Healing of a Radiolucent Periradicular Lesion With Periradicular Radiopacity

E. Kosti, DDS, T. Lambrianidis, DDS, PhD, P. Chatzisavvas, DDS, and I. Molyvdas, DDS, PhD

Periradicular radiopacities that reveal the existence of sclerotic bone are less common than periradicular radiolucencies. Replacement of a radiolucent periradicular area by sclerotic bone after endodontic treatment is not very often reported and may be confused with condensing osteitis. An unusual case is presented of sclerotic bone formation after endodontic treatment of a first mandibular molar with initial diagnosis of apical periodontitis.

Periradicular radiopacities that reveal the existence of sclerotic bone are detected less frequently than periradicular radiolucencies (1, 2). The term condensing osteitis, disputed by several clinicians (1–3), is usually used to describe the most common type of periradicular sclerotic bone formation (2).

Condensing osteitis arises as a consequence of a chronic, low-grade irritant in the root canal (2–13). The irritant causing the reactive bone sclerosis could be either the inflamed pulp in the case of chronic pulpitis, or microorganisms of low virulence in the case of a necrotic pulp or after inadequately treated root canal systems (2, 3, 7, 13).

Typically, condensing osteitis presents radiographically as a uniformly dense radiopaque lesion in close proximity to the apex of the involved tooth (7), combined with loss of lamina dura apically and widening of the periodontal membrane (2, 8). Occasionally, a small periradicular radiolucent area can be seen at the apex of the root surrounded by the radiopacity (9). The entire root outline is clearly noticeable, a feature of critical importance for differential diagnosis from benign osteoblastoma and osteoma (10). Root resorption in connection with condensing osteitis is reported in certain studies (8–10) with an incidence as high as 12% (8), whereas other published reports do not substantiate this finding (14, 15). Histologically, condensing osteitis appears to have densely packed bone trabeculae with limited marrow spaces, decreased in size to such a degree that in some cases it resembles compact bone (4, 5). The osseous tissue is lined by osteoblasts, and the marrow space may be infiltrated by lymphocytes (6).

Replacement of a radiolucent area by sclerotic bone after nonsurgical endodontic treatment has been reported occasionally in the literature (2, 9). It has been speculated that the obturating or sealant material in endodontically treated teeth could activate sclerotic bone formation (2). The irritant stimulates osteoblastic activity, which aims at reinforcing the affected bone, at replacing bone loss, or at acting as a barrier to repel the advance of the degenerative process (3).

In this article, a case is reported of sclerotic bone formation after endodontic treatment of a first mandibular molar with initial diagnosis of apical periodontitis.

CASE REPORT

A 13-year-old girl was referred for endodontic treatment of the right mandibular first molar.

The past medical history of the patient was noncontributory. Intraoral clinical examination was remarkable for the presence of a soft tissue swelling associated with the right first mandibular molar, sensitivity to percussion and palpation, and negative response to thermal and electrical vitality tests. The preoperative radiograph (Fig. 1) revealed the presence of an extended occlusal temporary cement filling and a periradicular radiolucency associated with both distal and mesial roots of the right first mandibular molar. A diagnosis of secondary acute apical periodontitis was made. A radiopaque formation surrounded by a radiolucent area located close to the apex of the right second mandibular premolar was also observed. It was considered to be either an odontoma or

![Fig 1. Preoperative radiograph revealed the presence of an extended occlusal temporary cement filling and a periradicular radiolucency associated with both distal and mesial roots of the right first mandibular molar.](image-url)
a supernumerary tooth, and the decision was made not to treat at that time.

During the first appointment, an access cavity was prepared, and a rubber dam was applied. Instrumentation was performed using the step-back technique, with final flaring of the coronal part of the root canal with Gates Glidden drills. Sodium hypochlorite (2.5%) was used as an irrigant, and chemically pure calcium hydroxide mixed with physiological saline was used as an interappointment intracanal medication. The patient was scheduled for the next appointment in 2 weeks.

By the next appointment, all symptoms had subsided. Calcium hydroxide was removed, and obturation was performed with the lateral condensation technique of gutta-percha cones and a ZnO-eugenol–based sealer (Roth 811, Roth Drug Co., Chicago, IL) (Fig. 2). The patient was then referred back to her dentist for the final restoration of the tooth.

Although the patient was informed about the necessity of recall visits at regular intervals for a period as long as 4 years, she returned only 5 years later. She was symptom-free, and the recall radiograph (Fig. 3) revealed replacement of the pre-existing radiolucent lesion surrounding the distal root with a radiopaque presentation.

