Primary Hyperparathyroidism

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Figs. 1 and 2: Plain X-ray showing multiple lytic lesions (brown tumors) with sclerotic margins in the head, neck and diaphysis of the right humerus and an old pathological fracture with deformity at the neck.

Fig. 3: Skull X-ray with a typical “pepper-pot” appearance

Fig. 4: Ultrasonography of the abdomen depicting medullary nephrocalcinosis

Fig. 5: Technetium-99 Sestamibi scan showing a left inferior parathyroid adenoma

A 26 year old housewife from West Bengal presented with progressive diffuse bony pains of 3 years duration and severe pain and inability to lift the right arm since 6 months. This was associated with the gradual development of proximal muscle weakness. There was no history of vomiting, polyuria, polydipsia, abdominal pain or neuropsychiatric manifestations. There was no past history of renal colic or nephrolithiasis.

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On Examination the blood pressure was 120/80 mm of Hg. Vital signs and general examination was normal. There was no visible neck swelling. There was proximal muscle weakness which was more prominent in the lower limbs. She had diffuse bony tenderness with severe tenderness over the right proximal humerus and inability to lift the right arm. Rest of the systemic examination was normal.

Investigations revealed a normal hemogram, renal and thyroid functions. Serum Calcium was 10.6 mg%, Phosphorus 1.8mg%, Alkaline Phosphatase 974 U/L, Vitamin D levels 4.0 ng/ml and parathyroid hormone levels (PTH) >2500 pg/ml. The 24 hour urinary excretion of calcium was elevated (532 mg/day), but that of phosphorus was normal (683mg /day). The patient underwent X –rays which revealed multiple lytic lesions (brown tumors) with sclerotic margins in the head, neck and diaphysis of the right humerus (Figures 1 and 2) and an old pathological fracture with deformity at the neck of the humerus. The skull X ray showed a’pepper pot’ appearance with a few larger lytic lesions (Figure 3). The radiographs of the femur, shoulder, and pelvis all showed generalised osteopenia, some areas of subperiosteal bone resorption along the medial aspects of the femoral neck and subligamentous bone resorption along the lateral ends of the clavicles.

Suspecting primary hyperparathyroidism, an Ultrasound of the neck was done which showed a well defined hypoechoic lesion noted in the left side of neck, below left lobe of thyroid with good vascularity suggestive of an ectopic parathyroid adenoma. Ultrasound abdomen revealed medullary nephrocalcinosis (Figure 4).

A technetium-99 Sestamibi scan showed a left inferior parathyroid adenoma (Figure 5).

The patient underwent surgical excision of the left inferior parathyroid gland, biopsy of which was reported as parathyroid adenoma. One week post operatively Serum calcium was 8.2mg%. She was discharged on oral calcium and Vit D supplements.

Symptomatic skeletal disease in primary hyperparathyroidism is over 30 times more common in India than the west, mainly due to delayed diagnosis and widely prevalent vitamin D deficiency (seen in about 70% of our population). The classical skeletal involvement in primary hyperparathyroidism is “Osteitis Fibrosa Cystica” essentially an increase in osteoclastic bone resorption associated with replacement of the marrow with fibrous tissue and an increase in new bone formation by osteoblasts. This is followed by subperiosteal resorption, formation of cysts and osteoclastomas (‘brown tumors’). Brown coloration is due to hemosiderin deposition. These lesions are non neoplastic and the term ‘tumor’ is a misnomer. They are usually found in the trabecular portions of long bones, pelvis, ribs and jaw. The commonest renal manifestations are nephrolithiasis, hypercalcuria, nephrocalcinosis, chronic renal failure and tubular defects.

The common laboratory abnormalities include hypercalcemia, hypophosphatemia, elevated alkaline phosphatase and a raised PTH level. These features along with radiological changes are strongly suggestive of Primary hyperparathyroidism.

Localisation of the lesion is possible by Ultrasonography\(^2\) and also by technetium-99 Sestamibi scan. Surgical resection is the treatment of choice with parathyroid adenoma being the commonest histology. Parathyroid carcinoma is rare but can be suspected if there is an aggressive disease course, palpable neck mass, markedly raised PTH or severe hypercalcemia.\(^3\)

**References**
