Treatment of bilateral furcation involvements with bonegraft and bioabsorbable barriers

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Abstract

Bilateral furcation involvements are a common occurrence .This case demonstrates the surgical treatment of bilateral furcation involvement at a single appointment. This article presents successful management of bilateral class II furcation involvement affecting lower molars with particulate bonegraft (betaTCP + HA) and guided tissue generation(GTR) bioabsorbable membrane. This article reiterates the fact that class II furcations are ideal cases for therapy bone graft +GTR and respond favorably to this therapy. Further treatment at a single appointment is more convenient and time saving for both the patient and the operator when the patient is deemed compliant to follow post operative instructions.

Key Words : Furcation, Bonegraft, guided tissue regeneration, flap debridment, guided tissue regeneration.

Introduction:

Treatment and management of teeth with furcation involvements is one of the most challenging problems confronting dentists. One major reason for this is improper access to these areas, hence performing excellent oral hygiene is difficult and time consuming therefore, the cooperation of patient gets weaker and consequently a poor prognosis is provided for the treated tooth.

Furcation involvements are classified in several ways: Glickman[1] classified these defects into four groups. Lindhe[2] used degrees 1-3 in this classification. Tarnow and Fletcher[3] classified these defects according to the probable vertical depth from the roof of furca apically. Two more classifications according to the remaining bony walls[4] and morphology of ledges and remaining bone have been done[5].

Furcation involvement can be treated by following techniques:

1. Scaling, root planning and gingival curettage for grade I furcation involvement[1,2] .
2. Furcationoplasty (odontomy + osteotomy) for grade I and initial grade-II furcation involvements [(1,2)] .
3. GTR for initial grade II furcation and Bone grafting for advanced grade II furcation and initial grade III furcation[1, 2.]
4. Tunnel preparation (tunneling) Root resection, hemisection, and bicuspidisation[1,2] for grade IV furcations.

Graft materials generally include, bone grafts[7,8] and non-bone materials[9]. Guided tissue Regeneration technique (G.T.R.) by using resorbable and unresorbable membrane such as Gortex [3-6,10,11].

These techniques are used on upper and lower jaws. In 1976, it was theorized that the type of tissue that predominates in the healing wound would determine whether the response is one of repair or regeneration[12].

Guided tissue regeneration (GTR) therapy introduced in 1980s has been widely used to regenerate lost periodontium from periodontal disease. Both human and animal studies have demonstrated various degrees of regeneration of bone and attachment apparatus[13–16].

The case report deals with treatment of bilateral gradeII furcation (by Glickmans classification) with bioabsorbable barriers and bonegraft for regeneration

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Fig 1 Preoperative Evaluation of 46

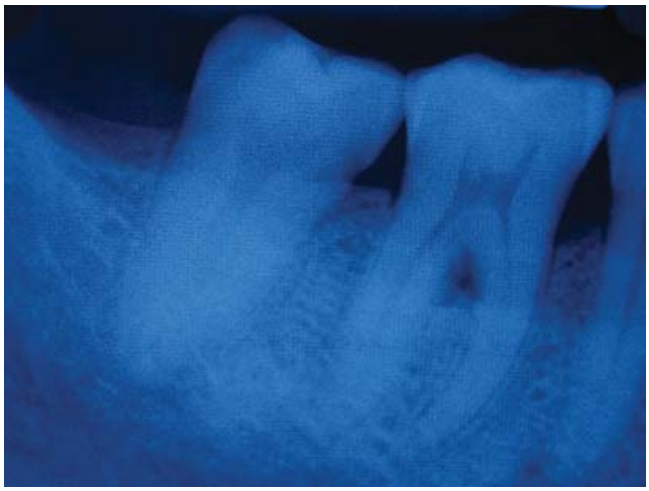

Fig 2 Preoperative IOPA of 46

Fig 3 Incision with 46 region

of furcation defects in lower molar region the results of which are monitored by radiographic evaluation.

