

# BONE TUMORS

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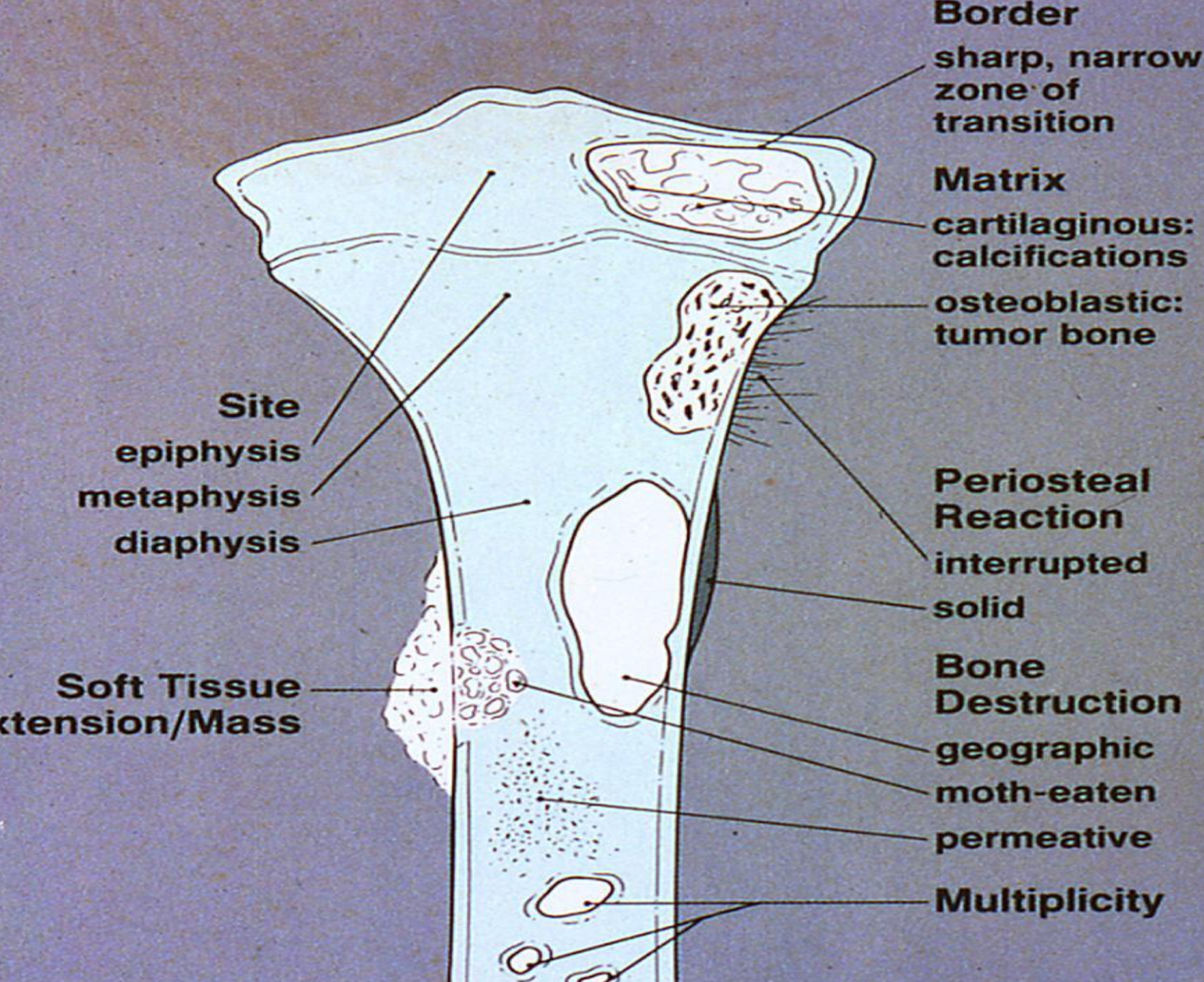
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Orthopedic Oncology

College of Medicine

Department of Orthopaedics





## Benign Lesion

## Malignant Lesion

well defined,  
sclerotic border

lack of soft  
tissue mass

solid  
periosteal  
reaction

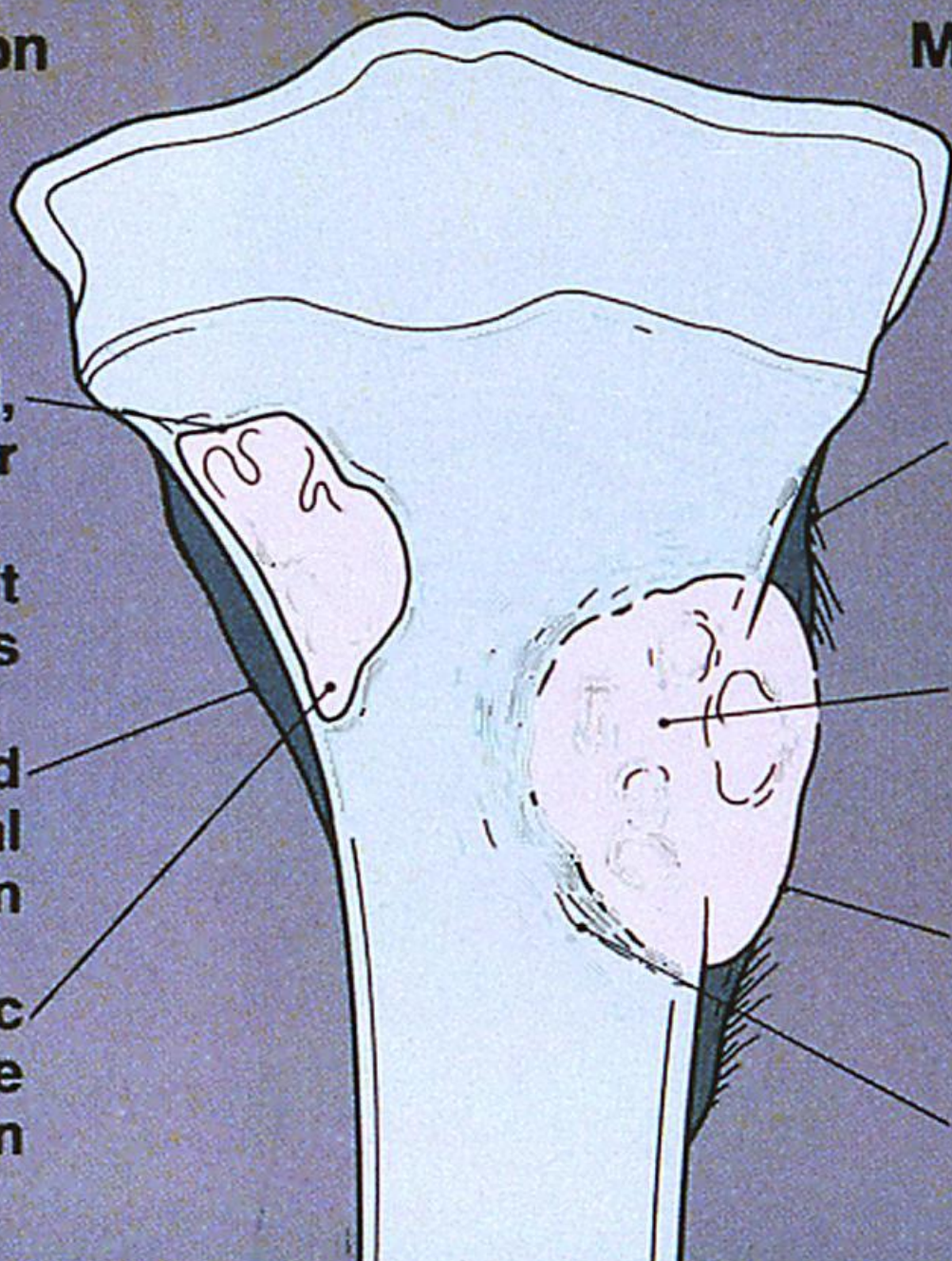
geographic  
bone  
destruction

interrupted  
periosteal  
reaction

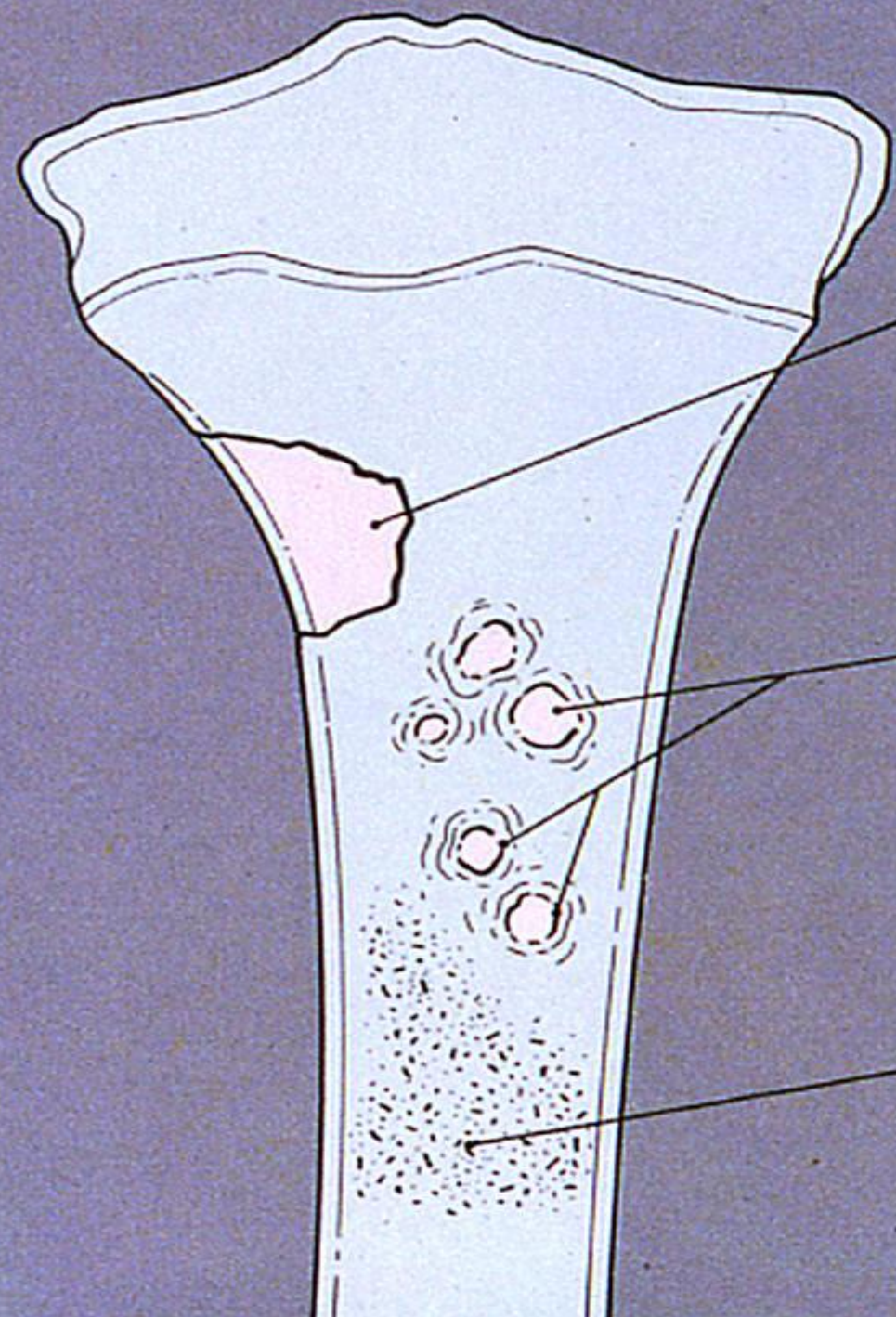
moth-eaten  
or permeative  
bone destruction

