

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 calcaneus .
- 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.**

Osteoporosis

- ❑ **Is a generalized decrease of bone mass.**

Radiological investigation:

- ❑ **Bone densitometry.**
- ❑ **Plain x-ray film:**
 - ❖ Detection of osteoporosis on plain film requires a reduction in bone mass of at least 30%.
 - ❖ Osteoporosis result in a loss of bone density, decrease in the number of trabeculae and coarse striations.

Osteoarthritis

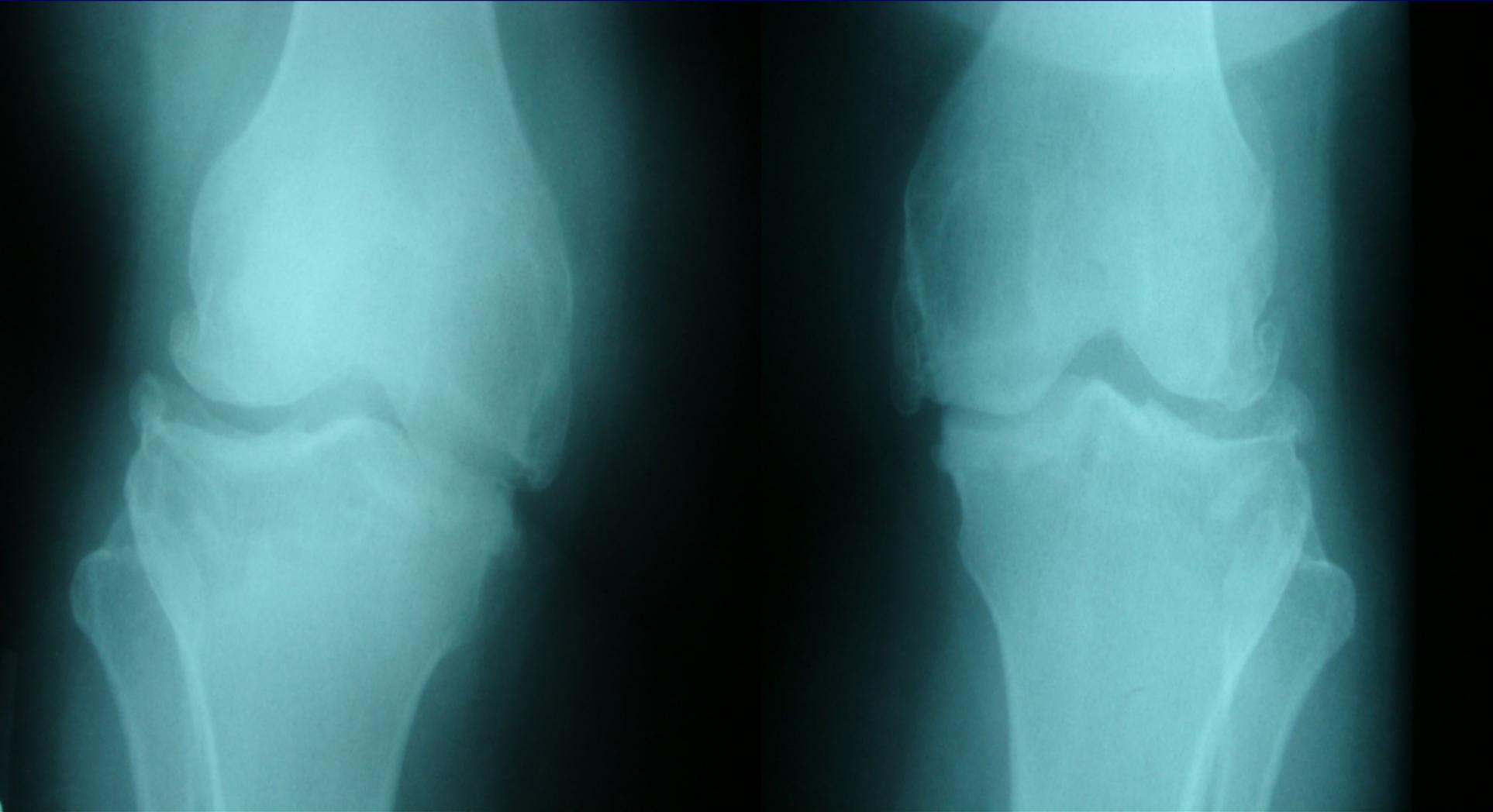
)degenerative joint disease(

- 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, shoulders and hands 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.



