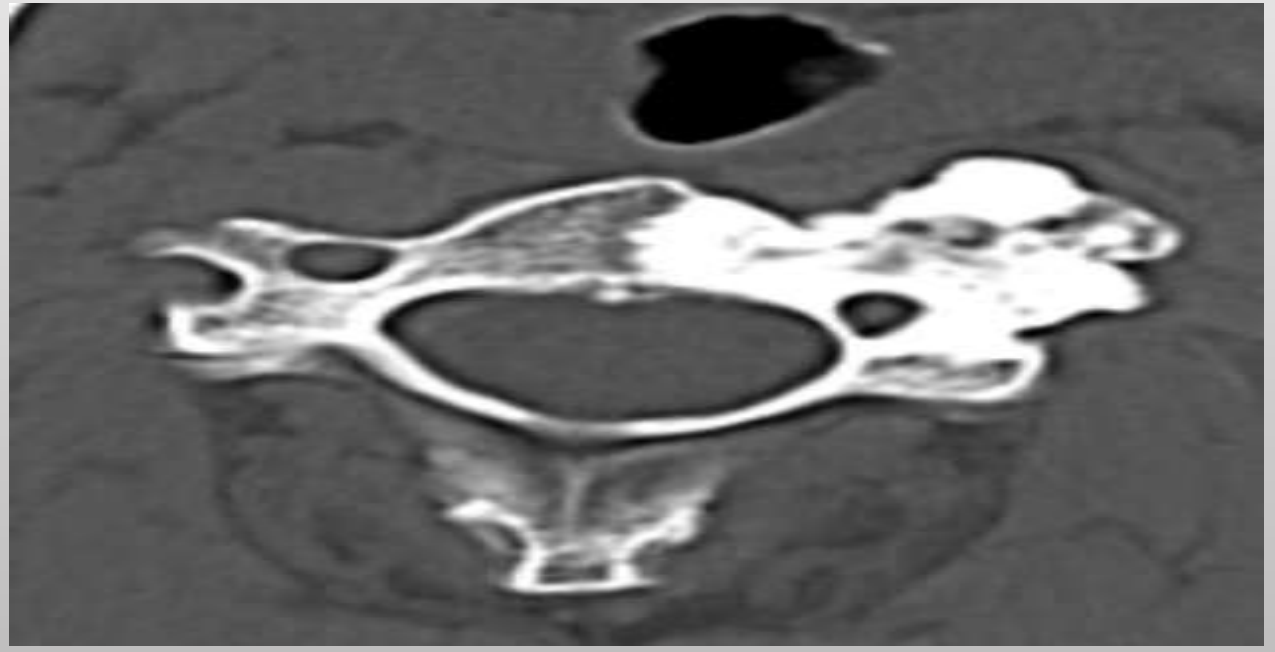


- **osteoid osteoma** is a benign (non-cancerous) bone tumor that typically occurs in the long bones of the body, such as the femur or tibia, but it can also appear in the spine or other bones.

Fig. 1 A 20-year-old female with a biopsy-proven osteoid osteoma of the humerus. Axial (**a**) and coronal reformats (**b**) showing a feeding vessel (*arrow*) entering the lesion's nidus (*arrowhead*)



Osteoblastoma is a rare, benign bone tumor that primarily affects young individuals, typically in their second or third decade of life.



