

Bone Lesions

00:00:09

- **Metaphyseal lesions** in immature skeletons, unfused growth plate (under 20 years) is often associated with **aneurysmal bone cysts**. These cysts can be multiloculated and have fluid-fluid levels on MRI, indicative of hemorrhagic and cystic fluid. Eccentric location is also characteristic.



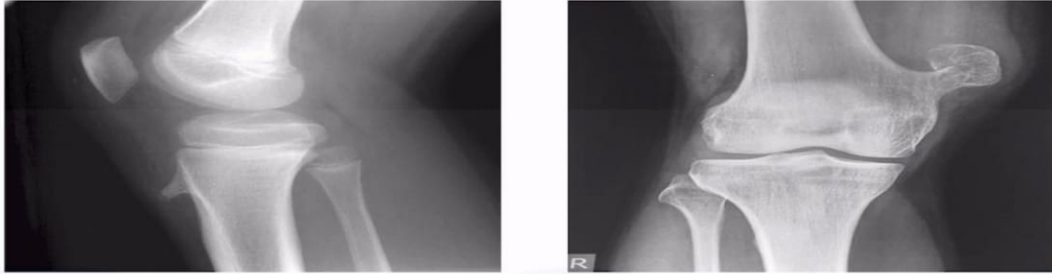
- **Chondroblastoma**, also known as cpdman's tumor, is another lesion found in immature skeletons with unfused growth plates (under 20 years). It is typically a metaphysical lesion that can be unilocular.



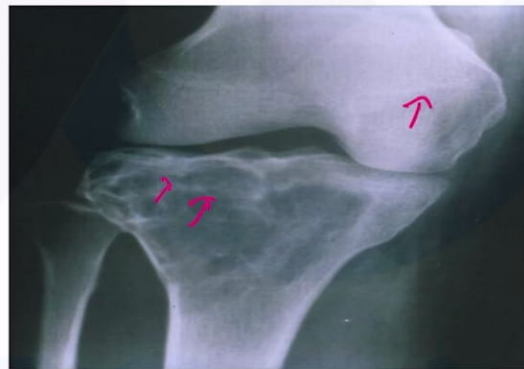
- **Simple bone cysts**, also called unicameral bone cysts, are typically found in the upper humerus, especially in the first decade of life. These are unilocular and may show a "fallen fragment" or "trapdoor" sign.



- **Osteochondromas** (also called exostosis) are bony growths that grow away from the joint and are covered by a cartilaginous cap. The cartilaginous cap is not visible on radiographs but can be seen on MRI. A cap thickness of more than 2 cm on MRI has a risk of malignant transformation into chondrosarcoma.



- **Giant cell tumors (GCT)**, or osteblastomas, are found in mature skeletons with fused growth plates (over 20 years). They are often located in the epiphyses, are multiloculated, and can have a "bubble-like" appearance. The most common site is the lower femur. also mc bone tumor in distal radius is GCT



- **Osteosarcomas** show a cloudy, dense osteoid matrix and increased alkaline phosphatase levels. They have central calcification with peripheral lysis and can have a "sunray" appearance due to disrupted periosteum. A "Codman's triangle" may also be present.



Cloudy matrix -Osteosarcoma

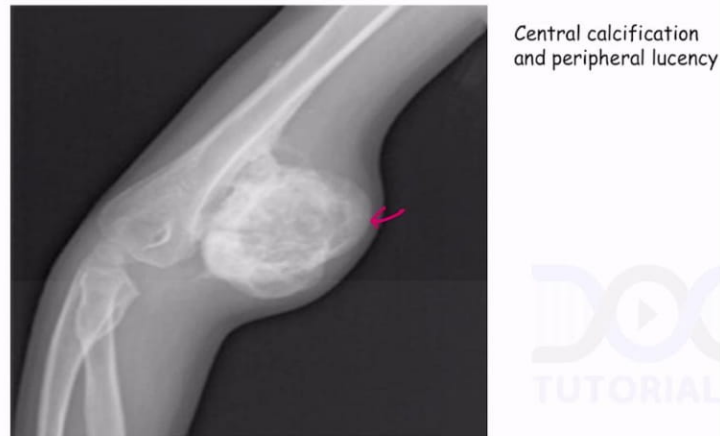


Central calcification
and peripheral lucency



Codman's Triangle
Sunray Appearance

- **Myositis ossificans** shows peripheral calcification with central lucency, similar to an egg.