soft tissue  
mass

wide zone  
of transition







### **Benign Process**

geographic—uniformly  
destroyed area  
with sharply  
defined border

### **Likely Malignant Process**

moth-eaten—areas  
of destruction  
with ragged  
borders

### **Aggressive/Malignant Process**

permeative—  
ill-defined  
area spreading  
through marrow  
space



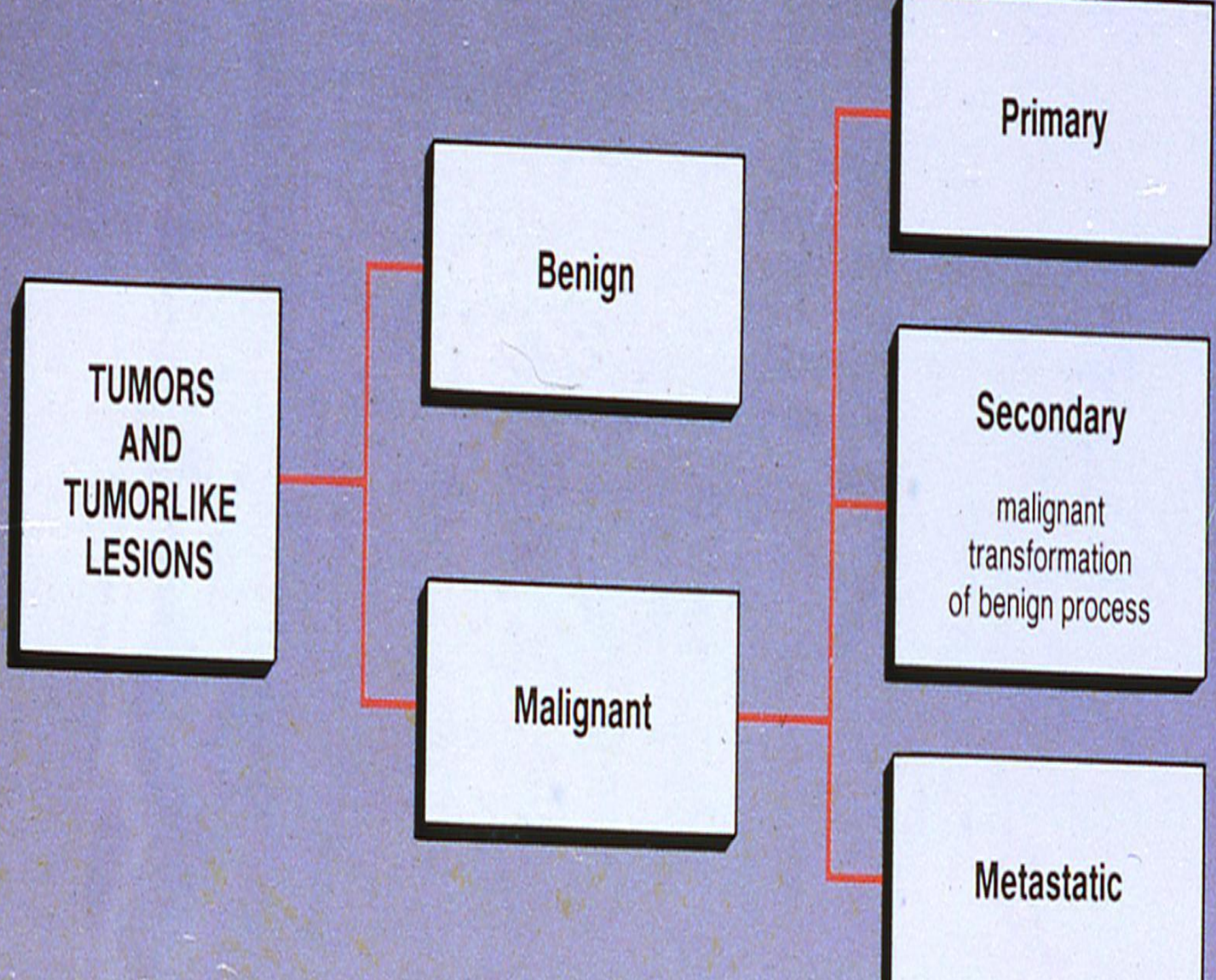




FIG. 13.2 CLASSIFICATION OF TUMORS AND TUMORLIKE LESIONS BY TISSUE OF ORIGIN

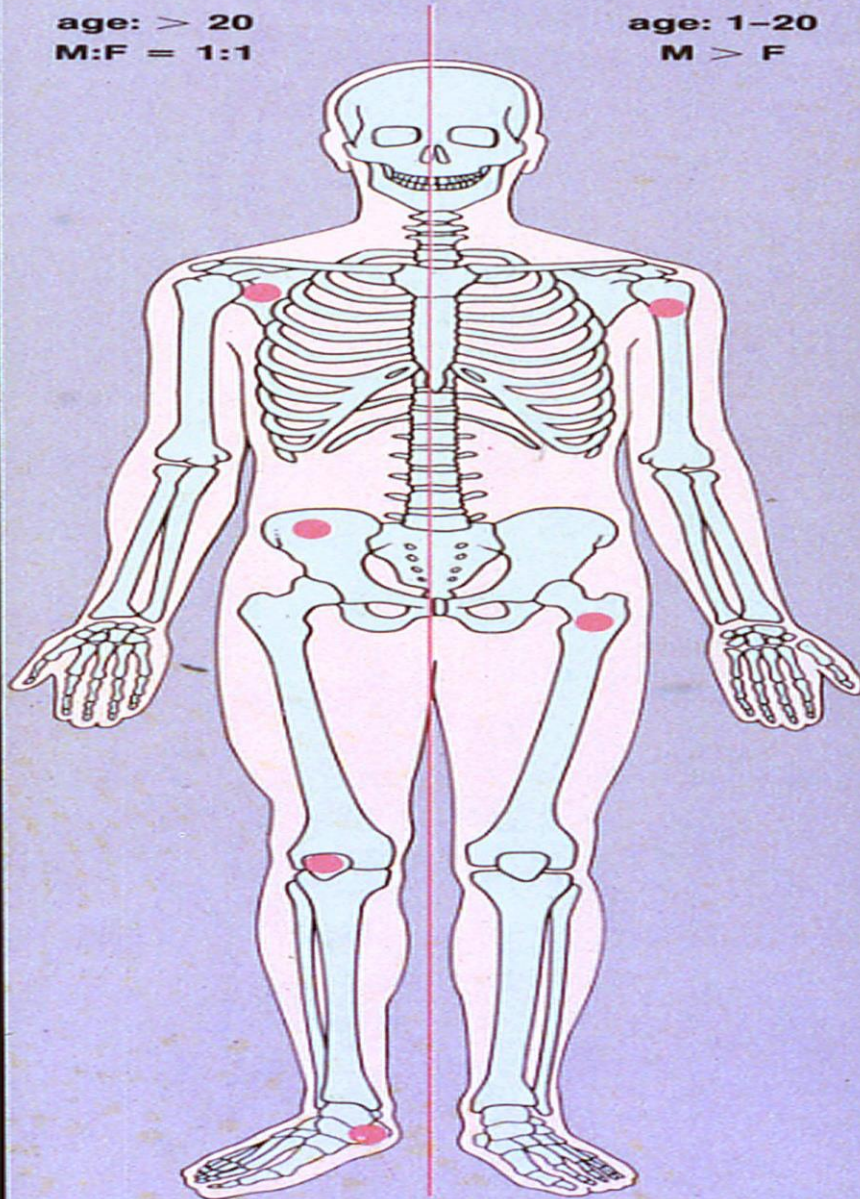
Tissue of Origin	Benign Lesion	Malignant Lesion
Bone-forming (osteogenic)	Osteoma Osteoid osteoma Osteoblastoma	Osteosarcoma (and variants) Juxtacortical osteosarcoma (and variants)
Cartilage-forming (chondrogenic)	Enchondroma (chondroma) Periosteal (juxtacortical) chondroma Enchondromatosis (Ollier's disease) Osteochondroma (osteochondrogenous exostosis, single or multiple) Chondroblastoma Chondromyxoid fibroma	Chondrosarcoma (central) Conventional Mesenchymal Clear cell Dedifferentiated Chondrosarcoma (peripheral) Periosteal (juxtacortical)
Fibrous and fibrohistiocytic (fibrogenic)	Fibrous cortical defect (metaphyseal fibrous defect) Nonossifying fibroma Benign fibrous histiocytoma Fibrous dysplasia (mono- and polyostotic) Periosteal desmoid Desmoplastic fibroma Osteofibrous dysplasia (Kempson- Campanacci lesion) Ossifying fibroma (Sissons' lesion)	Fibrosarcoma Malignant fibrous histiocytoma
Vascular	Hemangioma Glomus tumor Cystic angiomas	Angiosarcoma Hemangioendothelioma Hemangiopericytoma
Bone-marrow (hematopoietic) and lymphatic	Giant cell tumor (osteoclastoma) Eosinophilic granuloma Lymphangioma	Malignant giant cell tumor Histiocytic lymphoma Hodgkin's disease Leukemia Myeloma (plasmacytoma) Ewing's sarcoma
Neural (neurogenic) Notochordal	Neurofibroma Neurilemoma	Malignant schwannoma Chordoma
Fat (lipogenic)	Lipoma	Liposarcoma
Unknown	Simple bone cyst Aneurysmal bone cyst Intraosseous ganglion	Adamantinoma



