ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 11, Issue, 01, pp.627-630, January, 2019

DOI: https://doi.org/10.24941/ijcr.33862.01.2019

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

DIVIDE TO SAVE: 3 IN 1 APPROACH

[1, *]Dr. Peeyush Pathak and [2]Dr Rinku Shanklesha

Assistant Professor, Conservative Dentistry and Endodontics, AFMC, Pune-411040, India
Consultant Endodontist, Mumbai, India

ARTICLE INFO

Article History:
Received 28th October, 2018
Received in revised form
24th November, 2018
Accepted 20th December, 2018
Published online 31st January, 2019

Key Words:
Hemisection, PRF,
Bone Graft.

ABSTRACT

Advances in dentistry, as well as the increased desire of patients to maintain their dentition, have lead to treatment of teeth that once would have been extracted. Platelet-Rich Fibrin (PRF) is an autologous biologic material created by centrifugation of blood. Choukroun and his associates were amongst the pioneers for using PRF protocol in oral and maxillofacial surgery to improve bone healing in implant dentistry. Autologous PRF is considered to be a healing biomaterial and presently, studies have shown its application in various disciplines of dentistry. Advantages of PRF alone include less surgical time, elimination of techniques and potential healing difficulties associated with membranes, and less resorption during healing, as compared to guided bone regeneration procedures. Hemisection of a mandibular molar may be a suitable treatment option when the decay or resorption is restricted to one root and the other root is healthy. This article describes a simple procedure for hemisection in mandibular molar by vertical cut method, followed by faster regeneration of bone using PRF and bone graft and its subsequent restoration. Hemisection along with latest regenerative protocols and prosthetic rehabilitation yielded a satisfactory result.

Citation: ***Dr. Peeyush Pathak and Dr Rinku Shanklesha.*** **2019.** "Divide to save: 3 in 1 approach", *International Journal of Current Research*, 11, (01), 627-630.

INTRODUCTION

Advances in all phases of dentistry have provided the opportunity for patients to maintain a functional dentition for lifetime. The treatment may involve using a multidisciplinary approach for such teeth so that they can serve as independent units of mastication or as abutments in simple fixed bridges. Thus, tooth resection procedures are used to preserve as much tooth structure as possible rather than sacrificing the whole tooth (Parmar, 2003). Various procedures available are: root amputation, hemisection, radisection and bisection (Carranza and Newman). Root amputation refers to removal of one or more roots of multirooted tooth while other roots are retained. Hemisection denotes removal or separation of root with its accompanying crown portion of mandibular molars. Radisection is a newer terminology for removal of roots of maxillary molars. Bisection / bicuspidization is the separation of mesial and distal roots of mandibular molars along with its crown portion, where both segments are then retained individually (Parmar, 2003). Platelet rich fibrin is a fibrin matrix in which platelet cytokines, growth factors and cells are trapped and may be released after a certain time and serve as a resorbable membrane. Development of the bioactive surgical additives is one of the great challenges of clinical research which has been used to regulate inflammation and increase the speed of healing process.

Corresponding author:* **Dr. Peeyush Pathak

A wide range of intra- and extraarticular events and various signaling proteins mediate and regulate the healing process of both hard and soft tissues, respectively. But understanding this entire process is still incomplete; however, it is known that platelets play a crucial role not only in hemostasis, but also in the wound healing process (Carranza and Newman). Root amputation procedures eliminate a weak, diseased root to allow the stronger to survive, whereas if retained together, they would collectively fail. Selected root removal allows improved access for home care and plaque control with resultant bone formation and reduced pocket depth. Combining hemi section along with regenerative procedure represents a form of conservative dentistry, aiming to retain as much of the original tooth structure as possible (Kost *et al*., 1991; Kurtzman *et al*., 2006).

CASE REPORT

A 28 year old female patient reported to dental OPD of a tertiary care Dental centre with the chief complaint of pain in lower left back teeth since past one week. Patient was relatively asymptomatic before she developed continuous and throbbing pain in this region, which got aggravated during mastication and sleep. Patient's medical history was not contributory. On intra-oral examination, root stump was present with respect to 35 and 36 was found to be grossly carious.

