

Clinical History:

A 57-year-old man with a history of previous renal transplantation. A lateral radiograph of the lumbar spine was taken (Figure 1).

Figure 1: Lateral lumbar spine radiograph



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What is the diagnosis?

- a) Paget's disease
- b) Osteoblastic metastasis
- c) Multiple myeloma
- d) Renal osteodystrophy
- e) Osteopetrosis

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Answer:

d) Renal osteodystrophy

Radiological findings

The lateral radiograph of the lumbar spine (Figure 2) shows poorly-defined bands of increased density adjacent to the end-plates of the vertebral bodies, giving a classical 'rigger-jersey' pattern of renal osteodystrophy. Calcification of the abdominal aorta is noted anterior to the lumbar spine.

Figure 2: Same radiograph as Figure 1 with addition of arrows. There is increase in bone density adjacent to the end-plates of the vertebral bodies giving rise to the 'rigger-jersey' pattern (arrows)



Discussion

Renal osteodystrophy

Renal osteodystrophy occurs as a result of a biochemical abnormality causing diminished urinary excretion of phosphate in patients with long-standing renal failure. The serum alkaline phosphate level is elevated, while the calcium level is low or normal. Secondary hyperparathyroidism, combined with osteomalacia and a variable degree of osteosclerosis, then develops.

Radiographical findings include bony resorption, osteomalacia, brown tumour and osteosclerosis. In the spine, the 'rigger-jersey' pattern of osteosclerosis is often seen. It consists of poorly-defined bands of increased density adjacent to the end-plates of the vertebral bodies. Kyphoscoliosis may occur. Focal or sometimes generalised osteosclerotic appearance may be present, particularly in the later stages of the disease. Extra-osseous calcification is a common feature of renal osteodystrophy, especially in long-standing cases. Arterial calcification of large vessels is a frequent finding.

Paget's disease

Paget's disease affects middle-aged and elderly adults. There is rising prevalence with age and a marked preponderance in men. The geographical and racial incidence is remarkable, with certain races such as Caucasian origin being more affected. The disease process is biphasic, with active phase due to osteoclastic resorption of bone followed by an inactive osteosclerotic phase. The axial skeleton and proximal long bones are commonly affected. Radiographically, a coarse medullary pattern develops in the spine during the active phase. The vertebral body enlarges, with thickening and sclerosis of vertebral end-plates giving the classical 'picture-frame' appearance. Complications such as spinal stenosis or sarcomatous change may occur. None of the above features were seen in our patient.

Osteoblastic metastasis

Osteoblastic metastasis are usually secondary to carcinoma of prostate in men and breast cancer in women.

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Lymphoma and metastasis from mucinous adenocarcinoma of gastrointestinal tract are less frequent causes. The radiographical features include diffuse increase in bone density or poorly-defined sclerotic opacities in the vertebral bodies. The pedicles are usually involved. Our patient has no known primary and his radiological findings exclude this diagnosis.

Multiple myeloma

Multiple myeloma is the most common primary malignancy of bone. The commonest age of presentation is between the fifth and seventh decades of life. Males are more commonly affected. Pain in the back is one of the most frequent initial complaints. The axial skeleton is more often affected. Radiographically, multiple myeloma may present in several forms, such as generalised osteopaenia, multiple widely-disseminated osteolytic lesions or a permeating mottled pattern of bone destruction. In less than 5% of cases, the skeleton may be completely normal. In the spine, it can also present as an expansile lytic lesion with paraspinal soft tissue masses. Absence of the above-mentioned features makes this diagnosis unlikely in our patient.

Osteopetrosis

Osteopetrosis is a generalised, hereditary, skeletal dysplasia of unknown origin. Benign and malignant forms are recognised. The benign form is usually transmitted as an autosomal dominant trait and may become evident at any age. The infantile malignant form has autosomal recessive inheritance and commonly presents within the first decade of life. The radiographical features in the vertebral bodies are characteristic. The classical 'sandwich' vertebra or "bone-within-bone" appearance results from disseminated increase in bony density with obliteration of the normal trabecular pattern. In our patient, this diagnosis is easily excluded. ■

References

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