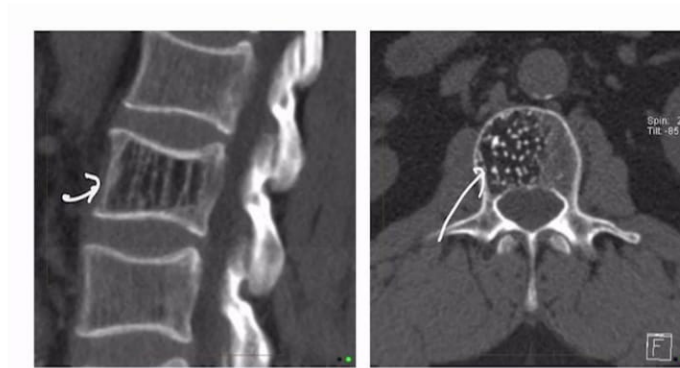
- **Ewing sarcoma** presents with an "onion peel" or lamellar periosteal reaction. It can mimic osteomyelitis, with symptoms such as fever and increased ESR.



- **Enchondromas** typically show a cartilaginous matrix with rings and arcs or O's and C's. Multiple enchondromas with soft tissue hemangiomas are seen in Maffucci syndrome, which carries a high risk of chondrosarcoma.



- **Vertebral hemangiomas** show vertical striations (gel bar or corduroy appearance) and a polka dot appearance on axial sections.



Fractures & Related Conditions

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- **Calcaneus fractures** are indicated when the **Böhler's angle** (measured from the anterior process to the superior articular facet to the tuberosity of the calcaneus) is reduced (normal **20-40** degrees). The Gissane's angle (measured along the anterior and posterior slopes of the calcaneus) is increased in calcaneus fractures (normal **122-145** degrees).



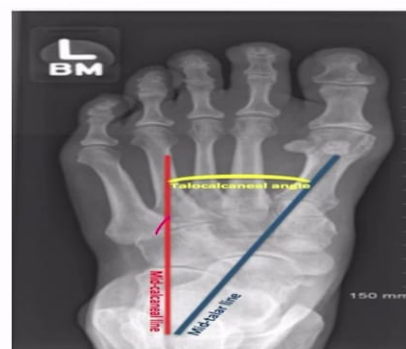
Bohler Angle Is Reduced (<20 degrees)

Gissane Angle is increased (>145 degrees)

Normal Bohlers Angle-20-40 degrees

Normal Gissane Angle-120-145 degrees

- The **talo-calcaneal angle** (also known as Kite's angle), measured between the mid-calcaneus line and the midline, is reduced in clubfoot (congenital talipes equinovarus).



- **Bauman's angle**, measured between the long axis of the humerus and the capitellum, is increased in cubitus varus deformity. This angle is used to assess reduction in supracondylar fractures of the humerus.



- Patella fractures are treated with cylindrical casts for non-displaced fractures, figure-of-eight tension wiring for displaced fractures, and patellectomy for comminuted fractures



Fracture Patella

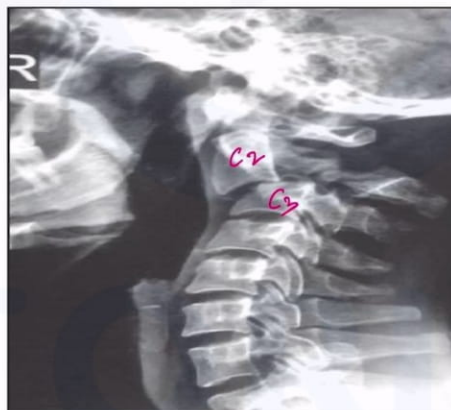


Figure of 8, tension wirebinding in avulsion fracture of patella

- **Osgood-Schlatter disease** affects the tibial tuberosity.
- **Bipartite patella** is a normal anatomical variant of a triangular fragment on the superolateral side of the patella.



- **Hangman's fracture** is a fracture and dislocation of C2 over C3.



- **Spondylolysis** is a break in the pars interarticularis, appearing as a "collar" on the scottish dog sign.
- **Spondylolisthesis** is the anterior displacement of a vertebra (e.g., L4 over L5), resulting in a "beheaded" scottish dog appearance. The anterior spinal line is discontinuous in spondylolisthesis.



