DISEASES OF BONE

CONGENITAL ANOMALIES-

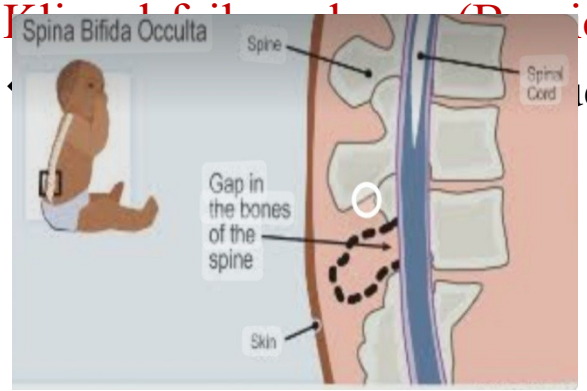
Acco. to Ayurveda-

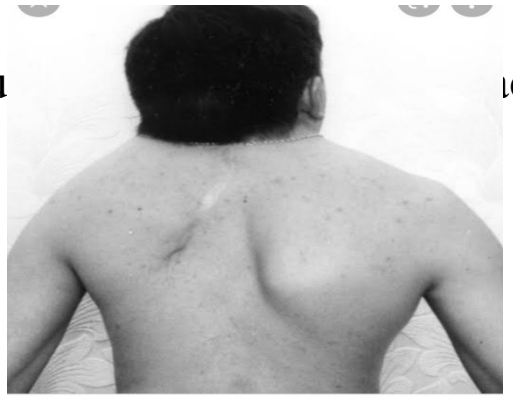
nkSânfoekuukr~ dqCta dqf.ka [kata tMa okeua fod`rk{keu{ka ok ukjh lqra tu;frA

Malformation of Vertebral Column-

Spinal bifida occulta-

- It results from failure of fusion of the halves of the vertebral arch(small gap in the bones of spine), most often in the lumber and sacral regions.
- Over bifida skin is intact, no visible sign of the defect
- Dimple or tuft of hair present.





Scoliosis-

- Sideways curvature of the spine.
- It occurs most often during the growth spruts just before puberty.
- Severe scoliosis can be painful and disabling.
- Treatment is not required, some times brace or surgery is required.

Kyphosis / Hunchback-

- Forward rounding of the back
- It is common in older women and often related to osteoporosis.
- Some people have back pain and stiffness.
- Treatment- Pain killer, Physiotherapy and some times surgery.

