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Healing of a large osteolytic mandibular lesion – A case report

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Abstract

The purpose of this article was to present a case report of 11–year old female patient with a large osteolytic mandibular lesion which healed after endodontic treatment. The patient was referred for radio diagnostics due to an incidental finding of a large osteolytic lesion of the area of the left lower first and second premolars in the panoramic radiograph taken before orthodontic treatment. CBCT was performed and the patient asked to have teeth 33-35 treated by endodontics before surgery. The patient missed the surgical appointment and when she reappeared several months later, the lesion showed signs of healing thus surgery were aborted. The presented case testifies to the observation that even large osteolytic lesions can heal after endodontic treatment without surgical approach.

Keywords: *mandible, osteolytic lesion, radio diagnostics*

Introduction

Periapical granulomas and radicularcysts are among the most frequentinflammatory lesions of the jaws [1-5]. Usually they are incidental radiographic findings [3]. The main cause of inflammation in periapical tissues is migration and colonisation of bacteria in the root canals. Block et al. [6] stated on the basis of 230 biopsies of periapical tissues that these pathogens rarely occur in periapical area. Only in one case bacteria were present in necrotic areas of periapical tissues. Bhasakar [7] as well as Lalonde and Luebke [8] noted the 42-44% frequency of radicular cysts among all the periapical inflammatory lesions. Nevertheless Riccuci [9] is doubtful as to such huge prevalence of cyst among the periapical lesions in all the papers, stating that scientists employ different methods of taking biopsies and various histological criteria. Himself he demonstrated the 23% frequency of radicular cysts and categorises them as "true cysts" with closed cavities and "pocket cysts" with cavities opened to the root canals. These two types of cysts were first described by Simon in 1980 [10]. There are papers stating the possibility of root canal treatment for pocket cysts, but Riccuci [9] emphasises that they are very scarce.

Differentiation between periapical granulomas and radicular cysts is only possible when based on histological analysis [9]. Nevertheless in practise radiological criteria are used very often, but as many papers show, they are not sufficient [9,13-15]. It is believed that a cyst has smooth border, is well-defined from surrounded bone and, if it is not infected, has peripheral bony cortex. A periapical granuloma is not well-defined from surrounding bone by means of sclerotic rim (apart from its cystic form) [9]. Radiodiagnostics influences treatment choice as granulomas are usually treated conservatively and patients with a suspicion of a radicular cyst are mostly referred for surgical treatment [1-5]. Finally only histological analysis can provide a definite diagnosis of the cystic lesion. According to Riccuci [9] there is no correlation between radiological features and histological diagnosis of a periapical lesion and one should avoid the usage of such terms as "granuloma" and "cyst", stating the diagnosis only on the basis of radiological image. Moreover one has to remember, that radiological image is a two-dimensional representation of a three-dimensional object. That is why Trope et al. [17] advocated the introduction of computed tomographic (CT) studies in differential diagnosis of periapical lesions. The lesions were differentiated on the basis of radiological densities between the content of the cyst's cavity and the surrounding tissues. Such possibility can be also gained through the use of digital radiography, which reduces the radiation dosage, being safer in comparison to conventional radiography and especially to CT [18]. The use of ultrasound completely eliminates the ionizing radiation, but one can take advantage of them only in specified cases, when there is a bony defect over the lesion where ultrasonic waves can traverse [16]. Ultrasound was first used in the differentiation of periapical lesions by Cotti et al. [19] in 2003. Recently Cone-Beam Computed Tomography (CBCT) is applied in many fields of dentistry, including endodontics and dental surgery [20,21].

The purpose of this article was to present a case report of a 11–year old patient with a large osteolytic mandibular lesion which healed after endodontic treatment.

Case report

A 11-year old female patient B.W. was referred to the Department of Dentomaxillofacial Radiology of the Medical University of Lublin, Poland, due to an incidental finding of a large osteolytic lesion of the area of the left lower first and second premolars in the panoramic radiograph taken before orthodontic treatment (Figure 1). The lesion measured 2cm in diameter and scalloped between the roots of the left lower first and second premolars. The lesion was a fairly-well circumscribed radiolucency involving the roots of the left first and second premolars of the mandible, reaching to