Fig.1. Preoperative

Fig 2. Preoperative radiograph

Fig 3. Endodontic treatment of distal root of 36

Fig 4. Composite built up

Fig. 5. Hemisection by vertical cut method

Fig. 6. Hemisection (vertical cut method)

Fig 7. PRF prepared from patient's blood

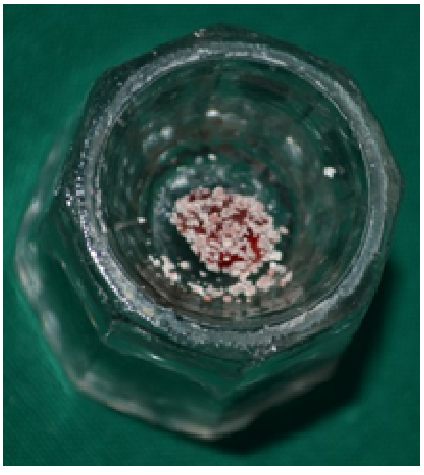

Fig 8. PRF mixed with bone graft

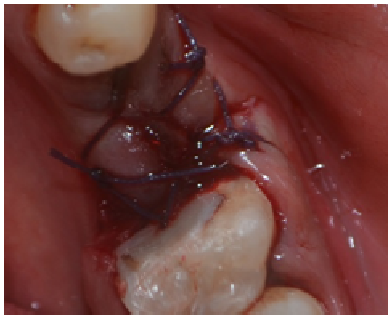

Fig. 9. Sutures placed

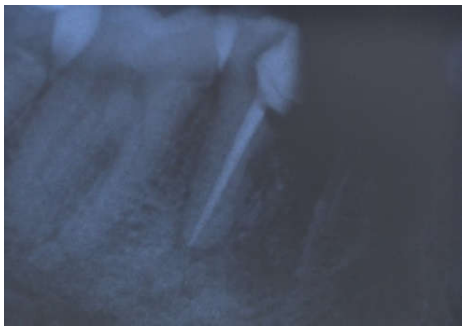

Fig. 10. Post operative

Fig. 11. Permanent prosthesis

On vertical percussion, 36 was found to be sensitive. On probing, no periodontal pocket was found in relation to 36. Vitality testing of 36 yielded no response (Fig 1). On radiographic examination (Fig 2), grossly carious 36 was evident along with slight bone loss in the furcation area. In the view of above findings, it was decided to first carry out endodontic treatment of distal root of 36 followed by the hemisection of the mesial root of 36 while retaining- the distal root (as adequate bone support was present) and extraction of 35, followed by preparation of PRF along with placement of bone graft in extracted site of 35 and fabrication of crown and bridge over 34 and36 using distal root of 36 as an abutment.

After the proper obturation of 36 (Fig 3), Composite built up was done in 36 (Fig 4) and hemisection was carried out in relation to 36, with the vertical cut method (Fig 5). A fine probe was passed through the cut to ensure separation. A long shank, taper fissure carbide bur in high speed handpiece was placed along the buccal groove and a cut was made. The cut was channeled towards the center of the tooth and then directed towards the interproximal furcation opening of the distal root. The bur was moved in the lingual and apical direction until the furcation area was reached. Once the bur had severed the floor of the pulp chamber, root was seperated from the remaining portion of the tooth. After separation, the severed portion of the mesial root was removed with a extraction forceps as well as the root piece of 35 (Fig 6).The remaining portion of the distal tooth was trimmed to remove any ledges or sharp spicules, as these structures are potentially detrimental for periodontal maintenance. The socket was irrigated with sterile saline to remove bony chips and debris followed by placement of PRF and bone graft into socket of 35 to promote faster healing.

Preparation of PRF: The protocol for PRF preparation is very simple and simulates that of PRP (Marco, 2010). It includes collection of whole venous blood (around 5 ml) in each of the two sterile vacutainer tubes (6 ml) without anticoagulant and the vacutainer tubes are placed in a centrifugal machine at 3,000 revolutions per minute (rpm) for 10 min, after which it settles into the following three layers: Upper straw-colored acellular plasma, red-colored lower fraction containing red blood cells (RBCs) and the middle fraction containing the fibrin clot . The upper straw-colored layer is removed and middle fraction is collected, 2 mm below to the lower dividing line, which is the PRF (Simon *et al*., 2013). The mechanism involved in this: the fibrinogen concentrated in upper part of the tube, combines with circulating thrombin due to centrifugation to form fibrin. A fibrin clot is then formed in the middle between the red corpuscles at bottom and acellular plasma at the top. The middle part is platelets trapped massively in fibrin meshes.