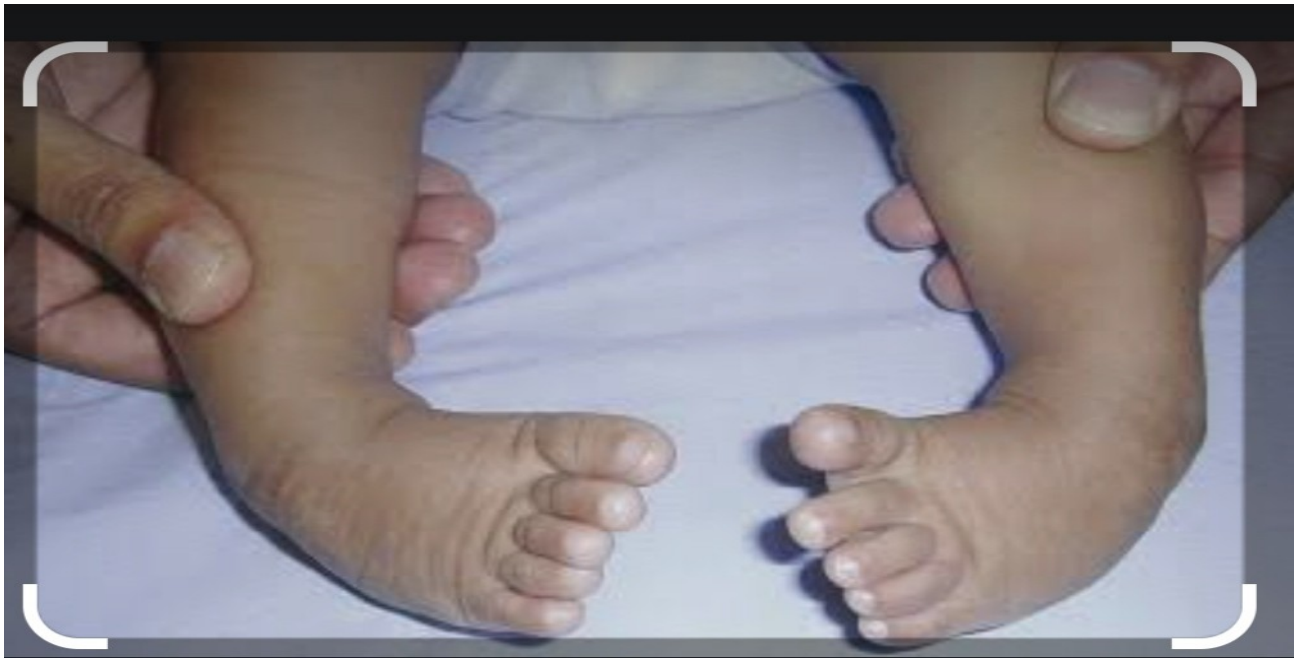
Lordosis-

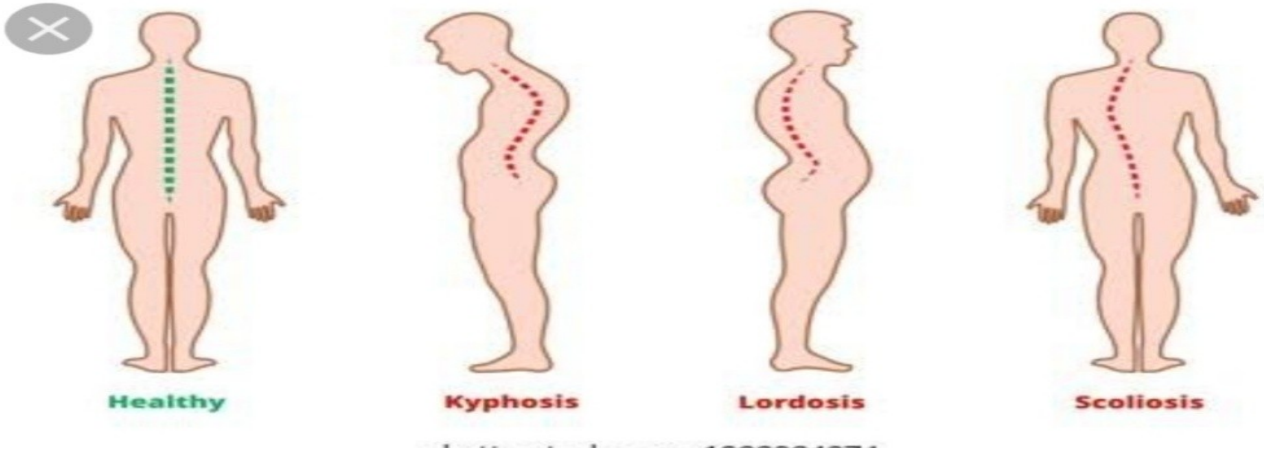
- Inward curving of lower back just above the buttocks.
- It may be inherited or caused by conditions such as arthritis, muscular dystrophy and dwarfism.
- Lower back pain.
- In children- lordosis correct itself and some adults need physiotherapy.

Malformation of Foot-

Club foot or CTEV(Congenital Talipes Equino Varus deformity)-

- It is a birth defect, one or both feet are rotated inwards and downwards.
- Affected foot, calf and leg may be smaller than the other.
- 50% cases both feet are involved.
- Issues with walking.
- It is managed by corrective POP cast(Ponseti method) and corrective footwear, some times lengthening of achilles tendon is required




Healthy
Kyphosis
Lordosis
Scoliosis

Malformation of Phalanges-

Polydactyl-

- In this condition someone is born with one or more extra fingers or toes.

Syndactyl-

- Abnormal connection of two conjoined digits.
- Most common webbing between middle and ring fingers.

Macrodactyl-

- In infants fingers or toes are abnormally large because of over growth of bone and soft tissues.

