

Bone Tumor Radiographs

How to diagnose ?

1- Age

2- Bone

3- Bone Zone: epiphyseal- Metaphyseal- diaphyseal

4- Nature: lytic, sclerotic, mixed

5- Location: centric, eccentric, cortical, juxtacortical

6- Margin

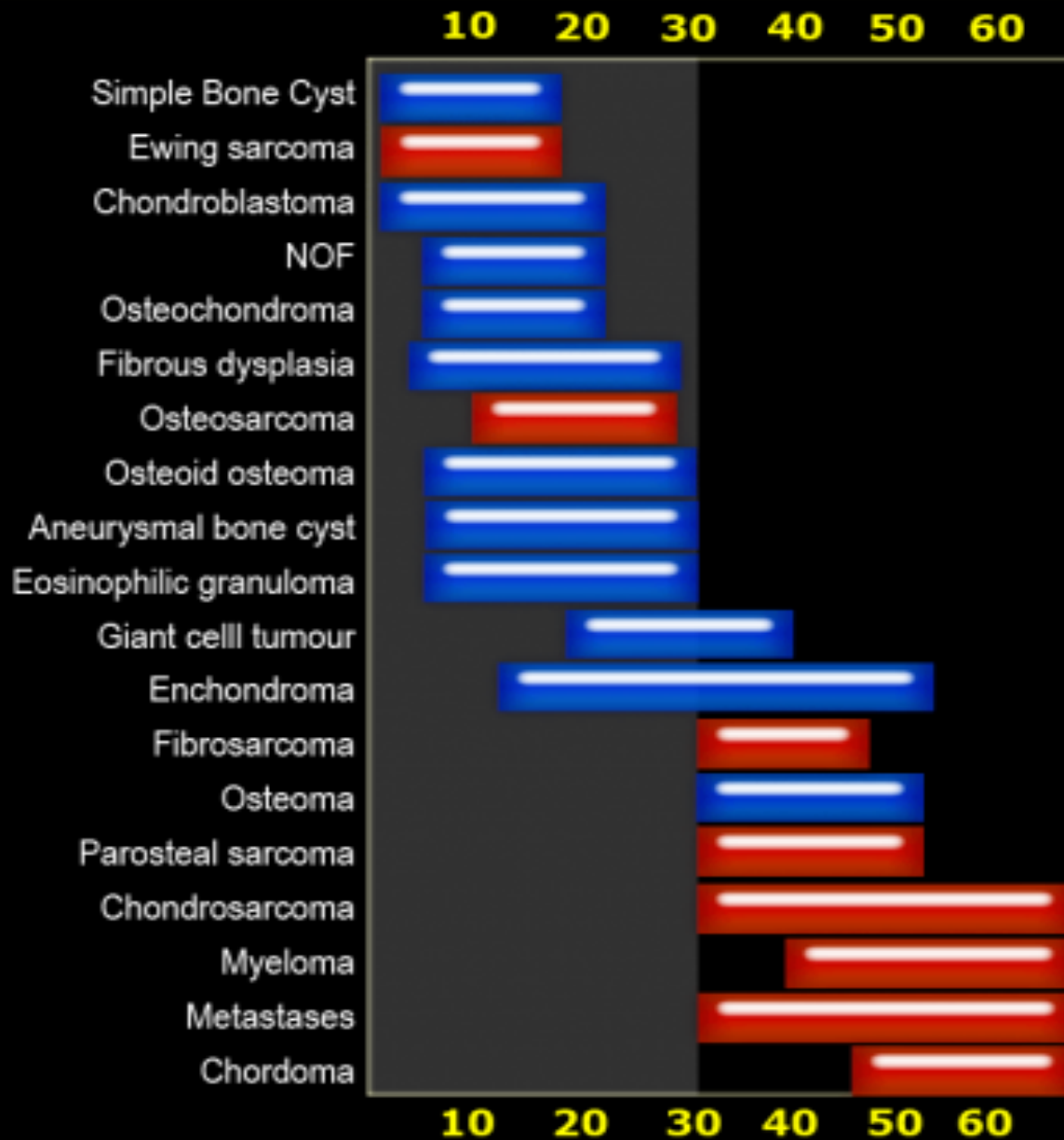