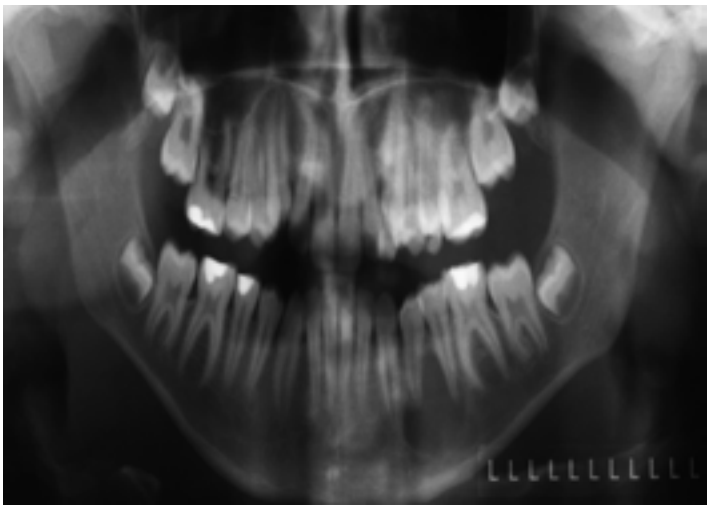

Figure 1. *Panoramic radiograph taken before orthodontic treatment revealed an incidental finding of a large osteolytic lesion of the area of the left lower first and second premolars.*

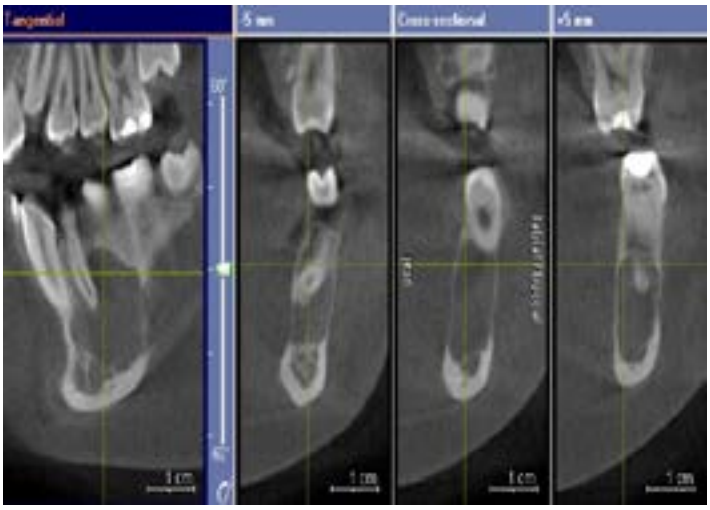

Figure 2. *In CBCT it was stated that the lesion caused mandibular expansion, especially marked in towards the vestibule, with thinning of buccal and lingual cortex, but did not cause resorption of the roots of the first and second premolars.*

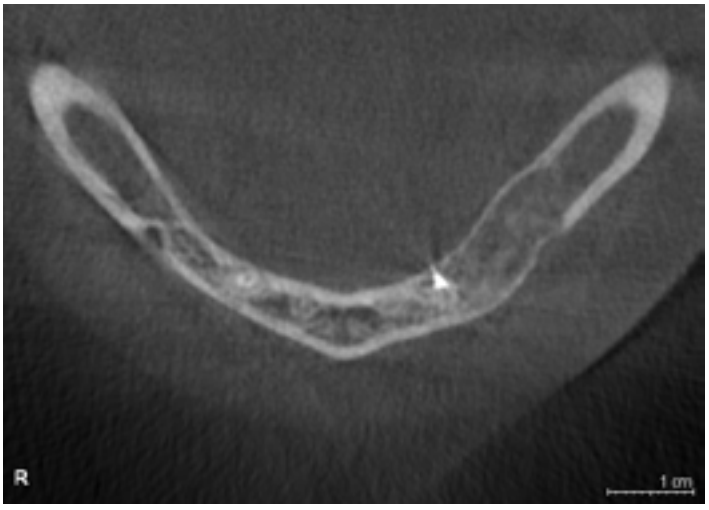

Figure 3. *CBCT examination taken 4 months after endodontic treatment revealed significant improvement as the lesion was partly filled with newly woven bone.*

