PERIAPICAL PATHOSIS THROUGH A NON-SURGICAL APPROACH

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ABSTRACT

Most periapical diseases are induced as a result of direct or indirect involvement of oral bacteria. The etiologic factors are oral contaminants through the root canal or degenerating pulpal tissues. Therefore, mere surgical removal of the periapical lesions without proper root canal disinfection and obturation will not result in the healing of periapical tissues.

This clinical study highlights follow up results of two cases demonstrating resolution of periapical pathology achieved through a non-surgical approach. Emphasis is laid on thorough debridement and placement of medicament followed with three dimensional obturation of root canal system by a simple lateral condensation technique in both cases.

Keywords: Periapical pathology, microorganism, endodontic surgery, metapex

INTRODUCTION:

Periapical pathosis is considered as an endogenous infection caused by oral microflora. Bacterial infection of dental pulp results in pulpal destruction and subsequently stimulates an inflammatory cell response and destruction of bone in the periapex.[1] The relationship between bacterial infection of dental pulp and periapical lesions formation has been elegantly demonstrated in the classic studies of Kakehashi et al (1965).[2]

Complete elimination of microbial irritants from the root canal system & maintaining the tooth in this disinfected state by preventing any ingress of oral microorganism & /or their toxins during or after treatment are the principle goal of endodontic therapy.[3] If this can be achieved indeed this would pave the way for high level of success of the endodontic and post endodontic treatment approaches, thus retaining the normal function and esthetic of the tooth.[4]

Until recently, surgical Intervention was considered to be necessary for treating endodontic periapical lesions, particularly when they were large in size. Even today, surgery is sometimes the preferred modality among many endodontists and general practitioners, particularly when resolution of the periapical lesion is

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delayed. However, advancements of scientific knowledge on the genesis, pathologic nature and clinical behaviour of endodontic periapical lesions and their successful treatment in various clinical trials have started favoring non-surgical approach.

Seltzer, Soltanoff and Bender[5] observed in a series of studies, that pulpo-periapical lesions have the potential for healing without surgical intervention. Heithersay[6] have demonstrated successful clinical management of large periradicular lesion by the use of calcium hydroxide used as an interim dressing. Only when there are persistent signs and symptoms and/or no radiographic evidence of healing of periapical lesion, a surgical method of treatment should be considered.

This paper highlights follow up results of two cases demonstrating resolution of periapical pathology achieved through a non-surgical approach, observed over a period of 12 months

CASE DETAILS:

CASE 1

A 15 year old female reported to the Department of Pedodontincs and Preventive Dentistry, dental college azamgarh, with discoloured maxillary central incisors. Patient gave a history of trauma about 2 years back. Medical history was non-contributory. Thermal and electric pulp tests were performed to determine the vitality of all the anterior teeth. Left maxillary central incisor and lateral incisor were found non vital showing no response to thermal and electric pulp tests.

Intraoral periapical radiograph of the involved teeth was taken which demonstrated a periapical Lesion (Fig.1). Patient was not willing for surgery and hence conventional root canal therapy was initiated. Access cavity was prepared on the maxillary central incisors, and the working length was determined. Canals were cleaned and shaped using K-Files by conventional method. 5.25 % sodium hypochlorite was used as the intracanal irrigant. The canal was enlarged to an apical size of ISO #60. Metapex (Calcium hydroxide+iodoform) (IVOCLAR META BIOMED CO LTD. KOREA) dressing was placed in the canal as the intracanal medicament, and access cavity was closed with GIC (Fig.2). Patient was recalled a month later and received a fresh dressing of Metapex, following thorough irrigation and drying of the canal. This procedure was repeated again after one month. After Five visits there was the healing of periapical pathology (Fig.3). In the sixth visit, the canals were cleaned and dried using paper points. Master cone selection was done

corresponding to ISO #60 size. Obturation was completed by lateral condensation technique using gutta-percha and zinc oxide eugenol root canal sealer (Fig.4)

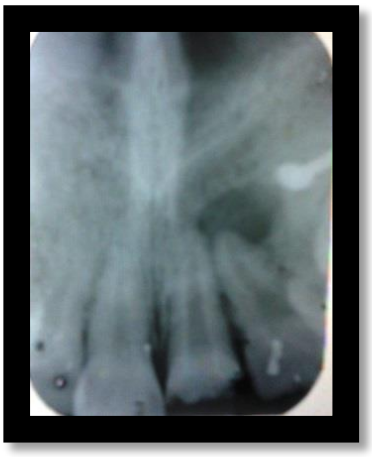

Fig.1(pre-operational)

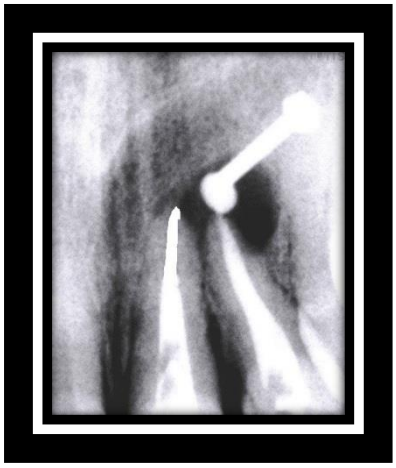

Fig.2 (Metapex Filling)

Fig.3 (resolution of lesion)

Fig.4 (Obturation)

CASE 2

A 12 year old female reported to the Department of Pedodontincs and Preventive Dentistry, dental college azamgarh, with the chief complain of swelling in left lower back teeth region. Medical history was non-contributory.

