

Treatment of Vertical Intrabony Defect using a Novel Entire Papilla Preservation Flap Technique with Bone Graft and Titanium Platelet Rich Fibrin: A Case Report

Abstract:

Treatment of intrabony defects is always a difficult task to manage for a periodontist. Various problems have been encountered like black triangle, increased food lodgement, plaque accumulation and ultimately failure of procedure were experienced. Thus more conservative approaches like papilla preservation flaps and Non-incised Papillae surgical approaches are preferred. But due to drawbacks of existent techniques there was an introduction of novel surgical technique, the Entire Papilla preservation Flap (EPPF). The present case report is a detailed description of treatment of vertical intrabony defect using EPPF technique, bone graft and titanium platelet rich fibrin membrane with 9 months follow up.

Key-words: Chronic Periodontitis, Grafting Bone, Platelet Rich Fibrin, Surgery

Introduction:

Periodontitis is a multifactorial disease which causes rapid attachment loss and bone resorption. Plaque and calculus accumulation, alteration of microbiota are the main causes of gingival inflammation further leading to vertical bony defects [1]. Various treatment modalities like flap surgery (FS) alone or FS in combination with bone grafts, platelet concentrates (PC) (Leukocyte Platelet Rich Fibrin (L-PRF), Advanced PRF), or any guided tissue regeneration procedures were performed and achieved reduction in pocket depth, gain in clinical attachment level and improved bone fill percentages [2]. Having said that, there are some drawbacks like loss of papilla fill, tissue recession and increased food accumulation which need to be addressed [3].

Thus to reduce these drawbacks more conservative surgical approaches usage has been started. Initially papilla preservation flaps have been tried in both anterior and posterior segments of teeth. But in recent trends a novel surgical approach, the Entire Papilla Preservation Flap (EPPF) was introduced by Aslan and Co-workers in 2017 [4] where it

is a novel surgical approach for treatment of intrabony defects. Briefly technique could be explained as follows for two scenarios- in case of first one Initial intra-crevicular incision was given sparing the papilla followed by vertical bevelled releasing incision was done buccally on gingiva of neighbouring interdental space to get an access to the

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intrabony defect. In second scenario when mal-aligned teeth with narrow interdental space were identified, vertical incision can be shifted one teeth away from normal incision line. Further in case of narrow interdental papilla oblique incision was provided at interdental papilla followed by normal sulcular incision of surgical site teeth and later vertical releasing incision was performed.

Usage of bone graft (BG) help in acting as scaffold so that fibroblasts and osteoblasts stimulate in new bone formation thus improving the surgical outcome. Titanium Platelet Rich Fibrin (T-PRF) was introduced by Tunali M et al.,[5] 2013 where its usage as biomaterial in the treatment of intrabony defects was established in recent studies done by Gummaluri SS et al.,[6] 2020 and Mitra DK et al.,[7] 2019 where they achieved improvement in clinical and radiographic parameters. Moreover thicker membrane of T-PRF help in better entrapment of cells and help in improved wound healing. As very less literature is available regarding this technique, we have performed this case of entire papilla preservation flap technique performed for the treatment of intrabony defect in left lower back tooth region along with bone graft (G-Bone™).

Case Report:

A 32 year systemically healthy male patient came to the department of periodontics during January 2020 with a chief complaint of dentinal hypersensitivity (DH) in entire oral cavity since 6 months. Upon history taking patient brushes with fingers once daily and occasionally uses a brush for cleaning of teeth. On clinical examination there was severe plaque and calculus accumulation, localized periodontal pocket and clinical attachment level of 8mm in 36 tooth region (Using University of North Carolina (UNC) 15 Probe). Later patient was subjected to thorough full mouth supra cum sub gingival scaling and root planing at 36 region with hand and ultrasonic instruments. Further oral hygiene instructions, HIORA sensi-kit was prescribed to patient for period of one month which contains tooth paste and mouth wash used twice daily. Then the patient was recalled for evaluation after 1 month, DH was reduced, no bleeding on probing, lesser plaque and patient was satisfied but for PD and CAL at 36 tooth region there was only little improvement (7mm remained). Intra oral periapical radiograph (IOPA) was taken at that 36 tooth region, showed a vertical intrabony defect (VID) of 5 mm.



Figure 1: a) Pre-operative probing depth 36 teeth region b) Incision Design c) Flap Reflection d) Surgical site showing vertical intrabony defect after debridement

Patient was explained regarding the problem of that teeth and explained regarding the pros and cons of surgical techniques that would be performed. After taking the informed consent from the patient regenerative procedure with BG+ T-PRF and EPPF was planned as this preserves the interdental papilla and reduces the papilla loss and reduces the plaque accumulation.

Surgical Procedure:

Before performing the surgery, routine blood investigations (clotting time, bleeding time, haemoglobin percentage, Hepatitis- B & C and RT-PCR for COVID 19) were performed and the values were within the physiological limits. After obtainment of profound anaesthesia (2%Lignocaine Hydrochloride +80,000 Adrenaline) on the left side, proper bone sounding was performed using UNC- 15 probe to identify the morphology and defect. Prior to incision, 10millilitres of blood was drawn from antecubital vein, directly transferred to medical grade titanium tubes (Supra Alloys, Camarillo, USA) and subjected to centrifugation based on Tunali M et al.,[5] protocol (3500 rotations per minute for 15 minutes). Based on first scenario explained in introduction, EPPF[4] was performed, vertical bevelled releasing incision was performed on premolar side (35 tooth) and intra-sulcular incision was given of molar side (36 tooth). Then flap was carefully reflected with preservation of papilla on 36 tooth side. After adequate accessibility careful debridement was done using Hufriedy curettes no 12/13 and 4r/4l. Further G-bone graft (Hydroxyapatite+ beta tricalcium phosphate) was placed over which T-PRF membrane was placed and vertical incision was sutured using

4-0 silk sutures (Ethicon Mersilk, Jhonson and Jhonson Pvt Ltd, New Delhi, India) (Figure 2).

