



APPLICATION OF PEDICLED PERIOSTEAL MEMBRANE WITH BONE GRAFT IN MANAGEMENT OF ADVANCED FURCATION DEFECT

Dr. Madhu S. Ratre

Reader, Department of Periodontology, Govt. College of Dentistry, Indore-452001, Madhya Pradesh, India.

Dr. Vineeta Gupta

Associate Professor, Department of Periodontics, Government Dental College, Raipur Chhattisgarh India-492001

Dr. Shaleen Khetarpal

Lecturer, Dept. of Periodontology, Govt. College of Dentistry, Indore, Indore-452001, Madhya Pradesh, India.

Dr. Brajendra Kumar

Professor, Department of Medicine, RIMS, Raipur Chhattisgarh, India-492001

ABSTRACT

Complete regeneration of lost supporting tissues at periodontally compromised furcation region is still an unpredictable, partially achieved goal. Various surgical approaches such as use of different collagenous and noncollagenous membranes in combination with or without bone grafts have been suggested as reliable treatment options for management of grade II furcation involvements. Currently, the autogenous pedicled periosteal membrane has been employed in regenerative management of various periodontal defects. Autogenous periosteal membrane is unique barrier membrane with its regenerative potential. This case report is an attempt to discuss successful management of grade II furcation involved teeth using periosteal membrane and bone graft in the mandibular molar region.

KEYWORDS : furcation defect, guided tissue regeneration; periodontal, periosteum, tissue grafts.

INTRODUCTION

It is well-known from the literature that multirrooted teeth suffer a higher risk of periodontal tissue destruction and tooth loss (Chace and Low, 1993). This could be correlated to multiple factors such as complex anatomy of the furcation, difficulties in early diagnosis and treatment execution. Also, outcome of periodontal therapy in furcation region becomes less predictable with increase in severity of furcation involvement (FI), amount and type of bone loss around the furcation and increased need of oral hygiene maintenance. Periodontal regeneration has been recommended as a viable therapeutic option for treating class II furcation defect in a recent consensus report (Reddy et al., 2015). Guided tissue regeneration (GTR) is a unique surgical approach with the use of membrane between root and gingival tissue to facilitate periodontal regeneration with new attachment by selective proliferation of the cells from periodontal ligament (Murphy and Gunsolley, 2003). Currently, autogenous periosteal membrane (PM) has been used as barrier membrane in various periodontal regenerative procedures (Gamal and Mailhot, 2008). Periosteum is a complex, specialized, well vascularized fibrous sheath which covers the external surface of most of the bones. Microscopically, it consists of outer, fibrous layer and inner proliferative layer. The inner layer (known as cambium layer) has a regenerative potential (Augustin et al., 2007).

The present case report is an attempt to discuss the application of autogenous pedicled periosteal membrane (PPM) with an alloplastic bone graft in management of grade II furcation defect in mandibular molar.

Case description - A 54 year female patient reported with a chief complaint of pain and swelling in the right mandibular first molar region since three days. The patient gave a history of root canal treatment and porcelain fused to metal crown treatment in same region two years back. A soft, fluctuant swelling, deep periodontal pocket measuring 7 mm on the facial surface and Glickman's class II FI was noticed in right mandibular first molar on examination (Figure 1.A). A diagnosis of Periodontal abscess as a consequence of periodontal destruction in furcation region of 46 was made. Drainage was established through the pocket and debridement was

performed with the curettes. Scaling and root planing was completed after remission of acute symptoms. Pedicled periosteal membrane (PPM) along with bone grafting was planned in the surgical phase.

