



Case Report

**JIGSAW PUZZLE - A CLASSICAL DOSSIER OF
PAGET'S DISEASE**

*Sandra Sagar*¹, *Karthikeyan Ramalingam*^{2*}, *Pratibha Ramani*³

¹Department of Oral & Maxillofacial Pathology, Saveetha Dental College & Hospitals, Chennai – 600077

^{2*} Professor and Head, Department of Oral & Maxillofacial Pathology, Saveetha Dental College & Hospitals, Saveetha Institute of Medical and Technical Sciences, Chennai – 600077

³ Professor & Head, Department of Oral & Maxillofacial Pathology, Saveetha Dental College & Hospitals, Chennai – 600077

How to cite: *Sagar S et al, Jigsaw Puzzle - A Classical Dossier of Paget's Disease. Int J Head Neck Pathol 2022; 5(2):1-6. DOI: <https://doi.org/10.56501/intjheadneckpathol.v5i2.554>*

Received :24/06/2022

Accepted: 15/07/2022

Web Published: 29/07/2022

Abstract

Paget's disease (PD) is a chronic bone disease characterised by increased resorption followed by excessive bone formation resulting in bone pain and fractures. PD is most common in the elderly and many are initially asymptomatic but can develop severe complications as disease progresses. Serum alkaline phosphatase is an important biochemical marker which is elevated in these patients. A clinical lion like face and radiological "cotton wool appearance" and a "jigsaw puzzle" pattern on histopathological examination are the characteristic features of PD. Bisphosphonates are the most commonly used drug of choice for treatment of patients with Paget's disease. We discuss a classic case of PD involving a 70 year old female in this case report.

Keywords: Paget's disease, Lion-like face, Cotton wool, Jigsaw puzzle

Address for Correspondence:

Dr. Karthikeyan Ramalingam,
Associate Dean, Professor and Head,
Department of Oral Pathology,
Saveetha Dental College and Hospitals,
Saveetha Institute of Medical and Technical Sciences,
Chennai, Tamilnadu, India.
Email: karthikeyanr.sdc@saveetha.com

INTRODUCTION

Paget disease of bone (PD) is characterized by abnormal deposition and resorption of bone leading to weakening of bones. Sir James Paget, a British surgeon was the first to describe Paget's disease in 1877. It is most commonly seen among the elderly people. PD can be either monostotic or polyostotic. The exact cause of Paget's disease is still unknown, however recent studies have shown that mutation in the sequestrome gene (SQSTM1) gene which plays a role in the osteoclastic activity via nuclear factor- κ B have a potent role in the etiology of PD. [1] PD is characterized by active bone remodeling, which leads to pain and pathological fractures.

CASE REPORT

A 70 year old female patient reported to the clinic with the chief complaint of right upper and lower back tooth for past 3 years which aggravates on mastication and relieves on taking medications. Patient had no relevant medical and surgical history. Patient had difficulty in hearing for the past 3 years. On extra-oral examination, there was evidence of bilateral swelling seen over the zygomatic region, obliterating the nasolabial sulcus. The patient had the characteristic leonine facies. On palpation, the swelling was hard in consistency. The swelling was immobile and attached to the underlying bone. Intra-orally, there was a swelling seen in the 18 region of the maxillary alveolus [Fig.1] with obliteration of the buccal sulcus. Cortical expansion was seen in the maxillary molar region. On palpation, the swelling was non-tender, consistency was hard and attached to the underlying bone. [Fig.2]



Figure.1 Extraoral clinical photographs showing diffuse swelling of the face giving a leonine facies appearance.



Figure.2 Intraoral clinical photographs showing cortical expansion in relation to right maxillary molar region

On radiographic examination, mixed radiopacities were evident in the skull vault, facial bones and sinus involvement, suggestive of cotton wool appearance [Fig.3]



Figure.3 Radiograph of the skull shows irregularly shaped radiopacities involving the entire skull, giving a characteristic cotton wool appearance.

