

Skeletal system

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Skeletal system

□ What is the skeletal system ?

Is all of the bones in the body and the tissues such as tendons, ligaments and cartilage that connect them.

□ The average adult human skeleton has around 206 bones.

Skeletal system / 2 investigation

Plain film:

- Plain films still remain the mainstay of radiological investigation of the skeletal system .
- views should always be obtained in two projections.

Ultrasound :

- neonatal hip for congenital dislocation .
- soft tissue lesions and abscesses.
- joint effusions .

CT in skeletal system

CT is very helpful in :

- assessment of bone tumours prior to surgery .
- evaluation of certain fractures , such as the acetabulum, spine and calcaneum .
- study of the spinal column .

MRI / Skeletal system

- ❖ MRI assists the investigation of bone tumours, soft tissue masses and joint .
- ❖ MRI is extremely sensitive in injuries to cartilage , muscle , ligaments, menisci and tendons.

Osteoarthritis

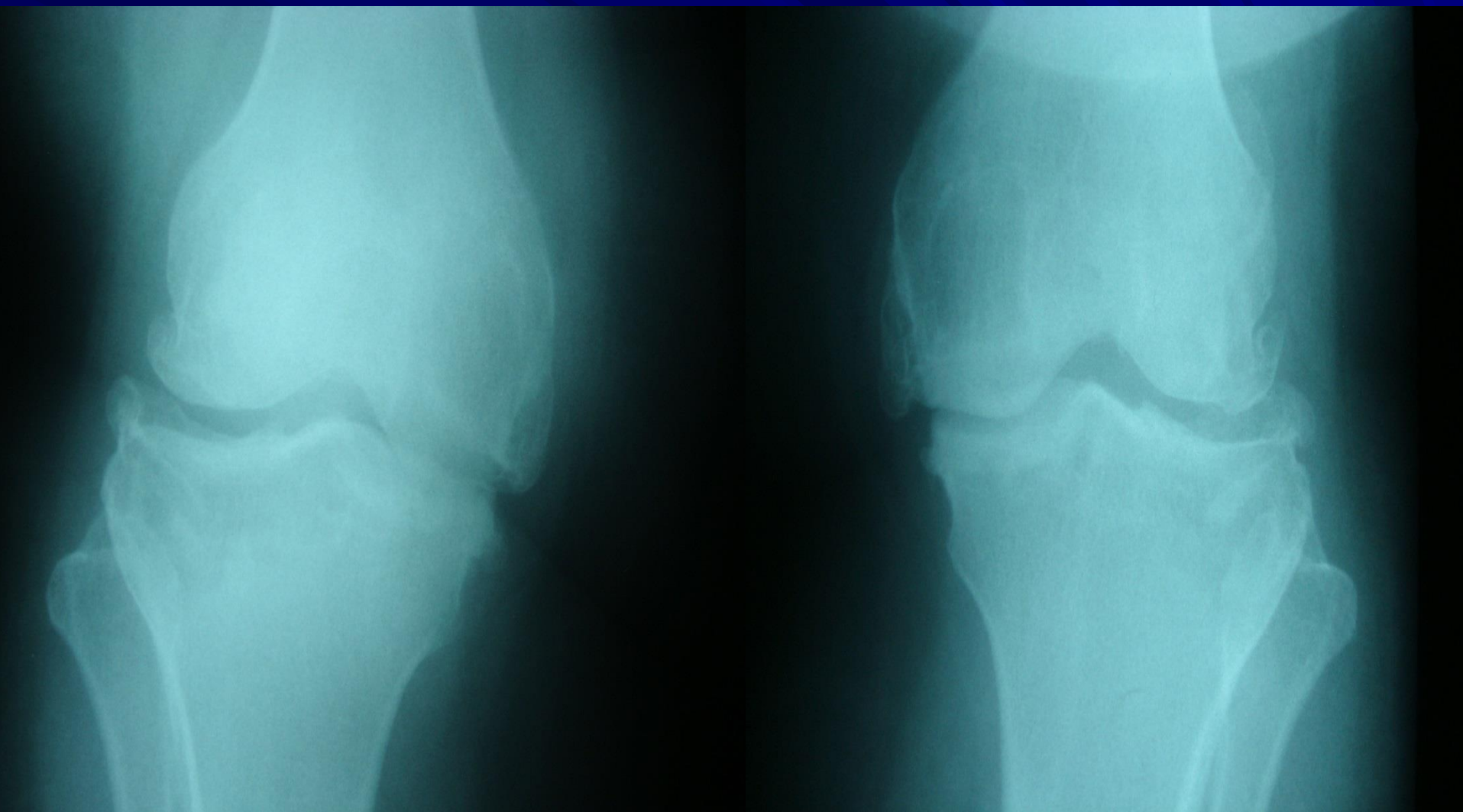
(degenerative joint disease)

