Renal Osteodystrophy

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PRESENTATION

A 63-year-old woman with chronic renal failure.

COMMENTS

Chronic renal failure is the commonest cause of secondary hyperparathyroidism and produces sustained hypocalcemia. The parathyroid glands respond to hypocalcemia by production of excess parathyroid hormones. The parathyroid hormones, in turn, cause osteoclastic resorption in bone, leading to osteoporosis and osteomalacia. Radiologic signs of hyperparathyroidism include bone resorption, brown tumor, bone sclerosis, and chondrocalcinosis. Subperiosteal resorption is considered to be virtually pathognomonic of hyperparathyroidism, and it is most commonly seen on the radial aspect of the middle phalanges of the hand.

The mechanism by which widespread and diffuse sclerosis of bone in secondary hyperparathyroidism occurs is uncertain. Sclerosis is often prominent in the axial skeleton, particularly the skull and spine. Spinal involvement often occurs with greater density at the endplates, resembling the stripes on rugby jerseys, hence the term "rugger jersey spine." The sclerotic bands in the rugger jersey spine usually have ill-defined margins compared with those seen in osteopetrosis, which is a very rare condition that produces dense and much better defined areas of sclerosis. The other causes of spinal osteosclerosis do not produce this pattern of endplate sclerosis.

Approximately 10% to 20% of patients with renal osteodystrophy will exhibit osteosclerosis. The diagnosis of osteosclerosis due to renal osteodystrophy should be made in combination with the finding of subperiosteal bone resorption in the fingers. The extent of radiographic abnormalities depends on the severity and duration of the renal disease. As renal failure can now be effectively managed, advanced radiographic changes are becoming less commonly seen.

Figure. Lateral radiograph of the lumbar spine shows ill-defined sclerotic bands along the vertebral body endplates. This is the characteristic appearance of the "rugger-jersey spine," typical of hyperparathyroidism. There is also prominent aortic calcification.

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