Case report:

A 52 year old male in good general health was referred

Fig 4 Furcation Defect with 46 exposed

to the department of Periodontics M.G.M. Dental College and Hospital Navi Mumbai for Periodontal treatment. After clinical and radiographic evaluation a case of generalized chronic periodontitis was diagnosed with bilateral class II furcation defects in lower 46 and 36 molars (fig 1 & fig12). The lamina dura was thickened.(fig 1 and fig 2 and fig 13). Both the molars showed Grade one mobility with and significant bone loss in the furcation area. The molars were checked for facets and a record of the occlusion and contact points was made. No facets were observed but heavy contacts were seen on the teeth. The teeth were vital. Phase I therapy was completed with equilibration of the occlusion which was given immense importance

The phase II or the surgical phase was initiated after a period of one month The patient was administered of local anesthesia bilateral block for lower molars, Intrasulcular and releasing incisions were given (fig 3) and a mucoperiosteal flap was elevated (fig 4). After complete removal of granulation tissue root surface are thoroughly scaled and planned using gracey curettes followed by micro ultrasonic tips. After homeostasis,

Fig 5 Bone Graft Placed with 46

the bone defect was recorded by Nabers probe. The defect was eliminated by grafting the furcation region with bonegraft (betaTCP + HA)(fig 5). Bioabsorbable GTR membrane (Periocol) was subsequently placed (fig 6) .The flap was sutured by silk #4/0 (fig 7) and covered by a surgical dressing (fig8) for 10 days followed by surture removal (fig 10 and fig 15). Elaborate post operative instructions were given and the patient put on antimicrobials and chlohexidine mouthrinse. Patient was evaluated radiographically and clinically after a week and subsequently every month (fig 11 and fig 14). Excellent bone fill was reported immediately postoperatively after one week but reduced slightly after one month. This remained unchanged at the six month follow up.

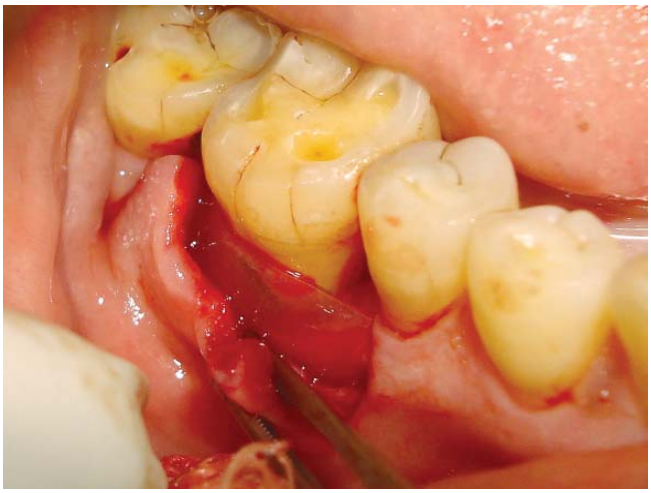

Fig 6 GTR Membrane Placed with 46

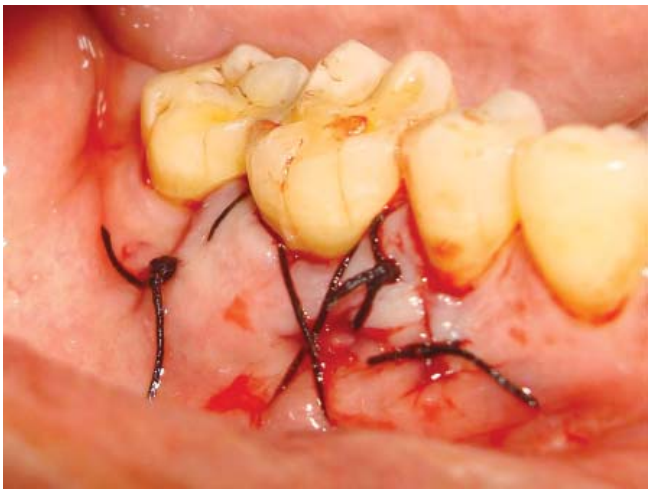

Fig 7 Sutures Placed with 46

Fig 8 Dressing Given with 46

Discussion:

The most favourable treatment therapy for advanced grade II furcation is GTR + bone graft in mandibular molars and interproximal defects. Clinical observations of GTR have shown more favor able outcomes in mandibular grade II furcations and facial grade II maxillary defects compared to limited success in other grade II or grade III defects[12]. Clinical studies have shown that GTR can improve the response of class II furcation defects to therapy by means of pocket reduction, gain in clinical attachment levels and bone defect fill. The improvement in these clinical parameters plus the potential of creating new attachment leads to the consideration of GTR