## Simple Bone Cyst

age: > 20  
M:F = 1:1

age: 1-20  
M > F



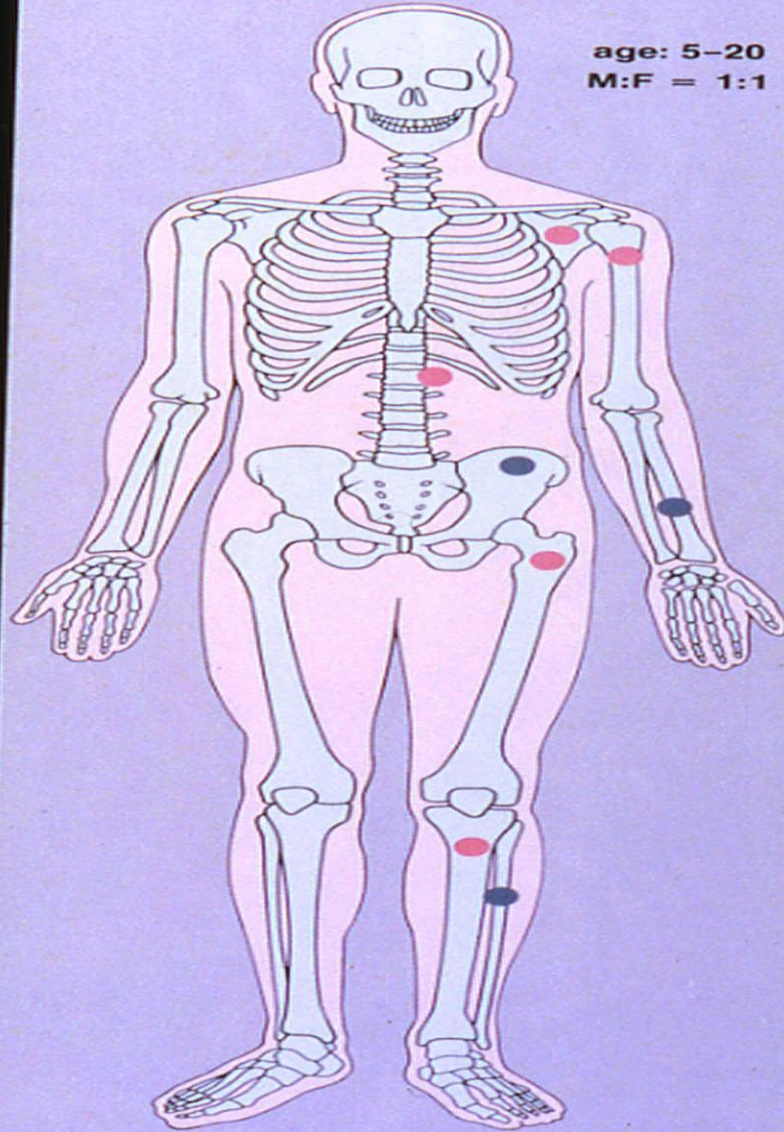





# Aneurysmal Bone Cyst

age: 5-20

M:F = 1:1



 common sites

 less common sites



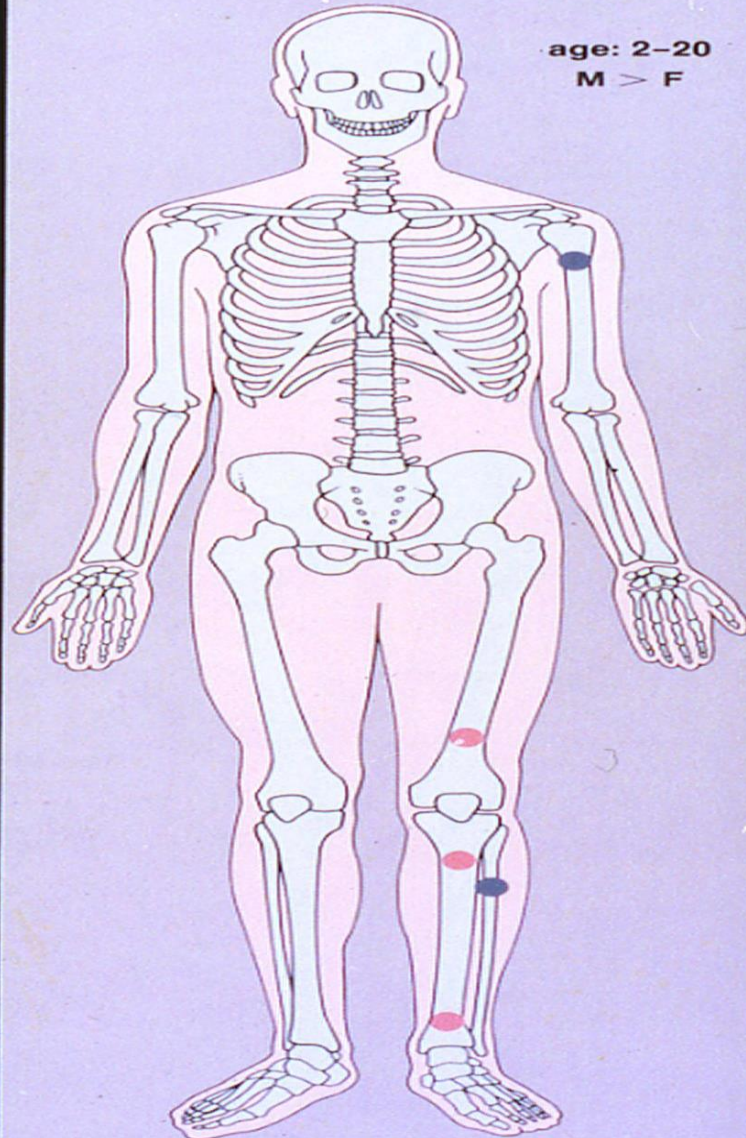




# Fibrous Cortical Defect and Nonossifying Fibroma

age: 2-20

M > F



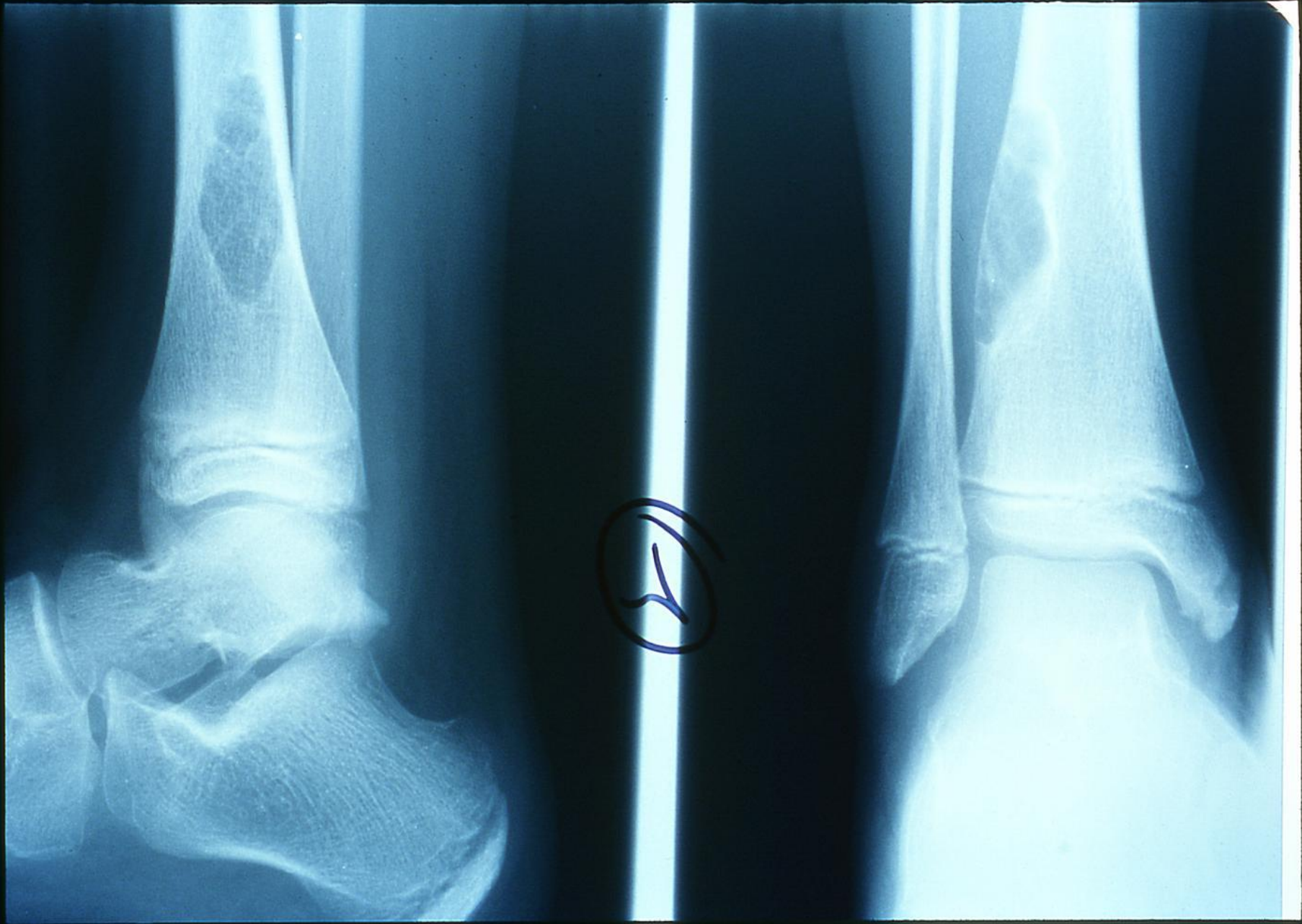
■ common sites

■ less common sites





