

Surgical Management of Periapical Lesion by Apicectomy

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Abstract

Periapical inflammatory lesion is the local response of bone around the apex of tooth that develops after the necrosis of the pulp tissue or extensive periodontal disease. Pulpal necrosis and chronic or acute apical periodontitis with cystic changes are the most common sequelae of the dental traumatic injuries, if the teeth are not treated immediately. Such lesions are to be treated with conventional root canal therapy as well as by surgical approach. The present case reports a case of a periapical lesion treated with curettage of the lesion, apicectomy, and root end obturation on a maxillary lateral incisor.

Keywords : Apicectomy, periapical lesion, MTA

Introduction

The success of endodontic therapy is ensured by complete periapical repair and regeneration. The requirement of surgery arises if the conventional root canal therapy fails to eliminate the lesion[1]. The aim of the periapical surgery is to remove periapical pathology followed by achieving complete wound healing and regeneration of the bone and periodontal tissue[2,3]. The indications for endodontic periapical surgery is decreasing in modern endodontic practice. The percentage of periapical surgery is 3 -10 % in typical endodontic practice[4].

Due to the disease process and intraoperative removal, the cumulative loss of cortical bone may hinder or retard healing at the surgical site [6,7] . Removal of periapical tissue is important step in surgical endodontics. Depending on the loss of cortical bone the operator should

decide upon the regenerative techniques. PRF and GTR was used as it enhances the regenerative process. This case report describe the successful surgical intervention of periapical lesion suggestive of large radicular cyst associated with right maxillary lateral incisor when non surgical approach failed.

Case Report

A 38 year old male patient reported to the department of conservative dentistry and endodontics with the chief complaint of pain in right maxillary incisors. His medical history was non- contributory. In dental history he reported that the tooth had undergone root canal treatment 7 months back. Clinical examination revealed tenderness on percussion of 12. Periodontal probing and mobility was within normal limits when compared with adjacent and contralateral teeth. On radiographic examination there was periapical radiolucency along the root surface of maxillary central and lateral incisor. Vitality test was done on 13 and 21 and they gave normal response. On the basis of history and clinical and radiographic examination diagnosis of previous root canal treatment with suspecting radicular cyst was made. As root canal treatment was proper the patient was explained the procedure of apicectomy to remove the lesion and written consent was taken.



Fig 1: Pre-operative radiograph

On the day of surgery patient was given chlorhexidine mouthwash to rinse. Local anesthesia was administered

and cervicular incision was given on the labial surface of 11,12,13 along with two vertical releasing incision, one on mesial side of right central incisor and second on distal surface of canine (fig 2 a). A full thickness mucoperiosteal flap was reflected(fig 2b). As labial cortical bone was intact the bony window osteotomy was done. Horizontal and vertical grooves were made with the bur to create a window of 5mm x 6 mm during which irrigation with saline was done. The width of bone cut was approximately 1mm(fig 2 c,d,e). There was escape of pus as the bone window was removed.



Fig 2 a: Crevicular and 2 vertical releasing incision.



Fig 2 b: full thickness flap was elevated.

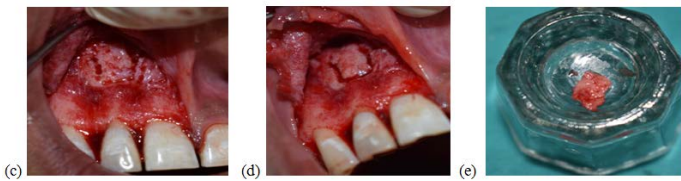


Fig 2 c, d, e : grooves made and bone osteotomy done.

From the exposed site granulation tissue was curetted until healthy bone margins were encountered and root tip is visible(fig 3a). The sample was send for histologic evaluation. The root end was resected and cavity prepared(fig 3 b&c). MTA was placed in the prepared cavity as root end filling material(fig 3 d).