Fig 9 1 Week Recall

Fig 10 1 Week post operative IOPA

Fig 11 One Month post operative Recall IOPA

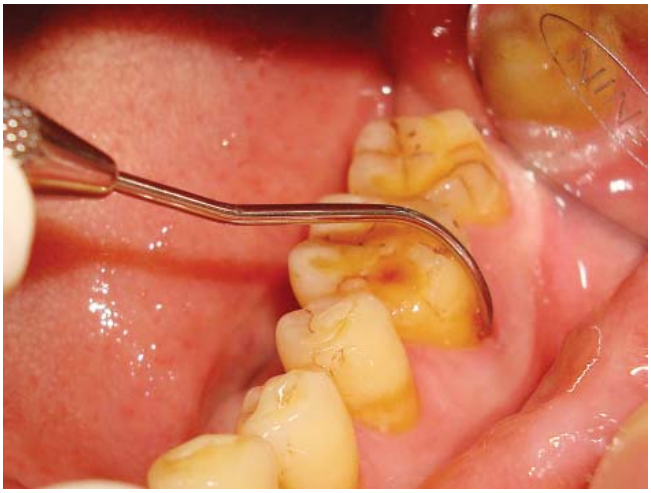

Fig 12 Preoperative Defect with 36

Fig 13 Preoperative IOPA with 36

as the treatment of choice in this type of periodontal defect. GTR has offered better results than open-flap debridement or bone replacement grafts alone in mandibular grade II furcation[14].

The regeneration of grade II furcation lesion, although possible, is not considered a totally predictable

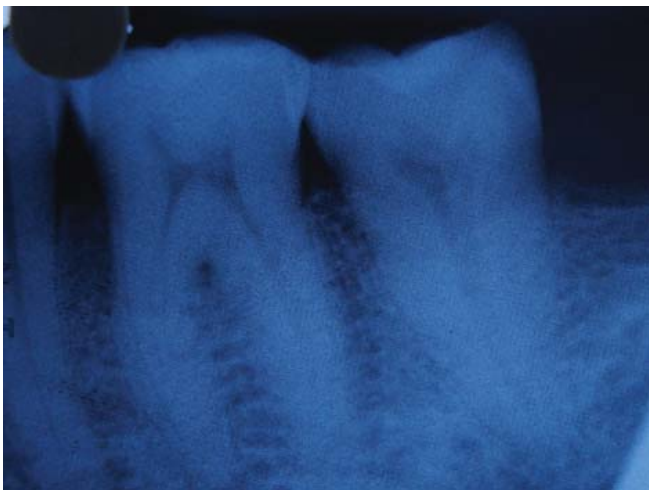

Fig 14 One Month post operative Recall IOPA with 36

Fig 15 Soft Tissue Healing with 36

procedure, especially in terms of complete bone fill[15]. Despite achieving significant positive gains in new attachment using GTR, consistently successful treatment of furcation defects with membrane techniques remains a challenge. Furcation morphology may restrict access for adequate debridement and root instrumentation and may have a reduced source of available cells and blood supply from the periodontal ligament and bone defect. One important factor for successful regeneration at furcation and non-furcation sites is the amount of periodontium that remains apical and lateral to the defect. Coronal migration of cells originating from the periodontal ligament and bone marrow spaces is particularly critical to the healing outcome following periodontal regenerative procedures in furcation defects. These and other factors may account for variability in the response to regenerative therapy in grade II furcation.

To increase the predictability and clinical success of regenerative therapy, factors related to the patient, furcation, surgical treatment, and postoperative period should be considered. Slight bone loss was observed in the furcation during the healing. It could

be contemplated that better plaque control or a more elaborate occlusal therapy may have prevented the same.

Conclusion:

It should be noted that there are many factors acting collectively that influence the final outcome of GTR in grade II furcations. The clinician should consider aborting surgery if a multitude of minor negative factors are present in the same patient. Alternatively, if GTR is performed, a less favorable prognosis is to be anticipated. Wherever possible, adverse factors should be modified to improve the prognosis. For example, tobacco cessation and space-maintaining devices should be used in poorly space-maintaining defects. Implementation of these changes may result in better predictability and an improved regenerative response.

Further standardizing the numerous factors that influence the regenerative status would lead to a better prognosis and a better final therapeutic result.

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