The success of this technique entirely depends on time gap between the blood collection and its transfer to the centrifuge and it should be done in less time. The blood sample without anticoagulant, starts to coagulate almost immediately upon contact with the glass, and it decreases the time of centrifugation to concentrate fibrinogen. Following proper protocol and quick handling is the only way to obtain a clinically usable PRF clot charged with serum and platelets. Resistant autologous fibrin membranes may be available by driving out the fluids trapped in fibrin matrix (Simon *et al*., 2013). PRF thus obtained (Fig 7) was mixed with Bone graft material (Fig 8) (perioglas, novaboneproducts, USA) and placed inside the socket of the mesial root of 36 and socket area of 35. Silk sutures were placed to approximate the flap (Fig 9) and after 7 days, the sutures were removed. Crown preparation was completed on 36 and 34 and fixed metal ceramic bridge was fabricated (Fig 11)

DISCUSSION

Root amputation/hemisection is a useful alternative procedure to save those multi-rooted teeth, which have been indicated for extraction. Before selecting a tooth for hemisection, patient's oral hygiene status, caries index and medical status should be considered.[5] Also, accessibility of root furcation for easy separation as well as good bone support for the remaining root should be assessed (Carranza and Newman). In the present case, because of excessive destruction of the crown portion of mesial root due to caries and fair amount of the distal root remaining with adequate bone support, hemisection carried out with the removal of the mesialroot and crown. Remaining tooth structure was restored with composites and used as an abutment in crown and bridge after repositioning the occlusal contacts in favourable position. Recently, Park *et al.* have suggested that hemisection of molars with questionable prognosis can maintain the teeth without detectable bone loss for a long-term period, provided that the patient has optimal oral hygiene (Park, 2009). Saad *et al* have also concluded that hemi section of a mandibular molar may be a suitable treatment option when the decay is restricted to one root and the other root is healthy and remaining portion of tooth can very well act as an abutment.[8]In the present case, the mesial part of the tooth structure was grossly decayed while the distal root could act as an abutment for the future prosthesis. Choukroun *et al* attempted to evaluate the potential of PRF in combination with freeze-dried bone allograft (FDBA) in sinus floor elevation to enhance bone regeneration and nine sinus floor augmentations were performed. As there was slight bone loss in furcation area of 36, and adequate bone support was present on the mesial surface of the distal root, in order to provide better bone support and faster bone healing, PRF along with bone graft material was placed inside the socket of the

extracted mesial root as well as in the socket of 35 (Marco *et al*., 2010; Simon *et al*., 2013).

Conclusion

Root amputation and hemisection may be considered as alternative treatment modality in the field of dentistry, to save the remaining healthy natural teeth. With recent refinements in endodontics, periodontics, restorative dentistry along with regenerative procedures, Hemisection has received acceptance as a conservative and dependable dental treatment. Hemisection along with regenerative procedure can be considered a suitable alternative to extraction and should be discussed with patients, during consideration of treatment options. The results of combining both the procedure are predictable, and success rates are high if certain basic considerations are taken into account.

REFERENCES

Carranza and Newman. Clinical periodontology, 8th edition. WBSaunders Co., Philadelphia.

Ingle JI. and Bakland LK. Endodontics, 6th edition.

Kost WJ., Stakiw JE. 1991. Root amputation and hemisection. *J Can Dent Assoc.,* 57(1):42–5.

Kurtzman GM., Silverstein IH., Shatz PC. 2006. Hemisection as analternative treatment for vertically fractured mandibular molars. *Compend Contin Educ Dent*., 27(2):126–9.

Kurtzman GM., Silverstein LH., Shatz PC. 2006. Hemisection as an alternative treatment for vertically fractured mandibular molars. *Compend Contin Educ Dent*., 27(2):126–9.

Marco DC., Michael T., David M., David M., Dohan Ehrenfest, 2010. Use of an autologous Leukocyte and platelet rich fibrin membranein post avulsion sites. An overview of choukroun's PRF. *J of implant and advanced clinical dentistry.,* 1(9)27-35

Park JB. 2009. Hemisection of teeth with questionable prognosis. Report of a case with seven-year results; *J Int Acad Periodontol.,* 11(3):214-9.

Parmar G., Vashi P. 2003. Hemisection: a case-report and review. *Endodontology*,15:26-29.

Saad MN., Moreno J., Crawford C. 2009. Hemisection as an alternativetreatment for decayed multirooted terminal abutment: a casereport; *J Can Dent Assoc.,* 75(5):387-90.

Simon BI., Gupta P., Tajbakhsh S. 2013. Quantitative evaluation of extraction socket healing following the use of autologous platelet rich fibrin matrix in humans. *J Conserv Dent.*, 16(4):284-93.

****