Spondylolysis

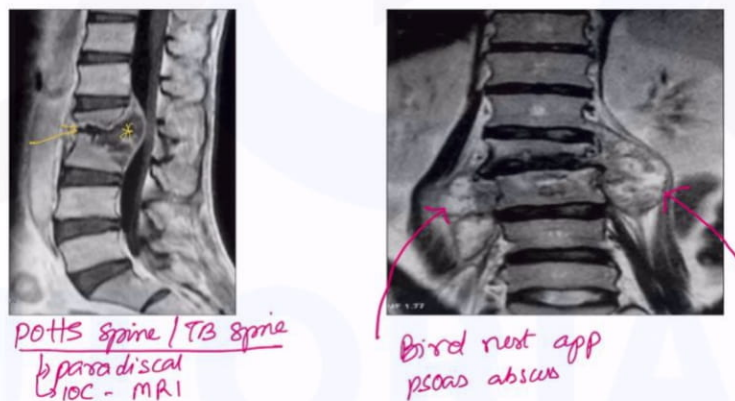


Spondylolisthesis

- **Ankylosing spondylitis** shows inflammation of bilateral sacroiliac joints. Findings include calcification of the interspinous ligament (dagger sign), calcification of the periphery of intervertebral discs (bamboo spine), trolley track or tram track signs, Romanus lesions, shiny corner signs, and squaring of vertebrae. Anderson lesions are located at the anterior part of the disc.



- **Tuberculosis (TB) spine** (Pott's disease) involves the disc and adjacent plates of the vertebrae. It can cause paraspinal abscesses.

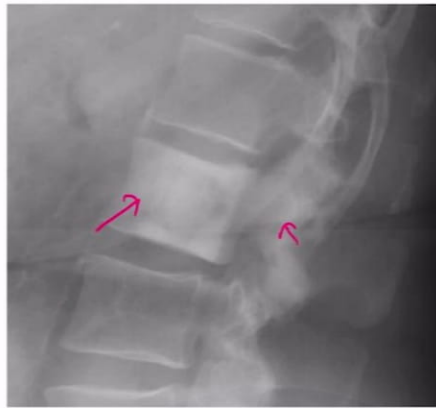


- **Cobb's angle** is used to measure scoliosis; an angle greater than 10 degrees indicates scoliosis.
- **Diffuse idiopathic skeletal hyperostosis (DISH)** shows flowing, wax-like ossification of the anterior longitudinal ligament.

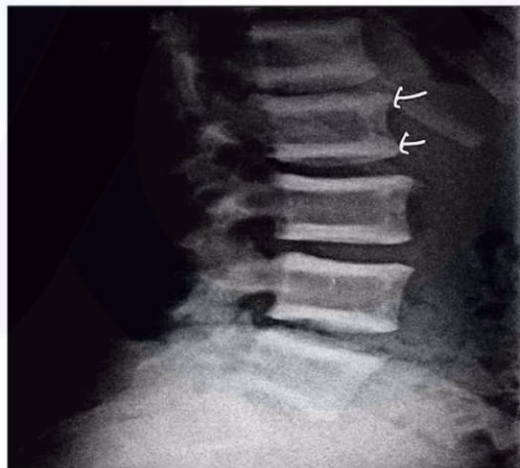


Flowing Wax like ossification
In Anterior longitudinal ligament

- **Alkaptonuria** shows calcification of the entire intervertebral disc.
- **Ivory vertebrae** (densely sclerotic) are seen in Paget's disease, osteoblastic metastasis (e.g., prostate), and lymphoma.



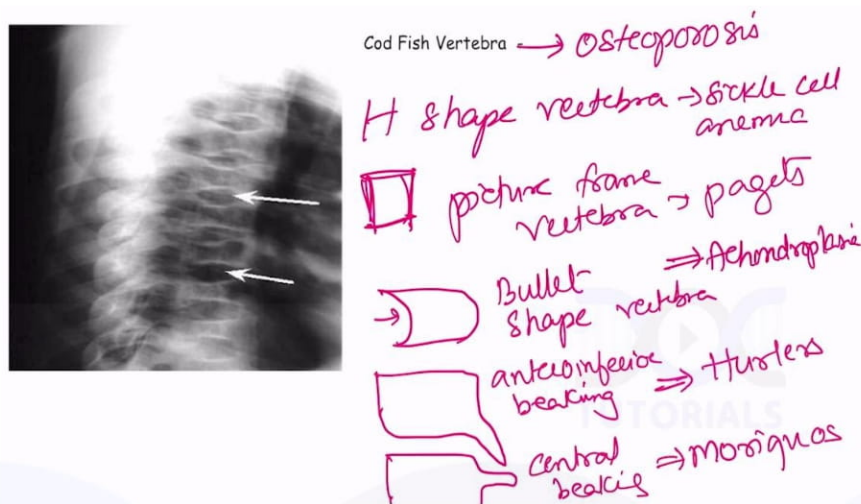
- **Sandwich vertebrae** (densely sclerotic superior and inferior endplates) are a feature of osteopetrosis.



