

Management of Large Periapical Lesion of Teeth via Conservative Approach (Report of two cases)

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Abstracts: Infection of the dental pulp occurs as a consequence of caries, operative dental procedures and trauma. These infections often cause total pulpal necrosis and subsequently stimulate an immune response in the periapical region. The latter is commonly referred to as a periapical lesion. The ultimate goal of endodontic therapy should be to return the involved teeth to a state of health and function without surgical intervention. All inflammatory periapical lesions should be initially treated with conservative nonsurgical procedures. Surgical intervention is recommended only after nonsurgical techniques have failed. Besides, surgery has many drawbacks, which limit its use in the management of periapical lesions. A nonsurgical approach should always be adopted before resorting to surgery. Periodic follow-up examinations are essential. Irrespective of the size of the lesion every attempt should be made to treat the periapical lesions with non-surgical endodontic therapy. The aim of this paper is to present two case reports of periapical radiolucent lesions, which were treated, non-surgically. [Patil S NJIRM 2014; 5(4) :94-97]

Key Words: Periapical lesion, Calcium hydroxide, non-surgical treatment.

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Introduction: Infection of the dental pulp occurs as a consequence of caries, operative dental procedures and trauma, which involve a mixed, predominantly gram-negative, anaerobic bacterial flora¹. These infections often cause total pulpal necrosis and subsequently stimulate an immuneresponse in the periapical region². The latter is commonly referred to as a periapical lesion. In the early endodontic practice, surgical intervention was considered to be necessary for treating endodontic periapical lesions, particularly when they were large in size³. Even today, surgery is sometimes the preferred modality among many endodontists and general practitioners, particularly when resolution of the periapical lesion is delayed⁴. However, advancements of scientific knowledge on the genesis, pathologic nature and clinical behavior of endodontic periapical lesions and their successful treatment in various clinical trials have started favoring non-surgical approach⁵. In this case series nonsurgical endodontic therapy proved successful in promoting the healing of periapical lesions.

Case 1: A 22 year old male patient reported to our unit with the chief complaint of discolored maxillary central incisors. Patient gave a history of trauma about 10 years back. His medical history

was non-contributory. Both maxillary central incisors showed no response to electric and thermal pulp tests. Intraoral periapical radiograph of the involved teeth demonstrated a periapical lesion measuring approximately 3-4 mm and hence root canal therapy was initiated.

After the patient's consent, treatment was performed following isolation with a rubber dam in place. Access cavity was prepared followed by the removal of necrotic tissue from the canal. Working length was determined (Figure 1)

Figure 1: Radiograph Showing Large Periapical Lesion and Working Length Determination



and instrumentation was accomplished with crown-down technique. 3% sodium hypochlorite was used for irrigation in between the instrumentation. Root canals were prepared with K files till # 55. Calciumhydroxide dressing was placed in the canal as an intracanal medicament (Figure 2)

Figure 2: Radiograph Showing Calcium Hydroxide Intracanal Medicament Placement



Figure 3: Postoperative Radiograph Showing Healing and Bone Formation of Lesion after 3 Months



And access cavity was sealed with *Cavit*. Patient was recalled three weeks later for follow up. Calcium hydroxide dressing was changed as discharge from the canal was noticed. At sixth week it was decided to obturate the canals as the drainage ceased. Master cone was selected and obturation was done by lateral compaction

technique using gutta-percha and zinc oxideeugenol root canal sealer. The patient was recalled for follow up. Clinical examinations showed no sensitivity to percussion and palpation. Radiographic examinations showed the progressive healing after three (Figure 3) and six months (Figure 4).

Figure 4: Postoperative Radiograph Showing Healing and Bone Formation of Lesion After 6 Months



Case 2: A 38 year old male patient reported to our unit with the complaint of mild pain, with the presence of a sinus since 5 months in the lower front teeth. History revealed the discontinuation of root canal therapy, with open cavities in relation to teeth # 31, 41 and 42. Radiographic examination revealed a large radiolucent periapical lesion extending from the distal border of #31 to root tip of #42 and measuring approximately 10-12mm in diameter (Figure 5). Root canal treatment was carried out under the same conditions as with Case 1.

