CASE REPORT

Paget's disease with craniofacial and skeletal bone involvement

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SUMMARY

Paget's disease is a metabolic disorder of bone caused due to defect in the remodelling process and is very common in western countries but is very rare in Asians and Africans. It was first described by a British scientist Sir James Paget in 1877. It can be monostotic or polyostotic depending on the number of bones involved. It most commonly affects older people of more than 50 years. Disease involvement can be symptomatic or asymptomatic depending on the extent of the disease process. Diagnosis of Paget's disease can be made by raised serum alkaline phosphatase levels, radiological examination and by radioisotope bone scans.

BACKGROUND

In 1873, Czerny used the term 'osteitis deformans' to describe an acute inflammatory condition in the tibia of a young man. Later, in 1877,¹ a British scientist, Sir James Paget described a bone disease that he termed as osteitis deformans, later on it was called as Paget's disease of bone. Paget's disease of bone is the second most common metabolic bony disorder after osteoporosis affecting individuals. It is believed as a chronic progressive non-inflammatory condition which is characterised by abnormality in the bone turnover. The newly formed bone will be poorly mineralised, more fibrous in nature and less dense with irregular trabecular pattern. Here we present the case of a 25-year-old man, which is a rare finding at this young age, with generalised involvement of the facial and skeletal bones.

CASE PRESENTATION

A 25-year-old man reported to Department of Oral Medicine with symptoms of pain and swelling in the right side of the lower jaw since 2 days; pain was dull and intermittent in nature, radiating to lower right side of face, aggravated and showing diurnal variations and relieves by itself after some-time. It was also associated with numbness of lower lip since few days. On extraoral examination diffuse swelling was noted in the right side of mandible extending from right the parasymphysis region to the angle of mandible (figure 1). Another swelling was also noticed in the right supraorbital region which was bony hard in consistency on palpation and tender; on intraoral examination slight discomfort was noticed in the lower part of the lingual cortical plate. Provisional diagnosis of hemihypertrophy of the right side of mandible was made.

INVESTIGATIONS

Biochemical examination

It revealed normal serum Ca, P, creatinine, T3, T4 and thyroid-stimulating hormone (TSH) levels, whereas the patient's alkaline phosphatase (1298 U/L) and erythrocyte sedimentation rate (ESR) (45 mm/hour) were elevated from normal levels.

Radiological examination

Panoramic view of the CT scan showed enlarged body on the right side of mandible with an ill-defined diffuse radiolucency of size 7.5×2 cm extending from the condylar head to the right angle of mandible. Another ill-defined radiolucency of size 2.5×1.5 cm was seen extending from the mesial of 46 to the distal and to third molar region with the loss of lamina dura at the distal root apex. A multilocular diffuse radiolucency can also be seen at the lower border of the mandible of varying size below the root apices of the lower right premolar-molar region which is extending to the lower border of mandible. The three-dimensional reconstruction image showed erosions in the right

Figure 1 Clinical photograph showing swelling in the right angle of mandible and supraorbital region.

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condylar head and at the lingual aspect of body of the mandible (figure 2).

Sagittal view CT image showed complete obliteration of the frontal sinus and right sphenoidal sinus. It also showed mildly compromised but intact optic canal with obliteration of the bilateral maxillary sinus (L>R) also involving the temporomandibular joint (TMJ) and the base of the skull (figure 3A). Coronal view CT scan finding included, partial obliteration of the right and left ethmoidal sinus, bilateral involvement of the nasal bones, bony

part of the nasal septum and all turbinates (R>>L) (figure 3B). Axial view CT image showed the involvement of maxillary sinus, zygomatic bone and right mandibular bone without involving the cervical vertebrae (figure 3C).

Histopathological examination

Bone biopsy from the mandibular angle was performed to confirm the diagnosis. Microscopic examination revealed thickened bony trabeculae covered by a thick layer of osteoid lined

Figure 2 CT panoramic view showing multiple areas of radiolucency in the right side of the body of mandible and three-dimensional reconstructed image showing lingual erosive changes.

Figure 3 (A–C) Sagittal view CT image showing complete obliteration of frontal sinus and right sphenoidal sinus. Mildly compromised but intact optic canal with obliteration of bilateral maxillary sinus (L>R) and also involving TMJ and base of the skull is shown (A). Coronal view CT scan finding included, partial obliteration of the right and left ethmoidal sinus, bilateral involvement of nasal bones, bony part of nasal septum and all turbinates (R>>L) (B). Axial view CT image showing involvement of maxillary sinus (C) zygomatic bone and right mandibular bone without involving the cervical vertebrae.

