

## A Bone Scan Is Not Always the Answer

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Recently I was reviewing a workers' compensation case where the case was declared basically permanent and stationary, with no residuals. This is not particularly unusual when the case is sent for review to an orthopedist by the insurance company. However, the basis for determining the status of the patient was unusual.

The orthopedist utilized a negative bone scan and negative AP and lateral plain films as the basis for his conclusion that the patient was possibly exaggerating his subjective complaints. What made this case even more interesting is that both the treating chiropractor and examining orthopedist were in agreement over the diagnosis, which was a cervical strain/sprain injury and generally AP and lateral cervical spine plain films should be unremarkable. With flexion and extension views of the cervical spine, we were able to demonstrate some intersegmental instability. Point in case: Don't use a bone scan to demonstrate soft tissue lesions unless your differential diagnosis includes infection or neoplasm.

General indications for radionuclide bone imaging can be summarized as follows:

- A. Screen for metastatic disease from certain primary malignancies.
- B. Localize questionable or undiagnosed metastatic sites for biopsy.
- C. Evaluate the nature and extent of various benign processes, including tumor, metabolic disease, and certain local or diffuse diseases of unknown etiology.
- D. Early diagnosis of acute osteomyelitis of any etiology, and following the response to medical or surgical therapy of acute or chronic osteomyelitis.
- E. Detect and evaluate the extent of various forms of arthritis, e.g., infections, degenerative, inflammatory; also prosthesis evaluation.
- F. Assess extent and patterns of known or occult trauma.
- G. Aid in the workup of bone pain, of any etiology, in the face of negative x-rays or other diagnostic modalities.
- H. Help diagnose and follow avascular necrosis, dystrophic calcifications.
- I. Define and follow congenital or developmental defects of the osseous skeleton.

This is just a general outline on the indications for the utilization of radionuclide bone imaging compiled by Kathryn Witzium, M.D., assistant professor of radiology at the UCSD Medical Center.

The main reasons why I generally request a bone scan are to evaluate a fracture or to screen for metastatic disease. The standard bone scan utilizes Tc-99m-Methylen-Di-Hydroxyethylene Diphosphate which is an organic phosphate analog. Tc99-MDP is a radionuclide which is cleared from the circulation through the renal system within two to four hours. Radiation dosimetry with a routine, adult bone scan is as follows: whole body = 2.6 RAD, bones = .70 RAD, kidneys = .80 RAD, bladder wall = 2.6 RAD. Patients with a history of prostate cancer, pelvic tumors, and renal disease puts them at risk to develop obstructive uropathy with this procedure.

In a chiropractic practice, a bone scan is most useful for evaluating the age of a fracture or rule out a possible fracture. Most fractures of the vertebral body will still demonstrate an increased uptake of the radionuclide up to seven months post injury. This is useful when attempting to answer the question as to whether a compression fracture is an old or new injury.

Under normal conditions, a stress fracture will indicate an increased uptake at the site within 24 hours. Most of the time initial plain films will be negative for a stress fracture or at times even an occult fracture which is in excellent alignment. A bone scan can be utilized to document the existence of a fracture.

As far as documenting nonosseous lesions, e.g., strains or sprains, a bone scan will always be negative. There must be some disruption or irritation of the bone matrix in order to demonstrate a positive uptake on a bone scan. Remembering this single point may become useful when faced with an insurance examiner attempting to whitewash a case.

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