After a follow up period of 3 months, the teeth were asymptomatic and sinus had resolved. At six months follow up, radiograph demonstrated initiation of bone tissue repair towards the centre of the lesion, minimal lamina dura, and early reconstitution of the periodontal ligament space and repair of the periapical lesion (Figure 6). Radiograph at 9 months showed progressive steady repair of the lesion (Figure 7).

Figure 6: Radiograph Showing Large Periapical Lesion and Working Length Determination

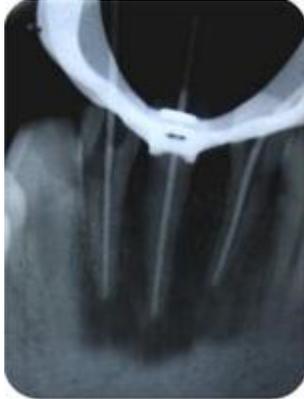


Figure 6: Radiograph showing calcium hydroxide intracanal medicament placement



Figure7: Postoperative Radiograph Showing Healing and Bone Formation of Lesion After 9 Months



Discussion: The definitive diagnosis of the type of periapical lesion can only be made by a histological examination. The current concept and rationale of endodontic treatment of periapical

lesion is centered on stopping the bacterial stimulation of the host response at the apical foramen that would allow healing of the lesions⁴. Calcium hydroxide is a commonly used intracanal medicament in endodontic treatments because of its bactericidal effects. It is thought to create favorable conditions for periapical repair and stimulates hard tissue formation. A success rate of 73.8% - 80.8% has been reported with calcium hydroxide, when used for endodontic treatment of teeth with periapical lesions³. It has been suggested that the presence of a cyst may impede or prevent root-end closure of an immature pulpless tooth even with the use of calcium hydroxide. Contrary to this, Halikan and Torkon have reported a case in which apical closure and periapical healing have occurred in a large cyst-like periapical lesion following non-surgical endodontic treatment with calcium hydroxide paste and a calcium hydroxide-containing root-canal sealer. The exact mechanism of action of $\text{Ca}(\text{OH})_2$ is speculative². It has also been reported that treatment with $\text{Ca}(\text{OH})_2$ resulted in a high frequency of periapical healing. $\text{Ca}(\text{OH})_2$ was used as an intra canal medicament in one of the above cases³.

Repair of periradicular tissues consists of a complex regeneration involving bone, periodontal ligament, and cementum. The area of mineral loss gradually fills with bone and the radiographic density increases. If the cortical plate is perforated, healing begins with the regeneration of the external cortical plate and proceeds from the outside of the lesion towards inside⁵. Maxillary lesions resolve faster than mandibular lesions due to the presence of a more extensive vascular network in the maxilla. Anterior lesions of both the maxilla and mandible heal at a faster rate than posterior lesions due to the close proximity of the buccal and lingual plates in the anterior segments¹.

At times, scar tissue can develop after conventional endodontic treatment as well as after periapical surgery. If there are no untoward clinical findings, it indicates fibrous healing or healing by scar formation. The radiograph usually shows a trabecular bone pattern radiating from the center that appears as a reduced, but incompletely resolved radiolucency⁵.

The patients should be recalled at intervals of three months, six months, one year, and two years, to assess the healing of periapical lesions. Hence, follow-up is extremely essential for a period of at least two years. Usually necrotic pulp is the cause for large periapical lesions. Therefore, if root infection is eliminated by nonsurgical root canal therapy, lesions should heal. The major difference between surgical and nonsurgical endodontic therapy of large cyst-like inflammatory periapical lesions is that periapical lesions treated by the former heal faster than those treated by the latter³.

Conclusion: A nonsurgical approach should always be adopted before resorting to surgery. Periodic follow-up examinations are essential. Irrespective of the size of the lesion every attempt should be made to treat the periapical lesions with non-surgical endodontic therapy.

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Conflict of interest: None

Funding: None