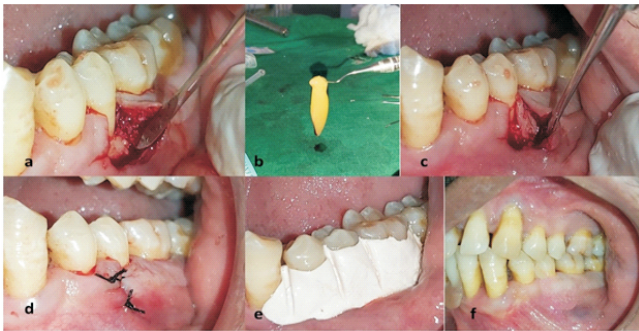


Figure 2: a) bone graft placed b) T-PRF membrane c) T- PRF membrane placed d) Suturing done e) Periodontal Pack Placed f) 9 months post-operative.

Post-operatively Amoxicillin 500mg thrice daily for 5 days, Diclomol tablet twice on first day and remaining 4 days based on requirement for pain control and 2% Chlorhexidine gluconate (Rexidine™) mouth wash twice daily for 15 days were prescribed. Patient was recalled after 10 days for suture removal and asked for not to brush the area for at least 1 month post-surgically and asked to clean with cotton pellet dipped in chlorhexidine solution for prevention of plaque and calculus accumulation. Amidst COVID 19 pandemic patient couldn't turn up for suture removal and got them removed at a local dentist. Later, patient turned up after 9 months (Figure 3) for recall visit and for assessment of treatment outcomes.

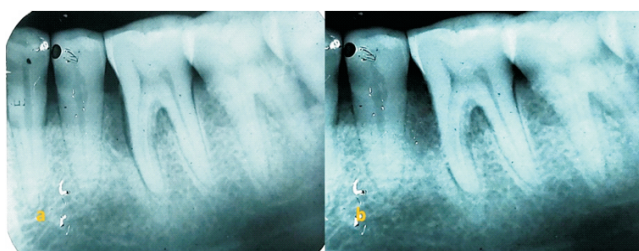


Figure 3 a) Pre-Operative intra oral periapical radiograph (IOPAR) in relation to 36 tooth region b) 9 months Post-operative intra oral periapical radiograph (IOPAR) in relation to 36 tooth region

Discussion:

Present case report was a detailed description of novel EPPF technique used in treatment of vertical intrabony defects. There was no complications in healing of surgical site, no scar formation, complete wound closure and post-operatively

pocket depth was reduced to 3mm and no bleeding on probing and patient was satisfied with the treatment outcome. Post-operatively radiographic defect reduced to 1.5 mm thus a Radiographic defect fill of 70% was recorded at 9 months. Very limited research was performed on this technique, so present case report results were compared with available data. This case report results are in accordance with study conducted by Aslan and Co-workers [4, 8] 2017 and 2020 where they concluded that this gave first healing intention, maintained integrity of papilla, good wound stability and improved radiographic parameters. These improvements in clinical and radiographic parameters in present case might be due to change of incision line away from defect, tunnelling preparation helped in maintaining of papilla integrity and blood supply careful reflection of flap[9], adequate access to VID additionally G-bone+T-PRF usage and 4-0 sutures also helped in stabilization of clot and proper integrity of surgical area and helped in uneventful healing.

Utilization of bone graft in the present study helped in acting as scaffold, clot stabilization and G-Bone has osteoconductive properties almost bordering the osteoinductive property which rapid the healing. T-PRF membrane helped in prevention of depression flap into the defect and presence of growth factors like platelet derived growth factor, vascular endothelial growth factor, insulin like growth factor and epidermal growth factor helped in rapid healing of surgical site [5]. It also show a rapid stimulatory effect on osteoblasts for new bone formation. Though there are added advantages and good results obtained, limitations such as careful reflection of flap makes it technique sensitive, not used for lingual bony defect, narrow interdental papilla may lead to tear, im-proper debridement and wound healing index cannot be used. Additional limitations of present case were normal suturing used, demineralized freeze dried bone allograft was not used for grafting, T-PRF tubes are costly, vertical incision may cause a scar formation and cone beam computed tomography was not utilized for checking bone fill. Surgical re-entry was not performed because of limitations and thus bone regeneration and type of attachment could not be assessed. Long term randomized controlled split mouth trials could show more impact and better treatment outcome results.

Conclusion:

Thus within limitations entire papilla preservation flap (EPPF) performed with G-bone+ T-PRF in present case helped in better improvement of clinical and radiographic parameters and it is regularly used in near future because of its maintenance of papilla integrity and better treatment outcomes. Moreover T-PRF could be a better alternative to connective tissue graft and other PC which could help in better wound healing, and thicker membrane helps in prevention of flap collapse.

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