



## SURGICAL MANAGEMENT OF A LARGE PERIAPICAL LESION USING TRICALCIUM SILICATE CEMENT AND PLATELET RICH FIBRIN FOLLOWED BY WALKING BLEACH OF DISCOLOURED TOOTH– A CASE REPORT WITH 2 YEAR FOLLOWUP

### Dental Science

**Dr Shilpi Tiwari\*** Senior lecturer , Department Of Conservative Dentistry and Endodontics , Dental College Azamgarh, Azamgarh. \*Corresponding Author

**Dr Vaibhav Krishna Singh** Senior lecturer, Department Of Conservative Dentistry and Endodontics , Dental College Azamgarh, Azamgarh.

### ABSTRACT

The most common approach to treat the cases of periapical lesion is an orthograde endodontic treatment, however lesions which are unable to heal nonsurgically needs a surgical intervention. MTA is considered as a gold standard material in root end filling, however it has shown several disadvantages, hence Biodentin was introduced to overcome these disadvantages of MTA. PRF is a way to accelerate and enhance the body's natural wound healing mechanisms as it provides the mechanical support and various growth factors which are necessary for the neoangiogenesis, vascularization and survival of the graft.

### KEYWORDS

#### INTRODUCTION:

Microorganisms are the main causative factor, which involves in the initiation and subsequent progression of a pulpal disease into the periapical region. Hence the removal of these microorganism from the root canal and periapical area is the main objective for a successful outcome of a given endodontic treatment.<sup>1</sup> Most common approach to treat these cases is orthograde endodontic treatment with adequate follow up, however some cases requires surgical approach to treat.<sup>2</sup>

The main objective of apical surgery is to remove the infected area of the root apex followed by the placement of a biocompatible root end filling material. MTA is considered as a gold standard material in periapical retrograde filling, since it has proved to be better than any other materials studied. However its long setting time, high cost and difficult manipulation prevent the clinicians to use it. Hence to overcome these difficulties associated with MTA, a new calcium silicate-based material “ BIODENTIN” was introduced in 2009 by Septodont.<sup>3</sup>

The apical surgeries with the use of barrier membrane and graft material can support the formation of new tissue and allows for a speedy regeneration and functional rehabilitation. According to Simonpieri et al. PRF provides the mechanical support and various growth factors necessary for the neoangiogenesis, vascularization and the survival of graft. Hence the usage of PRF is a way to accelerate and enhance the body's natural wound healing mechanisms.<sup>4,5</sup>

The present case report discusses the successful use of Biodentin as a root end filling material followed by PRF as a scaffold to treat a large periapical lesion and the walking bleach of discolored tooth followed by composite restoration with 2 year followup.

#### CASE REPORT:

A 25 year old female patient was referred to Department of Conservative and Endodontics with the chief complaint of pain and discharge in the front teeth region since 7 days. Patient had a history of trauma 17 years ago and also had a prior history of endodontic treatment of 12.

**Clinical and radiographic examination:** On clinical examination tooth #21 was found discolored and a swelling was present on both labial and palatal mucosa with an intraoral sinus in between 11 and 12 on labial mucosa. Clinical examination also revealed Ellis Class III fracture in 11 and 21. Access opening of 11 and 21 was previously done in a private clinic. Tenderness on percussion was positive with respect to 21 only. Grade 2 mobility was present in 11 and 12. The preoperative radiograph (fig 1A & 2A) showed well defined radiolucency involving the tooth 11, 12 and 13. 11 and 21 showed an open apex. Hence a provisional diagnosis of chronic periapical abscess was made in relation to 11, 12, 13 and symptomatic apical periodontitis in relation to 21. The treatment planned was to perform endodontic treatment of all involved teeth followed by apicoectomy of 11, 12 and 13. Endodontic treatment of 12 seems satisfactory, hence retreatment was not done.

Written consent was taken from the patient before initiating the treatment.

The conventional endodontic treatment of 11 and 13 was done using step back technique till an apical size of #80 and #60 respectively (fig 1B & 1C). As 21 was an open apex case and was not involved in the periapical lesion, hence was planned to treat with the orthograde approach. The apical 3<sup>rd</sup> of 21 was plugged with MTA (Angelus), followed by back filling with thermoplasticized obturation technique using Calamus ( Dentsply ) (fig 1C). Calcium hydroxide paste (ApexCal, Ivoclar) was used as an intracanal medicament and the endodontic treatment was performed in three visits.