- Is a degenerative condition affecting the articular cartilages and subjacent bone.
- Is part of the normal ageing process.
- Secondary osteoarthritis results from previous trauma and joint infection.
- Any joint may be affected, but the knees, hips, and shoulders are frequently involved.

Osteoarthritis / 2

Radiological features:

- ❖ **Osteophytes formation:** are spurs of bone which forms at joint margin.
- ❖ **Joint space narrowing.**
- ❖ **Sclerosis with Secondary degenerative cysts formation.**
- ❖ **Loose bodies:** result from separation of cartilage and osteophytes.





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Osteomyelitis

Is an infection of bone, staphylococcus Aureus is responsible for the majority of cases.

Radiological features:

- May be normal in the first 10 days or two weeks.
- The earliest sign is soft tissue swelling due to edema.
- Periosteal reaction
- Bone destruction

Multiple Myeloma

- Is a cancer of plasma cells (malignant proliferation).
- The most common bones involved are: the skull, spine, pelvis and ribs.
- The disease may occur in a disseminated form, or as a localized solitary mass (Plasmacytoma).

Multiple Myeloma / 2

Radiological features:

- At time of presentation 80% have skeletal abnormalities.

Plain films reveal:

- Generalized osteoporosis.
- Scattered lytic lesions with well defined margins
- Compression fractures of the vertebral bodies.



Bone metastasis

- ❑ Are the most common malignant bone tumors.