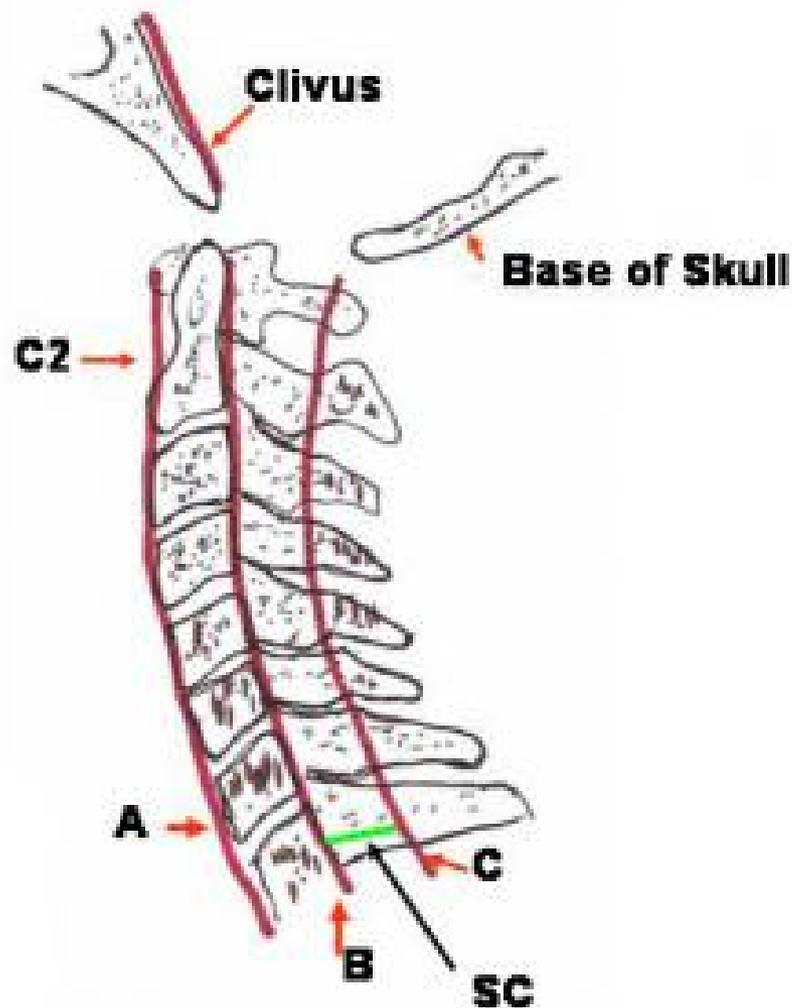


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Schematic lateral view of the cervical spine showing: A=anterior spinal line; B=posterior spinal line; C=spinolaminar line, SC=spinal canal





Osteomyelitis

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

:Radiological features

- **May be normal for up to 10 days.**
- 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

