

CASE REPORT

Focal Sclerosing Osteomyelitis and Orthodontic Treatment Planning

AMR RAGAB EL-BEIALY, BDS, MSC, MOrth RCS
YEHYA AHMED MOSTAFA, BDS, FDS RCS, MS, PHD

Orthodontic tooth movement is based on the response of the supporting periodontium and alveolar bone. Any abnormality in these underlying structures can affect tooth movement and therefore should be considered in treatment planning.

This article describes orthodontic treatment of a patient with a mandibular bony osteosclerotic lesion that negatively affected the progress of treatment and the final result.

Diagnosis

A 33-year-old female presented with a mild Class III malocclusion (Fig. 1). Many years earlier, the maxillary left canine and the mandibular left first per-

manent molar, right second premolar, and right second molar had been extracted.

X-rays revealed a circumscribed, radiopaque lesion with a faint radiolucent margin near the site of the extracted mandibular right second molar, at the level of the root apex. The finding was evaluated by a maxillofacial surgeon. Because the lesion was located near an extraction space, it was thought to be related to long-term infection of the extracted tooth. The preliminary diagnosis was condensing osteitis, also known as focal sclerosing osteomyelitis, caused by either odontogenesis or the hematogenous spread of a low-grade infection. Because the lesion was asymptomatic, how-

ever, no surgical intervention was planned.

Treatment Progress

Orthodontic treatment was undertaken to correct the patient's anterior crossbite through retraction of the mandibular anterior teeth. The residual spaces were closed and the molar roots uprighted, but the posterior teeth were protracted (Fig. 2). Because a high degree of resistance was encountered, molar uprighting took longer than expected. Total treatment time was 35 months.

Post-treatment radiographic evaluation showed contact between the mandibular right third molar root and the radiopaque bony lesion, with concomitant apical and lateral resorption of the mesial root (Fig. 3), although the bony lesion was noticeably smaller than in the pretreatment x-rays. A computed tomographic scan of the mandible was performed to confirm that the apparent resorption was not due to superimposition of the lesion and the root; the resulting image clearly showed resorption of the third molar's mesial root (Fig. 4).

Dr. El-Beialy is an Associate Lecturer, Department of Orthodontics, and Dr. Mostafa is Professor and Chair, Department of Orthodontics and Dentofacial Orthopedics, Faculty of Oral and Dental Medicine, Cairo University, Egypt. Contact Dr. Mostafa at 52 Arab League St., Mohandesseen, Giza, Egypt; e-mail: mangoury@usa.net.



Dr. El-Beialy



Dr. Mostafa

Discussion

Focal sclerosing osteomyelitis is considered the most common cause of periapical radiopacity in adults, appearing in 6-8% of all dental radiographs.^{1,2} Women are more frequently affected than men.² Some 85% of these lesions occur in the mandible, predominantly in the first molar regions.^{3,4} In a young adult, the condition often affects the periapical bone around a carious tooth with pulpal involvement.^{1,4}

The higher frequency of focal sclerosing osteomyelitis in the mandible than in the maxilla is related to both physiological and anatomical factors. The mandible is less highly vascularized

than the maxilla, with less collateral circulation. Moreover, the dense mandibular cortex prevents drainage of an infection. The chronic nonsuppurative, sclerosing form of osteomyelitis is a response to a chronic low-grade infection of the medullary bone.⁴

Radiographically, the condition is frequently observed at the roots of a mandibular molar or premolar with infected pulp.^{1,4} In the medullary region, a circumscribed mass of isolated bone will appear more radiopaque than the surrounding bone; the margins may be distinct or poorly defined.^{4,5} When these focal sclerotic lesions are asymptomatic, however, surgical treatment is unnecessary.⁴

Of primary concern to orthodontists is the lack of microcirculation and viable bone cells in the sclerotic area.^{5,7} Because effective tooth movement depends on an adequate blood supply to the tissues, sclerotic areas will respond abnormally to orthodontic forces, possibly preventing normal bone remodeling. Thus, an avascular, hyalinized bony lesion in the line of tooth movement can lead to root resorption.^{5,8}

In our experience, this condition is not rare in orthodontic cases. Radiographs of another patient, a 28-year-old male, revealed isolated bony lesions surrounding both mandibular second premolars (Fig. 5); mesial or distal movement of either tooth



Fig. 1 33-year-old female patient with mild Class III malocclusion before treatment.