Figure 4. *Panoramic radiograph taken 11 months after endodontic treatment demonstrated complete healing of the lesion with formation of lamina dura and regeneration of apical periodontal tissues.*

half of their length. The first and second premolars were free of any conservative restorations and dental caries, and their dental apices were fully closed. Both parents of the patient and the child did not report any history of trauma that could have affected this location. However, tentative clinical diagnosis was that of a radicular cyst. To get further diagnosis Cone-Beam Computed Tomography (CBCT) examination was performed by means of the Galileos (Sirona, Germany) unit and it revealed the existence of a radiolucent area measuring 20.5mm x 19mm x 9mm. The lesion caused mandibular expansion, especially marked in towards the vestibule, with thinning of buccal and lingual cortex (Figure 2). It did not cause resorption of the roots of the first and second premolars. Due to scalloping of the lesion radiological differential diagnostic includeda simple bone cyst as well as a keratocyst. The patient was referred to maxillofacial surgery ward, where it was decided that the lesion has to be removed together with the resection of the roots apices of the affected first and second premolars, after previous root canal treatment of left lower canine, first and second premolars. The decision about root canal therapy for canine was made as to avoid accidental injury to its blood vessels and nerves during the surgical procedure. The child presented for endodontic treatment 4 months after the initial panoramic radiograph. After PDL anesthaesia (SleeperOne, Dental Hi Tec) conventional endodontic access opening and biomechanical preparation of root canals was made of canine, first and second premolars. Serous discharge characteristic for the cysts was not observed in any of these teeth. At first root canals were prepared manually with the use of traditional technique, than the mechanical preparation was made

with the use of ENDO EZE – AET technique. The root canals were irrigated using 2% sodium hypochlorite and 3% hydroxide oxygen. Then calcium hydroxide paste was placed in the root canals and the access cavity was sealed with a temporary restorative material. The canals were obturated with Endomethazon N and gutta–percha point was added during the next appointmentone week later. Radiographic examination showed satisfactory obturation with a small overfilling. Next the patient was referred to the Department of Dental Surgery for removal of the lesion; however the procedure was postponed due to patient's anaemia. The patient did not show up for the nextscheduled hospitalisation, but came to the Department of Dentomaxillofacial Radiology 2 months later. CBCT examination revealed significant improvement (Figure 3). Therefore it was decided to abort surgery and perform periodical clinical and radiological follow-up. Complete healing of the lesion with formation of lamina dura and regeneration of apical periodontal tissues was seen in the radiographic image taken 8 months later (Figure 4).

Discussion

There are conflicting ideas between endodontists and dental surgeons on treatment approach in case of large periapical radiolucencies. Dental surgeons recommend the radical methods in the case of the cyst's existence, because of histological analysis of the lesion, having in mind the possibility of cancer's development such as carcinoma planoepitheliale, mucoepidermoid tumor, mixed tumor, adenomatoid odontogenic tumor or ameloblastoma. Meanwhile Ricucci [9] claims that the treatment of choice is root canal therapy, filling of the root canal and periodical radiological follow-up, no matter how distinct the lesion is and how it looks like in radiographic image. Surgical removing of the lesion, because it is regarded as a cyst, without previous conservative treatment is a serious mistake and can be the cause of medicolegal consequences. According to the literature up to 90% of periapical osteolytic lesions can be treated successfully through conservative treatment [16]. Aggarrval and Singla [16] presented three cases of complete healing of large maxillary periapical lesions after 30–36 months with the use of calcium hydroxide's dressings. The lesions were diagnosed by CT and ultrasound with power Doppler flowmetry as radicular cysts. All the patients reported history of trauma few years earlier.

Al Khasawnah et al. [1] investigated healing of 200 posttraumatic radicular cysts in response to calcium hydroxide-iodoform-silicon oil paste (CHISP) treatment through the root canal. No failure in cyst healing was reported and complete healing was achieved in an average of 75 days.

A study by Calişkan [2] focused on 42 mature anterior teeth with large periapical lesions ranging in size from 7 to 18 mm in diameter treated endodontically. This study suggested that the size of a periapical lesion was not a major determining factor in the decision to perform conventional root canal treatment or surgical removal of the lesion. According to this author, even large cyst-like periapical lesions containing cholesterol crystals can heal following nonsurgical root canal treatment.

The healing of the periapical lesions is claimed when the lost bone is replaced by the new one, resorbed cementum and dentine by the new cementum and periodontal ligament will renew. Nevertheless in some cases small scar tissue seen in radiographic image as a radiolucent area around the apex of the root could be the cause of diagnostic mistake. In such case the lack of symptoms and the presence of an appropriate width of a space with periodontal ligaments around the teeth previously surrounded by the lesion, is important.

In the presented case report no histopathology was obtained due to abortion of surgery. Lack of discharge could be a proof of non-inflammatory origin of the lesion, thus simple bone cyst was included in the differential diagnosis.

The presented case testifies to the observation that even large osteolytic lesions can heal after endodontic treatment without surgical approach.

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