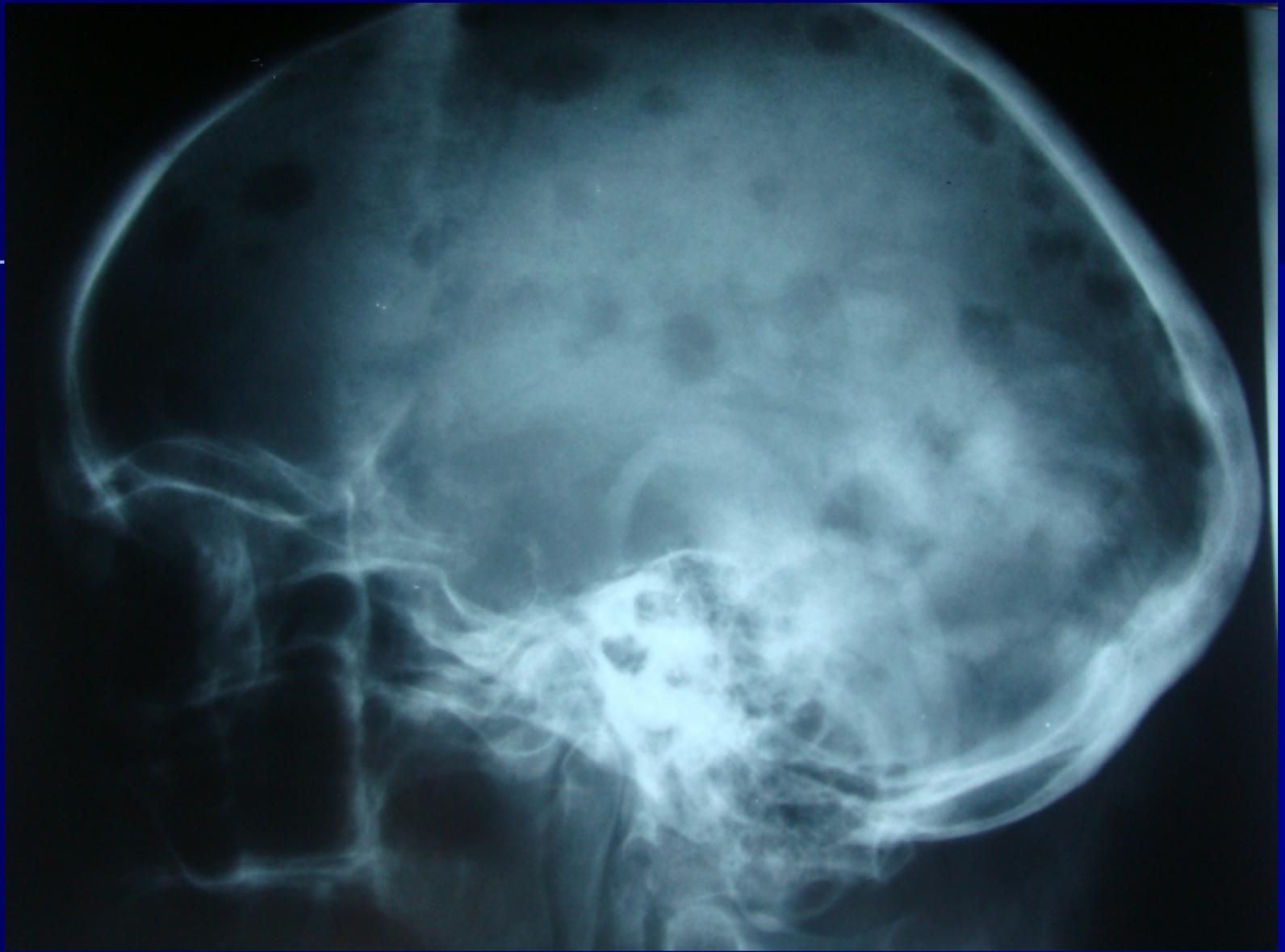
- ❑ Are the most common malignant bone tumors.
- ❑ Any primary tumor may metastasize to bone, but the most frequent are:

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.
- Epiphyseal plate fracture: usually in long bones.

Types of fractures /3

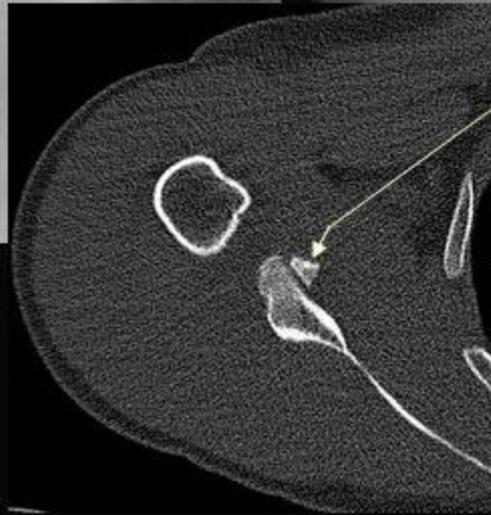
- Stress fracture: Is incomplete fracture caused by repeated stress, or over-use to bone, in the form of a fine crack.
most common in the proximal shaft of the tibia and fibula (long distance runners and ballet dancers).
- March fracture: is a type of stress fracture, also known as fatigue fracture of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



