Avicenna J Dent Res. 2017 June; 9(2):e26893. doi: 10.5812/ajdr.26893.

Published online 2016 January 20. **Case Report**

CBCT Features and Histopathological Examination of Fibrous Dysplasia in Maxilla: Case Report

Farzaneh Ostovarrad,[1] Faezeh Yousefi,[2] Sepideh Falah-Kooshki,[3] and Atena Karimi[3,*]

[1]Assistant Professor, Department of Oral and Maxillofacial Radiology, School of Dentistry, Guilan University of Medical Sciences, Rasht, IR Iran
[2]Assistant Professor, Department of Oral and Maxillofacial Radiology, School of Dentistry, Hamadan University of Medical Sciences, Hamadan, IR Iran
[3]Assistant Professor, Department of Oral and Maxillofacial Radiology, School of Dentistry, Kermanshah University of Medical Sciences, Kermanshah, IR Iran

[*]*Corresponding author*: Atena Karimi, Department of Oral and Maxillofacial Radiology , Dental School of Kermanshah University of Medical Sciences , Kermanshah, IR Iran. Tel/Fax: +98-8337277164, E-mail: Atenakarimi83@yahoo.com

Received 2015 January 26; **Revised** 2015 February 22; **Accepted** 2015 February 28.

Abstract

Introduction: Fibrous dysplasia is a developmental bone disease that is characterized by replacement of normal bone with fibrous tissue.
Case Presentation: A 58-year-old man came to the Oral and Maxillofacial Radiology Department, Hamadan College of Dentistry, with swelling on the left side of the maxilla. The lesion was diagnosed to be fibrous dysplasia of the maxilla with involvement of the maxillary sinus, based on the radiographic and histopathologic features.
Conclusions: Some radiographic features, such as a ground glass appearance and reduction in antrum size while keeping the original shape, are characterizations of fibrous dysplasia.

Keywords: Fibrous Dysplasia, Maxilla, Radiographic Feature

1. Introduction

Fibrous dysplasia (FD) is defined as a benign lesion in which normal cancellous bone is changed to immature woven bone and fibrous tissue. In this lesion, abnormal growth or swelling of the bone is a significant feature (1). The etiology of fibrous dysplasia is unknown (2) and initial symptoms most often present during childhood or adolescence (1). FD is extremely variable between individuals. When one bone is affected it is termed monostotic FD and when multiple areas are affected it is termed polyostotic (3, 4). The polyostotic form is generally more severe and tends to be unilateral, while the monostotic form is fortunately more common (5). Fibrous dysplasia usually occurs in young people, with 75% of cases presenting before the age of 30 years. The lesions of fibrous dysplasia are predominantly found in the posterior aspects of the maxilla (3).

The diagnosis of fibrous dysplasia can be made using radiologic features and histopathological examination. Computed tomography (CT) and magnetic resonance imaging (MRI) can be suitable for assessing the soft tissue and the extent of the lesion (6). In this type of lesion, grading of density is variable, although some may show completely radiolucent or radiopaque features. The lesion usually shows nonspecific increased uptake of radiotracer on bone scans (7). The MRI characteristics of fibrous dysplasia are variable.T1-weighted images reveal fibrous dysplasia as hypointense, and T2-weighted images reveal fibrous dysplasia as either hyperintense or hypointense. Signal intensity on T1 and T2-weighted images and the degree of contrast enhancement depend on the amount and degree of bony trabeculae, cellularity, collagen, cystic and hemorrhagic changes (8). The major differential diagnoses of FD include metabolic bone disease, Paget's disease, cement ossifying fibroma, osteomyelitis and osteogenic sarcoma (2). Conservative treatment, including shaving and debridement of the lesion, has been the treatment of choice (9).

2. Case Presentation

A 58-year-old man presented to our clinic with a complaint of swelling on the left side of the maxilla. In taking the history of the patient, he did not remember the first time that he noticed the lesion. Intraoral examination findings were normal. Extra oral examination showed bony, hard, non-tender swelling in the maxillary left region extending superiorly and inferiorly 1 cm below the canthus tragus line to the line joining the corner of mouth to the tragus and anteroposteriorly 1.5 cm away from the corner of the mouth to 2 cm in front of the left tragus. There were no apparent changes in the skin.

Axial CBCT revealed a lesion within the left zygomatic and maxillary bones. The lesion had blending borders, and there was no rim or capsule around the lesion. Its internal

structure had a ground glass appearance with severe nodular expansion. The antrum size had become smaller, while keeping the original shape. The lesion was not destructive. In CBCT, the reconstructed panoramic lesion was shown extending to the opposite side of the maxilla. The lesion had no effect on the lateral wall of the nose (Figure 1). The patient was edentulous and the lesion was extended to the alveolar crest.