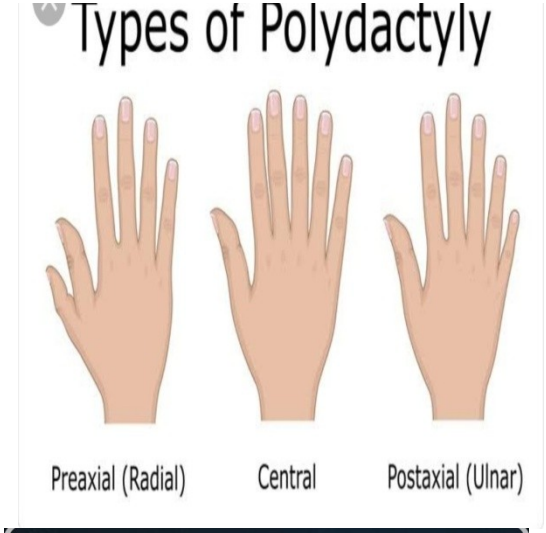
Microdactyl-

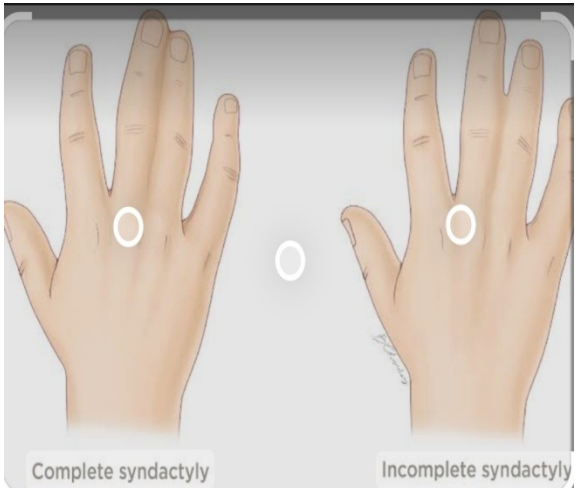
- Smallness or shortness of the fingers or toes.