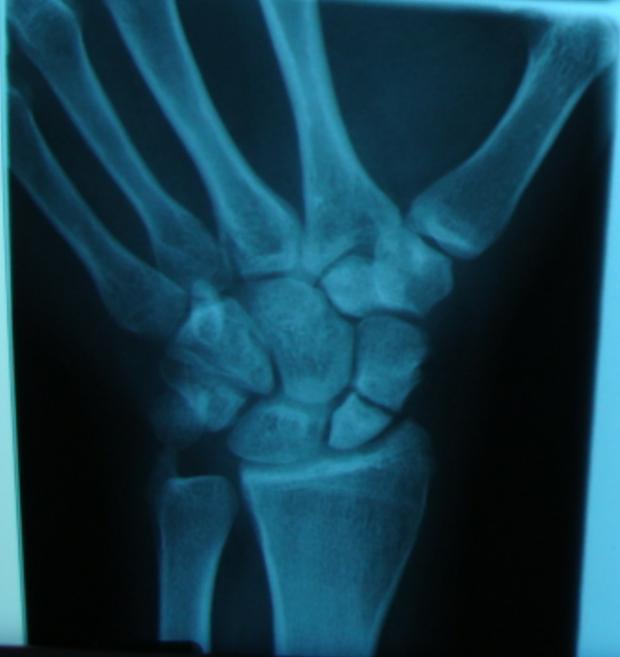


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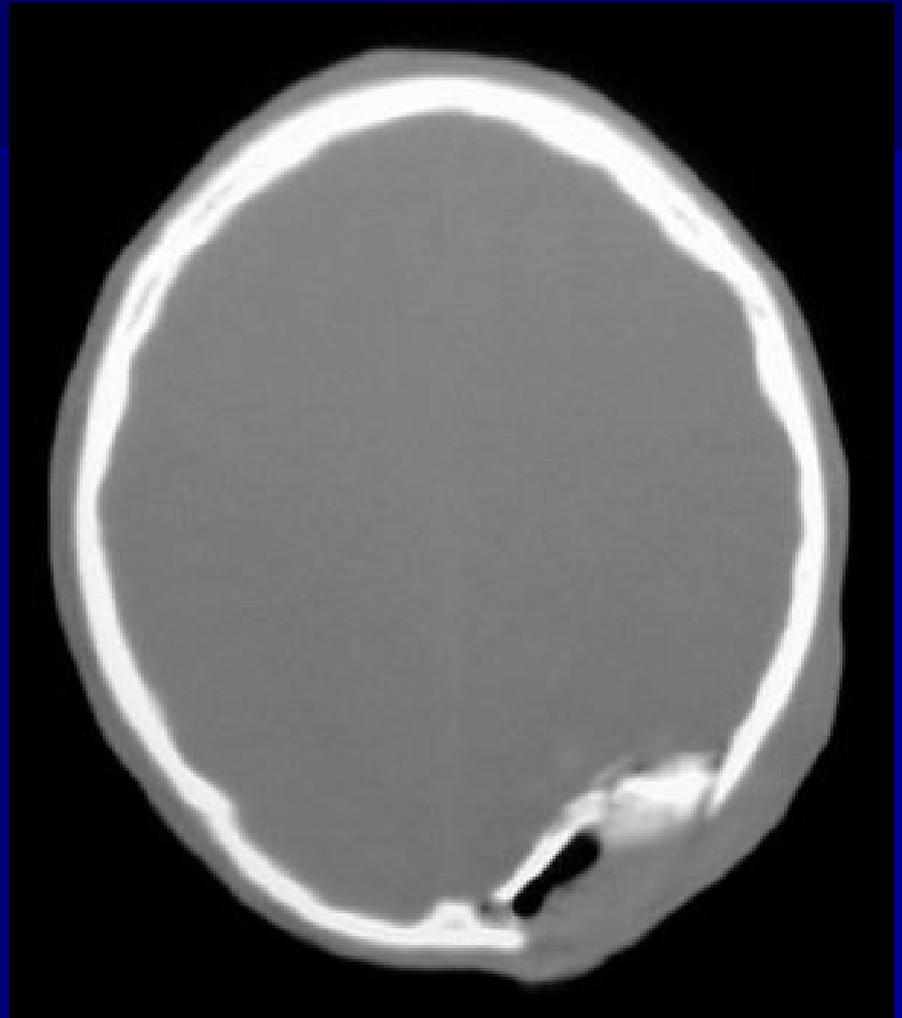
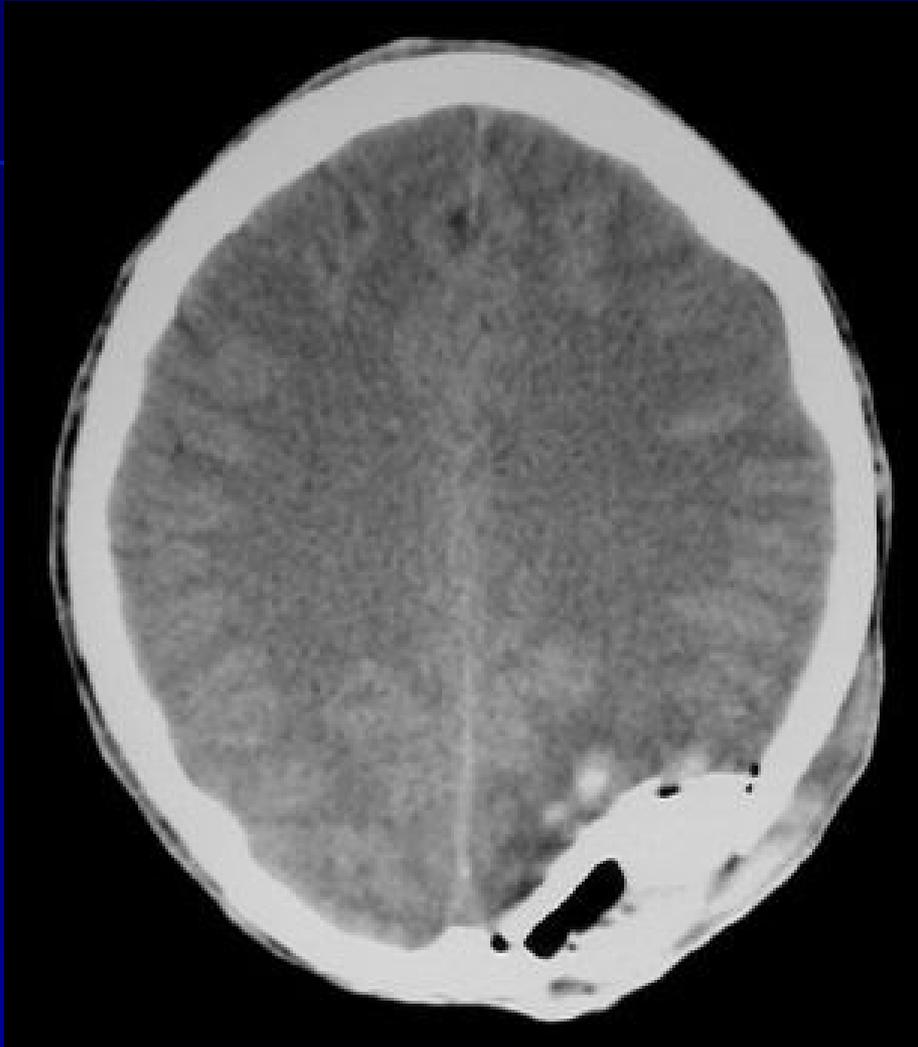


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4-8-24

MEA SALIM MURTHALI GOYER

DR. HOSUR

SPINAL INJURIES

The spinal injury can be classified in three types:

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





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IMA 90

Ref Scan 3
Ref TP -1034.5

A

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W 1500
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22-AUG-2005

IMA 91

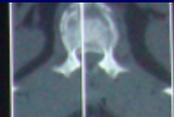
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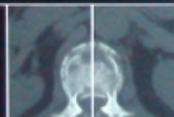
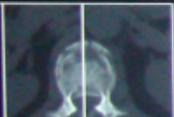
IMA 94

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IMA 95

Ref Scan 3
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Ref Scan 3
Ref TP -1034.5

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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 featuring a large, shimmering blue lake in the foreground, a dense forest of evergreen trees in the middle ground, and a range of snow-capped mountains in the background. The scene is framed by dark evergreen branches on the left and right sides. The text "Thank You" is overlaid in a large, bold, red font with a white outline, centered in the middle of the image.

Thank
You