The lesion was surgically incised, and the tissue was sent for histopathological examination. The sections revealed fibrous dysplasia with irregularly shaped trabeculae of immature (woven) bone in a cellular, loosely arranged fibrous stroma. The bone trabeculae were not connected to each other. They assumed curvilinear shapes, which have been likened to Chinese script writing (Figure 2). Regarding the radiographic features and histopathological examination, the diagnosis was fibrous dysplasia. So, the maxillofacial surgical treatment plan was only to follow the patient and cosmetic surgery depended on whether the patient wanted to undergo surgical intervention.

3. Discussion

Fibrous dysplasia is a bone disorder of unknown origin characterized by slow, progressive replacement (1). It is clear that CT is invaluable for the assessment of extensive lesions, especially those affecting the anatomically complex maxilla (4). CT scan will demonstrate a classic heterogeneous ground glass appearance with calcifications. Areas of low enhancement and cyst formation can be seen (10). The radiographic feature is more radiolucent and well-defined in the early stages and becomes mottled and more radiopaque as the disease progresses (6). It may have a granular or orange peel appearance, a wispy arrangement (cotton wool), or an amorphous, dense pattern (2).

Although CT is useful in assessing the lesion, the high dose absorbed by the patient during a CT scan limits its application. The advantages of CBCT, including higher resolution and lower radiation dose compared to CT, make it a valuable diagnostic tool for head and neck imaging (11). In this patient, CBCT helped to evaluate the extension of the lesion and determine any long-term changes associated with the progression of FD, as well as reactivation of the lesion growth.

Radiographic findings may resemble those of cemento-osseous lesions, but FD does not show a radiolucent border (5). FD most often has an ill-defined border in which the normal trabecular bone blends into the abnormal pattern (2). Metabolic bone diseases, such as hyperparathyroidism, may produce a similar pattern. However, these diseases are polyostotic and bilateral, and unlike fibrous dysplasia, do not cause bone expansion (5).

In this case, the patient's age and nodular expansion of the lesion did not indicate FD, but its internal pattern and the way it occupied the sinus led to the definitive diagnosis of FD, rather than COF or any other radiopaque lesions. This lesion also presented in the mature form of fibrous dysplasia, with a ground glass radiopacity pattern and displacement from the floor of the adjacent maxillary sinus upward. Occasionally, treatment of FD is required for cosmetic purposes; otherwise surgical treatment is not considered (12).

Footnotes

Authors' Contribution: Collection of data: Farzaneh Ostovarrad; writing of paper: Faezeh Yousefi, Sepideh Falah-Kooshki; writing and corresponder: Atena Karimi.

Funding/Support: This study was funded and supported by the office of research of Hamadan University of Medical Sciences.

References

1. Keskin M, Karabekmez FE, Ozkan BT, Tosun Z, Avunduk MC, Savaci N. Simultaneous occurrence of facial fibrous dysplasia and ameloblastoma. *J Craniomaxillofac Surg.* 2009;**37**(2):102–5. doi: 10.1016/j.jcms.2008.10.015. [PubMed: 19064325].
2. White SC, Pharoah MJ. In: Oral radiology. Principles and interpretation. 6 ed. Louis ST, editor. USA: Mosby Inc; 2009. pp. 485–515.
3. MacDonald-Jankowski D. Fibrous dysplasia in the jaws of a Hong-Kong population: radiographic presentation and systematic review. *Dentomaxillofac Radiol.* 1999;**28**(4):195–202. doi: 10.1038/sj/dmfr/4600440. [PubMed: 10455381].
4. Barat M, Rybak LP, Mann JL. Fibrous dysplasia masquerading as chronic maxillary sinusitis. *Ear Nose Throat J.* 1989;**68**(1):42. [PubMed: 2656231] 44-6.
5. Menon S, Venkatswamy S, Ramu V, Banu K, Ehtaih S, Kashyap VM. Craniofacial fibrous dysplasia: Surgery and literature review. *Ann Maxillofac Surg.* 2013;**3**(1):66–71. doi: 10.4103/2231-0746.110088. [PubMed: 23662263].
6. Fitzpatrick KA, Taljanovic MS, Speer DP, Graham AR, Jacobson JA, Barnes GR, et al. Imaging findings of fibrous dysplasia with histopathologic and intraoperative correlation. *AJR Am J Roentgenol.* 2004;**182**(6):1389–98. doi: 10.2214/ajr.182.6.1821389. [PubMed: 15149980].
7. Resnick D. Diagnosis of bone and joint disorders. 4 ed. Philadelphia, PA: Saunders; 2002. pp. 4285–840.
8. Jee WH, Choi KH, Choe BY, Park JM, Shinn KS. Fibrous dysplasia: MR imaging characteristics with radiopathologic correlation. *AJR Am J Roentgenol.* 1996;**167**(6):1523–7. doi: 10.2214/ajr.167.6.8956590. [PubMed: 8956590].
9. Yeow VK, Chen YR. Orthognathic surgery in craniomaxillofacial fibrous dysplasia. *J Craniofac Surg.* 1999;**10**(2):155–9. [PubMed: 10388417].
10. Berlucchi M, Salsi D, Farina D, Nicolai P. Endoscopic surgery for fibrous dysplasia of the sinonasal tract in pediatric patients. *Int J Pediatr Otorhinolaryngol.* 2005;**69**(1):43–8. doi: 10.1016/j.ijporl.2004.07.017. [PubMed: 15627445].

