

Periodontology

Whale's tail technique - A Case Report



Dipika Mitra
Professor

Correspondence Address

Deptt. of Periodontology
TPCT's Terna Dental College and Hospital
Sector - 22, Nerul, Navi Mumbai

Abstract

|| Brief Background

The “whale’s tail” flap technique is designed to preserve interdental tissue in guided tissue regeneration. This report describes the use of this flap technique along with autogenous bone graft.

|| Materials and Methods

A 37-years old patient presented with defect on mesial aspect of central incisor with probing pocket depth (PPD) of 9mm on the labial aspect and palatal PPD of 6mm. After treating the defect site surgically along with a follow-up of 6 months there was drastic reduction in PPD from 9mm to 4 mm.

|| Discussion

The preservation of papillary integrity during all dental procedures to minimize its disappearance as much as possible is essential for maintaining esthetics especially during and after periodontal surgery. The surgical technique presented in this paper allows regeneration of wide intrabony defects involving the maxillary anterior teeth with notable interdental diastemas, maintaining interproximal tissue to recreate a functional attachment with esthetic results.

|| Summary and Conclusions

The technique presents good outcome when used with osseous grafts and guided tissue regeneration

|| Key Words

Whale’s tail, CGF membrane, Graft, osseous defect.

|| Introduction

Guided tissue regeneration (GTR) comprises procedures attempting to regenerate lost periodontal structures through differential tissue responses.^[1] On the cellular level, periodontal regeneration is a complex process requiring coordinated proliferation, differentiation, and development of various cells types to form the periodontal attachment apparatus. The concept of periodontal regeneration arose from Melcher's theory which proposed that the cell type that repopulates the exposed surface at the periodontal repair site will define the nature of attachment that takes place^[2]. Cells from both periodontal ligament and alveolar bone are important to the formation of new bone, cementum and periodontal ligament^[3].

The GTR membrane prevents the overgrowth of epithelial cells and thereby prevents long junctional epithelial attachment formation. The classical approach to periodontal regeneration in the last 30 years has been the use of bone grafts in repairing periodontal defects. The association of guided tissue regeneration with graft materials has been reported with success.^[4] To optimize the regeneration and preserve soft tissues many techniques of papilla preservation have been described in literature^[5-10]. Bianchi and Bassetti^[11] described, in 2009, a surgical technique designed to preserve interdental tissue in guided tissue regeneration called the "whale's tail" technique.

It was intended for the treatment of wide intrabony defects in the esthetic zone involving the elevation of a large flap from the buccal to the palatal side to allow access and visualization of the intrabony defect and to perform GTR while maintaining interdental tissue over grafting material.^[11] The aim of this study is to describe a clinical case where the "Whale's tail" technique was employed to obtain regeneration with Concentrated Growth Factor (CGF) membrane. CGF is second generation of platelet concentrate which utilizes patient's venous blood alone to trigger platelet activation and fibrin polymerization. CGF can be used as alternative to traditional barrier membrane over bone graft.^[12]

|| Case Report

A 37-year-old man with chief complaint of diastema between central incisors presented to the Department

of Periodontology, TPCT's Terna Dental College & hospital. On examination: There was a clinical and radiographic evidence of an intrabony defect associated with the maxillary left incisors. Central incisor had a labial pocket probing depth of 9 mm and a palatal probing depth of 6 mm.

Technique

Two vertical incisions were performed from the mucogingival line to the distal margin of the lateral incisor and mesial margin of the central incisor on the buccal surface (Figure 2). A horizontal incision joined the vertical incisions at the apical aspect of the flap. In the coronal aspect of the flap intrasulcular incisions were made at buccal, interproximal and palatal sides. A full-thickness flap was elevated from buccal to palatal side through the diastema (Figure 3). The defect was debrided, the root was scaled, planned and conditioned with citric acid for 3 minutes.

Bone graft was used to fill the defect. CGF membrane was used to cover the graft (Figure 4,5,6,7). The flap was repositioned from the palatal to the buccal side, and its margins were sutured without tension, far away from defect (Figure 8). Coe pack dressing was given (figure 9). Antibiotics were prescribed (Amoxicilin, three times a day) for one week. Healing was uneventful. Recall appointments were performed once per week for the first 4 weeks and once per month at the following period. After 6 months the probing pocket depths was reduced to 4 mm (figure 10).