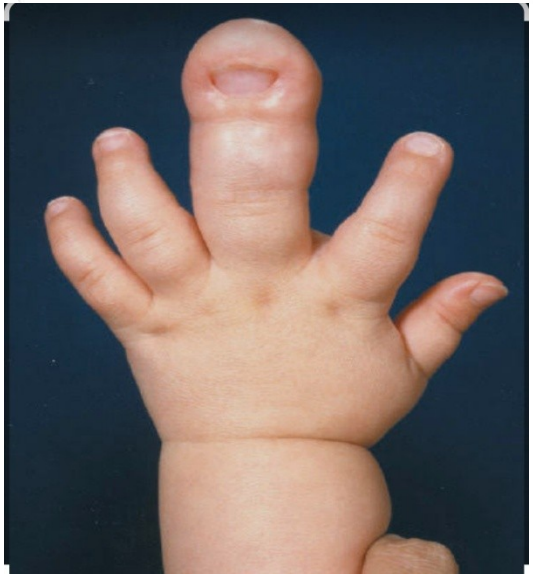
Other bone Malformation-

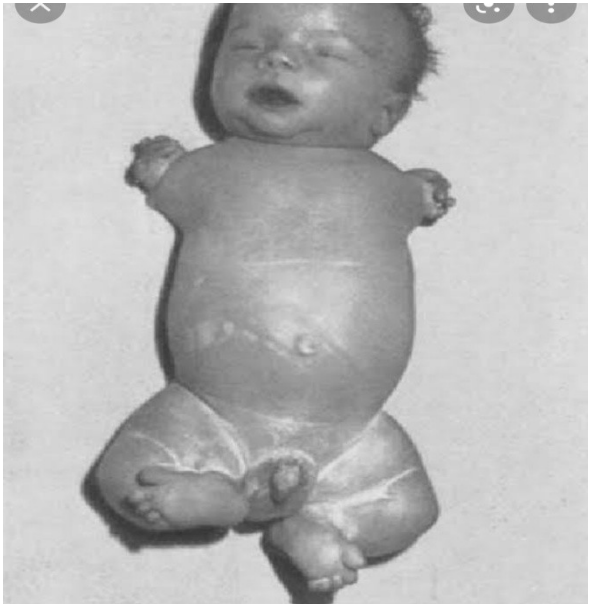
Phacomelia-

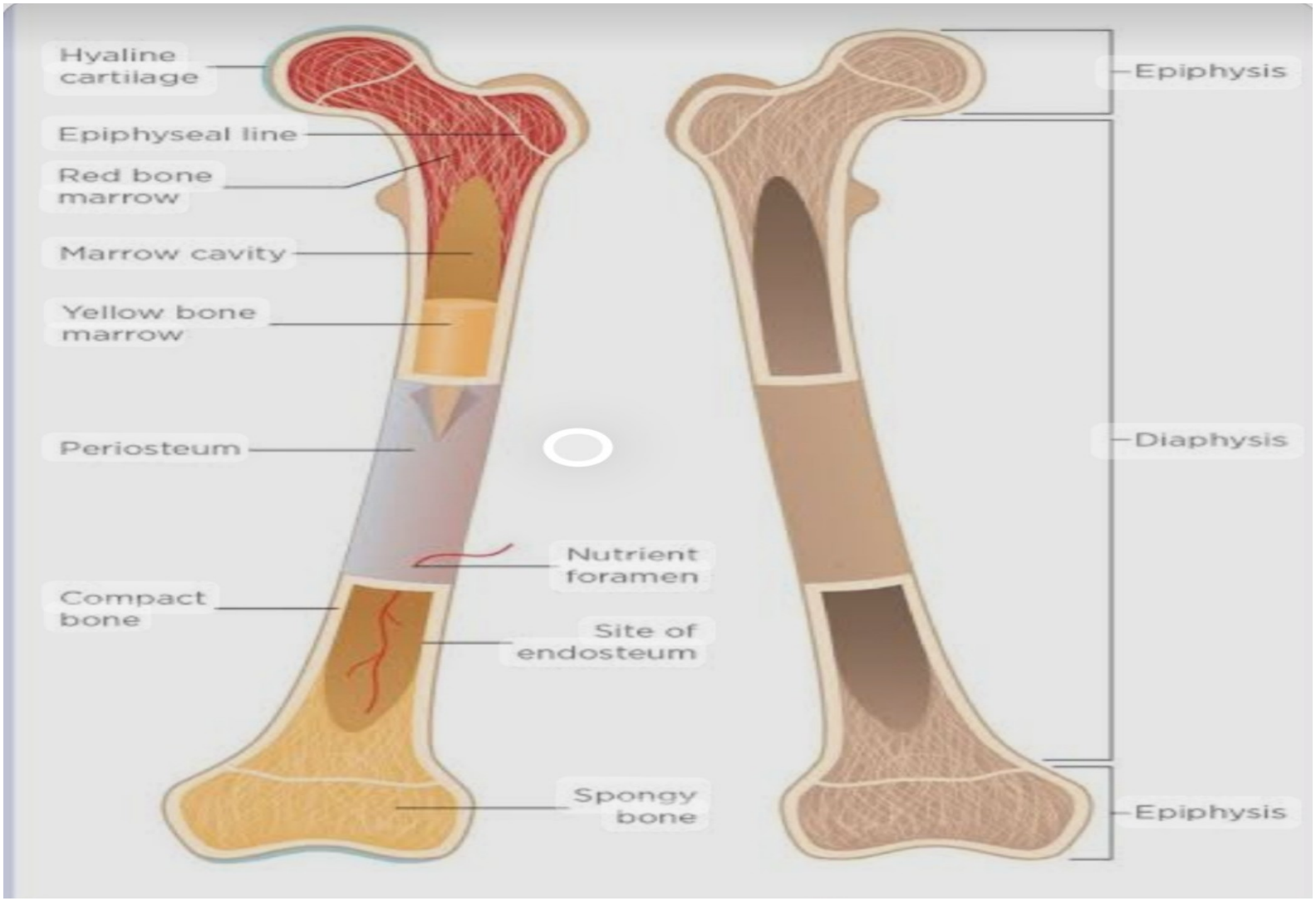
- It is rare congenital deformity in which the hands or feet are attached close to the trunk.
- The limbs being grossly underdeveloped or absent.
- This condition was side effect of drug thalidomide taken during early pregnancy.


Types of Polydactyly
Preaxial (Radial)
Central
Postaxial (Ulnar)


Complete syndactyly
Incomplete syndactyly






Hyaline cartilage
Epiphyseal line
Red bone marrow
Marrow cavity
Yellow bone marrow
Periosteum
Nutrient foramen
Compact bone
Site of endosteum
Spongy bone
Epiphysis
Diaphysis
Epiphysis

Osteomyelitis/ vfLFkeTtkxrfonzf/k&

Definition - Infection of the bone by microorganism is called Osteomyelitis.

