



Surgical Management of a Large Periapical Lesion Using Platelet Rich Fibrin - A Case Report

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Citation of this Article: Dr. Mridusmita Mukherjee, Dr. Arindam Bhattacharjee, “Surgical Management of a Large Periapical Lesion Using Platelet Rich Fibrin - A Case Report,” IJMSAR – September – 2022, Vol. – 5, Issue - 5, Page No. 29-33.

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Type of Publication: A Case Report

Conflicts of Interest: Nil

Abstract

Periapical lesions may follow due to bacterial infection of the dental pulp, their toxins, chemical agents, foreign bodies or trauma. Such lesions when occur may result in abscess, granulomas, or radicular cysts. So, they are managed by conventional approaches such as effective disinfection of the root canal system, control of periapical inflammation which can eliminate the irritants and boost host immune system thereby aiding in periapical wound healing. Amongst many methods, surgical method of managing a periapical lesion is one of the popular methods and has been time tested. However, periodic follow-up examinations are essential and various assessment tools can be used to monitor the healing of periapical lesions over time.

Keywords

Cysts, periapical pathology, platelet rich fibrin, growth factors

Introduction

The main goal of endodontic therapy is to completely eradicate all harmful microbial flora of root canal system and to restore the diseased teeth to a state of health and function. So, besides chemomechanical preparation, all inflammatory periapical lesions should be treated to ensure complete healing with no recurrence of pathologic signs and symptoms. Cysts constitute about 15% of all periapical lesions and nearly half of all periapical lesions are radicular cysts.^[1] Radicular cysts exist in two structurally distinct classes, namely those containing cavities completely enclosed in epithelial lining (periapical true cysts) and those containing

epithelium-lined cavities that are open to the root canals (periapical pocket cysts).^[2,3]

The purpose of this article is to present a case of successful surgical management of an infected radicular cyst associated with right maxillary quadrant.

Search Methodology

An electronic search was conducted in the PubMed database, Science direct with appropriate MeSH headings and key words related to the surgical management of periapical lesions. A hand search of journals was also conducted to enhance the electronic search results.

Case Report

A 24-year-old male patient was referred to the Department of Conservative dentistry and Endodontics with a chief complaint of discoloured upper front teeth since last 7 years and mobility since 2 months. He suffered trauma to maxillary anterior teeth 10 years back with associated swelling which receded with time.

On oral examination, it was found that the maxillary right central incisor (#11), right lateral incisor (#12), right canine (#13), and first and second premolar teeth (#14,#15) were found to be non-vital

(necrotic) with grade 1 mobility in relation to 11, 12. An occlusal view of the palate revealed well-defined radiolucency of considerable size, involving anterior part of the palate in relation to 11, 12 and 13, 14, 15 region with a thin radiopaque border. The clinical and radiographic signs were suggestive of chronic periapical abscess (cyst). So, non surgical treatment was planned and the patient was explained about it. Routine steps of endodontic treatment was started with access opening, working length determination, cleaning and shaping. It was followed by thorough irrigation and placement of iodoform with Ca(OH)₂ mixture. The case was followed for a period of 6 months with no remission. So, surgical intervention was planned and the patient was asked for consent.

Obturation was performed after 1 month and it was followed by flap elevation, curettage, apicectomy, root end filling and placement of platelet rich fibrin. Flap was sutured and patient was recalled after 1 week. Surgical site showed early signs of healing and radiographs were taken at 6 months, 1 year and 2 year interval to evaluate the prognosis. They showed excellent healing with time.