In our case, the radiolucencies associated with both mesial and distal roots of first mandibular right molar were diagnosed as chronic apical periodontitis, and endodontic treatment was performed. The healing process led to the appearance of periradicular radiopacity. The replacement of a radiolucent area by sclerotic bone seen in our case is not very often reported in literature. Morse et al. (2), following 211 teeth with apical periodontitis, found in the recall radiographs that in 21% of the cases, the radiolucency was replaced with radiopacity. Marmary and Kutiner (9) in a radiographic survey of the jawbone in 889 randomly chosen patients diagnosed condensing osteitis in 55 patients, whereas 23% of the biopsy was proposed, but the patient strongly objected to it. The radiolucency surrounding the apex of the mesial root had greatly diminished in size. In the panoramic radiograph, the radiopaque formation seen in the preoperative radiograph had now moved between the apices of first mandibular premolar and canine (Fig. 4). It was suggested that the patient keep a regular program of recall visits. Six years after the endodontic treatment, no symptoms were present. The radiopacity surrounding the distal root remained unchanged, and there were signs of periradicular radiopacity of the mesial root as well (Fig. 5).

DISCUSSION

In our case, the radiolucencies associated with both mesial and distal roots of first mandibular right molar were diagnosed as chronic apical periodontitis, and endodontic treatment was performed. The healing process led to the appearance of periradicular radiopacity. The replacement of a radiolucent area by sclerotic bone seen in our case is not very often reported in literature. Morse et al. (2), following 211 teeth with apical periodontitis, found in the recall radiographs that in 21% of the cases, the radiolucency was replaced with radiopacity. Marmary and Kutiner (9) in a radiographic survey of the jawbone in 889 randomly chosen patients diagnosed condensing osteitis in 55 patients, whereas 23% of the
teeth involved were endodontically treated. Among these cases, there may have been some that were in the process of healing at the time of the radiographic examination.

The replacement of a radiolucency with a radiopacity is considered an excessive phenomenon in the general remodeling procedure, after treatment. Osteoblastic activity that takes place at the end of the degenerative process does not reorganize the area to a normal bone trabeculation; instead, it continues the excessive placement of osteoid matrix that is gradually calcified by the accumulation of minerals without any resorption (3). A continuation of this activity is attributed to a good host response opposed to a low-grade irritant (2). The irritant, which acts as a bone stimulant, could be the inflamed pulp, microbes of low virulence, or even the filling material. In an animal in vivo study (16–18), gutta-percha/eugaperccha and gutta-percha alone (2) and sealer were used as filling materials and were found to be mild irritants leading to sclerotic bone formation.

The appearance of periradicular radiopacity after endodontic therapy in the first mandibular right molar of this case took place with a different rate for each root. At the distal root, the radiopacity was totally replaced by radiopacity, lacking periapical radiolucent halo, in a period of 5 years. At the mesial root, the bone sclerosis was visualized radiographically around the periphery of the apical radiolucent lesion only at the 6-year recall visit. The size of the initial radiolucency was significantly diminished, indicating successful healing.

In the 5-year and 6-year recall visits, the patient did not present any symptoms. During the clinical examination, there was no pain or tenderness on percussion or on palpation. The state of the tooth indicates that the radiopacity could be indicative of repair, although not complete repair, because only histological examination, which was not performed, could differentiate it from the pathology with the same radiographic appearance known as condensing osteitis. The treatment of choice for condensing osteitis is endodontic therapy (1, 2, 7, 8), although no treatment at all has also been suggested (5). As a result of endodontic treatment, the lesion may either regress (85%) or remain unchanged (15%), but no progression has been observed in any case (3, 8, 10). Whereas the intrabony lesion of condensing osteitis is itself asymptomatic, the associated tooth may manifest a diversity of symptoms (7). The tooth associated is quite often asymptomatic (3, 19), but in some cases, there may be tenderness on percussion or palpation or a minor diffused pain consistent with the compromised pulpal health. Pain caused by pressure on the lower alveolar nerve is very rare (10). Because the tooth did not require a post and crown prosthesis, which could upset the present status of tissue resistance and irritation, no question of retreatment emerged, and an annual recall visit program was scheduled. A surgical treatment would have been attempted for a symptomatic tooth that had received post and crown prosthesis because, in this case, conventional endodontic treatment could not be performed.

The toothlike structure was symptomless; hence, it was left untreated.

Dr. Kosti is affiliated with the Department of Endodontontology, and Dr. Lambiriandis is Associate Professor and Dr. Molyvides is Assistant Professor in the Department of Endodontontology, Dental School, Aristotelion University of Thessaloniki, Greece. Dr Chatzisavvas is in private practice.

Address requests for reprints to Dr. Kosti, 17 Agias Sofias Str, 54623, Thessaloniki, Greece; E-mail: helesava@otenet.gr.

References
学霸图书馆
www.xuebalib.com

本文献由“学霸图书馆-文献云下载”收集自网络，仅供学习交流使用。

学霸图书馆（www.xuebalib.com）是一个“整合众多图书馆数据库资源，提供一站式文献检索和下载服务”的24小时在线不限IP图书馆。
图书馆致力于便利、促进学习与科研，提供最强文献下载服务。

图书馆导航：
图书馆首页 文献云下载 图书馆入口 外文数据库大全 疑难文献辅助工具