Types- 1. Acute 2. Chronic

1. Acute osteomyelitis-

- It can be Primary (Haematogenous) or secondary (following an open fracture of bone operation).
- Primary/ haematogenous osteomyelitis is commonest (seen in children).

Etiopathogenesis-

- Staphylococcus aureus (Commonest cause)
- Other- streptococcus, pneumococcus

Sites-

- Lower femoral metaphysis (Commonest site)
- Other common site- upper tibia, upper femoral and upper humeral metaphysis.

Pathology-

Infection of bone (by bacteria)

Inflammatory reaction show by bone

Destruction of bone

Produce pus (exudate+cells)

Clinical Features-

- Its a diseases of childhood.
- More common in boys (Prone to injury)
- Presents with an acute onset of pain and swelling at the end of bone.
- Fever
- Find a primary focus of infection elsewhere in body (tonsil, skin etc.)

Examination-

- The child is febrile and dehydrated
- Present with classical sign of inflammation (Redness, heat, oedema, pain and loss of function) localised to the metaphyseal area of bone.
- In later stages, abscess in the muscle or subcutaneous plane.

Investigation-

- Blood- CBC, ESR are elevated
- X-ray
- Bone scan

Treatment-

- Treatment depends upon the duration of illness-

If the Patient is brought within 48 hours of the onset of the Pain-

(supposed that pus has not yet formed)

- Rest of limb
- Antibiotics and anti-inflammatory drugs give.

If the patient is brought-after 48 hours of the onset of symptoms-

- In this condition conservative treatment does not respond already collection of pus within or outside of bone.
- Surgical exploration and drainage is necessary.

Complication-

General complication-

- Septicaemia and Pyemia.
- If uncontrolled- may be fatal.

Local complication- (due to delay in diagnosis & treatment)

- Chronic Osteomyelitis
- Acute pyogenic arthritis.

Pathological fracture- through weakened bone.

Growth plate disturbances- (shortening, lengthening or deformity of limb)

Chronic Osteomyelitis-

Chronic Osteomyelitis is used for chronic pyogenic Osteomyelitis.

Pathology-

AO commonly leads to CO because of one or more of the following reasons:

- Delayed and inadequate treatment:

Delayed causes spread of pus within the medullar cavity and subperiosteally.

- Type and virulence of organism

Body defence mechanism may not able to control highly virulent organism so persists infection.

- Reduced immunity

When infection persists of the above reasons

↓

Bone responds by generating more and more sub-periosteal new bone so osteomylitic bone has an irregular surface

