



## REGENERATIVE/RESECTIVE APPROACH FOR GRADE III FURCATION INVOLVEMENT- A CASE REPORT WITH QUESTIONABLE CLINICAL SCENARIO

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**ABSTRACT** **Introduction:** Teeth with furcation involvement can be maintained in a state of function for a longer period of time if appropriately treated and if the patient is motivated adequately. This report highlights the effect of regenerative and resective therapy in the management of grade III furcation involvement.

**Observation:** A 48 years old male patient was evaluated for furcation involvement with respect to the root canal treated lower right first molar tooth. Grade III furcation involvement was noted for which regenerative therapy was attempted with platelet rich fibrin (PRF) and bone grafts. After 2 years of follow up, the furcation involvement still persisted and patient had a complaint of food lodgement. Hence, resective osseous surgery (tunnel preparation) was done to make the furcation ease for maintaining oral hygiene.

**Commentary:** In cases of periodontal loss, periodontal regenerative therapy must be the first treatment of choice. However, regeneration of grade III furcation involvement is more challenging and very few reports are available in the literature.

**Conclusion:** The selection of cases for regenerative or resective therapy depends on the clinicians' knowledge and practice. The ultimate goal of periodontal therapy is to provide a dentition that will function in health and comfort for life.

**KEYWORDS :** furcation involvement; regeneration; periodontal surgery

### INTRODUCTION

The ultimate goal of periodontal therapy is to provide a dentition that will function in health and comfort for life. Management of Furcation Involvement (FI) is a difficult task for the clinician. The success rate of regeneration is inversely proportional to the grade (Glickman's grading system) of FI. Grade III FI poses a great challenge.<sup>1</sup> Only few cases with quite favorable success rates have been reported till date. Hence, it turns out to be a big question for the clinician whether to go for regenerative or resective approach. This article focuses on the management of grade III FI.

### Case Report

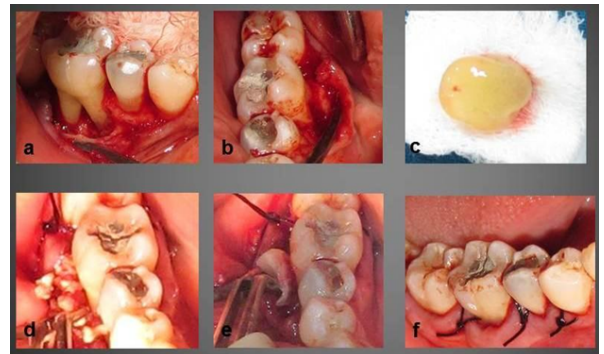
#### History

A 48 years old male patient was referred to the outpatient Department of Periodontology for the evaluation of furcation defect with respect to the right lower 1<sup>st</sup> molar. Patient had a history of pain in relation to the same tooth and visited the same institution, for which Root Canal Treatment (RCT) was done on lower right first molar. Patient had no medical/habit history.

#### Periodontal Examination & Procedure

On periodontal examination, probing depth of 10 mm with grade III furcation involvement was noted (Table 1). Periapical radiograph was taken with respect to the concerned tooth as given in table 1. Consent was taken from the patient prior to any therapy. Non-surgical periodontal therapy was done comprising of scaling and root planing and oral hygiene instructions. The surgical procedure consisted of flap reflection both on buccal and lingual aspects to visualize 1-2mm of healthy bone surrounding the defect and degranulation. PRF (Platelet Rich Fibrin) was obtained using the protocol given by Choukroun et al.<sup>2</sup> Intravenous blood from antecubital vein was collected in two 10ml sterile tubes and centrifuged at 3000 rpm for 10 minutes. Later, PRF from first tube was made into a membrane by squeezing it with cotton gauze and PRF from second tube was mixed with decalcified freeze dried bone allograft (DFDBA) and packed into the defect. Flap was repositioned and sutured with 3-0 silk sutures (Figure 1). Periodontal

dressing was placed.