- **Rugger-Jersey spine** (hazy sclerosis of the superior and inferior endplates) is seen in renal osteodystrophy.



- **Fish mouth vertebrae** (concave endplates) are seen in osteoporosis.

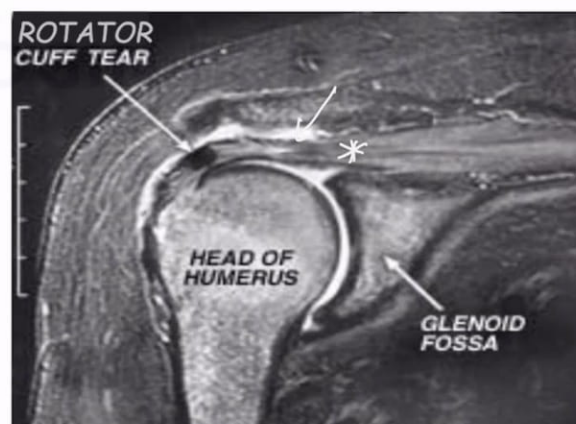


- **Head-shaped vertebrae** are seen in sickle cell anemia.
- **Picture frame vertebrae** are seen in Paget's disease.
- **Bullet-shaped vertebrae** and posterior scalloping are seen in achondroplasia.
- **Anterior inferior beaking** of the vertebrae is seen in Hurler's disease.
- **Central beaking** is seen in Morquio's disease.

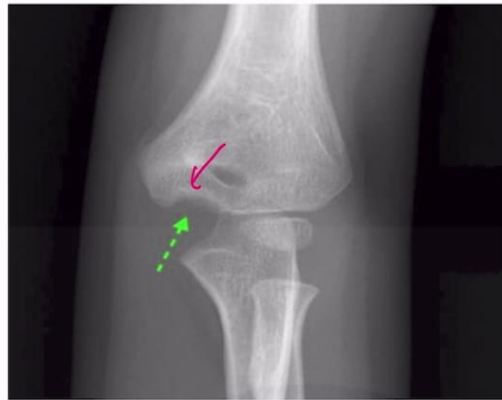
Other Key Concepts

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- **Rotator cuff syndrome** most commonly involves the supraspinatus tendon, but the subscapularis is often "forgotten".
- The acronym SITS refers to the rotator cuff muscles: supraspinatus, infraspinatus, teres minor, and subscapularis. The first three attach to the greater tubercle, while subscapularis attaches to the lesser tubercle.



- **Fishtail deformity** of the distal humerus is caused by resorption of the lateral aspect of the trochlea due to poor blood supply after distal humerus fractures.



- **Scaphoid fractures** most commonly occur at the waist and can lead to avascular necrosis. Nonunion is a common complication. The best X-ray view for scaphoid fracture is the oblique view. MRI is used for occult fractures.



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- **Sequestrum** (dead bone) and involucrum (new bone formation) are seen in chronic osteomyelitis.
- **Cloaca** is the opening in the involucrum.



Chronic osteomyelitis

- **Terry-Thomas sign** is the increased distance between the scaphoid and lunate bones seen in scapholunate dislocations.



Terry Thomas sign

- **Raindrop skull** is seen in multiple myeloma.(PUNCHEDOUT LYTIC LESIONS)
- **Geographic skull** is seen in eosinophilic granuloma.(BEVELLED EDGES)
- **Salt and pepper skull** is seen in hyperparathyroidism.(PEPPER POT SKULL)
- **Silver beaten skull** is seen in increased intracranial tension.
- **Crew cut appearance** is seen in thalassemia.
- **Cotton wool skull**, **circumscribed osteoporosis**, and **tam-o-shanter skull** are seen in different phases of Paget's disease.