↓

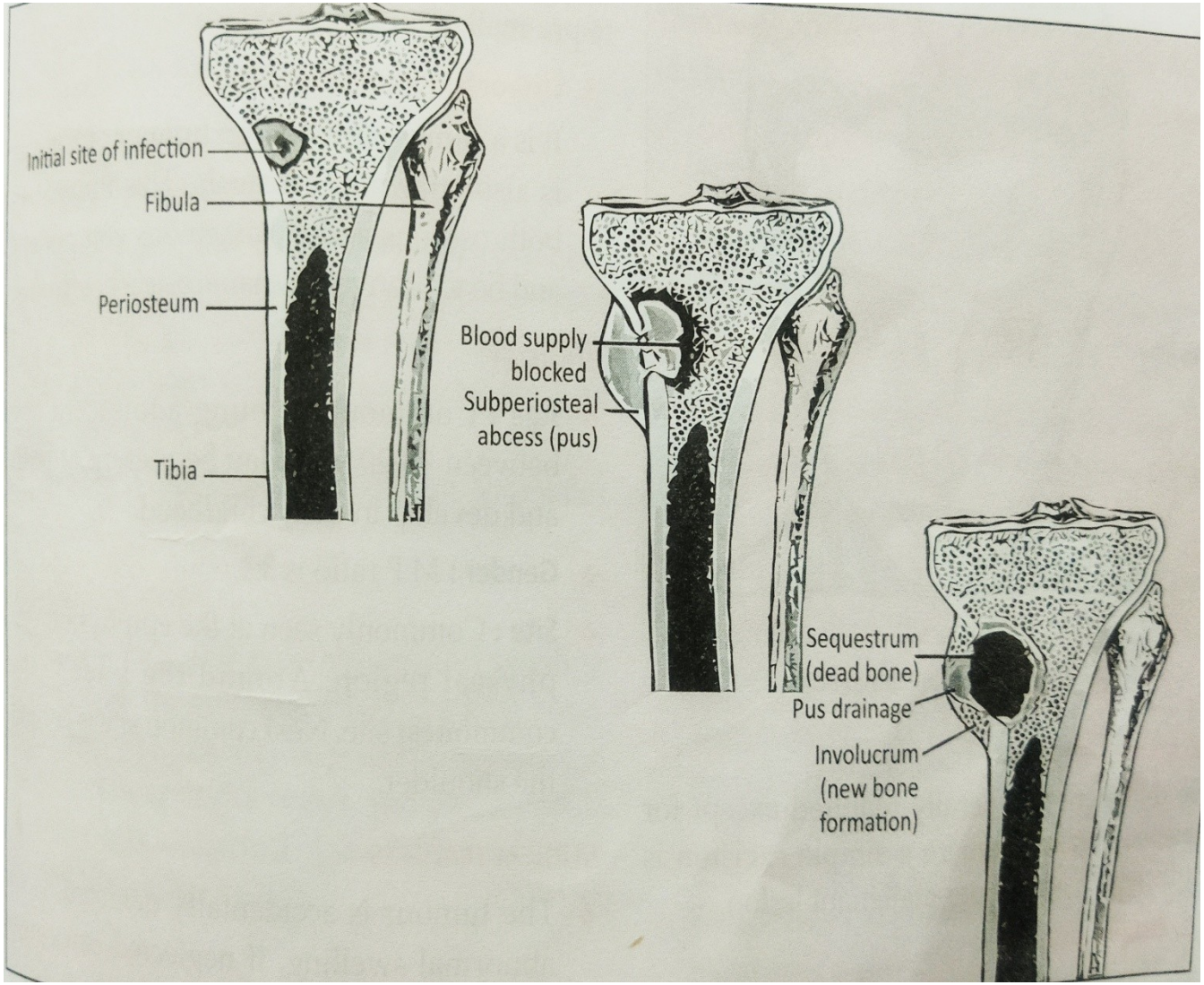
Continuous discharge of pus results in the formation of a sinus.

↓

Sinus tract gets fibrosed and the sinus fixed to the bone.

Cardinal features of chronic osteomyelitis: three main features

1. Sequestrum- it is a piece of dead bone.
2. Involucrum – it is the dense sclerotic bone overlying a sequestrum.
3. Cloaca- there may be some holes in the involucrum for pus to drain out.


Initial site of infection
Fibula
Periosteum
Tibia
Blood supply blocked
Subperiosteal abcess (pus)
Sequestrum (dead bone)
Pus drainage
Involucrum (new bone formation)

Clinical features-

- A chronic discharging sinus is the commonest presenting symptoms.
- Thickened, irregular bone.
- Tenderness on deep palpation.
- Generalized symptoms like fever, malaise etc.

Investigation-

- Same as acute Osteomyelitis.
- In X-ray- sequestrum, involucrum and cloaca.

Treatment-

- Proper debridement and drainage of wound.
- Sequestrectomy- excision of unhealthy dead piece of bone.
- Amputation- rarely requires, if chronic sinus undergoes in malignant changes.

According to ayurveda-

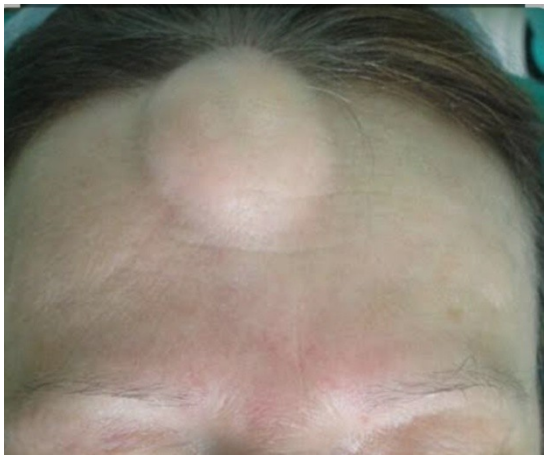
अथमज्जपरीपाको घोरः समुपजायते।
सोऽस्थिमांसनिरोधेन द्वारं न लभते यदा।
ततः स व्याधिना तेन ज्वलनेनेव दह्यते।
अस्थिमज्जोष्मणा तेन शीर्यते दह्यमानवत्।
विकारः शल्यभूतोऽयं क्लेशयेदातुरं चिरम्।
अथास्य कर्मणा व्याधिर्द्वारं तु लभते यदा।