Fig. 1: Pre-operative

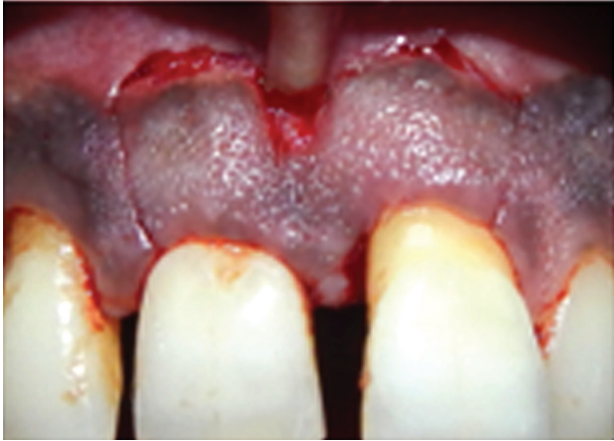


Fig.2: Incision

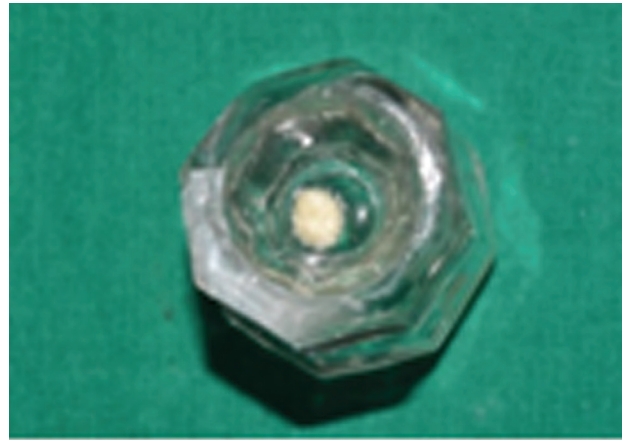


Fig.5: Sticky Bone



Fig.3: Elevation of Full Thickness Flap



Fig.6: Placement of Sticky Bone



Fig.4: CGF Membrane



Fig.7: Placement of CGF Membrane



Fig.8: Suture Placed



Fig.9: Placement Of Coe Pack



Fig.10: 6 Months Followup

|| Discussion

The preservation of papillary integrity during all dental procedures to minimize its disappearance as much as possible is essential for maintaining esthetics especially during and after periodontal surgery^[10]. The surgical technique presented in this paper allows regeneration of wide intrabony defects involving the maxillary anterior teeth with notable interdental diastemas, maintaining interproximal tissue to recreate a functional attachment with esthetic results^[11]. The advantages of "Whale's tail" flap is the elevation of a large flap from buccal to palatal, allowing the preservation of a large amount of soft tissue. Thus, it results in good primary flap closure^[11]. The use of incisions distant from the defects and graft margins drastically reduces the percentage of flap dehiscence mainly when membranes are used. The disadvantages of the technique are the necessity of a diastema in order to allow flap dislocation to palatal side.

The flap elevation is delicate and the surgeon must be careful to preserve the papilla, which will maintain the vascularization of the flap. Bianchi and Bassetti^[11] reported a CAL gain (4.57 ± 0.65 mm) and PPD reduction (5.14 ± 0.95 mm) with the "Wale's tail" flap. The first description of a surgical approach named papilla preservation was published by Takei et al.^[5] and the technique was designed to obtain a primary closure in grafted sites. In 1995, Cortellini et al.^{[6] [13]} published a modification of the Takei et al technique naming it modified papilla preservation technique. Other techniques described in literature were designed to maintain primary closure of the flaps at the interdental space. One of them is the simplified papilla preservation flap^[8] which has an advantage of limiting the membrane collapse, and its applicability in narrow and/or posterior interdental spaces^[8].