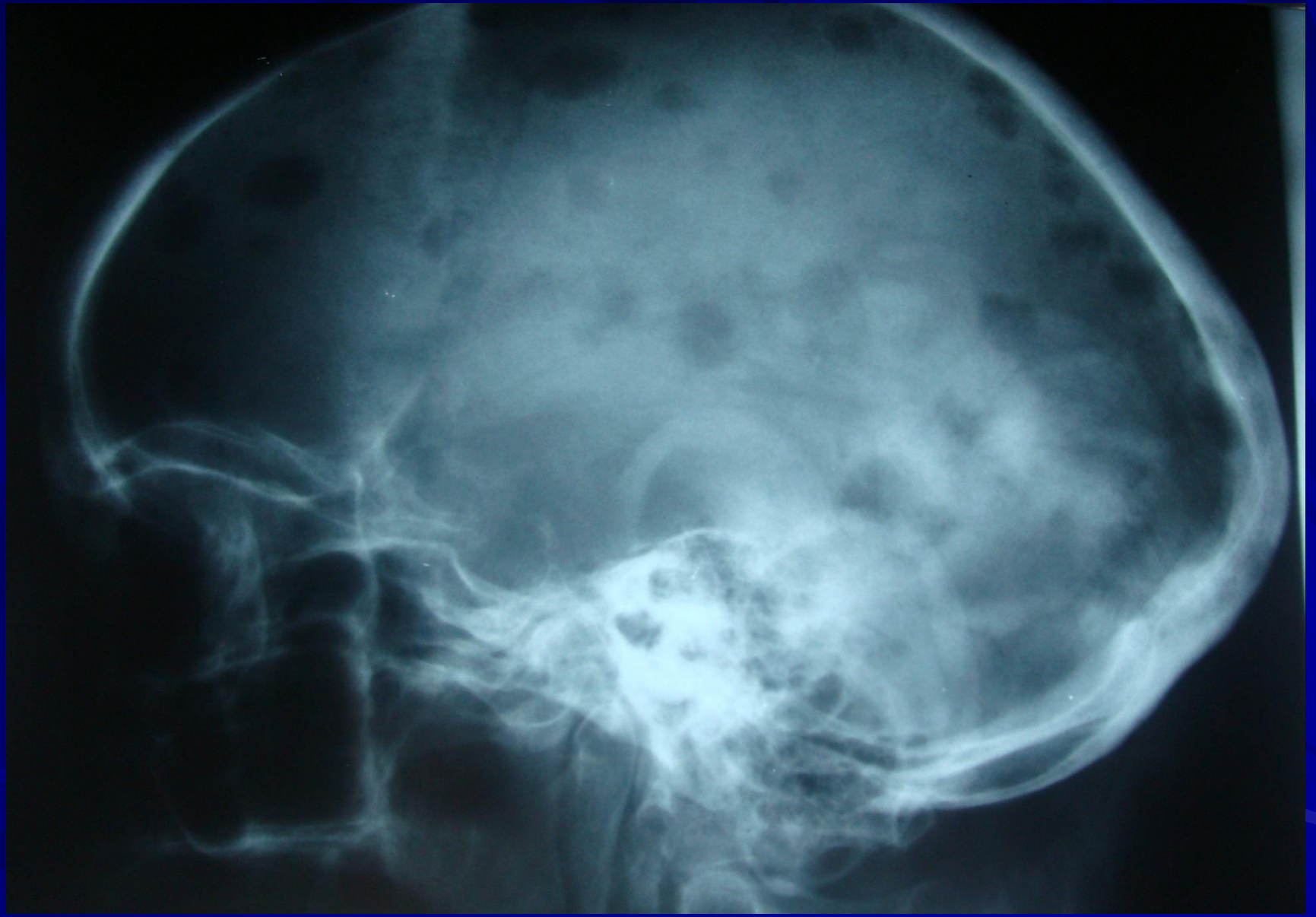
- ❑ Any primary tumor may metastasize to bone, but the most frequent are:

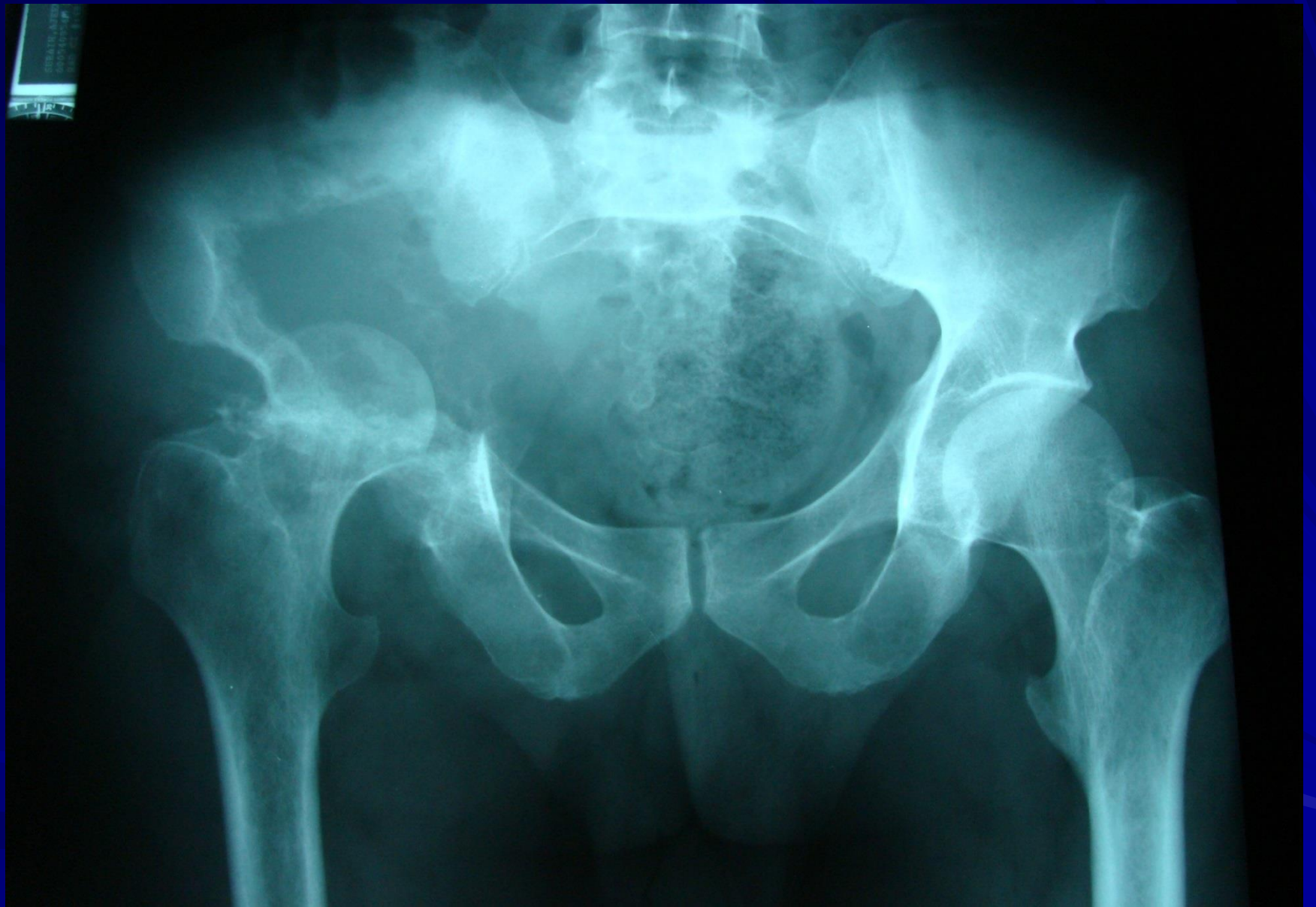
Breast: usually lytic in nature but may be sclerotic or mixed.

Prostate: the vast majority are sclerotic.

Lung, Kidney, thyroid,: lytic lesions

Adrenal gland: predominantly lytic.





Skeletal trauma

- ❖ Plain films are the initial evaluation of a patient with suspected skeletal trauma.
- ❖ At least two views (A.p, and lateral) should always be obtained.
- ❖ In any significant head or spine injury, CT scan is the initial investigation.
- ❖ CT will detect fractures as well as underlying intracerebral hemorrhage or contusions.

FRACTURES

Fracture: is a break in the continuity of bone or cartilage.

Closed fracture: Fracture with intact skin.

Open fracture: Fracture with skin and soft tissue wound connecting the fracture to the external environment.

Types of fracture

- Linear fracture.
- Comminuted fracture: a fracture with multiple fragments
- Avulsion fracture: a fragment of bone is detached from the site of a ligament or tendon insertion.
- Pathological fracture: a fracture through diseased bone.

Types of fractures /2

- Greenstick fracture: Incomplete fracture that usually occurs in children . The bone may also buckle without an actual break.
- Compression fracture: force is applied in the longitudinal axis of bone, usually occurs in the spine.
- Depressed fracture: usually occurs in the skull.

Types of fractures /3

- Stress fracture: Is incomplete fracture caused by repeated stress, or over-use to bone, in the form of a fine crack.
most common in the proximal shaft of the tibia and fibula (long distance runners and ballet dancers).
- **March fracture**: is a type of stress fracture, also known as fatigue fracture of second and third metatarsal bones caused by recurrent overstress, is more common in soldiers.



