

Radiology: Approach to Bone Tumors and Bone Tumor Differential Diagnoses
Stephanie Bernard, MD

Objective:

1. Be able to objectively evaluate the aggressiveness of a bone lesion based on the radiographic appearance.
2. Be able to differentiate the types of matrix in tumors radiographically.
3. Be able to formulate a reasonable differential diagnosis from the imaging.

Video lectures:

Part I: Radiographic approach to bone tumors

<https://www.youtube.com/watch?v=v00J-9FML4A>

Part II: Bone tumor differential diagnoses

<https://www.youtube.com/watch?v=soXMeBvFM3U>

Content:

1. Imaging features determining aggressiveness – Margins supplemented by periosteal reaction
2. Differential diagnoses – Know how to apply the features that can help you
 - a. Patient Demographic: Age and Race of the patient dramatically change differentials
 - b. Location: Tumors develop where the originating cell lines are active (ie. Lent Johnson – Field theory).
 - i. Learn common differentials based on longitudinal location (epiphyseal, metaphyseal, diaphyseal).
 - ii. Some tumors occur in specific bones (ie Adamantinoma-tibia). Learn some of the common differentials for individual bones and axial locations (cortical, juxtacortical)
 - c. Imaging appearance
 - i. Matrix forming tumors – Osteoid, Chondroid, Fibrous (be able to identify the matrix)
 - ii. Non-Matrix tumors
 1. Small round blue cell tumors (Ewing family / PNETs,) lymphoma
 2. Lytic lesions – Including the subset of expansile tumors (“alphabet soup lesions”)
 3. Vascular lesions of bone (hemangioma, hemangiopericytoma, angiosarcoma)
 4. Tumor mimics
 - d. Additional Differentials
 - i. Tumors with secondary ABCs on MRI
 - ii. Tumors with surrounding “edema” on MR
 - iii. Polyostotic lesions