Osteochondroma

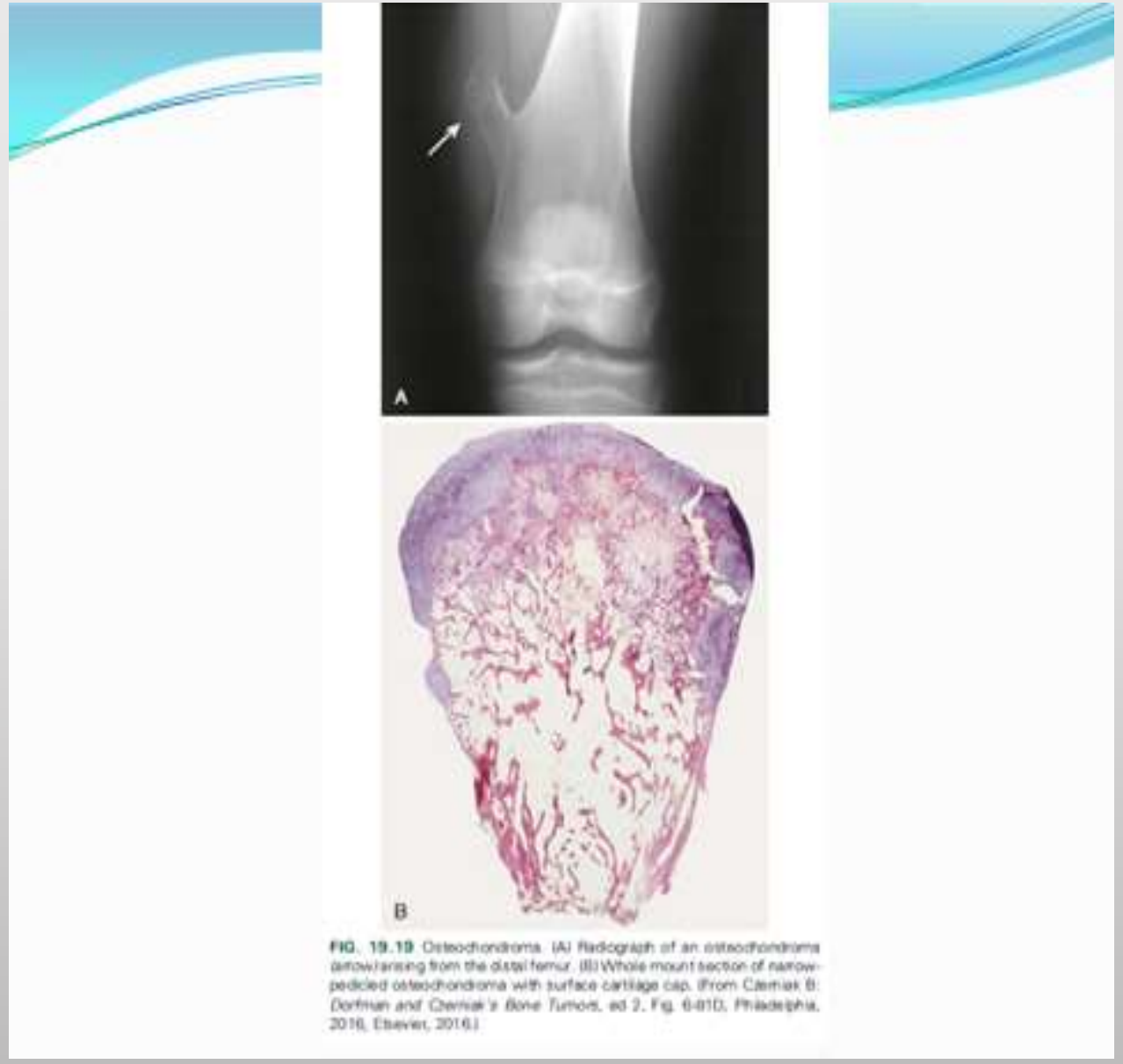


FIG. 19.19 Osteochondroma. (A) Radiograph of an osteochondroma (arrow) arising from the distal femur. (B) Whole mount section of narrow-pedicled osteochondroma with surface cartilage cap. (From Czerniak B: *Dorfman and Czerniak's Bone Tumors*, ed 2, Fig. 6-81D, Philadelphia, 2016, Elsevier, 2016.)

Chondroma is a **benign cartilage-forming tumor** that typically arises in the bones of the hands, feet, or long bones, although it can occur in other locations. It is composed of mature hyaline cartilage and generally grows slowly without causing significant symptoms unless it compresses surrounding structures or fractures the bone.