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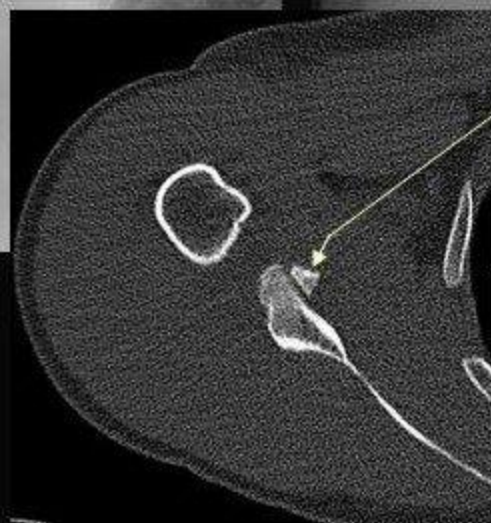


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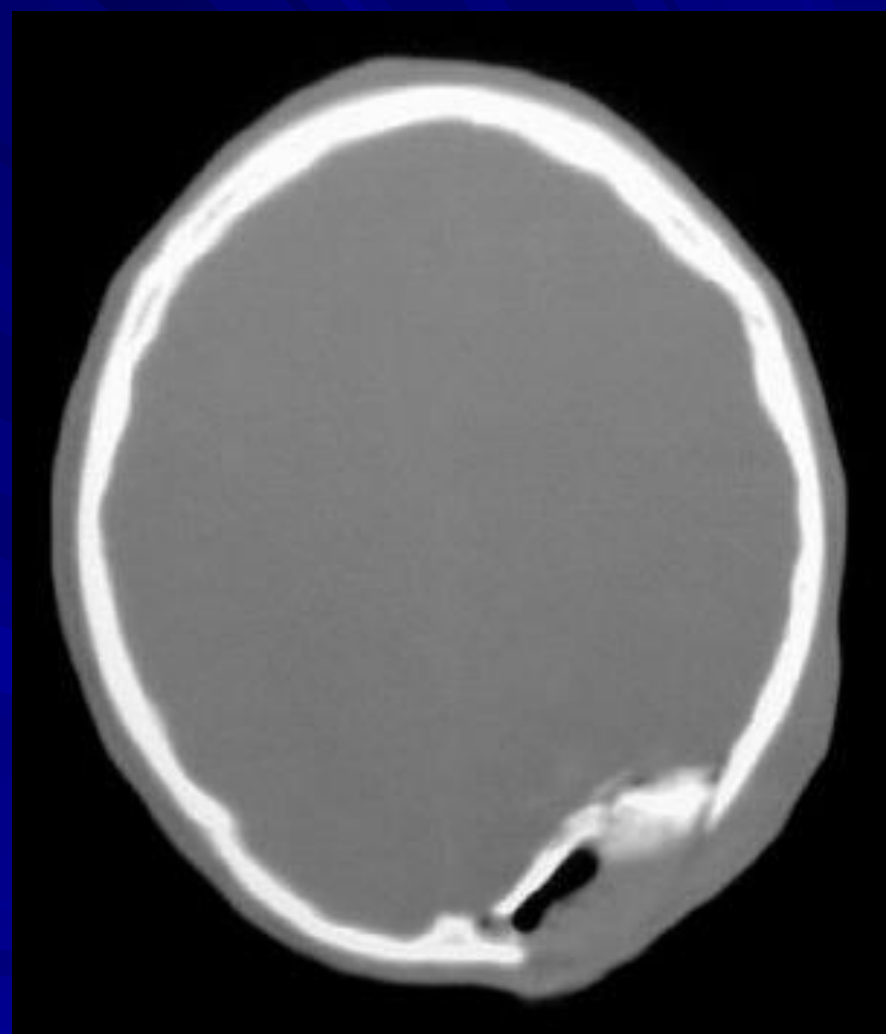
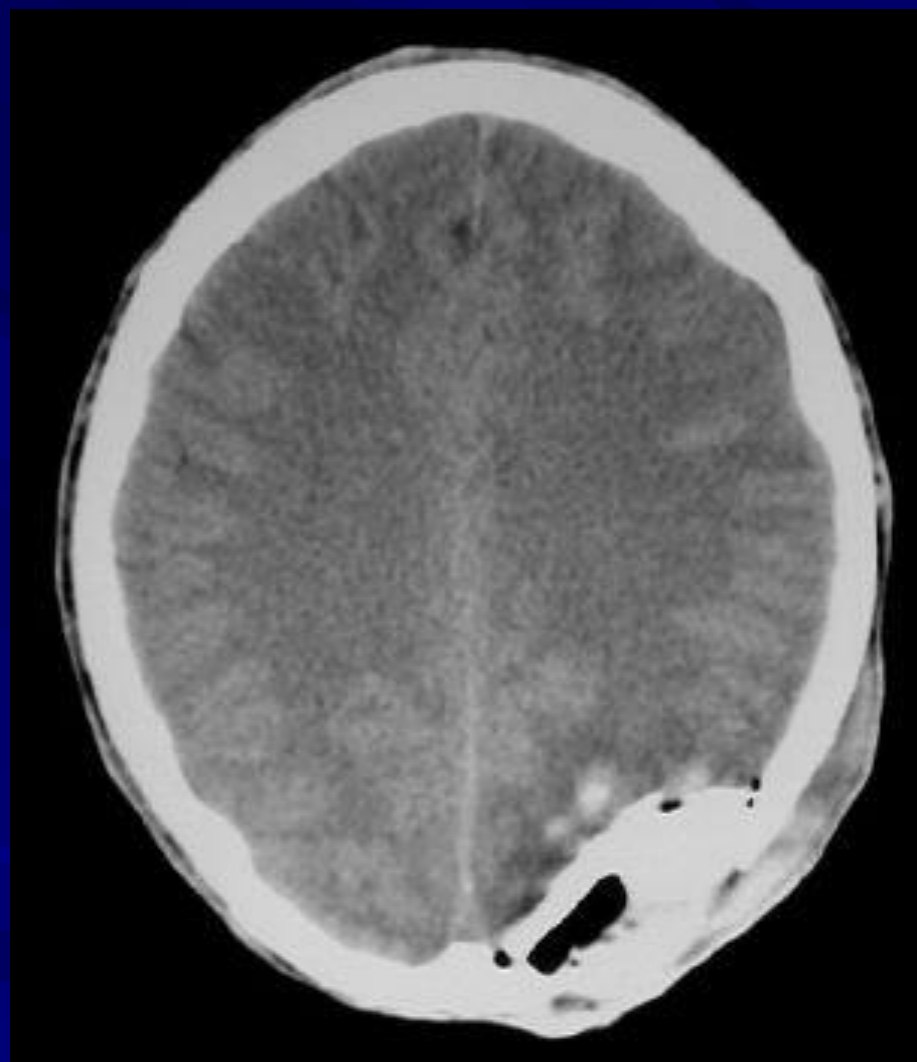
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4-8-24

