62 year old man with prostate cancer presents for restaging imaging

Kathryn Becker, MD
Diffusely metastatic prostate cancer ("Superscan")
Nuclear medicine bone scan shows increased uptake throughout the body, including the bilateral femurs, proximal tibia and fibula, proximal forearms, skull and spine.
Same patient’s bone scan 4 months prior demonstrates several areas of metastatic disease, including the shoulders and proximal femurs. Note the absence of lesions in the lower legs and skull.
Metastatic prostate cancer

• Prostate cancer = most common malignancy in men
• Most common site of metastasis is bone, followed by lung, then liver
• Prostate cancer metastasizes to bone via hematogenous spread
• Most lesions are osteoblastic, but can be osteolytic or mixed
Superscan

Superscan: intense symmetric uptake of radiotracer by the skeletal system with relative decreased uptake by the bladder, kidneys, and soft tissues

Differential diagnosis for superscan:

• Metastatic disease (prostate, breast, transitional cell carcinoma)
• Metabolic bone disease (hyperparathyroidism, renal osteodystrophy, osteomalacia)
• Paget disease
• Myelofibrosis
• Acute renal failure
• Flare phenomenon: increased uptake by healing bones in response to treatment
Superscan

Different etiologies can result in different patterns of diffuse uptake

- Metastatic disease: irregular increased activity throughout both appendicular and axial skeleton
- Metabolic disease: smoother appearance of symmetric increased uptake, increased skull uptake. Uptake throughout the distal appendicular skeleton
- Flare phenomenon: increased uptake correlates with areas of sclerosis on radiograph, which are areas of healing
