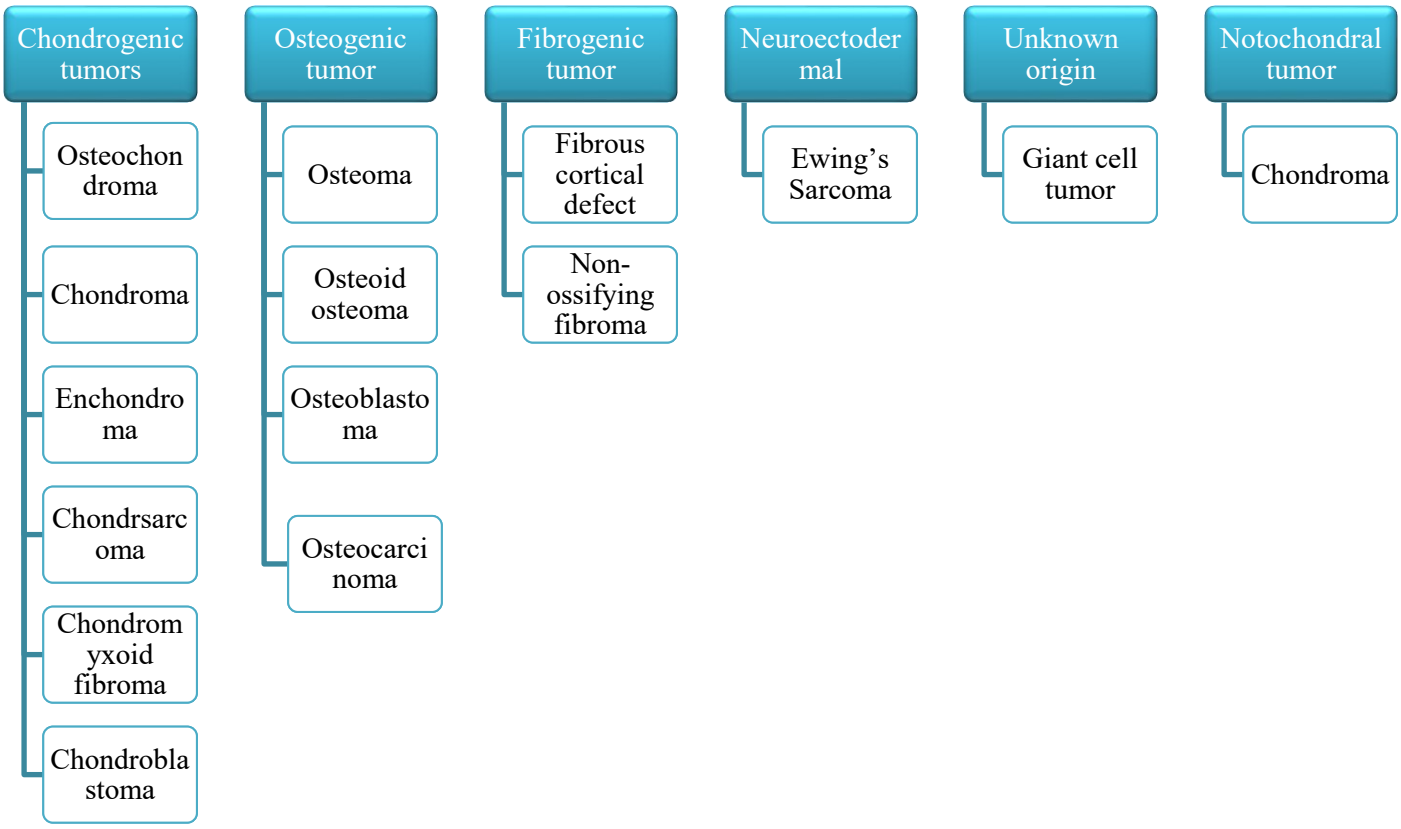
TUMORS OF BONE

- Classification
  - Histologic type:
    1. Haematopoietic
    2. Chondrogenic
    3. Osteogenic
    4. Fibrogenic
    5. Unknown origin
    6. Nueroectodermal
    7. Notochondral



- Osteosarcoma:
  - Malignant mesenchymal tumor – cancerous cells produce bone matrix.
  - Preference for metaphysical region of tubular long bones.
  - 50% of cases occur around the knee.
  - Bimodal age distribution
  - Most commonly affected bones are –proximal humerus, distal radius, distal femur, tibia
  - Smaller peak in elderly – most commonly secondary with primary bone diseases like Paget's disease, bone infarct or prior radiation.
  - Men> Women