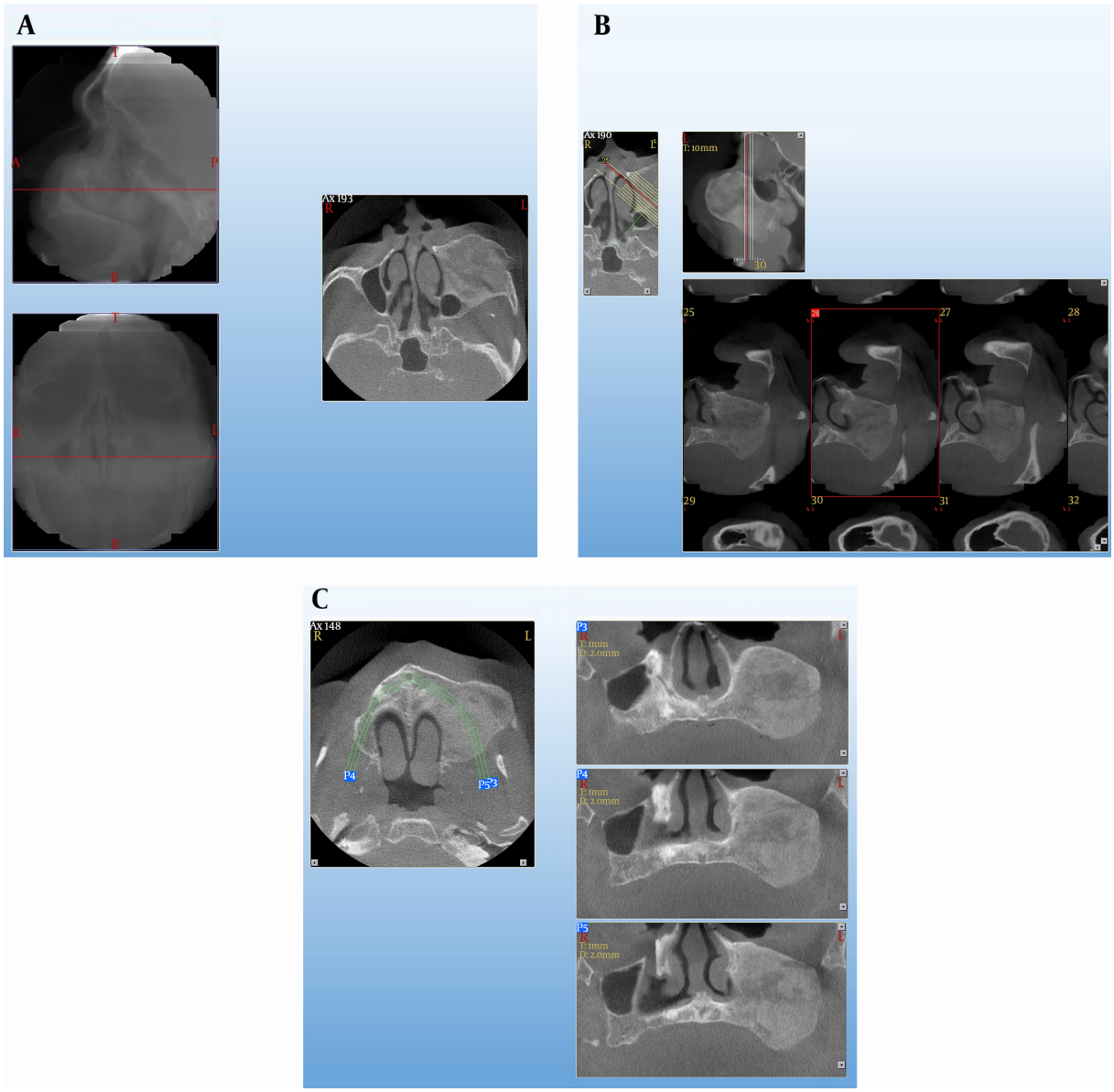

Figure 1. A, Multiplanar, cross-section and reformate panoramic CBCT showed an expansile radiopaque lesion on the left side of the maxilla with involvement of zygomatic bone and alveolar crest; B, Internal structure was ground glass without any rim or border; C, Maxillary sinus became smaller by keeping its original shape.

11. Frederiksen NL, Benson BW, Sokolowski TW. Effective dose and risk assessment from computed tomography of the maxillofacial complex. *Dentomaxillofac Radiol.