ततो मेदःप्रभं स्निग्धं शुक्लं शीतमथो गुरु।
भिन्नेऽस्थ्नि निःस्रवेत् पूयमेतदस्थिगतं विदुः।
विद्रधिं शास्त्रकुशलाः सर्वदोषरुजावहम्। (सु. नि

vk;qosZn fpfdRlk&

- izR;k[;s; le>dj fpfdRlk djuh pkfg,A
- Lusgu o Losnu ds i”pkr~ jDreks{k.kA
- Ikkd gksus ij vfLFk esa HksnuA
- iw;jfgr gksus ij oz.k dk “kks/ku djuk pkfg,A
- frDrnzO;ks ds DokFk ls iz{kkyuA

Bone Tumours



1. Benign 2. Malignant

1. Benign Tumours

I- Osteoma-

- Composed of sclerotic, well –formed bone.
- Most often are the skull and facial bones.
- It produce visible swelling.
- Sometimes it may bulge into one of the air sinuses (frontal ethmoidal etc) and cause obstruction to the sinus cavity, leading to pain.

Treatment-

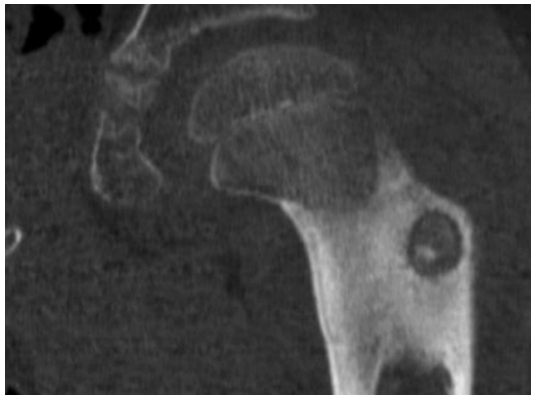
- No treatment is generally except for cosmetic region.
- Simple excision.

II. Osteiod osteoma-

- It is true benign tumour of the bone.
- It consists of a nidus of partially mineralized osteoid trabeculae surrounded by dense sclerotic bone.

Clinical features-

- Seen commonly between the age of 5-25 years.
- The bones of the lower extremity are commonly effected(Tibia).
- Presenting complaint is an irritating pain, worst at night and relieved by salicylates(Aspirin).



Examination-

- Superficial palpable swelling.

Investigation-

- X-ray, CT, MRI, Bone Scan.

Treatment-

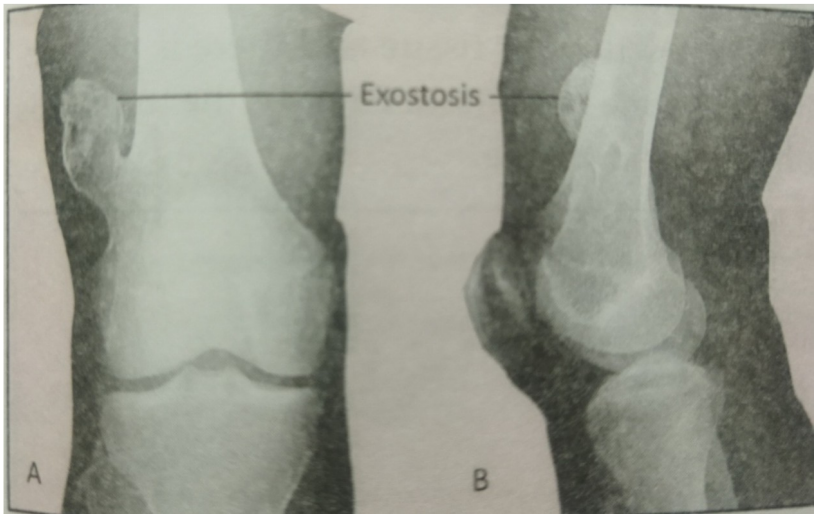
- Complete excision of the nidus along with sclerotic bone.