Fig1: Preoperative



Fig 2: flap exposed, bony defect curetted



Fig 3: Placement of Graft, PRF

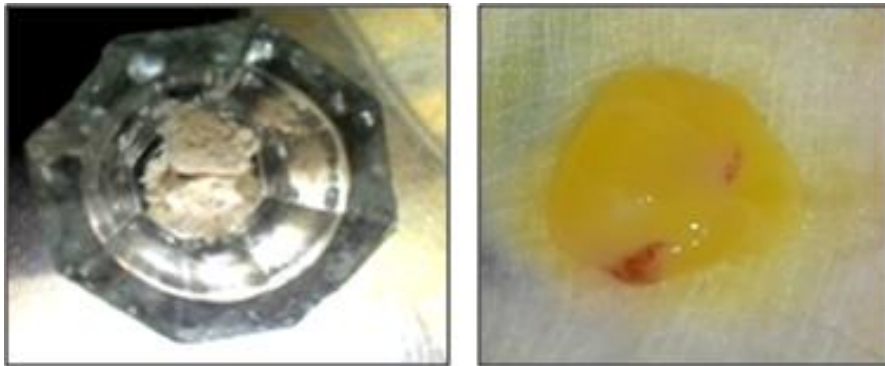
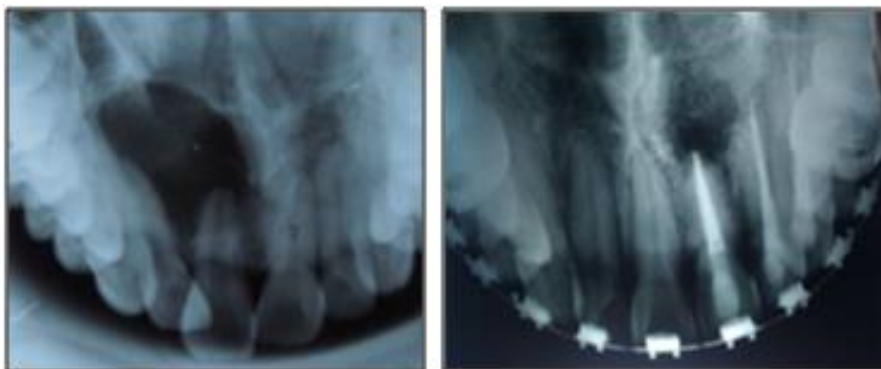


Fig 4: Suturing



Fig 5: Preoperative occlusal view Post operative view



Discussion

Radicular cysts are those which arise from epithelial residues in the periodontal ligament as a consequence of inflammation in a necrotic pulp^[4,5,6]. They are most commonly found at the apices of the non-vital teeth and maxilla is more commonly affected than mandible^[7]. They may be symptomless but may be discovered while routine radiographs are advised. Traditionally, the diagnosis of periapical lesion is based on clinical and radiographic presentations. However, the final confirmatory diagnosis is performed by histopathological examination of the tissues. The treatment of choice depends on the size and location of the lesion, and its proximity to vital structures. In the current case, repair and regeneration of a large periapical lesion, was achieved by using a combination of platelet rich fibrin and hydroxyapatite bone graft. Platelet rich factor has given new revolutionary step in bone healing. It contains cytokines, growth factors that include PDGF, TGF- β and IGF-1, leukocytes and various cytokines which enables the self-regulation of the infectious and inflammatory processes in host^[8,9]. It can store cells and release them later that can serve as a resorbable membrane. Here, we used the patient's own blood to prepare fibrin glue^[10]. The blood obtained from the subject was placed into the test tube and centrifuged immediately for 10 minutes at 3000 rpm^[11].

The PRF clot was separated from the plasma and was utilised. Following 2 years, there was excellent healing due to the presence of a more extensive vascular network in the maxilla, which facilitates resolution following improved bone density. Although clinical as well as radiographic data are used to monitor such cases but the nature of newly

formed tissue in the defect can be detected only by histopathological examination. Other assessment tool such as 'periapical index' (PAI),^[12] and ultrasound with color power Doppler are also equally beneficial in this regard.^[13]

Conclusion

The fate of a periapical cyst largely depends on the method of treatment to allow effective repair and regeneration. It is hypothesized that the PRF has a natural fibrin framework that allows slow release of growth factors.^[14] It acts as a natural fibrin scaffold that releases platelet-derived growth factor and transforming growth factor and thereby stimulates tissue regeneration. It guides cell migration into the wound and supports revascularization of the graft by supporting angiogenesis. Çalışkan postulated a follow up of two to ten years for appropriate healing of periapical lesions by nonsurgical approach^[15]. In many situations where the size and extent of the lesion is of critical importance or in calcified or nonnegotiable canals and for cases where there is a time constraint surgical management is a viable option.

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