* 1995;**24**(1):55–8. doi: 10.1038/dmfr.24.1.8593910. [PubMed: 8593910].
12. Yasuoka T, Takagi N, Hatakeyama D, Yokoyama K. Fibrous dysplasia in the maxilla: possible mechanism of bone remodeling by calcitonin treatment. *Oral Oncol.* 2003;**39**(3):301–5. [PubMed: 12618204].

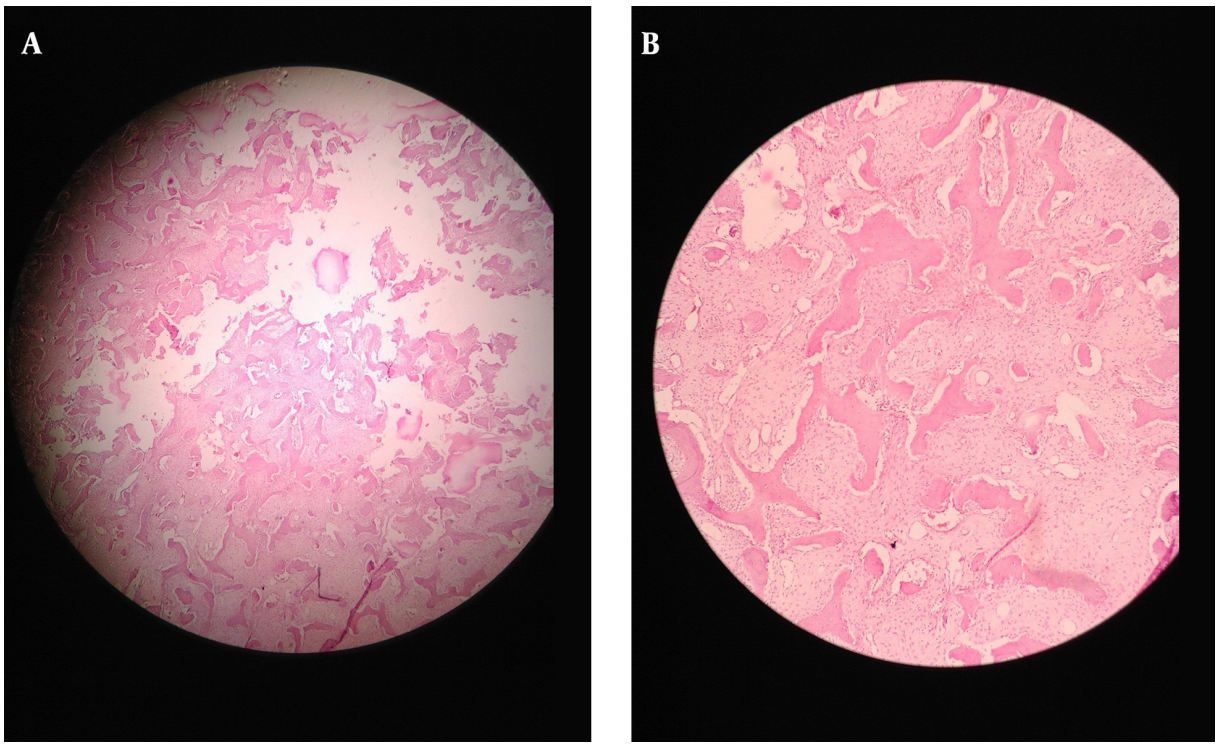

Figure 2. Histopathology of Incised Tissue Showing Features Consistent With Fibrous Dysplasia