After informed consent and local anesthesia, crevicular incision was given, extending from mesial line angle of 45 to distal line angle of 47. Releasing incision was given from mesial line angle of 45 to the mucobuccal fold, taking into consideration the mental neurovascular bundle (Figure 1.B). A complete full thickness, triangular flap was raised and debridement was completed. A horizontal, partial thickness incision was given at the inner side of the base of the flap to release sufficient length of the periosteum and is separated from the mucoperiosteal flap by sharp dissection. The dissected PM remained attached to the mucoperiosteal flap at its distal aspect (Figure 1.C, D). Alloplastic hydroxyl apatite + β tricalcium phosphate bone graft was condensed at furcation (Figure 2.A). The pedicled periosteum was placed over the bone graft and stabilized (Figure 2.B). The flap approximation was completed with 3-0 black silk suture (Figure 2.C) and periodontal dressing was placed. Amoxicillin 500 mg and Ibuprofen was prescribed three times a day for five days. The healing was satisfactory at three weeks post-operatively and at this stage sutures were removed. Patient was recalled after every three months till a period of two years (Figure 2.D). There was significant reduction of probing pocket depth from 7 mm to 4 mm and significant bone fill in the furcation region and periodontal condition was stable during two years post-operatively.



Figure 1, A. Horizontal probing showing furcation involvement in 46. **B.** Horizontal and oblique releasing incisions. **C.** Surgical exposure of furcation defect after elevation of mucoperiosteal flap. **D.** Harvested pedicled periosteal membrane.

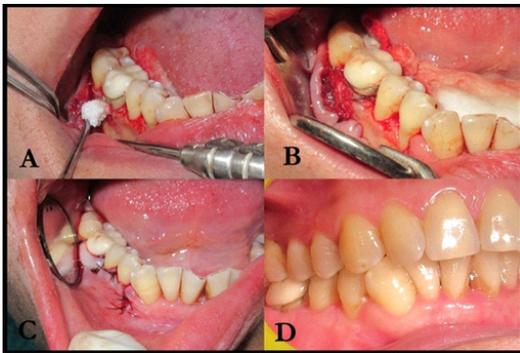


Figure 2, A. Bone graft placement at the furcation site. B. Sutured PPM over the furcation containing bone graft. C. Flap closure over the PPM. D. Periodontal status two years post-operatively.

Discussion

- A systematic review in 2003 strongly emphasized that Class II furcations respond most favorably to a combination approach using GTR and bone grafting together (Murphy and Gunsolley, 2003). An ideal GTR membrane should be biocompatible, cell occlusive, space maintainer and cost effective. PM fulfills most of these requisites. In addition, as the cambium layer is rich in osteogenic and progenitor cells, it acts as a source of autogenous regenerative cells and molecules (Augustin et al., 2007). Some researchers have compared autogenous periosteal graft as barrier to open flap debridement in the treatment of Class II furcation defects in lower molars, and they observed significant improvement in vertical and horizontal bone levels in the inter-radicular area when compared to open flap debridement (Lekovic et al., 1991). Recently, PPM has been used as GTR membrane in the management of furcation and intrabony defects. The outcome of present case report is in accordance with the results of study of Verma et al., (2011). They had evaluated pedicled periosteal graft in the management of buccal grade II furcation involvement in a split mouth study. After 6 months, they observed a higher and statistically significant gain in periodontal attachment level at the experimental site.

In one study, pedicled periosteum was applied as GTR in treatment of intrabony defects (Singhal et al., 2013). Authors concluded that space provision by alloplastic graft material increases regenerative potential of marginal PM in a 6 months post operative assessment. Kumar et al., (2014) studied radiographically and found higher advantage of alloplastic material supplementation to the periosteal membrane over the marginal pedicle periosteum alone for treatment of two or three wall intrabony defects in a 9 months study. The present case report demonstrates that the autogenous PPM in combination with bone graft effectively reduces periodontal probing depth and results in significant improvement in periodontal status at furcation region.

Hence, the present case report concludes that autogenous pedicled periosteal membrane with an alloplastic bone graft is an effective, regenerative approach in surgical management of grade II periodontal furcation involvement. Though more studies with long term follow up are required to further validate this statement.

RESULTS

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CONCLUSION

Autogenous periosteal membrane is unique barrier membrane with its regenerative potential. This case report is an attempt to discuss successful management of grade II furcation involved teeth using periosteal membrane and bone graft in the mandibular molar region.

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