  - Pathogenesis:
    - 70% have acquired genetic abnormalities.
    - Frequent gene mutations
    - Retinoblastoma gene – critical cell cycle regulator
    - P53 gene – a DNA repair gene

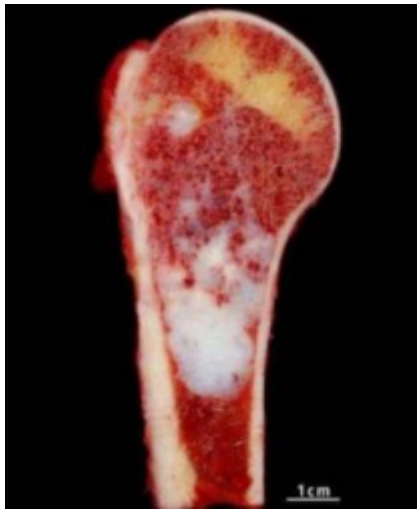
- Bone tumors:
  - Gross:
    i. Big bulky tumors that are gritty, grey-white containing areas of haemorrhage and cystic degeneration.
    ii. Tumor tissues destroy the surrounding cortices and produces soft tissue mass.
    iii. Spreads extensively along the medullary canal, infiltrating and replaning the marrow, surrounding pre-existing bony trabaculae.
    iv. Infrequently penetrate the epiphysis to enter the joints.

  - Microscopy:
    i. Tumor cells vary in size and shape and frequently have large hypochromatic nuclei
    ii. Mitosis and bizarre giant cells are common.
    iii. Formation of bone by tumor cells is characteristic feature.
    iv. Neoplastic bone (tumor osteoid) has a coarse lace-like architecture and surrounded by the tumor cells.
    v. Osteosarcoma may exhibit multinucleated osteoclast like giant cells.

  - Clinical Features:
    i. Presents as painful progressively enlarging mass
    ii. Radiographically – Large destructive mixed lytic and blastic mass with infiltrate margins.

iii. Codman's triangle- triangular shadow between cortex and raised end of periosteum.
iv. Haematogenous spread is common.

- Chondrosarcoma:

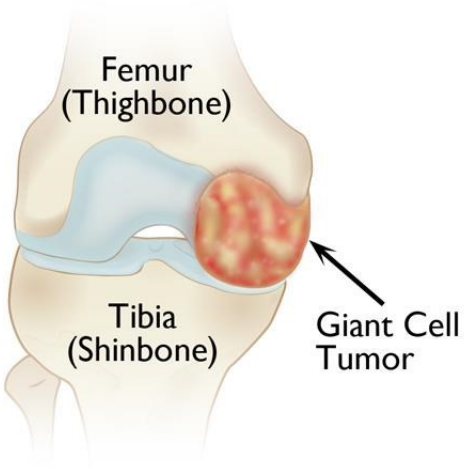


- Malignant tumor of cartilage.
- 2nd most common.
- Affects males twice as that of female.
- Subclassified according to site as
  1. Central (intermedullary)
  2. Peripheral(Juxtacortical and surface)
- Site of occurrence – central portion of the skeleton – pelvis, shoulder and ribs.
- Gross:
  i. Greyish, lobulated mass.
  ii. Focal calcification(may be)
  iii. Mucoid degeneration or necrosis

- Microscopy:
  i. Enlarged plump nuclei.
  ii. Multiple cells per lacunae.
  iii. Hyperchromatic nuclear pleomorphism.

- Grading:
  i. Graded from 1(low)to 3(high)
  ii. High grade chondrosarcoma have increased cellularity, atypia and mitosis.
  iii.

➢ Osteoclastoma:



- Also known as giant cell tumor of the bone.
- Relatively uncommon, benign but locally aggressive tumor.
- Individuals in their 20s and 40s.
- Arises in the ends of the long bones, epiphyses predominantly.

- Gross:
  i. Large, red brown tumor undergoing frequent cystic change.

- Microscopy:
  i. Uniform and mononuclear cell - proliferating part of the tumor.
  ii. Scattered osteoclasts seen in the background having 100 or more nuclear resembling nuclei of mononuclear cells.
  iii. Secondary features: necrosis, haemosiderin deposition and reacting new bone formation.

- Clinical course:
  i. Frequently causes arthritis like symptoms due to location of the tumor.
  ii. Cystic lesion radiographically.
  iii. Conservative surgery as curettage associated with 40-60% recurrence.