MS 1  Acute osteomyelitis

Acute osteomyelitis

Plain radiographs reviewed

Spine

MRI

Acute osteomyelitis diagnosed

Other bones

Acute osteomyelitis not diagnosed

CT, MRI or Nuclear medicine

Diagnosis established

Normal scan

Treatment

Osteomyelitis excluded
**REMARKS**

1 **Plain radiograph**
   1.1 Regional radiographs should be the initial examination to determine whether there is any underlying pathological condition.
   1.2 Typical findings of bone destruction and periosteal reaction may not appear until 10-21 days after the onset of infection because 30-50% of bone density loss must occur before radiographs become abnormal.
   1.3 Plain radiographs are unreliable to establish the diagnosis of osteomyelitis in patients with violated bone.
   1.4 Plain radiographs of spine are not sensitive to detect vertebral osteomyelitis but findings of endplate destruction and progressive narrowing of adjacent disc space are highly suggestive of infection.

2 **Nuclear medicine**
   2.1 Scans should be interpreted with contemporary radiographs.
   2.2 Three-phase Technetium-99m methylene diphosphonate (Tc-99m-MDP) bone scan
      2.2.1 Bone scan is more sensitive than plain radiography (up to 90% sensitivity).
      2.2.2 Bone scan can be positive as early as 3 days after onset of disease (10-14 days earlier than plain radiograph).
   2.3 Gallium scan
      2.3.1 Gallium scan is helpful as conjunction with a bone scan. Combined gallium and bone scan studies has sensitivity of 81-90% and specificity of 69-100%
   2.4 White blood cells (WBC) scan
      2.4.1 This is sensitive and specific for bone infection and particularly useful in violated bone.
   2.5 Fluorodeoxyglucose (FDG) PET
      2.5.1 It has high accuracy (up to 96%) for confirming or excluding chronic osteomyelitis.
      2.5.2 It may be an alternative to MRI if suspecting chronic osteomyelitis.

3 **CT**
   3.1 CT is useful to accurately define sequestra, soft tissue abscesses and bone destruction, and to guide biopsy.
   3.2 Sequestra, cortical destruction, periosteal reaction and intraosseous gas undetected on MRI can be well seen on CT.

4 **MRI**
   4.1 MRI is highly effective for detection of bone marrow edema in spine and long bones.
   4.2 MRI can reveal the relationship between an infective process in spine, the adjacent spinal canal and soft tissue.
   4.3 Contrast MRI is sensitive but should be correlated with other imaging studies.

**REFERENCES**