Figure 4 Histopathological slide.

with flattened osteoblasts. The interosseous tissue was scanty containing dilated or distended blood space and scanty fibrous tissues. There were occasional osteoclastic giant cells at the margins of the trabeculae. At places irregular cement lines were also seen which was suggestive of Paget's disease (figure 4).

A bone scan was advised to check for any other bony involvement. It showed diffuse increased uptake of isotope by all the four limbs, frontal, sphenoidal, ethmoidal, occipital, maxillary bone of skull, entire right mandible with anterior third of left side, pelvic bones especially ilium, both ischial bones and SI joints suggestive of Paget's disease (figures 5 and 6).

DIFFERENTIAL DIAGNOSIS

Fibrous dysplasia and metastatic carcinoma were considered under differential diagnosis.

TREATMENT

The patient was referred to a higher centre for further management.

OUTCOME AND FOLLOW-UP

The case was followed up on telephone once in every 6 months for 2 years and was found to be satisfactory.

DISCUSSION

Paget's disease of bone also known as osteitis deformans, which is considered to be a misnomer, is seen due to increased turnover in bone production which leads to abnormal bone expansion and deformities. The aetiology for Paget's disease precisely is not known but association with virus like paramyxovirus has been seen with intranuclear inclusions of virus in the osteoclasts.² In some cases, familial association has also been noted with AD traits on chromosome 18q, locus D18S42.^{3 4} Paget's disease is relatively common in countries such as North and South America, Australia, New Zealand and Canada but it is rare in Asia, Africa, Middle East, Scandinavia, Spain and Italy. Less number of cases has been described in India until now.^{5 6} Men are affected more as compared to women (1.8:1) and older age groups of individuals more than 50 years. It has been seen that the incidence of disease will enhance as the age advances. Paget's disease of bone can be monostotic or

Figure 5 Bone scan showing areas taken up by isotope on skeletal and craniofacial area.

Figure 6 Bone scan showing areas taken up by isotope on craniofacial area.

polyostotic in nature depending on the number of bones involved. Most commonly involved bones are the pelvic girdle, spine, lumbar region, thoracic region and cervical and skull bones. Involvement of maxilla and mandible has been seen in 17%⁷ of cases with slight predilection for maxilla compared to mandible, the ratio being 2.3:1.⁸ Most cases are asymptomatic in nature but symptomatic cases may lead to various manifestations such as arthritis, bone pain, pathological fractures, bowing of legs and kyphosis. Involvement of the nerve canal or foramen may lead to neurological symptoms such as hearing loss, blindness and facial paralysis with enlargement of the skull and facial bones.^{9–10} The overlying skin of the affected bones will be warm on palpation due to increased vascularity in the bones. Patients may develop cardiac manifestations too due to increased vascularity that leads to high cardiac output which result in cardiomegaly, cardiac failure and death.

Our case presented with involvement of multiple facial, skeletal and jaw bones at very young age of 25 years which is not consistent with the previous literature and is rare for this age group. Paget's disease of bone can be diagnosed by clinical and radiological examinations with isotope bone scans which can be confirmed by elevated alkaline phosphatase levels in serum and hydroxyproline in urine, which was positive in our patient too.

Patients with Paget's disease can be treated by using bisphosphonates, as they inhibit exaggerated osteoclastic activity and reduces bone loss, given by intravenous or oral routes. The most commonly used bisphosphonates in the management of Paget's disease are pamidronate, etidronate, zoledronic acid, alendronate and riseridronate. Bisphosphonates can be used in combination also which may provide good relief and they remain as the mainstay of treatment. Calcitonin can also be used which inhibits osteoclastic activity and reduces bone pain but is not used anymore due to the development of resistance and relapse after the treatment. Mithramycin, a potent cytotoxic antibiotic, can

also be used for the resistant cases. Symptomatic treatment for pain relief may include analgesics whereas severe cases may require surgical management.^{11–13}

Several, but rare, complications have also been noted in some patients, most commonly being the development of osteosarcoma (81%), fibrosarcoma (14%), chondrosarcoma (3%), malignant fibrous histiocytoma (1%), malignant giant cell tumour and lymphosarcoma (0.5%).^{14–15} No treatment was given to the patient in our Dental College; he was referred to a higher centre for better management and treatment.

Contributors NPR, JA conception and design, acquisition of data or analysis and interpretation of data. SMM, DDD drafting the article or revising it critically for important intellectual content. DDD gave final approval and other.

Competing interests None declared.

Patient consent Obtained.

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Learning points

- Second most common metabolic bony disorder after osteoporosis.
- Paget's disease of bone is not very common at young age.
- Maxillary involvement is more as compared to mandible with a ratio of 2.3:1.

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