An incisional biopsy was done in relation to 18 region and was submitted for histopathological examination. On grossing, a single bit of hard tissue specimen was received in formalin, hard in consistency, measuring 0.5x0.3x0.2 cm, black in colour. The tissue bit was kept for decalcification in 10% formic acid followed by routine tissue processing.[Fig.4]

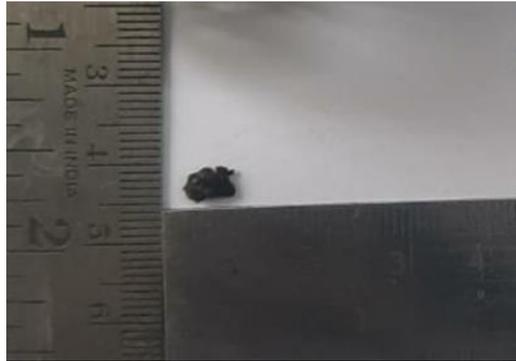


Figure 4: Grossing image showing the tissue specimen

Histopathological examination showed irregular bony trabeculae with prominent basophilic reversal lines, numerous osteocytes within the lacunae and simultaneous areas of bone formation and bone resorption. The areas of bone formation showed the presence of bony trabeculae lined by plump osteoblasts. The areas of bone resorption are seen surrounded by multi-nucleated giant cells. The intervening connective tissue stroma was fibrovascular with mild chronic lymphoplasmacytic infiltrate. Areas of haemorrhage were also seen.[Fig.5]

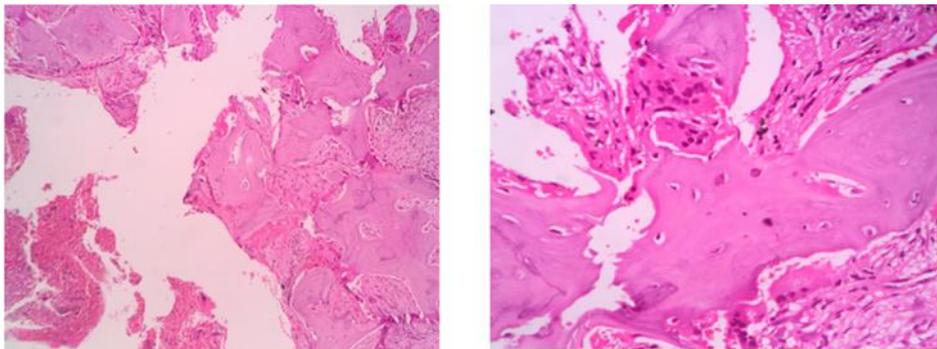


Figure 5 Photomicrographs showing jigsaw puzzle pattern of bony trabeculae with osteocytes along with prominent basophilic reversal lines and multinucleated giant cells. (H & E, 10x/40x)

Correlating the clinical, radiologic, and histopathologic findings, a final diagnosis of Paget's disease of bone was established. Patient was referred for further evaluation of alkaline phosphatase levels and was advised a bone scan for further evaluation .

DISCUSSION

PD is the second most common bone disorder with osteoporosis being the most common. PD was found to be more common among the western countries, however it has been increasingly reported in Asian countries in the recent times.[1]

PD commonly affects elderly people over the age of 40 and it most often presents as an incidental finding during radiographic examination. Fractures, either pathologic or traumatic are more common in later stages of the disease progression. Radiological and histopathological examination usually provide the diagnosis of PD. The exact cause of PD is still unclear. However genetic factors play a great role in this disease since most of the affected patients have a positive family history of the disease. The initial finding of PD is often incidental

with an elevated serum alkaline phosphatase level or an incidental finding during radiograph examination. Though the patients appear to be asymptomatic initially, they develop bone pain and fractures due to the expansion of bone and compression of adjacent neural structures. The overlying skin in those regions of bone expansion may be warm due to the increased vascularity associated with high bone turnover.[2,3]

Maxilla is the most commonly affected site followed by mandible. Cortical expansion of the maxillary alveolus and flattening of the palate is the most commonly observed feature. In edentulous patients, there is a common complaint of ill-fitting dentures. Leontiasis Ossea or lion like facies, characterised by enlargement of mid third of the face is seen in PD, but it may also be seen in patients who have advanced lepromatous leprosy. [1-3] In this present case also, the patient had a lion like appearance of the face.

