



PRIMARY HYPERPARATHYROIDISM PRESENTING AS MULTIPLE PATHOLOGICAL FRACTURES

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Abstract : Primary hyperparathyroidism often was not diagnosed until patients develop symptoms and signs of advanced disease. The prevalence rate varies from 1 to 4 percentage. Elevated PTH levels cause bone resorption, formation of polyostotic lesions and reduction in bone mineral density predisposing to pathological fractures. We had a case of primary hyperparathyroidism with fracture neck of humerus, fracture neck of femur and supracondylar fracture femur following trivial trauma. The patient also had left superior parathyroid adenoma with elevated parathyroid hormone and alkaline phosphatase. She was treated with percutaneous screw fixation for neck of humerus fracture and neck of femur fracture with plating for supracondylar femur fracture. Enucleation of left superior parathyroid adenoma was done followed by calcium and vitamin D supplementation. During follow up period the patient had good fracture union, improvement in bone density and good functional outcome .

Keyword :Hyperparathyroidism, Parathyroid adenoma, Bone resorption, Pathological fractures.

CASE REPORT

A 25 yrs old female patient presented to our trauma ward with pain over left shoulder and left hip following trivial fall. She already had bone pain and myalgia for one year. On examination there was swelling and tenderness over the left shoulder and left hip, the range of movements were painful and restricted. X ray showed fracture neck of femur (Fig.1) and neck of humerus (Fig.2) with diffuse osteoporosis (Fig.3).



Fig 1 X-Ray showing neck of femur fracture



Fig 2 X-Ray showing neck of humerus fracture



Fig 3.Hand X-Ray with diffuse osteoporosis

On evaluation the patient had increased Alkaline phosphatase and parathyroid hormone, mild increase in Serum calcium with decreased Serum phosphorus, Serum albumin and Vitamin –D (Table.1). Thyroid profile, Serum estradiol, Serum prolactin were normal.

Investigation	Patient's Value	Normal Value
HB %	11.5	12-15 gm
Serum Calcium	10.6 mg/dl	8.5-10.5 mg/dl
Serum Phosphorus	1.7mg/dl	2.3-4.7mg/dl
Serum Albumin	3.0g/dl	3.5-5 g/dl
Serum Alkaline phosphatase	1531 U/L	35-104 U/L
Serum Parathyroid hormone	1900pg/ml	11.1-79.5 pg/ml
Serum 25-hydroxyvitamin D	4.4 ng/ml	>6 ng/ml

Table.1.Blood Investigations

Ultrasonogram neck revealed normal study.99m-Tc sestambi scan showed left superior parathyroid adenoma (Fig.4). There was no evidence of any other focus of abnormal tracer concentration suggestive of ectopic parathyroid adenoma.

Fig 4 99-Tc Scan

The patient was treated with percutaneous cancellous screw fixation for neck of humerus (Fig.5) and neck of femur fracture (Fig.6). Enucleation of the parathyroid adenoma was done. Serum parathyroid hormone levels became normal (Table.2.) .The patient was on calcium and vitamin D supplements with regular follow up.



Fig 5.Immediate post op X-Ray-humerus fracture



Fig 6.Immediate post op X-Ray of neck of femur fracture

Investigation	Patient's Value	Normal Value
Serum Calcium	10 mg/dl	8.5-10.5 mg/dl
Serum Parathyroid hormone	19.5pg/ml	11.1-79.5 pg/ml

Table.2.Post Operative Blood Investigations

Within 1 month of previous injury, the patient again sustained supracondylar fracture femur after trivial fall and she was treated with locking plate (Fig.7 & 8).



FIG 7. X-Ray showing supracondylar fracture femur

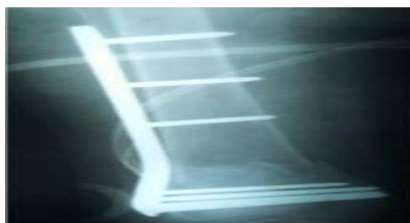


Fig 8.Immediate post op X-Ray
FOLLOW UP

The patient was followed up upto 12 months , initially at 4 weeks interval for 6 months latter on 8 weeks interval with x rays and blood investigations include serum parathyroid hormone and serum calcium. The 1 year follow up x rays showed good union and the bone density became normal (Fig.9,10&11).



Fig 9.X-Ray 1 year follow up neck of humerus fracture



Fig 10.X-Ray 1 year follow up neck of femur fracture



Fig 11. X-Ray 1 year follow up

Serum levels of parathyroid hormone and calcium was within normal limits. The patient had good functional outcome with pain free full range of movements (Fig.12,13,14,15,16&17).



Fig 12. Hip Flexion



Fig 13.Hip Extension



Fig 14.Shoulder Abduction



Fig 14.Shoulder Adduction



Fig 17.Knee Flexion



Fig 18.Knee Extension

DISCUSSION

Primary hyperparathyroidism was reported by Von Recklinghausen a century ago and also coined the term osteitis fibrosa cystica. The prevalence rate varies from 1% to 4% with a female: male ratio of 3:1. More common in 30 – 50 yrs age group. In 80% of cases the cause is a solitary adenoma secreting parathyroid hormone and in 20% a glandular hyperplasia. The causes for primary hyperparathyroidism include solitary adenoma (50-85%), multiple adenomas (10 %), hyperplasia (10-40 %) and carcinoma (rare). Primary hyperparathyroidism may be associated with multiple endocrine neoplasia (MEN 1 and II) syndromes. It produces two types of bone lesion. One is slowly progressive type with cortical thinning with osteoporosis and another one is rapidly progressive type. PHPT typically have only small elevations in serum calcium concentrations (less than 11 mg/dl). Clinical features depend upon the serum calcium levels. High calcium level affects multiple systems including cardiac system, nervous system, renal system, gastro intestinal system and produces bone pain and profound muscle weakness in musculo skeletal system. Radiological manifestation are seen in less than 2% of cases. Radiological findings include diffuse osteoporosis, sub periosteal erosion, cystic lesions (Brown tumor), pathological fracture, salt and pepper mottling of the skull, loss of lamina dura in mandible. The incidence of brown tumours in patients with primary hyperparathyroidism is 1.5% to 1.7% . Nowadays hyperparathyroidism is usually treated before such lesions develop ; therefore they have become extremely rare. The investigations should include blood investigations, high resolution USG, CT, MRI and Sestamibi scan.

MANAGEMENT

The patient can be medically managed with cinacalcet – calcimimetic by allosteric activation of the calcium-sensing receptor that is expressed in various human organ tissues. The primary management is surgical excision of the tumor. After tumor excision the bone histology returns to normal in 5-6 weeks. Brown tumor will resolve with increase in bone density and sclerosis. The average time of union will be delayed and prone for malunion unless the fracture is splinted externally or internally.

CONCLUSION

Hyperparathyroidism is asymptomatic in many patients, and may present only with a fracture. The extensive skeletal involvement due to hyperparathyroidism has rarely been reported. High index of suspicion is necessary to diagnose this unusual presentation of primary Hyperparathyroidism. A pathological fracture in a young lady with marked osteopenia is highly suggestive. Substantial improvement in bone density, promotion of fracture healing, and prevention of pathological fracture can be achieved by early diagnosis and parathyroid adenectomy. So one should keep in mind while diagnosing these cases, failure to which may result in disastrous complication.

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