Benign Lesion

- well defined, sclerotic border
- lack of soft tissue mass
- solid periosteal reaction
- geographic bone destruction

Malignant Lesion

- interrupted periosteal reaction
- moth-eaten or permeative bone destruction
- soft tissue mass
- wide zone of transition
Clues by appearance

Patterns of Bone Destruction

- Geographic
- Moth-eaten
- Permeative
Geographic Bone Destruction

- Destructive lesion with sharply defined border
- Implies a less-aggressive, more slow-growing, benign process
- Narrow transition zone
Geographic Lesions

- Non-ossifying fibroma
- Chondromyxoid fibroma
- Eosinophilic granuloma
Moth-eaten Appearance

- Areas of destruction with ragged borders
- Implies more rapid growth
- Probably a malignancy
Multiple Myeloma; Patterns of Bone Destruction

- Geographic
- Moth-eaten
- Permeative
Examples of Moth-eaten Appearance

- Myeloma
- Metastases
- Lymphoma
- Ewing’s sarcoma
Permeative Pattern

- Ill-defined lesion with multiple “worm-holes”
- Spreads through marrow space
- Wide transition zone
- Implies an aggressive malignancy
- Round-cell lesions
Patterns of Bone Destruction

- Geographic
- Moth-eaten
- Permeative
Permeative Pattern
Round cell lesions

- Lymphoma, leukemia
- Ewing’s Sarcoma
- Myeloma
- Osteomyelitis
- Neuroblastoma
Periosteal Reactions

- **Benign** (None or Solid)
- More aggressive or malignant
  - Lamellated or onion-skinning
  - Sunburst
  - Codman’s triangle
• Codman’s triangle
Tumour Matrix

- **Osteoblastic**
  - Fluffy, cotton-like or cloud-like densities eg Osteosarcoma

- **Cartilaginous**
  - Comma-shaped, punctate, annular, popcorn-like eg enchondroma
Expansile Lesions of Bone

- Multiple myeloma
- Brown tumor
- Mets
- Enchondroma
- Aneurysmal bone cyst
- Lymphoma
- Fibrous dysplasia
Clues by Location of Lesion
In transverse plane

- **Central**
  
  *Enchondroma*

- **Eccentric**
  
  *GCT, osteosarcoma, fibroma*

- **Cortical**
  
  *Non-ossifying fibroma, osteoid osteoma*

- **Parosteal**
  
  *Parosteal osteosarc, osteochondroma*
In the Longitudinal Plane

- **Epiphyseal**
  - GCT, chondroblastoma
- **Metaphyseal**
  - Osteomyelitis, osteo-and chondrosarcoma
- **Diaphyseal**
  - Round cell lesions, ABC, enchondromas
Tumor Types; Characteristic Locations

- Simple bone cyst
  - Proximal humerus
- Chondroblastoma
  - Epiphyses
- Giant Cell tumor
  - Epiphyses
Characteristic Tumors By Body Site

Pelvic Lesions

- Chondrosarcoma
- Solitary plasmacytoma
- Chordoma
Lesions of the Spine

- Osteoblastoma
  - Expansile, with punctate densities within
- Chordoma
- ABC
- Metastatic disease
Sclerotic met
Characteristic Locations

- Adamantinoma
  - Tibia
- Chordoma
  - Sacrum, clivus
- Osteoblastoma
  - Spine, posterior
Clues by Density Of Lesion

- **Sclerotic Cortical Lesions**
  - Osteoid osteoma
  - Brodie’s abscess
  - Stress fracture
Osteoid Osteoma
Healing Stress Fracture
Lytic Lesions in Children

- *Eosinophilic granuloma*
- Neuroblastoma
- Leukemia
Lytic Lesions in Adults

- Metastatic lesions
  - Lung
  - Renal
  - Thyroid
- Multiple myeloma
- Primary bone tumor
Blastic Lesions in Children

- Medulloblastoma
- Lymphoma
Blastic Lesions in Adults

- Metastatic disease
  - Breast – female
  - Prostate – male
- Lymphoma
- Paget’s disease
- Etc mastocytosis, fluorosis
Other Clues
Benign Lesions Without Sclerotic Borders

- Giant Cell tumor
- Brown tumor
- Osteolytic phase of Paget’s Disease
Soft Tissue Extension

• *Usually implies malignancy*

• *Benign conditions with soft tissue extension*

  Osteomyelitis