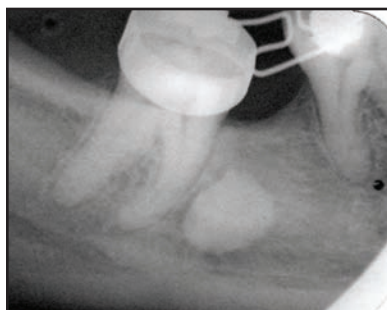


Fig. 2 Mandibular right third molar during space closure and molar uprighting.

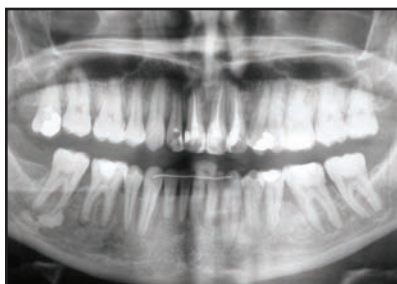


Fig. 3 Post-treatment radiograph, with close-up of mandibular right third molar showing apical and lateral resorption of mesial root.



would have jeopardized the integrity of the root. A patient's medical history, including chronic low-grade infection, should always be considered in conjunction with pretreatment radiographic evaluation.

ACKNOWLEDGMENTS: The authors would like to thank Drs. Sherihan Hasan and Lobna Tawfik for their assistance with the production of this manuscript.

REFERENCES

1. Wood, N.K. and Goaz, P.W.: *Differential Diagnosis of Oral Lesions*, 4th ed., Mosby-Year Book, St. Louis, 1991, pp. 551, 555-559.
2. Marmary, Y. and Kutiner, G.: A radiographic survey of periapical jawbone lesions, *Oral Surg. Oral Med. Oral Pathol.* 61:405-408, 1986.
3. Farman, A.G.; de V Joubert, J.J.; and Nortjé, C.J.: Focal osteosclerosis and apical periodontal pathoses in "European" and Cape coloured dental outpatients, *Int. J. Oral Surg.* 7:549-557, 1978.
4. Topazian, R.G. and Goldberg, M.H. (eds.): *Oral and Maxillofacial Infections*, 2nd ed., W.B. Saunders Co., Philadelphia, 1987.
5. Shafer, W.G.; Hine, M.K.; and Levy, B.M.: *A Textbook of Oral Pathology*, 4th ed., W.B. Saunders Co., Philadelphia, 1983, pp. 502-503.
6. Boyne, P.J.: Incidence of osteosclerotic areas in the mandible and maxilla, *J. Oral Surg.* 18:486-491, 1960.
7. Douglass, G.D. and Trowbridge, H.O.: Chronic focal sclerosing osteomyelitis associated with a cracked tooth: Report of a case, *Oral Surg. Oral Med. Oral Pathol.* 76:351-355, 1993.
8. Eliasson, S.; Halvarsson, C.; and Ljungheimer, C.: Periapical condensing osteitis and endodontic treatment, *Oral Surg. Oral Med. Oral Pathol.* 57:195-199, 1984.



Fig. 4 Three-dimensional computed tomographic image of mandibular right third molar, showing mesial root resorption.

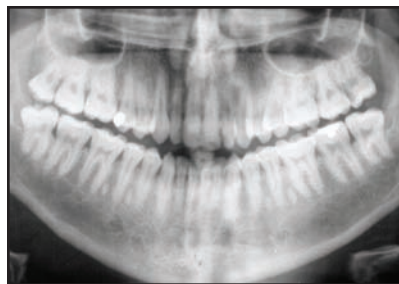


Fig. 5 28-year-old male patient with isolated osteosclerotic lesions surrounding both mandibular second premolars.