MEER SAJIM MURTHALI LOYAL

DR. HOSHI

SPINAL INJURIES

The spinal injury can be classified in three types:

- 1 - Compression fracture.
- 2- Burst fracture.
- 3- Fracture-Dislocation.



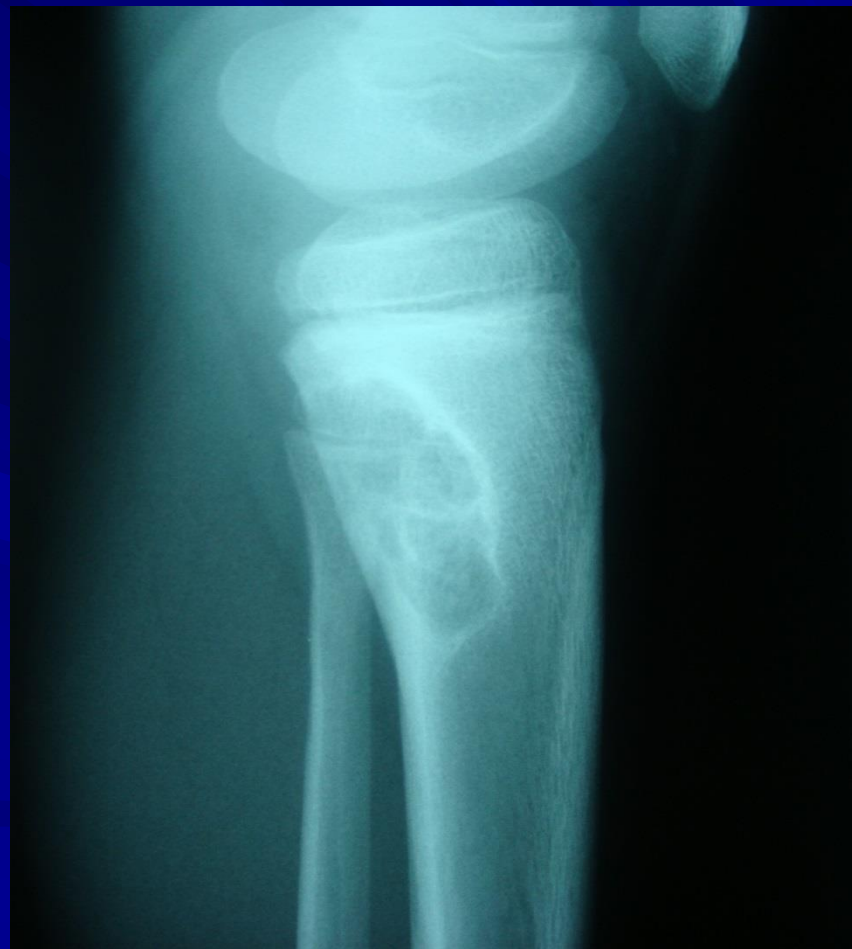


Benign bone tumour

- Are generally well defined and have a sharp narrow zone of transition between normal and abnormal bone . (where in malignant tumour is ill-defined)
- Benign lesions sometimes cause thinning of the adjacent cortex, however cortical destruction is more typical of malignant lesions .
- A well defined sclerotic margin is in favour of benign lesions and rare in malignant lesions

Benign bone tumours / 2

- *Non-ossifying fibroma*
- *Chondroma*
- *Osteochondroma*
- *Osteoma*
- *Ostoid osteoma*
- *Osteoblastoma*
- *Simple bone cyst*
- *Aneurysmal bone cyst*
- *Haemangioma*



Malignant bone tumour

- Are destructive lesions , often associated with periosteal reaction , and have a wide zone of transition between normal and abnormal bone.
- The most common malignant bone tumour is a metastasis and it's often solitary .

Malignant bone tumors / 2

Radiological features :

- Plain film: shows an area of bone destruction
- CT and MRI are the best imaging modalities to evaluate tumours and determine bone and soft tissue involvement
- Features that may be verified by CT / MRI:
 - tumour vascularity
 - infiltration of surrounding tissue
 - relationship to nerves and vessels

Malignant bone tumours / 3

The most common primary malignant bone tumors are:

- ❖ *Osteogenic sarcoma*
- ❖ *Ewings tumour*
- ❖ Chondrosarcoma
- ❖ Fibro sarcoma
- ❖ *Giant cell tumor*



A scenic landscape photograph featuring a large body of water, likely a lake or wide river, in the middle ground. The water is a deep blue with whitecaps reflecting the light. In the background, a range of rugged, snow-capped mountains rises against a clear sky. The foreground is framed by dark, silhouetted evergreen trees on the left and right sides. A small, sandy beach is visible at the bottom of the frame, with a few small figures of people. The text "Thank You" is overlaid in the center in a large, red, sans-serif font with a white outline.

Thank
You