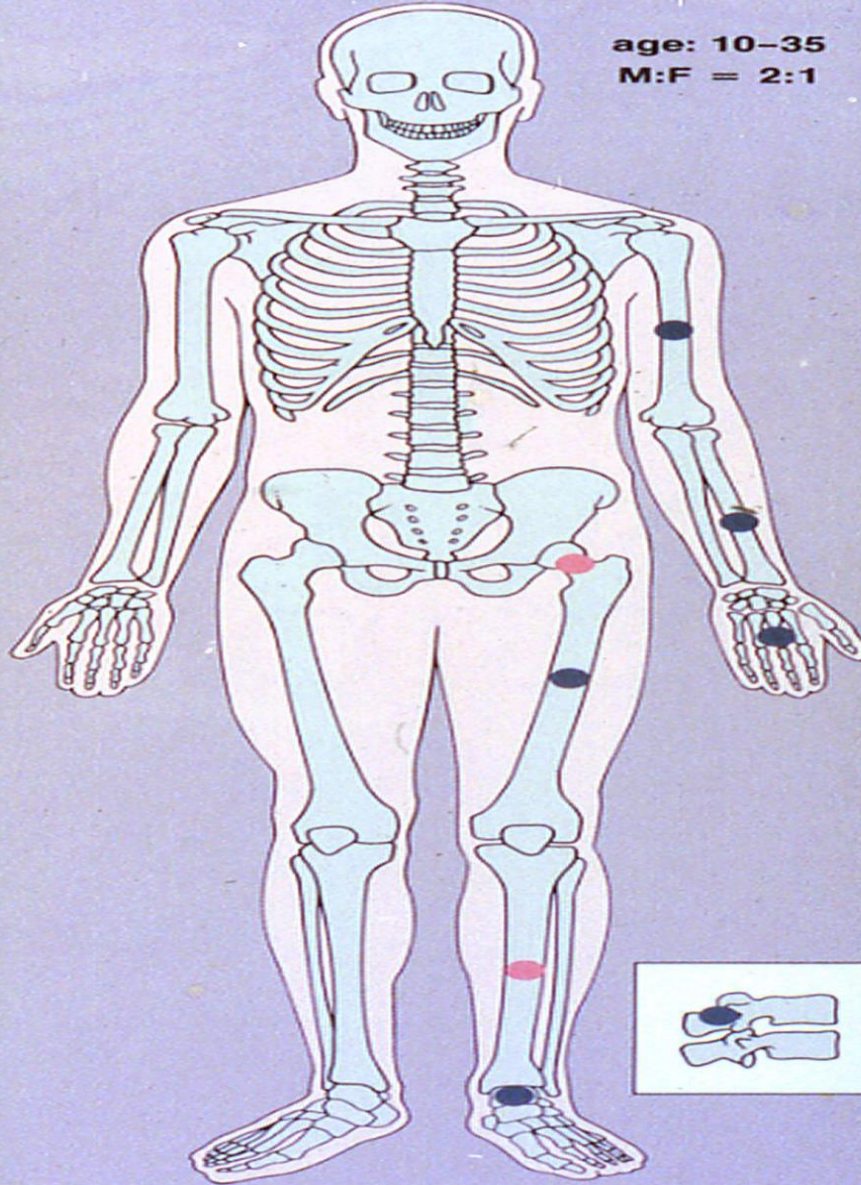






# Osteoid Osteoma

age: 10-35  
M:F = 2:1



■ common sites

■ less common sites





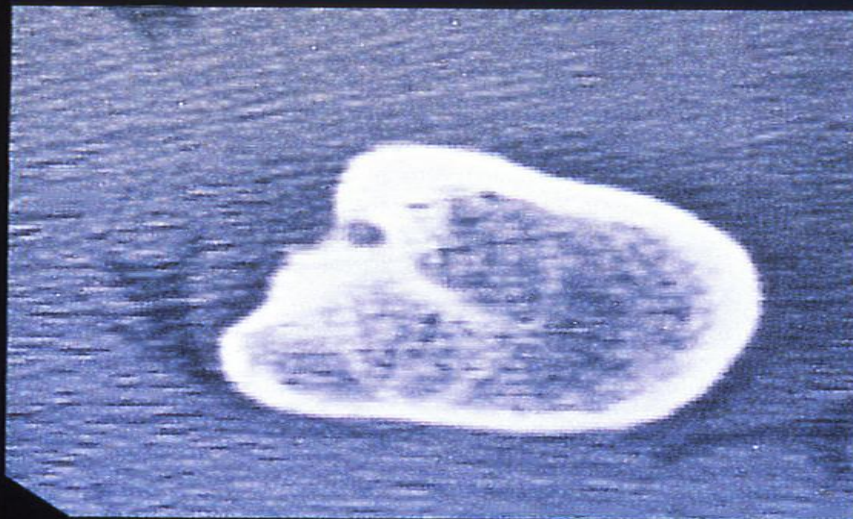




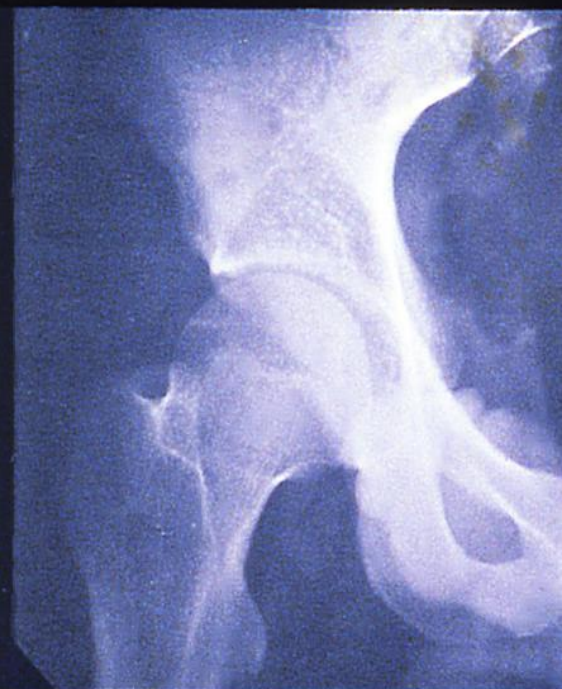










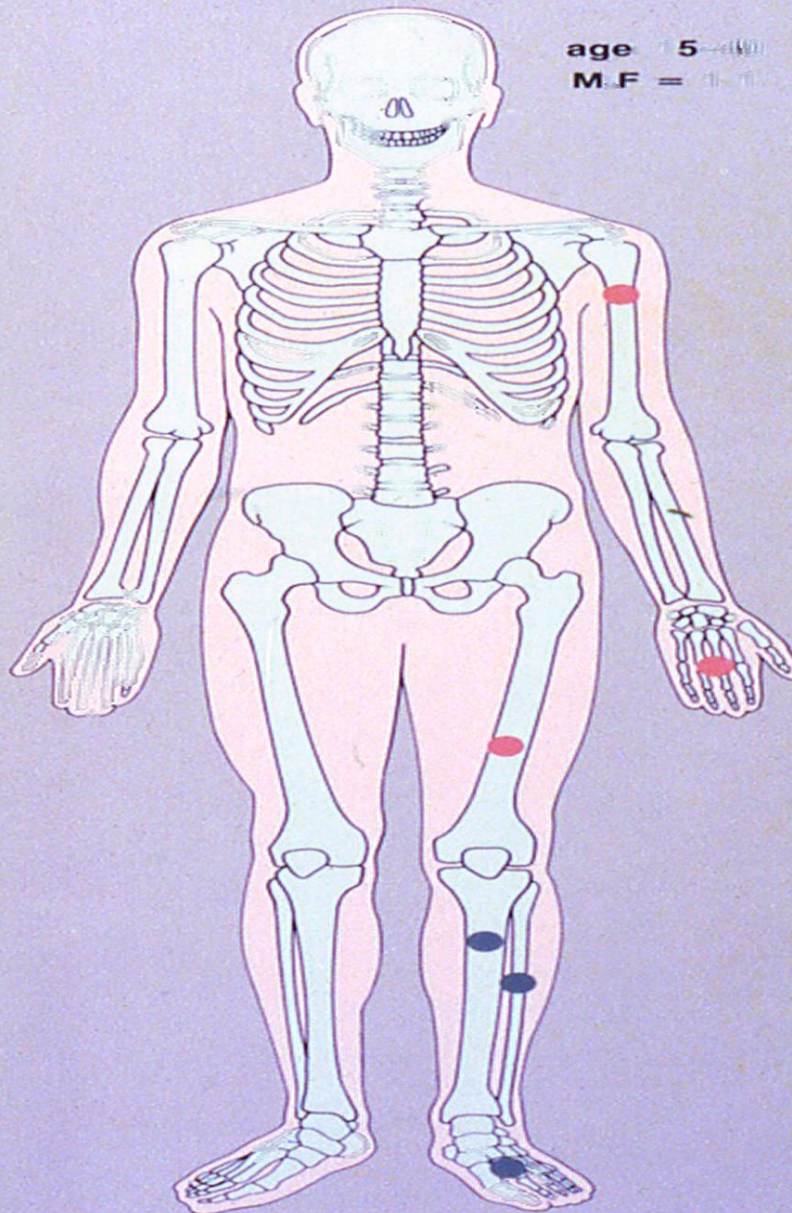





# Ewing sarcoma

age 7-50

M.F = 1:1



 common sites

 less common sites





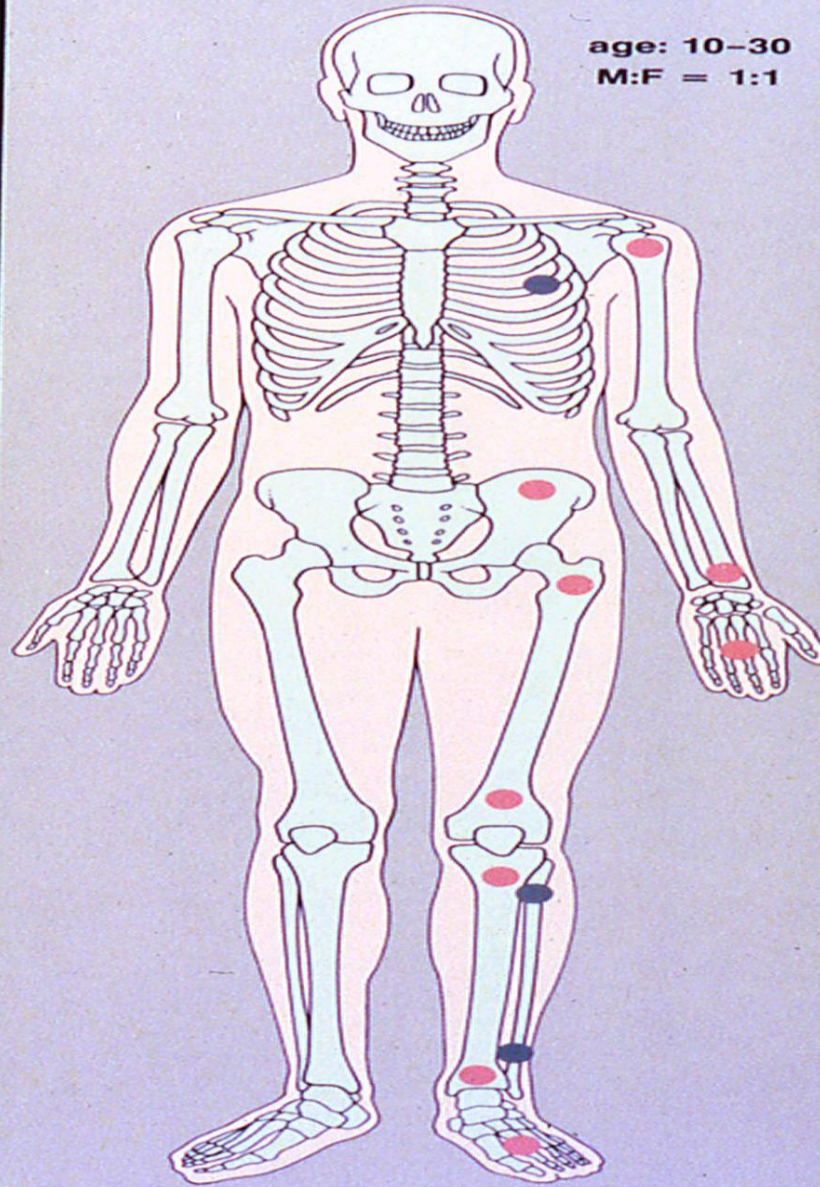






