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LONG-TERM RADIOGRAPHIC FOLLOW UP OF ENDODONTICALLY TREATED TEETH ASSOCIATED WITH LARGE PERIAPICAL LESIONS

Abstract

The aim of this paper is to report the healing of two large periapical lesions following non-surgical root canal treatment. The first case was a mandibular right lateral with periapical lesion of endodontic origin in a 40 year-old female patient with extra oral fistula and swelling. In the second case, a mandibular right central incisor was affected in a 22 year-old male patient. The root canals were prepared and filled with calcium hydroxide as an intra-canal medicament. The patients were recalled for clinical evaluation at intervals of 3 weeks. Root canals obturations were performed with gutta–percha and AH Plus sealer. The clinical and radiographic examination after 1 year revealed complete repair. This report confirms that large periapical lesions can respond favourably to nonsurgical treatment.

Keywords: *calcium hydroxide, endodontic treatment, canal, surgery,periapical healing, periapical lesion*

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Geniş periapikal zədələnmə ilə əlaqəli endodontik müalicə edilmiş dişlərin uzunmüddətli radioqrafik təqibi

Xülasə

Məqalənin məqsədi müalicədən sonra böyük periapikal zədələnmələri olan iki halın cərrahi yanaşma olmadan endodontik müalicəsi və rentgenoqrafiya ilə birlikdə sağalma prosesini təqdim etməkdir. Birinci halda, 40 yaşlı qadın xəstənin sağ alt yanaq dişində ekstraoral fistula və şişdən qaynaqlanan iri periapikal lezyon, sağ alt mərkəzi diş mənşəli 22 yaşlı kişi xəstədə periapikal lezyon görünür. Hidroksid ilə doldurulmuş kalsium hazırlandıqdan sonra kök kanalları yenidən kliniki xəstələrdə qiymətləndirmə 3 həftəlik fasilələrlə aparıldı. Kanalın doldurulması AH Plus və qutta-perça ilə tamamlandı. Bir il sonra bir klinik və rentgenoqrafik müayinə tam bərpası müşahidə edilmişdir. Bu müalicədə, endodontik müalicələrdən sonra müdaxiləyə ehtiyac olmadan müvəffəqiyyətli bir əməliyyatla periapikal lezyonların sağaldığı bildirildi.

Açar sözlər: *kalsium hidroksid, endodontik müalicə, kanal, cərrahiyyə, periapikal şəfa, periapikal zədə*

Introduction

Periapical lesions develop as sequelae to pulp disease. They often occur without any episode of acute pain and are discovered on routine radiographic examination. The incidence of cysts within periapical lesions varies between 6 and 55%. The occurrence of periapical granulomas ranges between 9.3 and 87.1%, and of abscesses between 28.7 and 70.07%. It is accepted that all inflammatory periapical lesions should be initially treated with conservative nonsurgical procedures. Studies have reported a success rate of up to 85% after endodontic treatment of teeth with periapical lesions. A review of literature was performed by using electronic and hand searching methods for the nonsurgical management of periapical lesions. Various methods can be used in the nonsurgical management of periapical lesions: the conservative root canal treatment, decompression technique, active nonsurgical decompression technique, aspiration-irrigation technique, method using calcium hydroxide, Lesion Sterilization and Repair Therapy, and the Apexum procedure. Monitoring the healing of periapical lesions is essential through periodic follow-up examinations.

Dental pulp infections; errors in the dental procedure, trauma or their result from the combination and traumatic accidents, especially periapical infection in young patients may be the cause and usually present in anterior teeth (Sundgvist, 2019:522-30). In traumatic occlusion, which is one of the most common etiology of periapical inflammation. In traumatic occlusion, which is one of the most common etiology of periapical inflammations, the cause of inflammation is that the factor is constant and unchanging. Such long-term irritations can cause periapical cysts in the apical region (Kvinnsland, Kristiansen, Kvinsland, Heyeraas, 2012:211-9; Wesselink, 2011:205-8). Periapical or radicular cysts are inflammatory processes associated with teeth with infected and necrotic pulp are cysts (Celik, Belli, 2012:64-9). Definitive diagnosis among the lesions can be done with histological examination. However, the clinical diagnosis of a periapical cyst may be based on: one or more non-viable teeth containing the periapical lesion size of the lesion greater than 200 mm2, the lesion produces a straw-colored fluid on aspiration, radiographic image as a well-defined radiolucent area bounded by a thin radiopaque line or it drains from the root canal system (Eversole, 2014:203-59).

The current philosophy in the management of periapical lesions includes the initial use of nonsurgical methods. When this treatment approach is not successful a surgical approach may be adopted (Nair, Pajarola, Schroeder: 2012:93-102). The following factors must be considered, while deciding on the management approach: Although there is a general belief among endodontists that large cyst-like periapical lesions and apical true cysts are less likely to heal after root canal treatment, there is no conclusive evidence on this issue. The most important reason why lesions such as granulomas, abscesses and cysts associated with apical periodontitis, regardless of size, do not heal after non-surgical root canal treatment is persistent intraradicular infection, and it is thought that the formation of these apical cysts may be associated with the formation of pathological (inflammatory) hyperplasia of the resting cells in apical periodontitis lesions (Walker, Davis, 2018:215-20). Generally, different canal irrigations and temporary root canal filling are used in the conservative treatment of periapical lesions. In general, calcium hydroxide (Ca(OH)2) therapy is used for the treatment of infected root canal and periapical lesions (Caliskan, Sen, Murphy, Kaugars, Collet, Dodds, 2016:620-4). Ca (OH)2 is a preferred medicament in lesion treatments due to its stimulating hard tissue formation and antibacterial tissue dissolving effects (Morse, Bhambani, 2013:333-40).