Before scheduling for the surgical procedure routine blood investigations was done to assess the platelet count, hemoglobin, bleeding time, and clotting time and found to be within the normal limits. Under local anesthesia, a full thickness mucoperiosteal flap was reflected by given a sulcular incision. Labial cortical plate was perforated in relation to involved teeth. Tissue curettage was done at the defect site followed by thorough irrigation using sterile saline solution (fig 1D). 3mm root end resection was done in 11, 12 and 13 using tapered fissure carbide bur (SS White Burs) followed by root end cavity was prepared with diamond-coated ultrasonic tip ( Satelec ). Then root end filling was done with Biodentin ( Septodont ) (fig 1E). To obtain PRF 10ml of patient's blood was drawn from antecubital vein followed by centrifugation (REMI centrifuge machine) for 10 min under 3000 revolutions/minute (fig 1F). PRF was carried out and packed into the defect (fig 1G). Flap stabilization was done followed by suturing using 3-0 black silk suture material (fig 1H). Palatal splint was given to support palatal healing (fig 1I). Analgesics, antibiotics and 0.2% chlorhexidine mouthrinses were prescribed for 7 days. Suture removal was done 1 week later (fig 1J), then after 1 week walking bleach of 21 was started using sodium perborate (fig 3A). Desired shade was achieved after 3 dressings/week (fig 3B). Finally all access filling were done with composite and Ellis class III of 11 & 21 was restored by putty index method with composite resin (fig 3C).



**Fig 1A** – Preoperative IOPA, **fig 1B & 1C** – Postobturation IOPA of 11, 12, 13, **fig 1D** – Enucleation of the lesion after flap reflection, **fig 1E** – After root end resection followed by root end filling of 11, 12, 13 with biodentin, **fig 1F** – obtained PRF from patient's own blood, **fig 1G** – PRF placement into the surgical defect, **fig 1H** – After suture placement, **fig 1I** – Palatal obturator was given, **fig 1J** – Suture removed after 7 days



**Fig 2A-** IOPA after root end resection , fig 2B- 1 year follow up radiograph , fig 2C- 2 year follow up radiograph



**Fig 3A**– Shade of 21 before walking bleach , fig 3B- shade of 21 after walking bleach, fig 3C– 11 & 21 after composite buildup

## DISCUSSION

Biodentine has almost similar composition as MTA. The main difference between Biodentine and MTA is the presence of calcium chloride in biodentin, which decreases the setting time (12-15) min. The primary clinical advantage of biodentin is its fast setting which decreases the risk of partial material loss and contamination from the surgical site.<sup>6,7</sup> Hence the Biodentin was used in the present case.

Platelet rich fibrin (PRF) is considered as an ideal scaffold in repair and regeneration as it provides a variety of growth factors such as platelet-derived growth factor(PDGF), transforming growth factor  $\beta$ 1(TGF  $\beta$ 1), insulin-like growth factor(IGF) etc and these growth factors affects the cell migration, cell attachment, cell proliferation and cell differentiation. In the present case after flap reflection, a tunnel (through and through) lesion was detected, which is characterized by an eroded buccal and lingual bone plate.<sup>4,5</sup> Hence PRF was given to fill the bony defect.

1 year follow-up radiograph (fig 2B) showed a significant reduction of the lesion cavity and a 2 years follow up radiograph (fig 2C) showed the complete resolution of lesion cavity.

## REFERENCES–

1. Karunakaran JV, Abraham CS, Karthik AK, Jayaprakash N. Successful nonsurgical management of periapical lesions of endodontic origin: a conservative orthograde approach. *Journal of pharmacy & bioallied sciences*. 2017 Nov;9(Suppl 1):S246.
2. Prasanthi NN, Chittam J, Simpsy GS, Sajjan GS. Surgical management of a large inflammatory periapical lesion with platelet-rich fibrin. *Journal of Interdisciplinary Dentistry*. 2017 May 1;7(2):76.
3. Caron G, Azérad J, Faure MO, Machtou P, Boucher Y. Use of a new retrograde filling material (Biodentine) for endodontic surgery: two case reports. *International journal of oral science*. 2014 Dec;6(4):250-3.
4. Prasanthi NN, Chittam J, Simpsy GS, Sajjan GS. Surgical management of a large inflammatory periapical lesion with platelet-rich fibrin. *Journal of Interdisciplinary Dentistry*. 2017 May 1;7(2):76.
5. Singh S, Singh A, Singh S, Singh R. Application of PRF in surgical management of periapical lesions. *National journal of maxillofacial surgery*. 2013 Jan;4(1):94.
6. Walivaara DA. Periapical surgery with Biodentine™ as a retrograde root-end seal: a clinical case series study. *OHD*. 2015;14(2):120-24.
7. Ballester JC, Nieto IM, Oltra DP, Diago MP. Periapical surgery with a new retrograde root canal filling material: Tricalcium silicate cement. *Science*. 2019 Mar;5(1):34-41.