CASE REPORT

Juvenile Paget's Disease

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Juvenile Paget's disease (JPD), a rare genetic disorder characterized by markedly accelerated bone turnover, presents in early childhood. We report a child with typical features of JPD who remained undiagnosed till 15 years of age. Rarity of this disease in Indian literature and need for early diagnosis to prevent progression of disease prompted us to report this case.

Key words: *Bisphosphonates Juvenile Paget's disease, Metabolic bone disease.*

Juvenile Paget's disease (JPD) is an autosomal recessive disorder characterized by increased bone turnover secondary to enhanced osteoclastic activity(1). There are very few Indian reports of JPD(2,3). We describe a 15-year old boy who presented with characteristic features of JPD.

CASE REPORT

A 15–year old boy presented with the history of progressive increase in head size and bowing deformity of the legs since the age of 5 years. Problems started with a fracture and deformity of right femur, which persisted despite surgical intervention. Subsequently, he developed progressive diminution of vision in both the eyes. There was no history of headache, vomiting or convulsions. He was a second child born by normal delivery to second degree consanguineously wed couple. Development was normal and he was attending school until he developed diminution of vision. There was a family history of similar deformity of limbs in his elder brother, which started around 6 years of age. At the time of presentation, the elder sibling was 18 year old and immobile.

On examination, he weighed 55 kg. His height was 142 cm (<3rd percentile) with upper segment, lower segment ratio of 0.76:1. He had massive macrocephaly with a head circumference of 70 cm. Head was asymmetrical. There was parietal prominence, depressed nasal bridge, hypertelorism and left maxillary prominence. Teeth were malaligned. Hands were broad and thick. There was severe genu valgum deformity and he could walk only with support. Chest was broad and asymmetrical with prominent thick clavicles and sternal prominence. There was no evidence of rickets. Spinal examination revealed scoliosis to right. Respiratory and cardiovascular systems were unremarkable. Per abdomen examination did not reveal organomegaly. Neurological examination revealed normal intelligence and normal motor examination. There was horizontal nystagmus with bilateral optic atrophy and vision was limited to finger counting at 3 meters in both the eyes. Hearing was normal.

Investigations were as follows; Hb10g/dL, calcium 8.6 mg/dL and phosphorous 4.2 mg/dL. Alkaline phosphates was increased to 1799 units (normal=50-140 units).

X-ray of pelvic bones and femur revealed lytic lesions (***Fig.*1**) with fracture and bowing. There was no radiological evidence of rickets. X-ray skull revealed extensive sclerotic lesions in the frontal bone and base of skull (***Fig.*2**). CT skull revealed thickening of medial wall of the orbit with optic canal narrowing.

Diagnosis of JPD was made and the child was started on oral alendronate 20 mg per day and calcitonin nasal spray 100 IU per day. Decompression of the optic canal was considered. However, the procedure was deferred in view of doubtful restoration of vision and anticipated severe bleeding. At first follow-up after 4 weeks, alkaline phosphatase level had started showing declining trend. Subsequently, he was lost to follow-up.

DISCUSSION

Paget's disease is a metabolic bone disease characterized by increased bone resorbing function of the osteoclast, owing to an increase in its number, size and resorbing activity(1). Initially it starts as "lytic phase" which is followed by compensatory increased activity of osteoblasts "Sclerotic phase". The bone turnover rate increases up to 20 times of normal. This results in increased bone formation, which is more deficient, vascular and disorganized. As the new skeleton is structurally weak and more vascular, patients present with repeated fractures and deformities. Markedly elevated level of alkaline phosphatase and radiographs revealing characteristic mosaic pattern (both osteolysis and osteosclerosis) are diagnostic of Paget's disease.

Paget's disease is essentially a disease of adults presenting in fourth and fifth decade of life(2). There are scarce reports of JPD from India(3,4). Only 2 children below 16 years reported in a series of 51 cases(3). JPD is characterized by widespread skeletal involvement presenting in childhood with progressive deformities, short stature, growth retardation, progressive macrocephaly and facial deformity, mainly maxillary expansion. Index child had all these characteristic features. Compression and trapping of nerves, especially auditory and optic nerves result in deafness and optic atrophy. Our child had optic atrophy but not deafness. Two other conditions considered in differential diagnosis were polyostotic fibrous dysplasia and hereditary hyperphosphatasia. Markedly elevated alkaline phosphatase level is unusual in polyostotic fibrous dysplasia. Though, hereditary hyperphosphatasia is