PD is diagnosed primarily by radiological examination. During the early course of the disease, there is a predominant lytic activity followed by sclerosis giving the characteristic cotton wool appearance, thickened trabeculae, bone expansion, cortical thickening, and deformity.[4] Our case presented with classical cotton wool appearance involving the craniofacial bones. A differential diagnosis of lytic or sclerotic metastasis should also be considered for localised lesions, though the radiological appearances are usually characteristic.[5] The other classic radiographic appearances seen in various bones affected by PD are “blade of grass”, “flame sign”, “Brim sign” and, “TamO’Shanter” skull are, which were not seen in our case. [6]

Histopathological examination shows an alternating resorption and formation of bone. In the active resorptive stages, numerous osteoclasts are seen surrounding the bony trabeculae and the osteoblastic activity is seen with formation of osteoid rims around bony trabeculae. A highly vascular fibrocellular connective tissue replaces the marrow. A characteristic microscopic feature is the presence of basophilic reversal lines in the bone. These lines indicate the junction between alternating resorption and formation that results in a “jigsaw puzzle,” or “mosaic,” appearance of the bone. [1,2] Our case showed the classical jigsaw puzzle appearance.

Patients with PD show an elevated serum alkaline phosphatase levels but blood calcium and phosphorus levels are usually normal. Hence the patients must be advised to evaluate the serum alkaline phosphatase levels. The clinical and radiographic features, are sufficient for initial diagnosis, histopathological findings and biochemical examination provides the confirmatory diagnosis. In most of the cases, patients are asymptomatic and require no treatment. However NSAIDs and bisphosphonates are the most commonly used treatment for patients with the advanced forms of Paget’s disease.[1,2,7]

CONCLUSION

Though patients with PD are asymptomatic initially, an early diagnosis and prompt treatment can save the patient from the complications associated with the disease progression.

Financial support and sponsorship

Nil

Conflicts of interest

There are no conflicts of interest

REFERENCES

1. Karunakaran K, Murugesan P, Rajeshwar G, Babu S. Paget’s disease of the mandible. *J Oral Maxillofac Pathol* 2012;16:107-9.
2. Eversole R, Su L, ElMofty S. Benign fibrous lesions of the craniofacial complex. A review. *Head Neck Pathol* 2008;2:177-202.
3. Bae KB, Kwon JH, Kim YH, Jung TY, Cho JH. Juvenile Paget’s disease with paranasal sinus aplasia. *Clin Exp Otorhinolaryngol* 2008;1:224-6.
4. Bastin S, Bird H, Gamble G, Cundy T. Paget’s disease of bone: Becoming a rarity? *Rheumatology (Oxford)* 2009;48:1232-5.
5. Sekar B, Augustine D, Murali S. Paget’s disease of mandible: A case report and review of literature. *J Orofac Sci* 2010;2:13-17.
6. Theodorou DJ, Theodorou SJ, Kakitsubata Y. Imaging of Paget disease of bone and its musculoskeletal complications: Review. *AJR Am J Roentgenol* 2011;196:S64-75.
7. Michou L, Brown JP. Emerging strategies and therapies for treatment of Paget’s disease of bone. *Drug Des Devel Ther* 2011;5:225-39.1.



Published by MM Publishers
<https://www.mmpubl.com/ijhnp>

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.
To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc/4.0/> or send a letter to Creative Commons, PO Box 1866, Mountain View, CA 94042, USA.

Copyright ©2022 Sandra Sagar, Karthikeyan Ramalingam, Pratibha Ramani