Intraoral periapical radiograph of the involved teeth was taken which demonstrated a periapical Lesion (Fig.1) and since patient was not willing for surgery non-surgical intervention was planned & hence conventional root canal therapy was initiated. Access cavity was prepared, and the working length was determined (Fig.2). Canals were cleaned and shaped using K-Files by conventional method. 5.25 % sodium hypochlorite was used as the intracanal irrigant. The canals were enlarged to an apical size of ISO #35. Metapex (Calcium hydroxide+iodoform) (Ivoclar) dressing was placed in the canal as the intracanal medicament, and access

cavity was closed with GIC (Fig.3). Patient was recalled a month later and received a fresh dressing of Metapex, following thorough irrigation and drying of the canal. This procedure was repeated again after one month. There was the healing of the periapical pathology after 6 months hence the obturation was planned.

In the sixth visit, the canals were cleaned and dried using paper points. Master cone selection was done corresponding to ISO #35 size. Obturation was completed by lateral condensation technique using gutta-percha and zinc oxide eugenol root canal sealer. (Fig. 4)

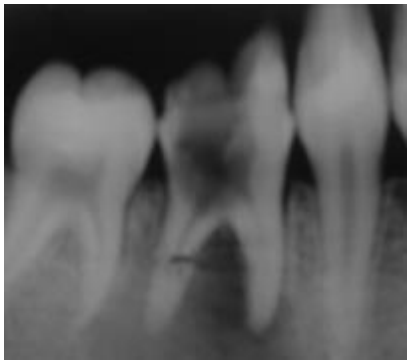

Fig.1(Pre-Operative)

Fig.2 (Working Length)

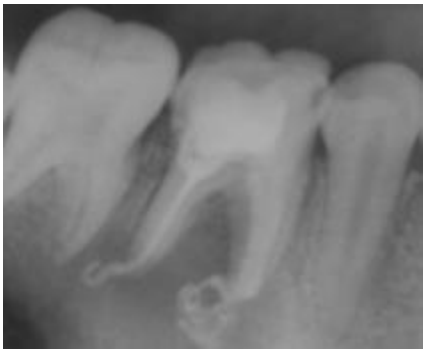

Fig.3(Metapex Filling)

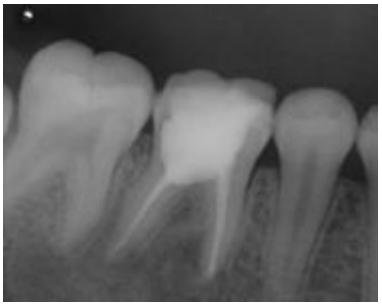

Fig.4 (Obturation)

DISCUSSION

Conventional root canal treatment is aimed primarily at eliminating these bacteria as completely as possible. Treatment options to manage large periapical lesions range from non-surgical root canal treatment and /or apical surgery to extraction.

Current philosophy in the treatment of teeth with large periapical lesions includes non-surgical root canal treatment[7] When this treatment is not successful in resolving the periradicular pathosis, additional treatment in the form of surgical intervention (curettage and apical resection with retrograde filling).Necrotic pulps provide a good nutritional supply for pathogenic bacteria, which must be present for the

development of periapical lesion. Root canal treatment is based primarily on the removal of microbial infection from the complex root canal system. Irrigants and intracanal medicaments aid in reducing the microbial flora of infected root canals. In both cases, calcium hydroxide was used as the intracanal medicament. It has been shown that use of calcium hydroxide as addressing for 1 week efficiently eliminates bacteria from the root canals.[8]

In modern root canal therapy, calcium hydroxide $Ca(OH)_2$ is the most commonly utilized intracanal dressing. It has been used clinically to obtain microbial control, dissolve organic remnants, heal periapical inflammation, arrest inflammatory root resorption, stimulate hard tissue formation and serve as a temporary obturating material between appointments. Delivering dry Ca(OH)2 powder alone is almost impossible, particularly in smaller and curved canals.

Caliskan & Sen[9] have reported that treatment with calcium hydroxide resulted in a high frequency of periapical healing showing completed resorption of the periapical defect. The exact mechanism of action of calcium hydroxide is still speculative.

Ghose et al[10] has advocated that direct contact between the calcium hydroxide and the periapical tissue was necessarily beneficial for osseoinductive reasons. It is suggested that if calcium hydroxide is confined to the root canal, it is possible that the inflammation created by the diffusion of calcium hydroxide through the apical foramen may be sufficient to cause breakup of the cystic epithelial lining, thereby allowing a connective tissue invagination into the lesion with ultimate healing.

Limitation: In the presented cases, both the patients were special child so in such cases isolation with rubber dam was not postulated. Hence we opted for the method of cotton roll isolation to prevent contamination.

CONCLUSION:

The clinical cases reported in this article showed excellent healing of large periapical lesion achieved through a non surgical approach. Emphasis was laid on thorough debridement, disinfection and Metapex (Calcium hydroxide+iodoform) used as the interim dressing effectively contributed to the healing of the periapical lesion. It would be interesting to observe and monitor the prognosis of large periapical lesions following conventional root canal treatment before surgery is contemplated.

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