7- Periosteal Reaction

8- Cortical Destruction

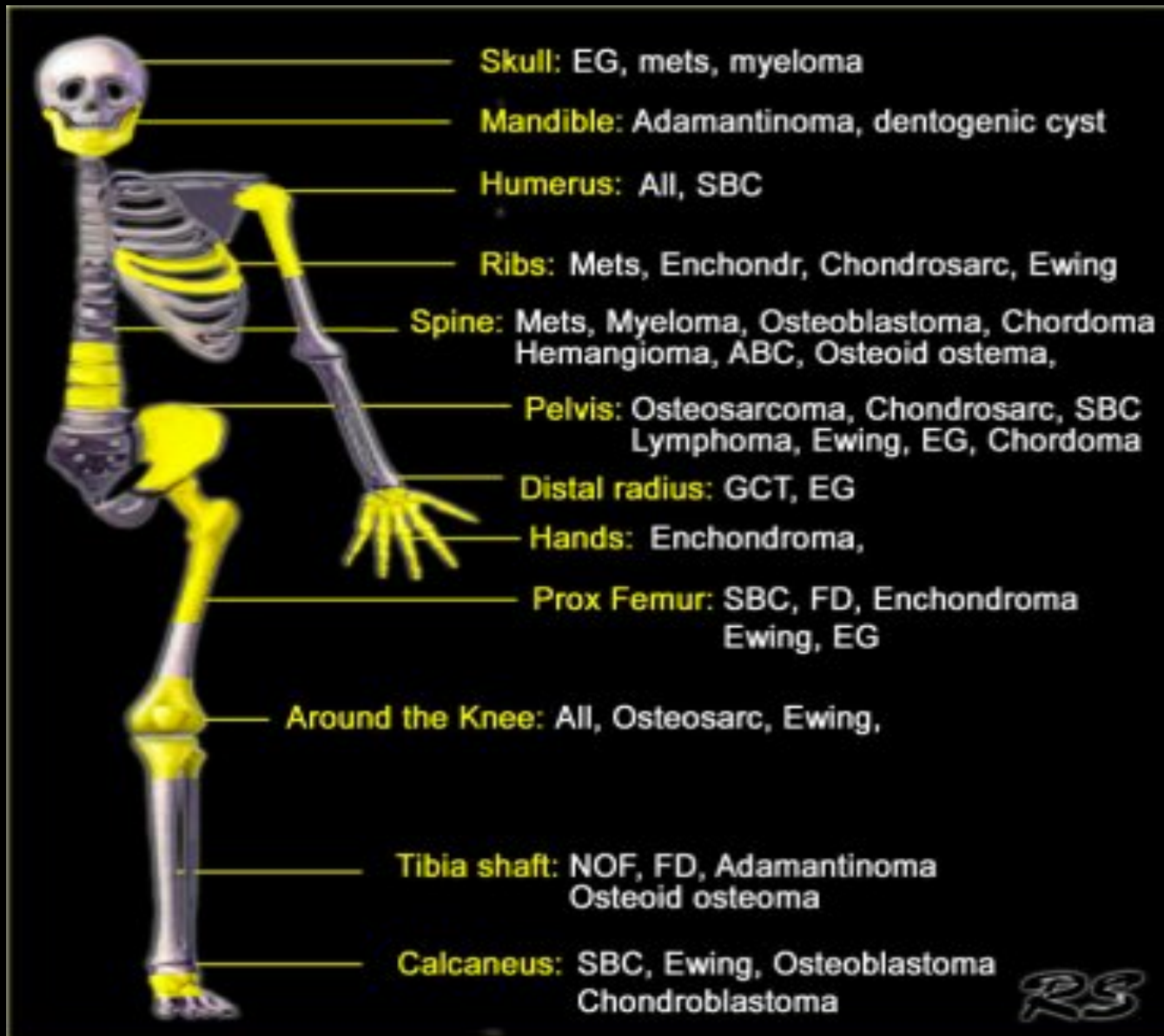
9- Matrix

10- Solitary or Multiple

1- Age



2- Bone Affected



Rule

Metastases are rare distal to the elbow
and knee joints.