# Enchondromatosis (Ollier's Disease)

age: 10-30  
M:F = 1:1



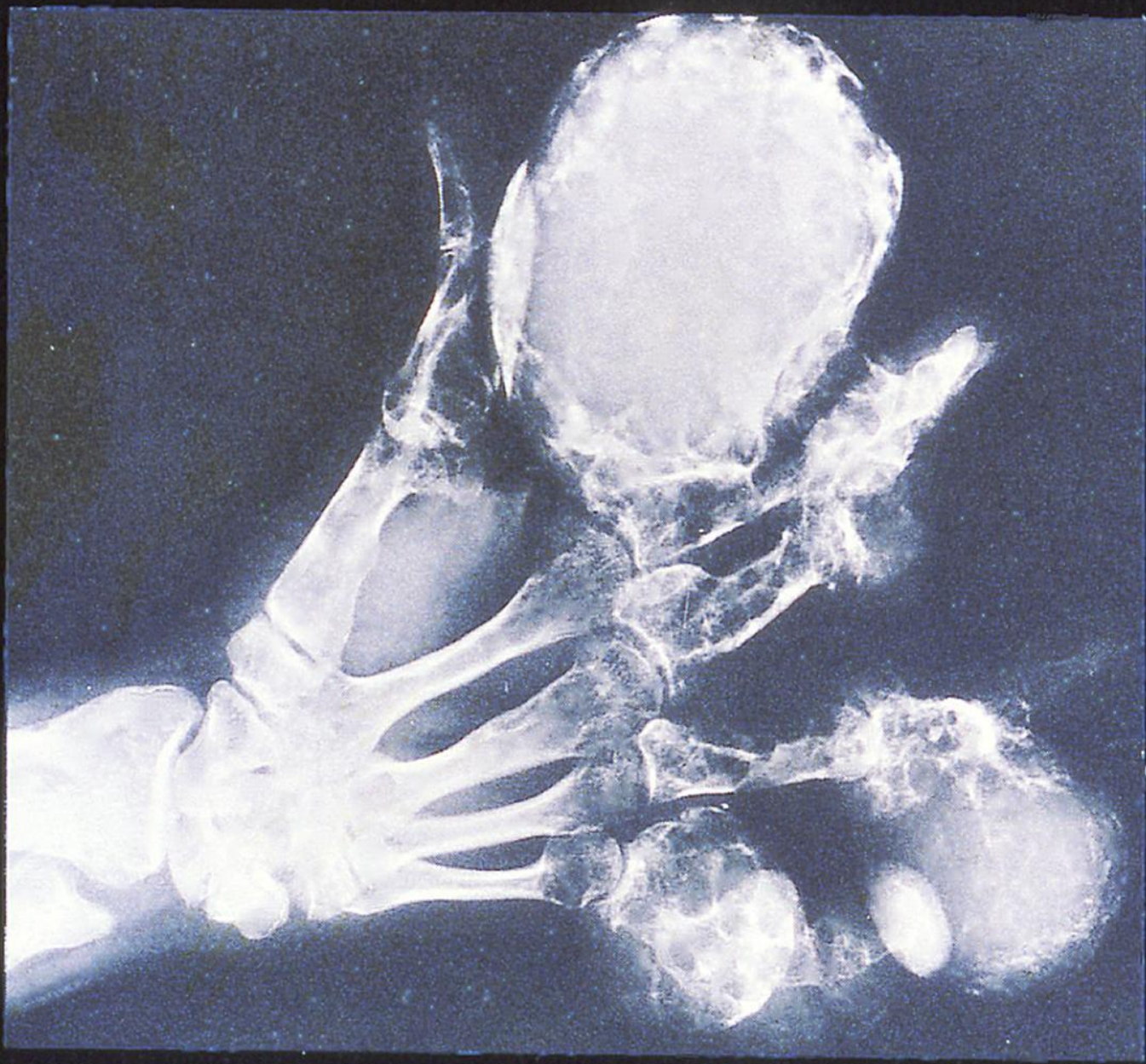
 common sites

 less common sites







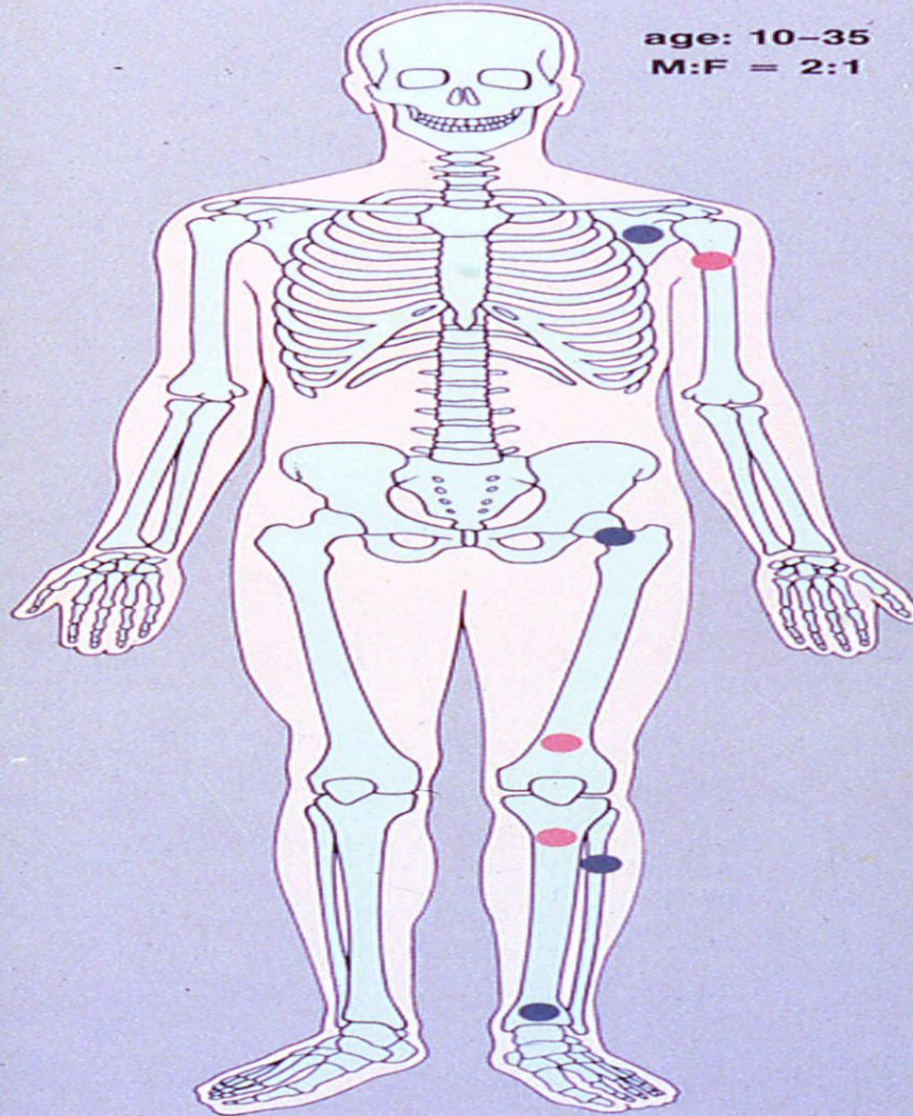





# Osteochondroma

age: 10-35

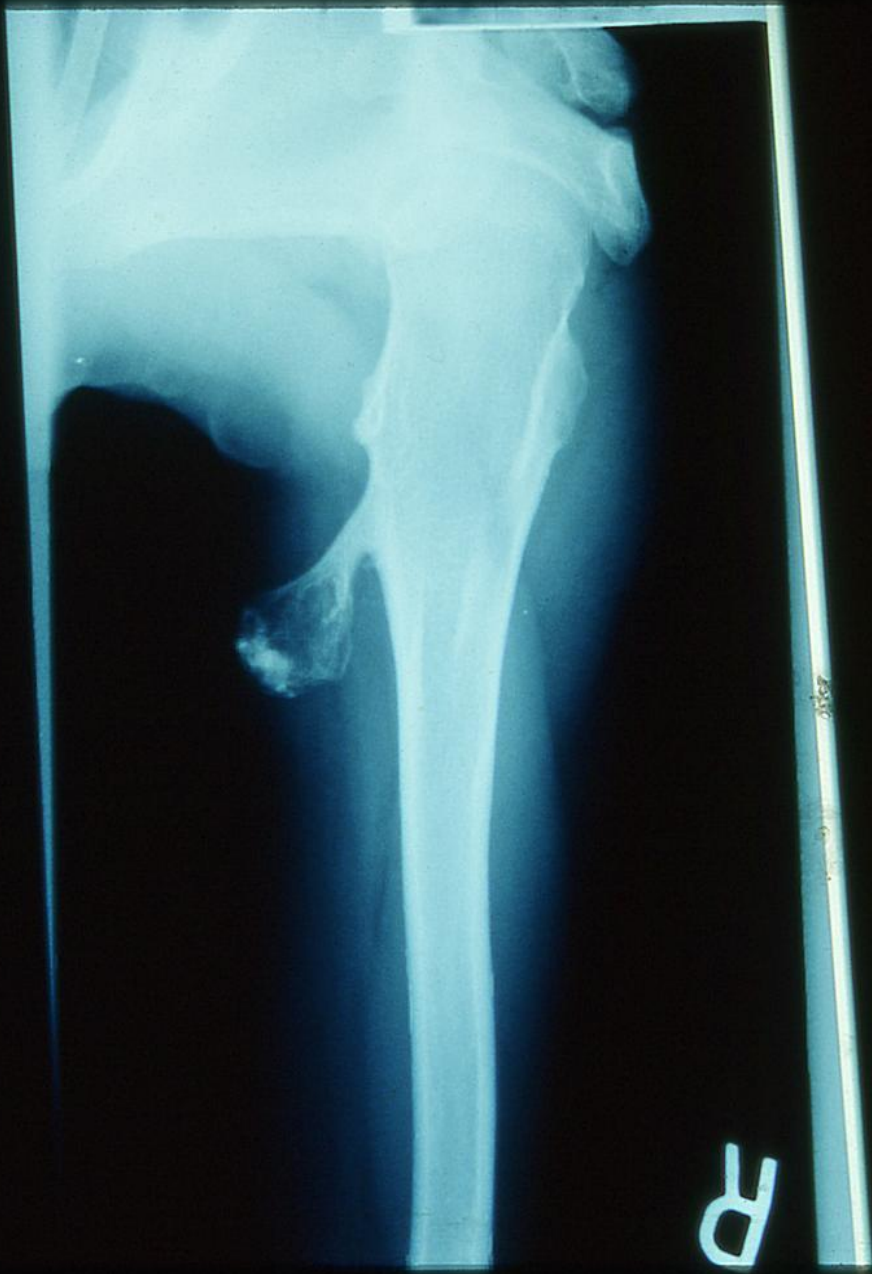
M:F = 2:1



 common sites

 less common sites



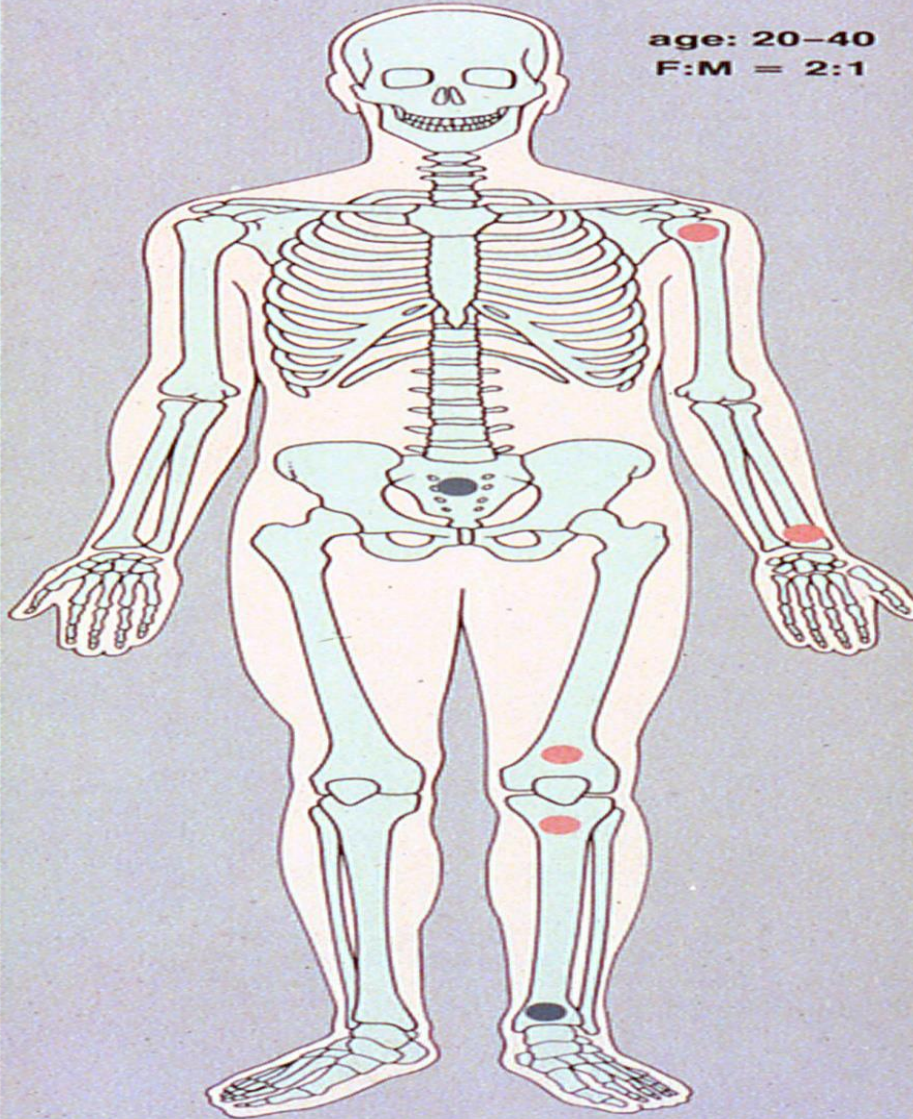





# Giant Cell Tumor

age: 20-40