Fig 3 a: tissue curetted and root apex seen

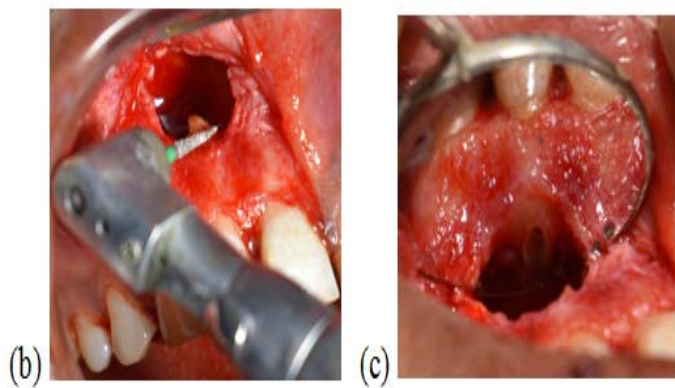


Fig 3 b and c: root end resected and cavity prepared



Fig 3 d: placement of MTA

As the extension of defect was large PRF was used to fill the defect and increase the regeneration potential. Chorion membrane was placed over it, flap was sutured with 5-0 suture and surgical procedure was completed. The patient reported for follow up after 8months with radiographic signs of healing and no clinical signs and symptoms.

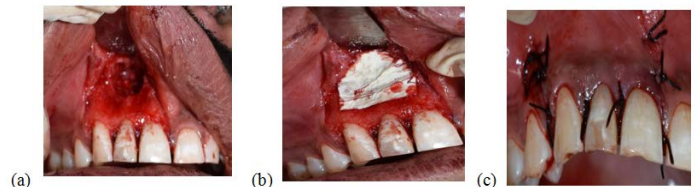


Fig 4 a: PRF was placed, b: chorion membrane was placed, c: 5-0 suture were given.

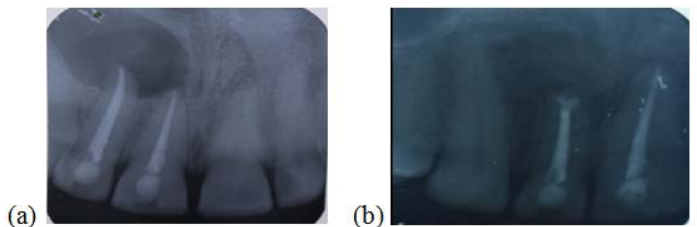


Fig 5 a: Pre- operative radiograph, b: post – operative radiograph

Discussion

Root canal treatment should be considered first for the treatment of periapical lesions and periapical surgery should be considered last, when conventional root canal treatment fails or is not possible. This case report describe

the successful surgical approach to remove the lesion when routine treatment fails. The histopathology reports confirmed the sample as radicular cyst.

Apicectomy allows minimal apical resection and enables the placement of material for retrograde sealing, which allows better waterproofing of the canal [8]. The success rate of apical surgery is 75-90% and is evaluated through clinical exploration and radiographic controls after nearly half a year [9]. Radicular cysts are the most commonly occurring cystic lesions in the oral cavity with the percentage ranging from 52% to 68%. The commonest location of radicular cyst is maxilla[10,11]. The infection of the periradicular space due to trauma or caries is the usual etiology. The management of periapical localized cysts requires conventional nonsurgical root canal therapy. MTA is widely used as a root end filling material [15,16]. MTA has been favoured due to its higher biocompatibility, waterproofing and sealing ability over the currently available root-end filling materials[17]. Also it stimulates the development of new bone trabeculae.

In this case PRF was used. PRF is both a healing and an interpositional biomaterial. As a healing material, it accelerates wound closure and mucosal healing due to fibrin bandage and growth factor release [7]. PRF contains growth factors like PDGF, TGF- β 1 and β 2, IGF, epidermal growth factor (EGF), vascular EGF, and fibroblast growth factors which play a major role in bone metabolism and potential regulation of cell proliferation[12,13,14]. PDGF is an activator of collagenase which promotes the strength of healed tissue. TGF- β activates fibroblasts to form collagen which deposits collagen within the wound. PRF facilitates healing by controlling the local inflammatory response[12,18]. Chorion membrane is derived from developing embryo. It consists of collagen types I, III, IV, V, and VI, proteoglycans, fibronectin, and laminin. All

these help in regeneration and rapid healing of lesion. Post operatively the patient is asymptomatic. As the defect was quite large the healing process is still going on and patient is recalled for follow ups.

Conclusion

The management of periapical lesion with surgical treatment is justified if nonsurgical interventions fail. The use of MTA and PRF gives excellent results by aiding the surgical procedure in healing of the lesion. This case report describes successful management of radicular cyst through surgical approach after conventional root canal treatment showed no signs of healing the lesion.

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