Although clinical as well as radiographic data are used to monitor cases, the relative absence of clinical symptoms in chronic apical periodontitis makes the assessment primarily a radiographic one. Various methods can be used to assess the healing of periapical lesions by interpretation of periodic recall radiographs (Nair, Pajarola, Schroeder, 2012:93-102). The success–failure criteria laid down by Strindberg is primarily a system designed to detect changes in radiographic appearance. The criteria for success are that: (a) the contours, width, and structure of the periodontal margin are normal; (b) the periodontal contours are widened mainly around the excess filling; and the criteria for failure are: (a) a decrease in the periradicular rarefaction; (b) unchanged periradicular rarefaction; (c) an appearance of new rarefaction or an increase in the initial rarefaction (Khayat, Byers, Taylor, Mecifi, Kimberly, 2017:577-87). Even though the periapical conditions are viewed as a continuous process of healing or

developing periodontitis, the system is strictly dichotomous, that is, there is no middle ground between success and failure.

A 40-year-old female patient applied to our clinic with complaints of swelling in the lower anterior region and fistula mouth. Radiographic examinations showed radiolucency surrounded by a clear border associated with the lower anterior teeth. It was determined that a periapical lesion occurred due to traumatic occlusion in the tooth of the patient who did not have any systemic disease. As a result of the electrical pulp test performed on the lower central and lateral incisors, only the left lateral tooth was devitalized. A periapical lesion occurred due to traumatic occlusion in the tooth of the patient who did not have any systemic disease determined (Barbakow, Cleaton-Jones, Friedman, 2012:522). While low sensitivity was detected in vertical percussion in the related tooth, it was determined that there was grade 2 mobility. After the access cavity of the left lower lateral tooth was opened, the working length was determined to be 1 mm shorter than the apical canal with the number 15 K file under rubber-dam isolation. The canal was shaped using the crown down technique with rotary nickel-titanium files (Dentsply Maillefer, Ballaigues, Switzerland). Irrigation was provided by using 2.5% Sodium Hypochlorite (NaOCl) throughout the procedure. At the end of the session, calcium hydroxide (Merck, Darmstadt, Germany) was placed in the canals and closed with Cavit (ESPE, Seefeld/Oberbay, Germany). Calcium hydroxide medicament was renewed 3 times in total at intervals of one week. Approximately 1 month later, since the involved tooth was asymptomatic, the canal filling was performed with AH Plus (Dentsply De Trey, Konstanz, Germany) and gutta-percha (Diadent, Chongju, Korea) using the lateral condensation technique. The patient's condition was followed up with 6 months and 1 year routine follow-ups. In the clinical and radiographic examination performed after a one-year follow-up period, it was observed that the tooth was asymptomatic and the bone healed (Bhaskar, 2016:657).

In the electrical pulp test, a delayed response was obtained from the teeth except the right central tooth, and no response was obtained from the right central tooth. It was thought that pulp necrosis developed due to trauma etiologically in this tooth. Root canal treatment was started only in the right central tooth. After the necessary root canal shaping, the dressing was done with Ca(OH)2 for 3 weeks. Ca(OH)2 treatment was continued for 3 months. At the end of 3 months, radiographic improvement was observed and after the disappearance of the symptoms, the treatment was completed by filling the canal with gutta-percha and AH Plus paste. In the left central and right lateral teeth, which had a late response to the electric pulp test at the beginning of the treatment, the test was renewed at the end of the treatment and the response was within normal limits taken. The apical lesion was healed in the radiograph taken as a result of the 6-month and 1-year follow-up of the right central tooth that underwent root canal treatment.

Result

Surgical treatment of cystic lesions, reduction of bone support, destruction of blood vessels and nerves feeding and innervating the teeth adjacent to the surgical area, damage to anatomical structures such as mental foramen, lower alveolar nerve branch and/or artery, nasal cavity, maxillary sinus, anatomical defects. Because of these disadvantages, we preferred non-surgical endodontic treatment as the treatment procedure in the cases presented.

Large periapical lesions can heal after successful endodontic treatments without the need for surgical intervention. Although the treatment process takes a long time, the success to be achieved will please both the physician and the patient.

Healing of pre-existing periapical lesions is most pronounced from 3 months to 2 years. Teeth with initially healthy periapical structures predictably maintain good periapical health. Maxillary teeth, especially lateral incisors, showed poorer healing rates than mandibular teeth. Clinical relevance: Radiographic healing rates may vary among tooth groups within the dentition. Periapically healthy teeth that are root filled may not need postoperative controls.

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