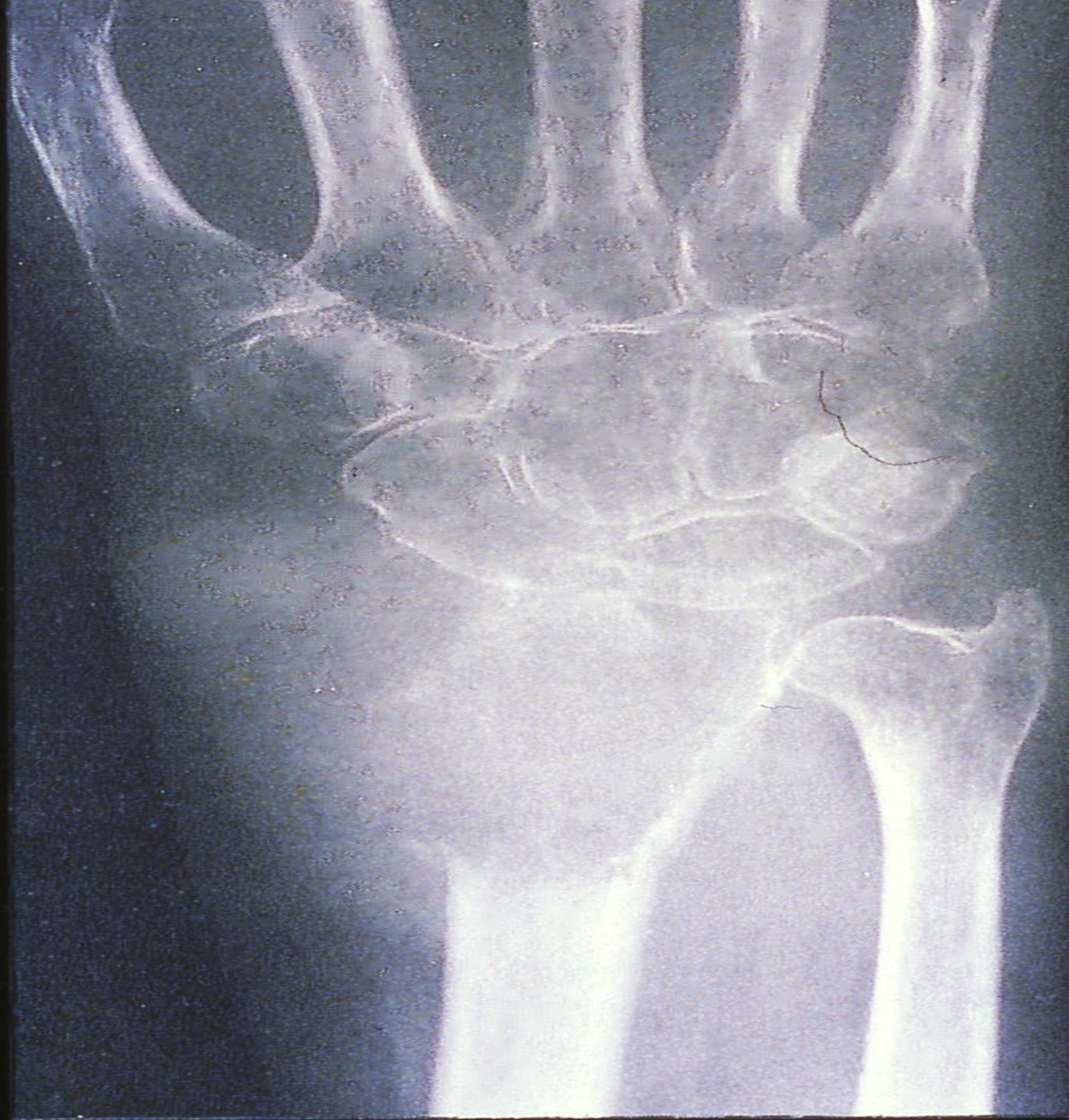
F:M = 2:1



 common sites

 less common sites



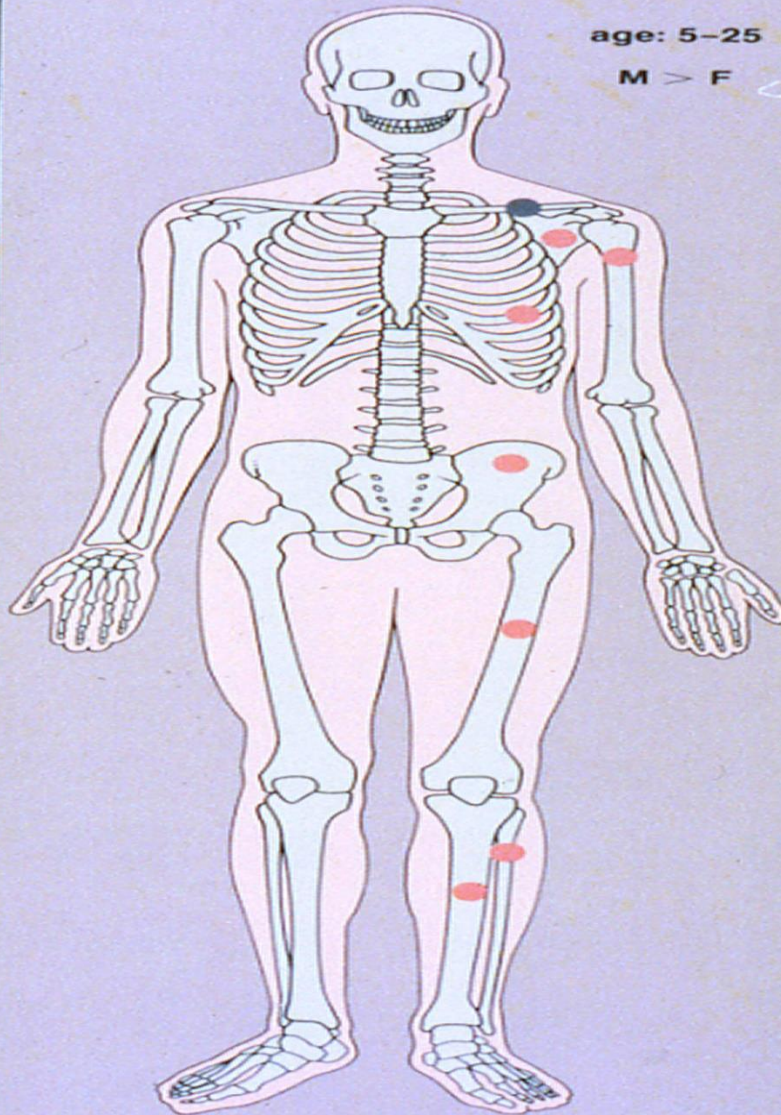




# Ewing's Sarcoma

age: 5-25

M > F



■ common sites

■ less common sites











# OSTEOSARCOMA

**Primary**

**Secondary**

**Metastatic**

malignant  
transformation  
of benign  
conditions

**Conventional**

**Lungs**

**Low-Grade  
Central**

**Paget's  
Sarcoma**