With this technique authors showed a mean CAL gain of 4.9 ± 1.8 mm and a PPD reduction of 5.8 ± 2.5 mm. Checchi et al.^[10] described a long-term evaluation period (22 years) after the use of surgical interdental papilla preservation technique. The interproximal tissues were still stable after this period, although a partial exposure of the buccal root surface of the left central incisor, lateral incisor, and premolar had occurred. An interesting result was showed when the gingival blood flow during healing was compared between the modified Widman flap and the simplified

papilla preservation flap^[14]. The later technique may be associated with faster recovery of the gingival blood flow post-operatively. A higher gingival blood flow to different parts of the periodontium might have an essentially positive effect on the speed and on the quality of the healing process. Furthermore, an improved healing process would be of paramount importance for the final outcome of various regenerative procedures^[14]. In a study conducted by Ying X (2017) the use of concentrated growth factors and autogenous bone for periodontal soft tissue

augmentation and bone regeneration. He concluded that CGF combined with autogenous bone can achieve periodontal soft tissue and bone augmentation. A 12 months follow-up period revealed stable augmentation and a satisfying esthetic effect.^[12]

|| Conclusion

In the light of these findings we can suggest that the “Whale’s tail” technique along with CGF membrane has a good and predictable results when used with bone graft.

Co-authors



Meenakshi Talati
P. G. Student



Silvia Rodrigues
Reader



Rohit Shah
Reader



Saurabh Prithyani
Lecturer



Harshad Vijaykar
Professor and Head

|| References

1. Glossary of Periodontal Terms, ed 4. Chicago: The American academy of periodontology, 2001.
2. Melcher AH. On the repair potential of periodontal tissues. *J Periodontol.* 1976; 47: 256-60.
3. Melcher AH, McCulloch CA, Cheong T, Nemeth E, Shiga A. Cells from bone synthesize cementum-like and bone-like tissue in vitro and may migrate into periodontal ligament in vivo. *J Periodontal Res.* 1987; 22: 246-7.
4. Schallhorn RG, McClain PK. Combined osseous composite grafting, root conditioning, and guided tissue regeneration. *Int J Periodontics Restorative Dent.* 1988; 8: 8-31.
5. Takei HH, Han TJ, Carranza FA Jr, Kenney EB, Lekovic V. Flap technique for periodontal bone implants. Papilla preservation technique. *J Periodontol.* 1985; 56: 204-10.
6. Cortellini P, Prato GP, Tonetti MS. The modified papilla preservation technique. A new surgical approach for interproximal regenerative procedures. *J Periodontol.* 1995; 66: 261-266.
7. Murphy KG. Interproximal tissue maintenance in GTR procedures: description of a surgical technique and 1-year reentry results. *Int J Periodontics Restorative Dent.* 1996; 16: 463-77.
8. Cortellini P, Prato GP, Tonetti MS. The simplified papilla preservation flap. A novel surgical approach for the management of soft tissues in regenerative procedures. *Int J Periodontics Restorative Dent.* 1999; 19: 589-99.
9. Cairo F, Carnevale G, Billi M, Prato GP. Fiber retention and papilla preservation technique in the treatment of infrabony defects: a microsurgical approach. *Int J Periodontics Restorative Dent.* 2008; 28: 257-63.
10. Checchi L, Montevecchi M, Checchi V, Bonetti GA. A modified papilla preservation technique, 22 years later. *Quintessence Int.* 2009; 40: 303-11.
11. Bianchi AE, Bassetti A. Flap design for guided tissue regeneration surgery in the esthetic zone: the “whale’s tail” technique. *Int J Periodontics Restorative Dent.* 2009; 29: 153-159.
12. Ying X, Chen Y, Luo N. The Use of Concentrated Growth Factors and Autogenous Bone for Periodontal Soft Tissue Augmentation and Bone Regeneration: A Case Report. *Electronic J Biol.* 2017; 13: 3-7.
13. Cortellini P, Tonetti MS. Improved wound stability with a modified minimally invasive surgical technique in the regenerative treatment of isolated interdental intrabony defects. *J Clin Periodontol.* 2009; 36: 157-63.
14. Retzepi M, Tonetti M, Donos N. Comparison of gingival blood flow during healing of simplified papilla preservation and modified Widman flap surgery: a clinical trial using laser Doppler flowmetry. *J Clin Periodontol.* 2007; 34: 903-11.