

## NON-SURGICAL MANAGEMENT OF A LARGE PERIAPICAL LESION: A CASE REPORT

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**ABSTRACT: Aim** - To report the non-surgical management of a large periapical lesion. This paper presents the successful management of periapical lesion with successful resolution of signs and symptoms both clinically and radiographically. With dawn of era of minimal intervention in dentistry, surgical management of periapical lesions become controversial. Non-surgical or conservative management of periapical lesions not only cause less trauma to the tissues, but also promote faster and less eventful healing. This article highlights the healing potential of non surgical endodontic treatment in the management of large periapical lesions.

**KEYWORDS:** Periapical lesion, Calcium hydroxide, Sodium hypochlorite

## INTRODUCTION

Bacteria lodged in the root canal system plays major role in the development and maintenance of periapical lesions. Thus, the elimination of these bacteria plays an important role in healing of apical and periapical lesions after endodontic treatment.<sup>1,2</sup> Generally periapical lesions are diagnosed either during routine dental radiographic examination or following acute toothache.<sup>3</sup> Most periapical lesions (>90%) can be classified as dental granulomas, radicular cysts or abscesses.<sup>4</sup> All periapical lesions should be initially treated with conservative nonsurgical endodontic procedures.<sup>5</sup> When endodontic treatment is performed to accepted clinical standards, a success rate of around 90% can be expected.<sup>6</sup> Various previous studies have reported a success rate of up to 85% after endodontic treatment of teeth with periapical lesions.<sup>7,8,9</sup> Murphy WK et al reported a high percentage of 94.4% complete and partial healing of periapical lesions following nonsurgical endodontic therapy.<sup>10</sup> Surgical intervention should be considered only after non surgical techniques have failed.<sup>11</sup> Performing periapical surgery on every case with a periapical lesion will most likely enhance healing kinetics. Nevertheless, it can hardly be justified because surgery has repercussions for the well-being of the patient; swelling, pain, and discomfort are among the expected side effects.<sup>12</sup> Furthermore, many anatomic locations preclude apical surgery either because of inaccessibility or risk to adjacent structures. In accordance, the American Association of Endodontists recommended that apical surgery should be considered only in cases that cannot be treated otherwise.<sup>13</sup>

Although chemo-mechanical preparation of root canals is able to reduce the bacterial presence, an intracanal medicament with antibacterial action is still required to maximize the disinfection of the root canal system.<sup>14</sup> The need for intracanal medication increases in those cases where bacteria are resistant to routine endodontic therapy, and where the treatment cannot be successfully completed due to the presence of pain or continuing exudates.<sup>15</sup>

Various nonsurgical methods that have been used in the management of periapical lesions including conservative root canal therapy without adjunctive treatment, passive decompression of the lesion, active non surgical decompression technique using the Endo-eze vacuum system, needle aspiration of the cystic fluid using a buccal palatal approach, aspiration through the root canal, methods using intra canal calcium hydroxide, lesion sterilization and repair therapy (LSTR) and apexum procedure.<sup>16</sup> Calcium hydroxide have been widely used as an intracanal medicament in endodontics for many years. It is used in various clinical conditions such as to promote apexification, to repair perforation, to enhance healing of periapical lesions, to control root resorption, and to control exudation in teeth with persistent periapical inflammation.<sup>17</sup> This paper presents case reports of non surgical management of a large periapical lesion with Ca(OH)<sub>2</sub> as an intracanal medicament.

### Case report

A 20-year old patient with non contributory medical history presented with swelling on palatal surface of maxillary anterior teeth region. The patient gave a history of trauma to his anterior teeth when he was 17 years old. Intraoral examination revealed that teeth 11 was discoloured. Teeth 12, 13 failed to respond to thermal and electric pulp testing; the adjacent teeth responded within normal limits. Periodontal probing revealed a normal and intact gingiva. The swelling was soft and fluctuant with no sinus tract opening.

An occlusal radiograph revealed a large radiolucent lesion apparently involving the apices of teeth 11, 12, 13, 14 and 15 (**Fig. 1**). The patient complained of intermittent pain in tooth 11 and 12. Hence, it was decided to treat teeth 11, 12 and 13.