**Bones**

**Telangiectatic**

**Postradiation  
Sarcoma**

**Multicentric  
(Multifocal)**

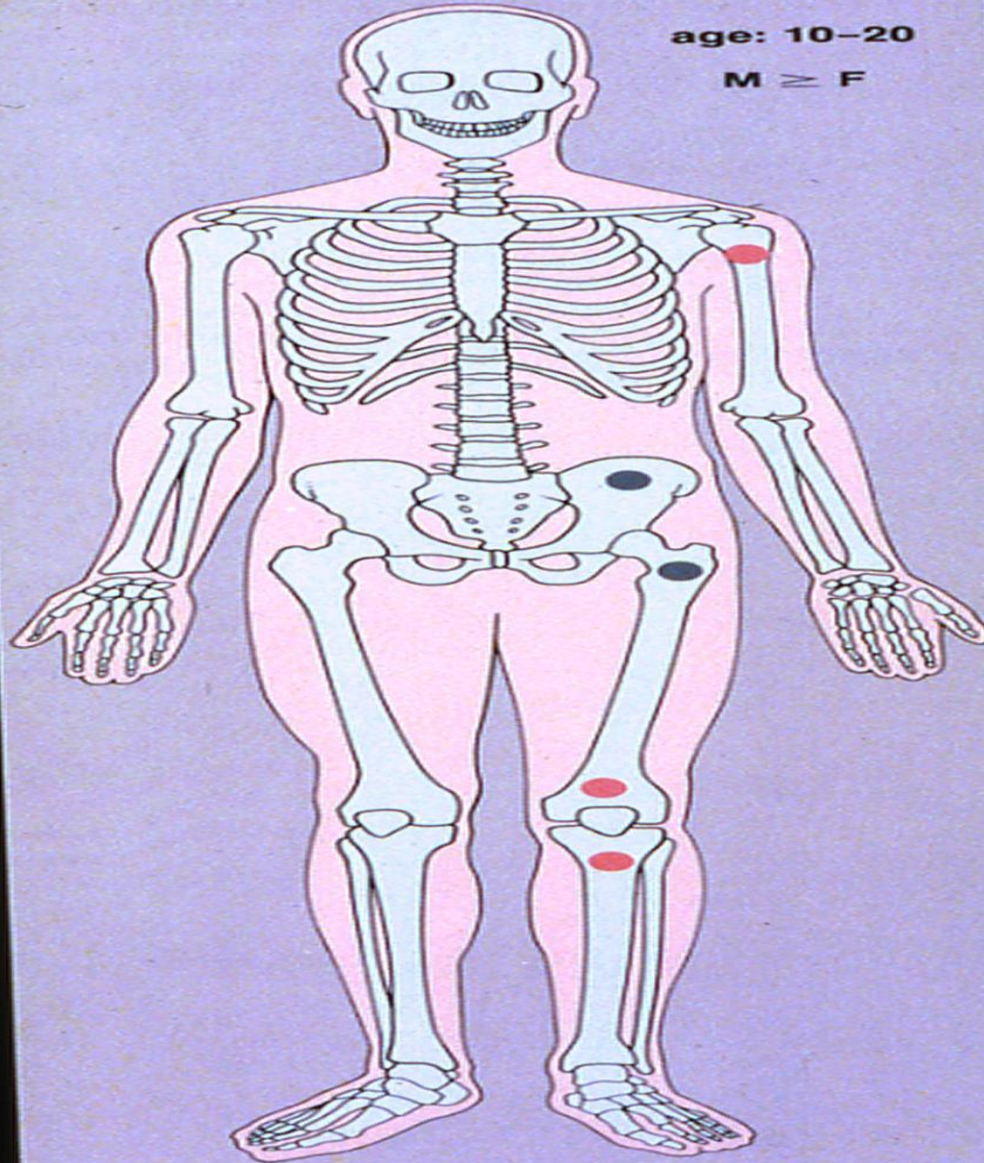
**Juxtacortical**



# Conventional Osteosarcoma

age: 10-20

M = F



■ common sites

■ less common sites

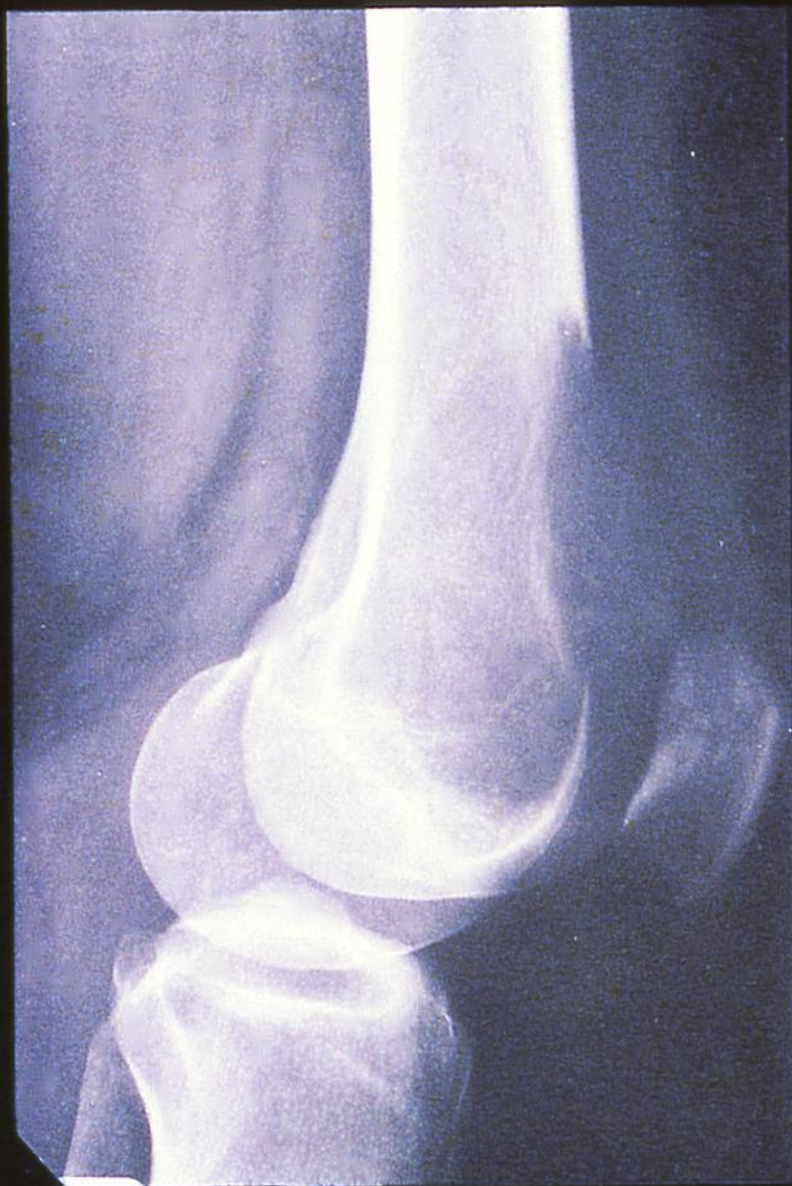








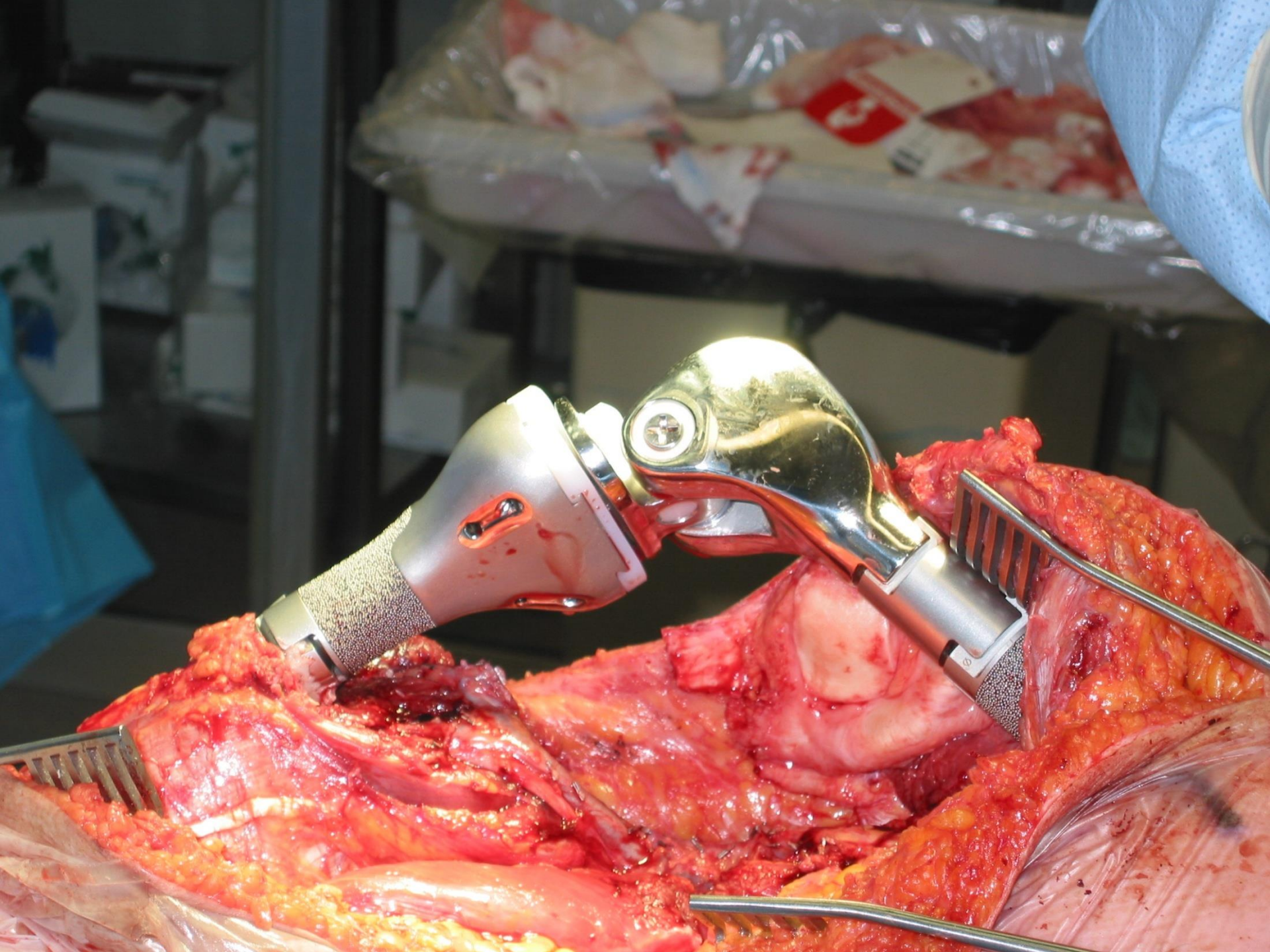










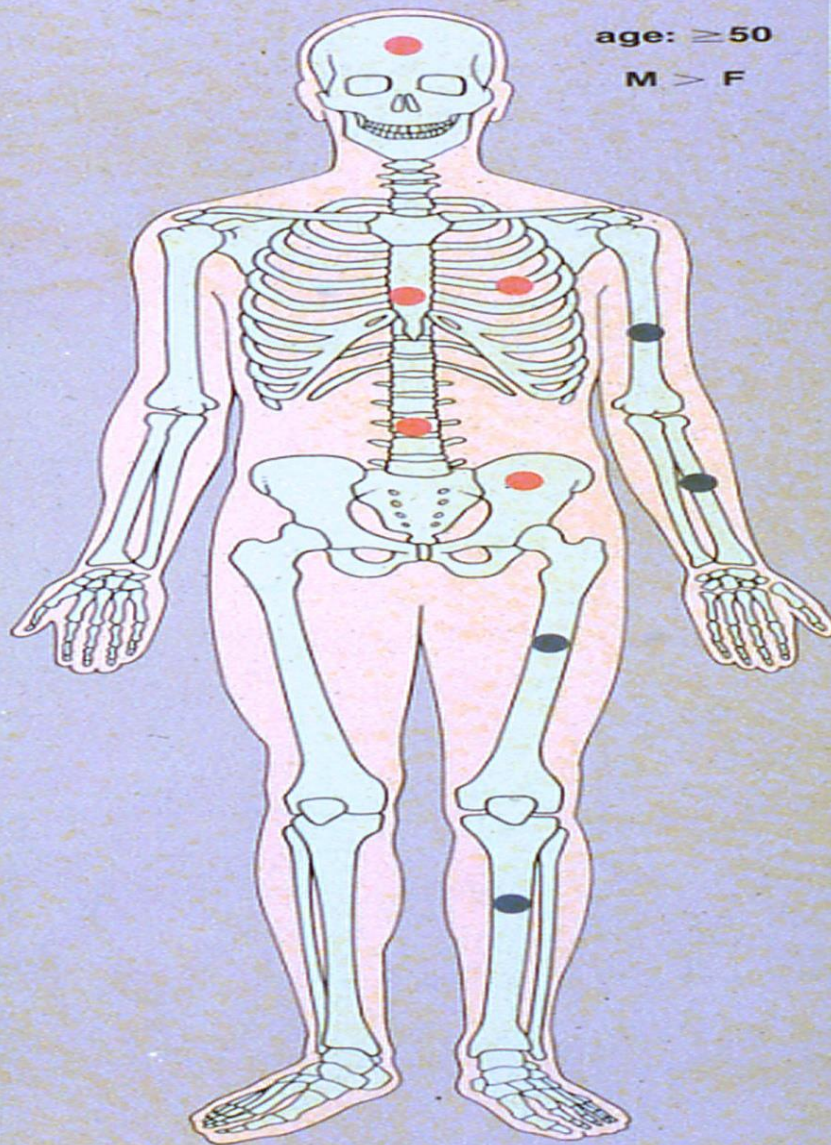