Bone Zone

	< 30 ys	> 30 ys
Epiphyseal	Chondroblastoma Infection	Geodes- GCT Infection
Metaphyseal	SBC- ABC-NOF Enchondroma Osteochondroma Osteosarcoma -CMF	Enchondroma Chondrosarcoma Metastases- Myeloma
Diaphyseal	Ewing sarcoma Osteoid osteoma FD	Metastases- Myeloma Lymphoma

4- Position of the Lesion

1- Centric

2- Eccentric

3- Cortical

4- Juxta-cortical

Centric Lesions

1- SBC

2- Eosinophilic granuloma

3- Fibrous dysplasia

4- ABC

5- Enchondroma

Eccentric Lesions

- 1- Osteosarcoma
- 2- Non-ossifying fibroma
- 3- Chondroblastoma
- 4- Chondromyxoid fibroma
- 5- GCT
- 6- Osteoblastoma
- 7- ABC

5- Nature of the Lesion

1- Osteolytic

2- Sclerotic

3- Mixed

Sclerotic Lesions

0-10 years

Osteosarcoma

10-20 years

Osteosarcoma, EG, Osteoid osteoma,
Osteoblastoma

20-40 years

Enchondroma, Osteoma, bone island
Parosteal osteosarcoma

40 years

Bone metastases, bone island

6- Margin

Age	Well-defined	Ill-Defined
0-10	EG SBC	EG-Ewing Osteosarcoma- leukemia
10-20	NOF- Osteoblastoma FD- SBC- EG- ABC CMF-Chondroblastoma	EG-Ewing Osteosarcoma
20-40	GCT, Enchondroma Chondrosarcoma- Osteoblastoma	GCT
> 40	Metastases Myeloma- Geodes	Metastases Myeloma- Chondrosarcoma

Periosteal Reaction

A periosteal reaction is a non-specific reaction occur whenever the periosteum is irritated by a malignant tumor, benign tumor, infection or trauma.

Rule

Malignant lesions never cause a benign periosteal reaction.

Rule

A periosteal reaction excludes the diagnosis of :

1- Fibrous dysplasia

2- Enchondroma

3- Non-ossifying fibroma

4- SBC

(unless there is a fracture)

Ballooning

Ballooning is a special type of cortical destruction :destruction of endosteal cortical bone and the addition of new bone on the outside occur at the same rate, resulting in expansion.

Rule

When you are confronted with ballooning think in GCT if the lesion is epiphyseal or chondromyxoid fibroma if the lesion is metaphyseal.

9- Matrix

1- Chondroid

2- Osteoid

Osteoid-Producing Tumors

1-Osteoma

2- Osteoid osteoma

3-Osteoblastoma

4- Osteosarcoma

5- Enostosis

10- Solitary or Multiple

Polyostotic lesions < 30 years

- 1- Non- ossifying fibroma
- 2- Fibrous dysplasia
- 3- Multifocal osteomyelitis
- 4- Enchondromas
- 5- Osteochondroma
- 6- Leukemia
- 7- Metastatic Ewing' s sarcoma

Polyostotic lesions > 30 years

1-Metastases

2- Multiple myeloma

3- Multiple enchondromas

4-Fibrous dysplasia

5- Brown tumors of hyperparathyroidism

6- Bone infarcts

Take Home Message

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- 8- Cortical Destruction
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- 10- Solitary or Multiple