Following Access cavity preparation, there was drainage of yellow straw-coloured fluid from tooth 11 and 12. Initially root canal space negotiation was done with size 10 k-file. Working length was determined in relation to 11,12,13. A 27 gauge needle was used for proper irrigation of the root canal space. By applying digital pressure on the swelling present on the palatal surface of maxillary teeth, a yellow straw colored fluid coming out through the 11 and 12 access opened teeth. Proper irrigation was done through sodium hypochlorite irrigation solution. Cleaning and shaping done with Protaper file rotary file system. The canals were enlarged upto the file size F3. The canals were dried with paper points. Calcium hydroxide was used as an intracanal medicament which was placed into the root canal space of 11,12 and 13. Closed dressing was given.

At the next appointment after 1 week, the patient was asymptomatic with no evidence of swelling in the palatal surface. Temporary restoration was removed. Canals were irrigated with sodium hypochlorite and saline solution to remove any remnants of calcium hydroxide medicament. Proper cleaning and shaping done. Finally obturation was done. Permanent restoration was placed in relation to teeth 11,12 and 13.

The patient however failed to report for the scheduled appointment and reported back only after 6 months. The patient was asymptomatic and an occlusal radiograph revealed a decrease in size of the lesion. (**Fig,2**)

### Discussion

The management of large periapical and peri radicular lesions is the subject of prolonged debate. The treatment options range from Root canal treatment or NSRCT with long-term Ca(OH)<sub>2</sub> therapy to various surgical interventions, which include marsupialisation, decompression with a tube and surgical removal of the lesion.<sup>18</sup>



**Fig.1: Preoperative radiograph**



**Fig.2: Post operative radiograph-after 6 months.**

A thorough instrumentation along with copious irrigation are the foundation stones of a successful root canal treatment. Although Instrumentation and irrigation reduce bacterial count, an agent with bactericidal action is still needed to ensure optimum disinfection.<sup>19</sup> Irrigation with 5.25% sodium hypochlorite and adequate biomechanical preparation is recommended for successful root canal treatment, followed by calcium hydroxide intracanal medication.<sup>20</sup> Souza et al., suggested that the action of calcium hydroxide beyond the apex may be four-fold: (a) anti-inflammatory action, (b) neutralization of acid products, (c) activation of the alkaline phosphatase and (d) antibacterial action.<sup>21</sup> The anti bacterial efficacy of calcium hydroxide depends on the sustained release of calcium and hydroxyl ions to the root canal system and periapex. As they are progressively resorbed by the periapical fluids, regular renewal of the canal dressing is required in decreasing the intensity of the periapical inflammatory process. Calcium hydroxide has various biological properties, such as antimicrobial activity, high alkalinity, inhibition of tooth resorption and tissue dissolving

ability.<sup>23,24,25,26</sup> Because of these effects, calcium hydroxide has been recommended for use as intracanal medicaments and in several other clinical situations. Several works have studied the mixture of other substances to calcium hydroxide with the purpose of improving some of its properties.<sup>27</sup> Study by Abu Zeid et al. showed that calcium hydroxide detoxifies bacterial endotoxin.<sup>28</sup> Lethal actions of calcium hydroxide on bacterial cells are probably caused by the damage to the bacterial cytoplasmic membrane, protein denaturation and damage to DNA.<sup>29</sup> In the present case conventional root canal therapy combined with calcium hydroxide as an intracanal medicament lead to complete healing of the periapical pathology avoiding its surgical management. Other materials under research as intra canal medicament are Simvastatin and Epigallocatechin-3-gallate. Simvastatin is a hydroxymethylglutaryl-coenzyme A reductase inhibitor, which is used as a cholesterol reducing agent and also possess anti-inflammatory activities.<sup>30</sup> Epigallocatechin-3-gallate (EGCG) is a major polyphenol of green tea that has anti-inflammatory properties. EGCG suppressed the progression of apical periodontitis in a rat model, possibly by diminishing Cyr61 expression in osteoblasts and, subsequently, macrophage chemotaxis into the lesions.<sup>31</sup>

#### CONCLUSION

Non-surgical management of periapical lesions have shown a high success rate. A non-surgical approach should always be adopted before resorting to surgery. Complete periapical healing in relation to both the teeth was observed. Use of Calcium hydroxide paste was found to be judicious under thorough cleaning and disinfection procedures. However, complete healing can be assured only at a longer follow up period with no recurrence of pathologic signs and symptoms. Periodic follow-up examinations are essential and various assessment tools can be used to monitor the healing of periapical lesions. The surgical approach can be adopted for cases refractory to nonsurgical treatment, in obstructed or nonnegotiable canals and for cases where long-term monitoring of periapical lesions is not possible.

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