III. Osteochondroma (Exostosis)-

- It is commonest benign tumour of bone.
- Osseous and cartilaginous both are component of this tumour.

Aetiology-

- Age- common is adolescent age between 10-20 years.
- Gender-
- M:F Ratio- is 3:1
- Sites around knee is the commonest site, next common site is around the shoulder.



Clinical features-

- It is accidently detected as an abnormal swelling.
- If neglected pressure symptoms on neighbouring structure like muscle, vessels and nerves.
- It can also mechanical obstruction of joint movement.

Investigation- X-ray

Treatment- Complete excision.

2. Malignant Tumours-

I- Giant cell Tumour (GCT)-

- It is locally malignant tumour of the bone.
- Local recurrence is more common(=50%).
- 5% accounts of bone tumours.

Aetiology-

- Age- 20-40 years.
- Sites- Epiphyseal end of long bone (Upper end of tibia, lower end of humours, lower end of redius etc.)
- Gender- A little higher to females.

Clinical features-

- It is present slow growing, painful swelling.
- Egg shell crackling may be present on palpation.
- Limitation of joint movement is late features.
- Mainly arising the epiphyseal end of a long bone.

Investigation-

X-ray: show classical lytic lesion (Soap bubble appearance).

Treatment- complete excision.

II- Osteosarcoma-

- This is a highly malignant intra-medullary bone tumour
- Highly mortality rate.

Clinical features-

- Pain is the earliest presenting features.
- Gradually limitation of joint movment.
- Pathological fracture is occurs.
- Metastasis- lungs is the commonest site.

Investigation-

- X-ray- show in typical case, sun ray or Sun burst appearance.
- Bone scan, CT, MRI.

Treatment-

- Limb salvage should always be attempted when possible but one should not hesitate to recommend amputation when needed.
- Radiotherapy
- Chemotherapy

III- Multiple myeloma-

- It is a tumour arising from neoplastic proliferation of plasma cells or myeloma.
- Normal plasma cells are found in the bone marrow.

Pathology-

- Affects flat bones i.e., the pelvis, vertebrae, skulls and ribs.
- It may occurs as a solitary lesion, multiple lesions etc.
- The bone is simply replaced by tumour tissue and there is no reactive new bone formation.

Clinical features-

- The tumour affects adults above 40 years.
- Men is more affected than women.
- Presentation is that of multiple site involvement.
- Complaint is increasingly severe pain in the lumber and thoracic spine.
- Loss of weight.
- Neurological symptoms due to press on the spinal cord or the nerve.
- Locally tenderness or swelling over the affected bone.

Investigation-

- X-ray- Multiple punched out lesions in the flat bone.
- Blood- Hb%- Low, ESR high, Increase protein A/G ratio etc.
- Urine- Bence Jones proteins are found.
- Sternal Puncture- Myeloma cells may be seen.
- Bone scan, CT.

Treatment-

Excision

Radiotherapy

Chemotherapy.

iv- Ewing's sarcoma-

- This is a malignant small, round, blue cell tumour.
- Genetic factor is responsible for a large percentage.
- More common in male, usually present in childhood (10 to 20 year age).
- Most common site- pelvis and proximal long tubular bone.
- Patients usually experience extreme bone pain.

Sign and symptoms-

- Fever, anaemia, ESR increased etc.
- On radiography lamellated or Onion skin type lytic lesions with periosteal reaction.

Treatment-

- Chemotherapy
- Radiotherapy
- Excision

Metastatic Bone tumours-

- Secondary tumours in the bone happen when cancer cells spread to the bone from a primary tumour somewhere else in the body.
- Secondary cancer in the bone are sometimes called bone secondary.
- Cancer spread to bone- breast cancer, thyroid cancer, prostate cancer, kidney cancer, lungs cancer etc.

Simple Bone Cyst-

- It is benign cystic lesion filled with fluid seen in children.

Incidence-

- Age- 5-15 years.
- Gender- M:F ratio is 2:1
- Sites- proximal humerus and proximal femure etc.

Clinical presentation-

- Always detected accidentally except in cases with pathological fracture when patient present with pain.

Investigation-

- X-ray- shows an osteolytic lesions.

Treatment-

- As spontaneous resolution is seen.
- Treatment is necessary only if no resorption is observed.
- Steroids prednisolone is injected into the cyst.
- Total excision and bone grafting done, if conservative management not respond.