

RADIOGRAPHIC PATHOLOGY

I. DEFINITIONS

- “Radiographic appearances are governed by anatomic or physiologic changes in the presence of disease processes. Radiologic ‘diagnosis’ is founded on knowledge of these alterations, the prerequisite being awareness of disease mechanisms.” *H.M. Worth*

II. THE RADIOGRAPHIC REPORT

- Patient name, age, ethnicity, referring physician, and date of radiographs
- Radiographic Procedure (brief but more descriptive for invasive procedures)
- Radiographic Findings (objective info: location/anatomy/structural effects)
 - a. *Anatomy*: epicenter (above/below/in the canal), local/generalized, monostotic/polyostotic
 - b. *Shape*: hydraulic (cysts), scalloping, regular/irregular
 - c. *Internal*: density (opaque/lucent/mixed), trabeculation, septation, mineralization/calcification (amorphous/discrete/grainy), geographic radiolucency or hydraulic/cystic radiolucency
 - d. *Periphery*: borders discrete or well-defined vs. blending or permeative, cortication, sclerosis, capsule
 - e. *Behavior*: space occupying, displacing, destroying, expanding, or osteo-inducing such as in new periosteal bone formation
- Interpretation/Impression (subjective DDx: may include clinical or surgical findings, histologic findings, or other diagnostic procedures)

III. IMAGING MODALITIES (pre-biopsy preferred)

A. Panoramic and Occlusal Radiographs

- i. Together help simulate CT coronal and axial sections, especially in cases of cortical expansion/periosteal reaction.
- ii. Useful when cost or access to more advanced imaging a factor, or follow-up cases...aka: “poor man’s CT”

B. Computerized Tomography (standard)

- i. Acquired Coronal (not corrected), Axial, and Sagittal.
- ii. Contrast (ie: Gadolinium) can enhance lesional features and is essential for neoplastic lesions

C. Magnetic Resonance Imaging (MRI)

- i. Soft tissue imaging modality based on proton spin and magnetic moments of hydrogen ions (T1 and T2 weighted)
- ii. Not good for bone pathology because hydrogen ions in bone are bound and not free to spin and relax.

D. Nuclear Medicine (adjunct, still evolving)

- i. Radiopharmaceutical (technetium) gamma photon detection system which is utilized for identifying areas of increased metabolic activity – such as in neoplasia, septic arthritis, metabolic bone disease, active condylar hyperplasia, and osteomyelitis (except in chronic sclerosing phase in which CT's are more ideal)

E. Positron Emission Tomography (adjunct, still evolving)

- i. FDG (glucose analogue) shows increased activity in areas with high metabolic (glycolytic) activity – such as in osteomyelitis, hyperparathyroidism, or neoplasia metastases or follow-up.

F. TMJ Tomography

- i. Imaging modality for various joint conditions ranging from reactive to neoplastic.

IV. CONDITIONS

-Correlate with clinical and histopathologic findings

A. Developmental

- i. Symmetry, often asymptomatic, long history, little or no change over time

B. Neoplastic

- i. Malignant: Infiltrative growth pattern, ragged, poorly demarcated or ill-defined, paresthesia
- ii. Benign: Slow growth, uniform, well-demarcated or well-defined

C. Reactive/Inflammatory

- i. Inflammatory symptomatology if any, shorter history, more common