

Osteosclerosis - Focal or Diffuse

In the lumbar spine, high bone density (osteosclerosis) is usually caused by focal sclerosis of sub-chondral bone adjacent to inflamed inter-vertebral joints. This is common in men and in people over the age of 60. In such circumstances, a routine lumbar spine radiograph typically shows "degenerative intervertebral joint disease and/or intervertebral disc disease," inferences made by the radiologist based on focal bony sclerosis and/or osteophytes adjacent to the facet joints and/or discs. Focal sclerosis can also reflect local synthesis of woven bone, as in a healing fracture, bony metastasis, or Paget's disease. Because focal sclerosis is so common in the spine, the MGH Bone Density Center routinely measures the hip (at no additional charge) in every patient referred for a spine measurement. □□

If severe focal sclerosis of a vertebra or other bone is evident on the low-resolution images provided by a bone densitometer, the MGH Bone Density Center typically excludes the bone from the report. If the focal sclerosis is mild, we typically include the bone, but add to the report a warning that the technical quality of the measurement was marginal because of "focal sclerosis or fracture". However, the distinction between mild and severe is subjective, and varies with the physician who interprets the test. In addition, even experienced reviewers may miss the focal nature of an increase in bone density, because bone densitometers generate images with poor spatial resolution (to keep the radiation dose as low as possible). □□

If our report says "Osteosclerosis is present", the measured bones are diffusely sclerotic. Diffuse bony sclerosis is uncommon, and usually more marked in trabecular than in cortical bone. If a routine radiograph confirms that the increase in bone density is diffuse and not focal, and not suggestive of Paget's disease, then the patient may have a metabolic bone disease. Potential causes of diffuse osteosclerosis include renal failure, myelodysplastic syndromes, poisoning with fluoride, lead or heavy metals, congenital osteopetrosis, and rare osseous dysplasias. It can also be idiopathic, and is often asymptomatic. Idiopathic osteosclerosis is first classified as hereditary or non-hereditary, by measuring the BMD of other family members. For a detailed discussion, see "Osteosclerosis, Hyperostosis, and Related Disorders" by Boy Frame, et al., Elsevier, New York. □□