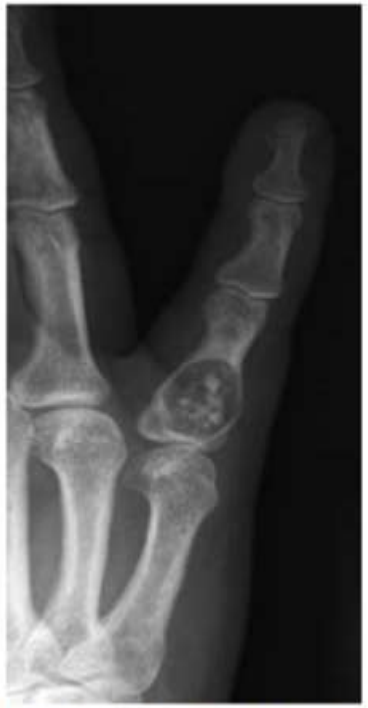


FIG. 19.20 Enchondroma of the proximal phalanx. The radiolucent nodule of cartilage with central calcification thins but does not penetrate the cortex.

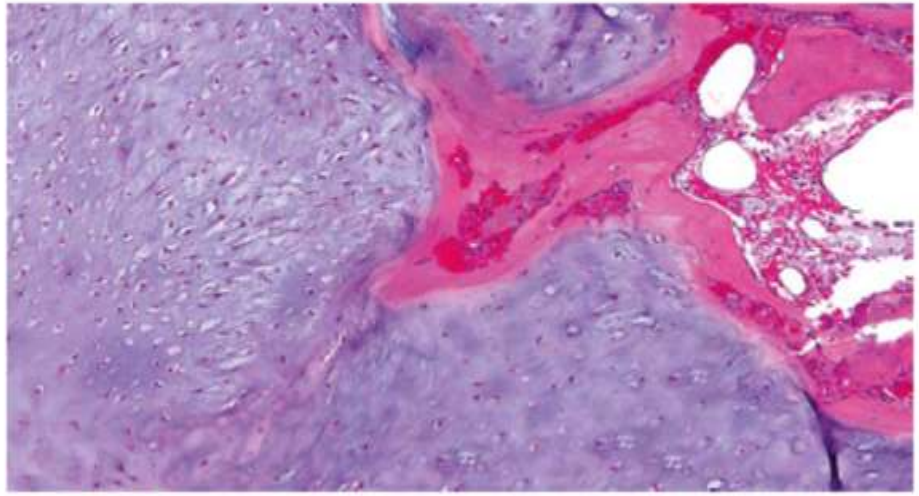
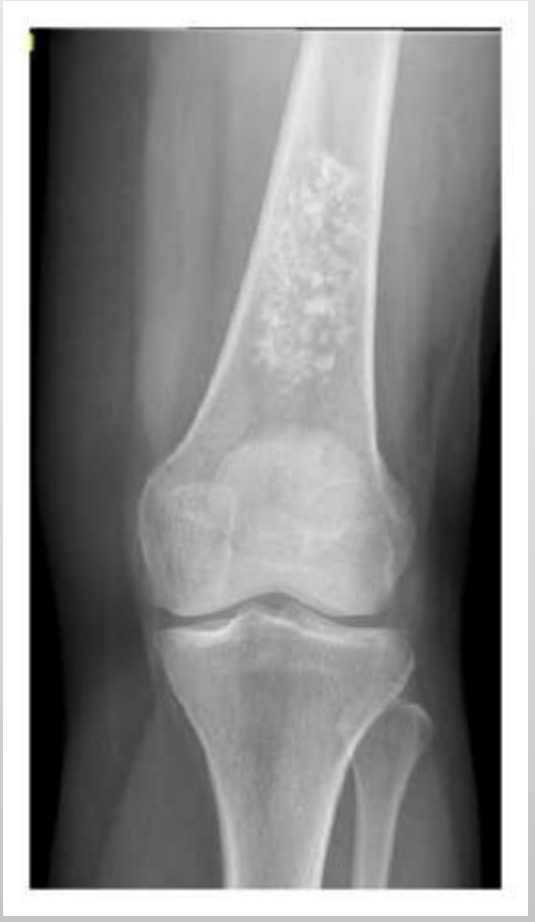
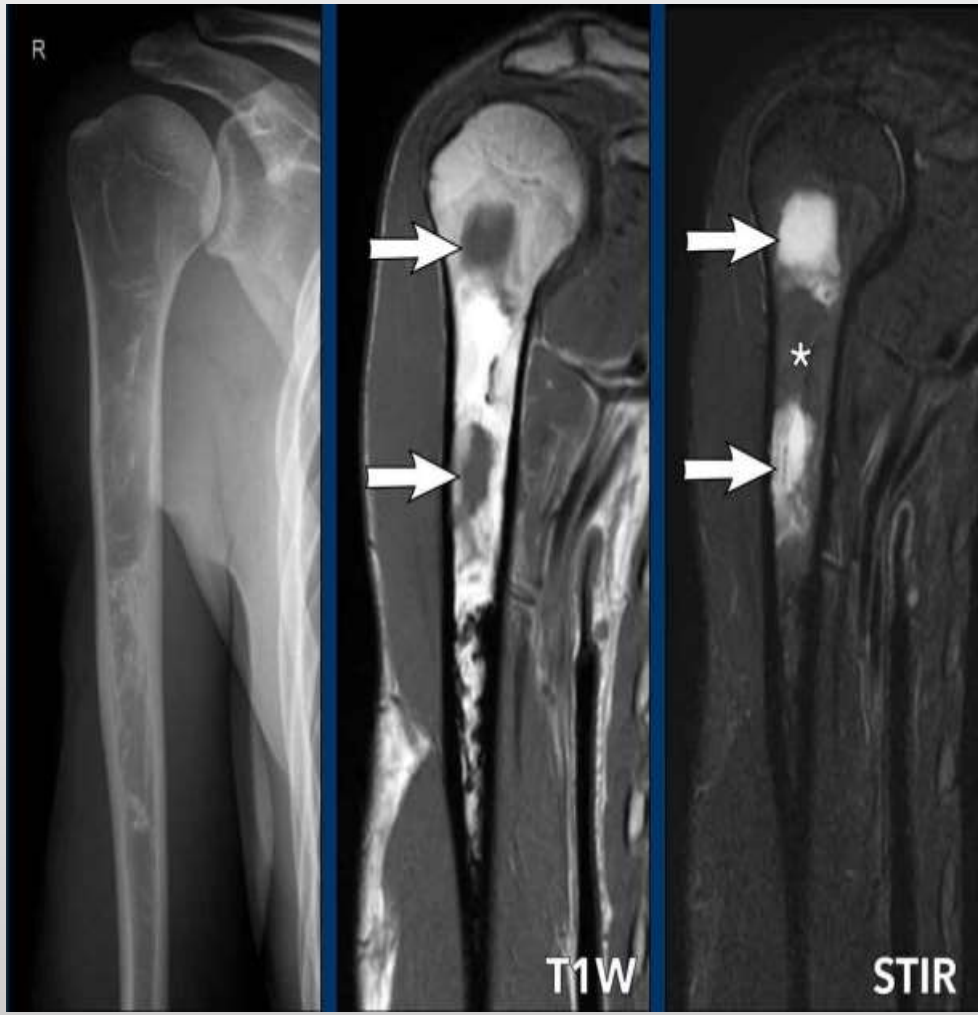


FIG. 19.21 Enchondroma composed of a nodule of hyaline cartilage encased by a thin layer of reactive bone.