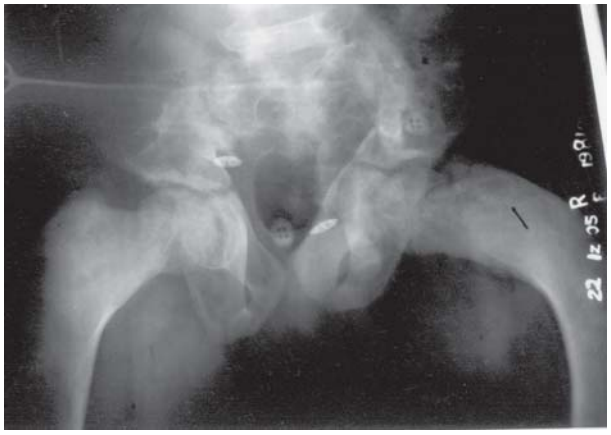

FIG.1 *X-ray pelvis revealing lytic lesions in the right femur with extensive bowing.*

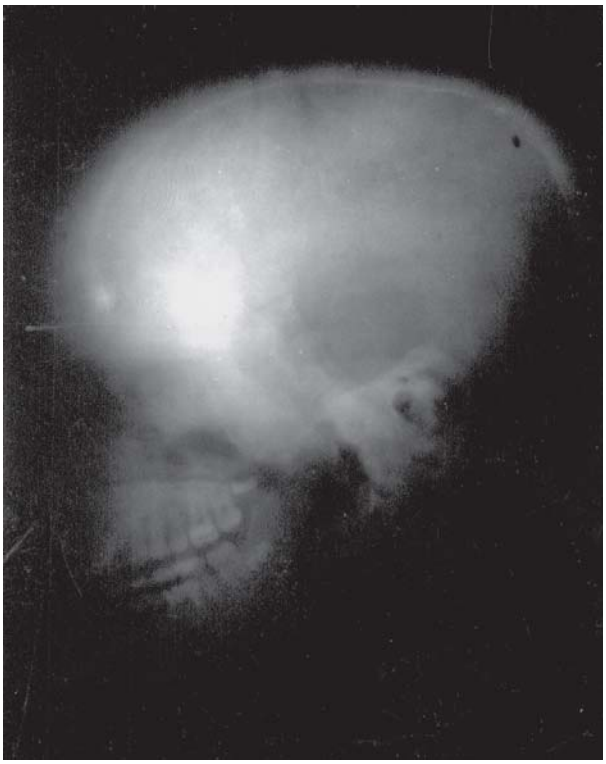

FIG. 2 *X-ray skull lateral view revealing extensive sclerotic lesions in the frontal bone and base of skull anteriorly. There is evidence of bone enlargement with widening of diploe.*

associated with high level of alkaline phosphatase, it manifests much earlier and radiographs do not reveal typical mosaic pattern.

Morbidity of JPD is very severe and majority of children become wheel chair bound by 15 years if untreated(1,5). Oral bisphosphonate therapy, especially alendronate, markedly suppresses bone turnover and brings about remission(6-9). Early use in pediatric patients prevents development of deformities and arrests progression of the disease and further fractures. Though there is concern about permanent disturbance of bone remodeling with alendronate, safe use has been documented in pediatric age group in recent studies, at least in short term(10). Calcitonin is a useful adjuvant, especially for pain relief(2).

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REFERENCES

1. Deftos LJ. Treatment of Paget's disease - taming the wild osteoclast. NEJM 2005; 353: 872-875.
2. Joshi SR, Ambbore S, Butala N, Patvardhan M, Kulkarni M, Pai B, *et al.* Paget' disease from Western India. J Assoc Physicians India 2006; 54: 535-538.
3. Anjalji Thomas N, Rajaratnam S, Shanthly N, Oommen R, Seshadri MS. Paget's disease of bone: Experience from a center in Southern India. J Assoc Physicians India 2006; 54: 525-529.
4. Bhadada S, Bhansali A, Unnikrishnan AG, Khadgawat R, Singh SK, Mithal A, *et al.* Does Paget's disease exist in India? A series of 21 patients. J Assoc Physicians India 2006; 54: 530-534.
5. Cundy T, Davidson J, Rutland MD, Stewart C, DePaoli AM. Recombinant osteoprotegerin for Juvenile Paget's disease. NEJM 2005; 353: 918-923.
6. Cundy T, Wbeadon L, King A. Treatment of idiopathic hyperpbospbatasja with intensive bisphophonate therapy. J Bone Miner Res 2004; 19: 703-711.
7. Lombardi A. Treatment of Paget's disease of bone with alendronate. Bone 1999; 24 (5 Suppl): 598-618.
8. Wendlova J, Gabavy S, Paukovic J. Paget's disease of bone - treatment with alendronare, calcium and calcitriol. Vintr Lek 1999; 45: 602-605.
9. Khan SA, Vasikarnn S, McCloskey EV, Beneton MN, Rogers S, Coulton L, *et al.* Alendronate in the treatment of Paget's disease of bone. Bone 1997; 20: 263-271.
10. Bianchi ML, Cimaz R, Bardare M, Zulian F, Lepore L, Boncompaign A, *et al.* Efficacy and safety of alendronate for the treatment of osteoporosis in diffuse connective tissue diseases in children. Arthritis Rheum 2000; 43: 1960-1966.