# Myeloma

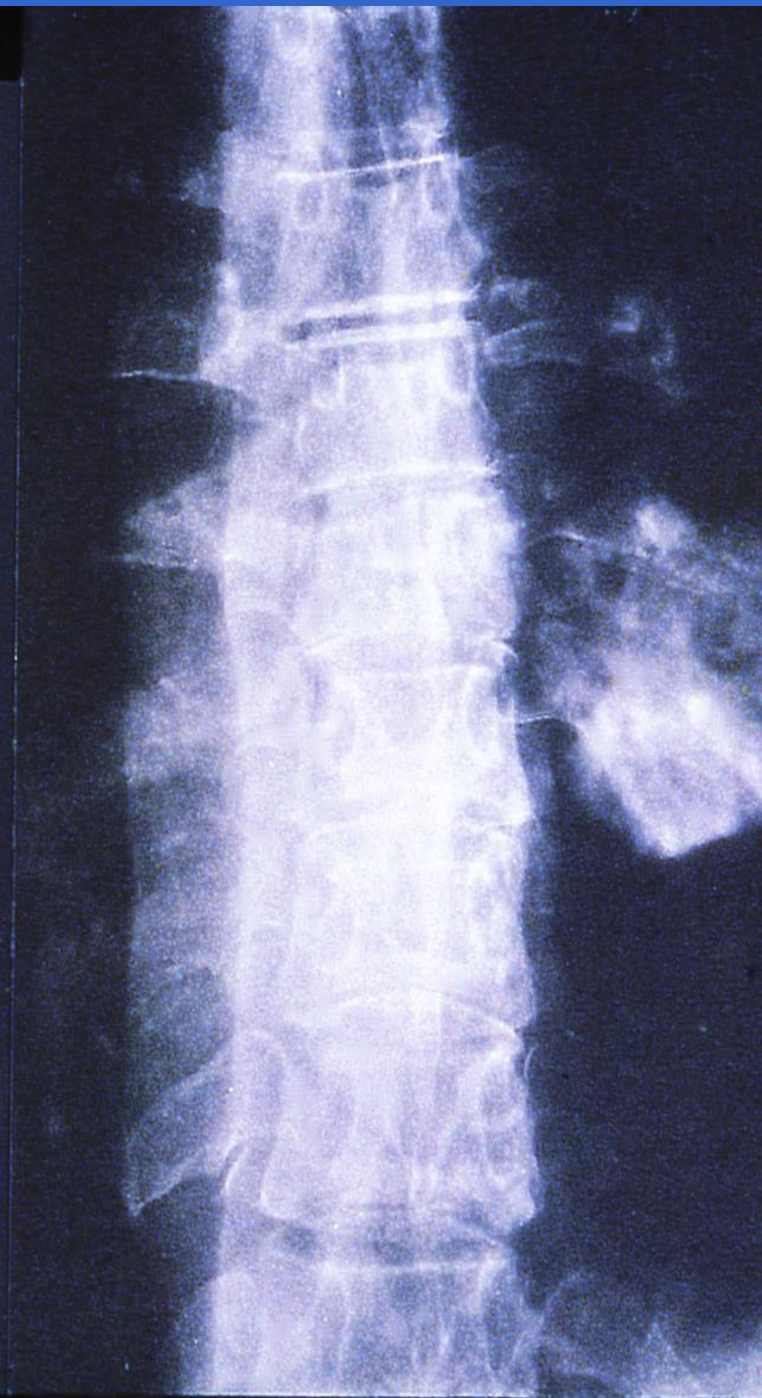
age:  $\geq 50$

M > F

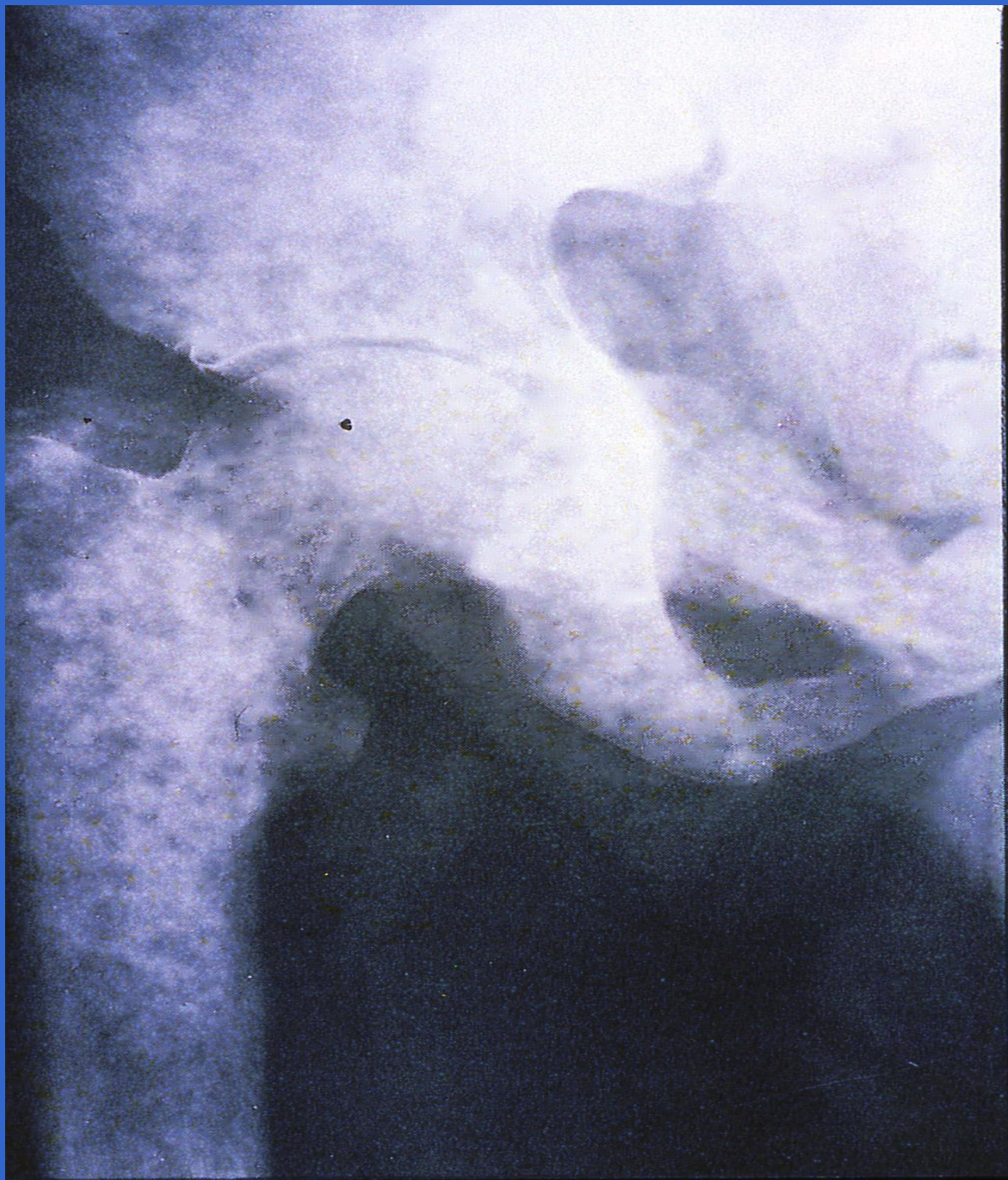


 common sites  
 less common sites

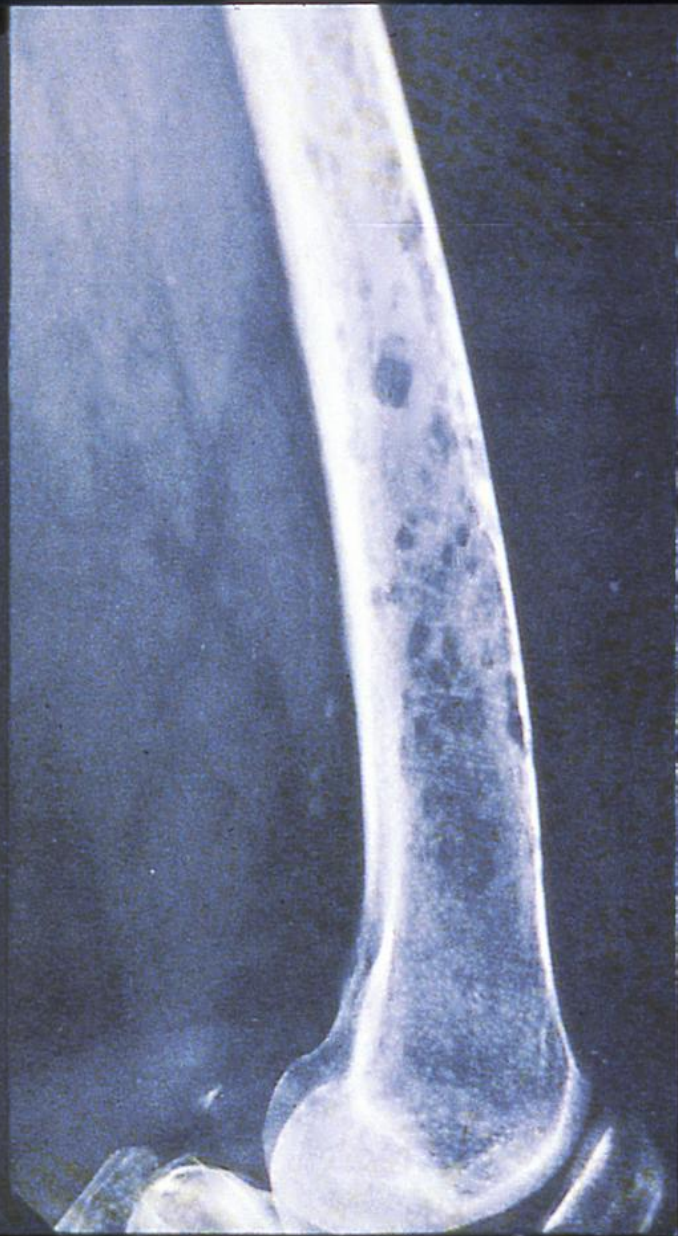




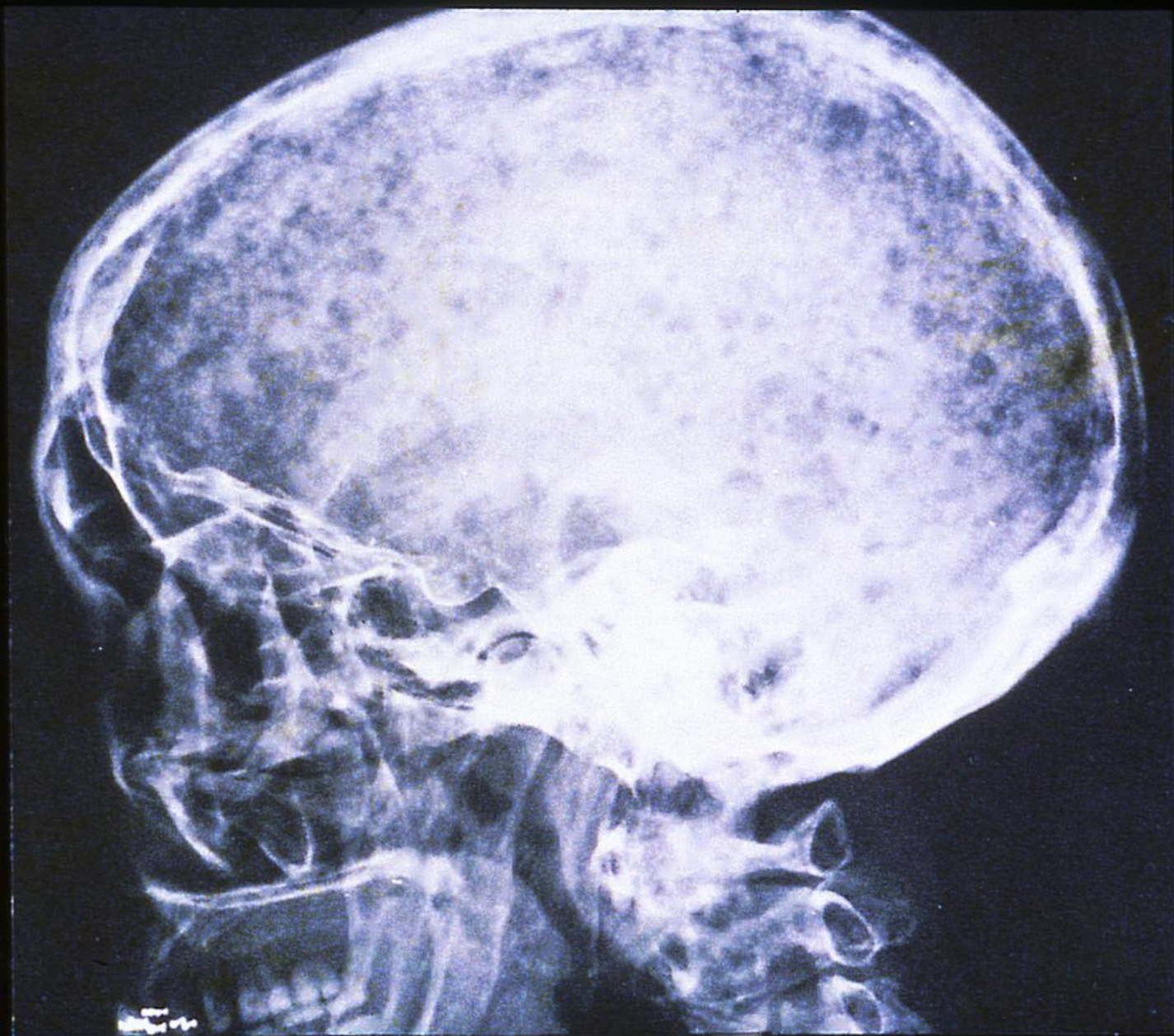








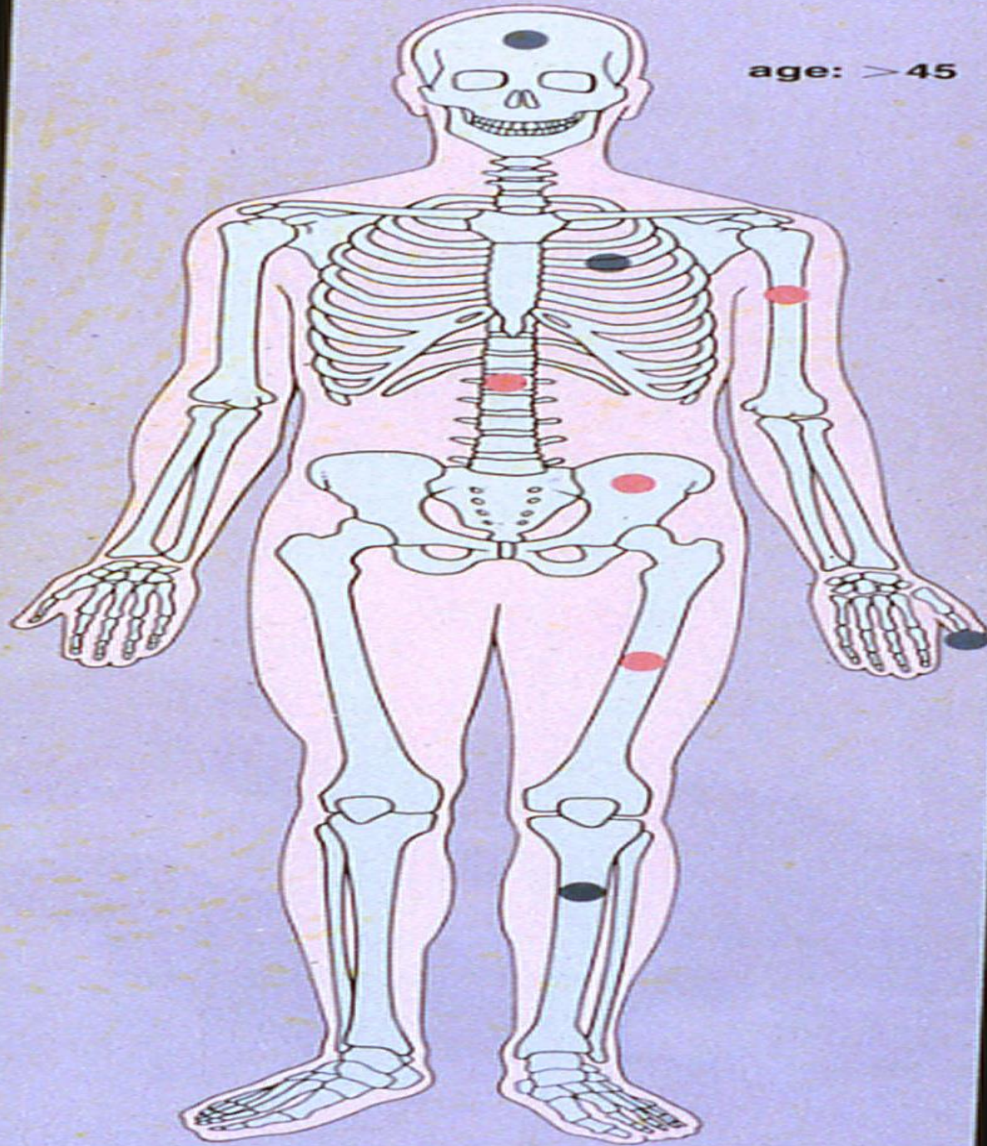






# Metastatic Lesions

age: >45



■ common sites

■ less common sites







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