The radiograph demonstrates an intramedullary, well-defined, chondroid lesion within the distal femoral metaphysis, showing characteristic “ring-and-arc” calcifications without cortical destruction or soft-tissue extension — findings consistent with an enchondroma or low-grade cartilaginous tumor.



Radiologic and MRI appearance of a cartilaginous tumor in the proximal humerus. Plain radiograph (left) demonstrates an intramedullary, well-defined lytic lesion with characteristic chondroid (“ring-and-arc”) calcifications and preserved cortical margins. Axial T1-weighted MRI image (middle) shows low-to-intermediate signal intensity within the lesion, consistent with cartilaginous matrix. STIR sequence (right) reveals high signal intensity within and around the lesion (asterisk), indicating associated marrow edema. The imaging features are compatible with an enchondroma or low-grade chondrosarcoma, depending on the clinical presentation.



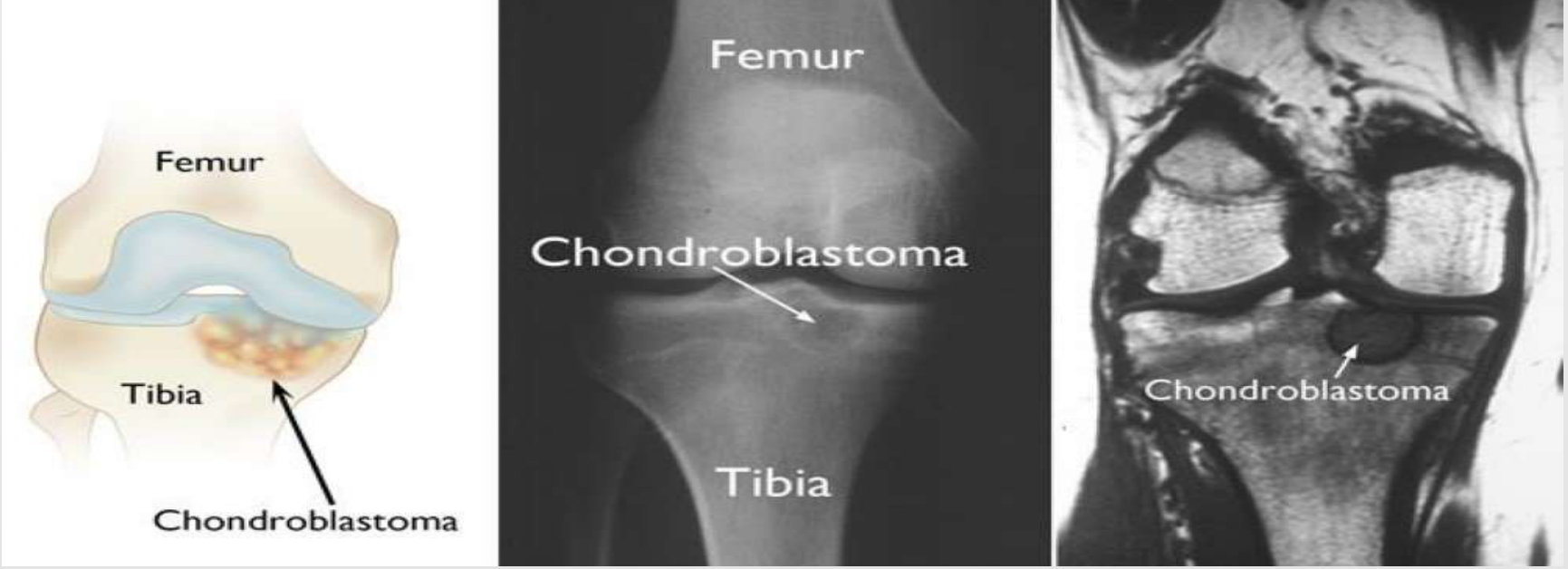


Illustration (left), X-ray (center), and MRI scan (right) all show a chondroblastoma at the top of the tibia. This is a common location for the tumors to occur.

Chondroblastoma