**Figure 1: Regenerative Approach On Lower Right First Molar.**

a. Defect on buccal aspect; b. Defect on lingual aspect; c. PRF obtained; d. PRF and bone graft packed in the defect site; e. PRF membrane; f. Suturing



**Figure 2: Tunneling Procedure On Lower Right First Molar.**

a. Probing pocket depth; b. Furcation defect; c. Flap reflection on the buccal aspect; d. Gingivectomy on the lingual aspect; e. Furcation tunnel; f. Tunneling procedure; g. Tunneling procedure; h. Tunneling procedure



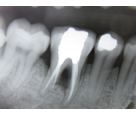
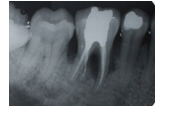
- Suturing;  
g. Application of interdental aid in the furcation tunnel; h. One year follow up

### Post-operative Care & Follow Up

Antibiotics and analgesics were prescribed. Oral hygiene in the surgical site was maintained with chlorhexidine mouthwash. Sutures and pack were removed 10 days postoperatively. Periodontal examination and maintenance was done at 1 and 3 months post operatively, every 6 months once thereafter.

At 2 years follow up, the periodontal examination showed recession in the furcation entrance, and persistent grade III furcation involvement. In addition, patient had a complaint of food lodgment in the furcation site. Radiographic examination revealed bone formation (radiopacity) at the mesial and distal aspects of lower right first molar, but at the furcation area there was still radiolucency depicting bone loss (Table 1).

**Table 1: Comparison Of Clinical And Radiographic Parameters Between Baseline And 2 Years After Regenerative Therapy**

Parameters	At baseline	2 years after regenerative therapy
Probing pocket depth	10mm	6mm
Clinical attachment level	12mm	10mm
Furcation involvement	Grade III	Grade III
Mobility	Grade I	No mobility
Clinical picture		
Radiographic view		

A tunnel preparation was planned to make the region accessible for oral hygiene maintenance. The procedure (Figure 2) consisted of apically positioned flap on the buccal aspect and gingivectomy on the lingual aspect. On the buccal aspect internal bevel gingivectomy of 1.5mm was performed. Two vertical incisions on the mesial and distal line angles of the adjacent teeth were given and full thickness flap was reflected till the mucogingival junction. Degranulation was done. The flap was apically positioned and sutured with 3-0 silk sutures. Periodontal pack was placed. Sutures and pack removal were done at 1 week post operatively. Patient was advised to use an interdental brush in the furcation area and recalled every 2 weeks once for one month and once in every 6 months thereafter.

### DISCUSSION

The clinician's decision in the management of a periodontal defect is significant, and it depends on various factors such as anatomic considerations, patient morbidity, etc. Goldman and Cohen stated that furcation defect is a no wall defect with poor prognosis due to lack of osteogenic cell proliferation, lack of sufficient bony walls providing the cells of the periodontal ligament which contribute most importantly to the regenerative process.<sup>3</sup> In the present case report, regenerative approach in grade III FI did not result in satisfactory outcomes which had led to impaired oral hygiene maintenance care. The vertical bone loss of more than 3mm in the furcation area limits the success rate of regenerative therapy<sup>4</sup> and it was true in this case. A recent consensus report from AAP (American Academy of Periodontology) regeneration workshop on furcation defects stated that evidence of histologic periodontal regeneration in mandibular Class III defects is limited to one case report.<sup>5</sup>

Apart from regenerative approach, various resective techniques are documented in the literature. This includes bicuspidization, hemisection and root resection.<sup>6-8</sup> Bicuspidization is the separation of roots of mandibular molars along with its crown portion, after which both the segments are treated prosthetically and retained individually. This technique was not attempted in the present report as it results in deliberate removal of the tooth structure for the prosthetic management. In addition, it would further increase the expenditure for

the patient. Hemisection/Root resection is indicated in cases of severe bone loss around one root of a tooth. Hence, it was not considered in the present treatment plan.

The tunneling procedure involves deliberate removal of bone to make it accessible for oral hygiene maintenance. However, in the present case, through and through FI (Grade III) was present and minimal bone was removed during the surgical procedure. The primary aim of the intervention was to make the furcation defect accessible to the patient for oral hygiene maintenance. Adequate oral hygiene care during the periodontal maintenance therapy might indicate that the tunneling procedure is a cost-effective alternative way for treating grade III FI. This procedure has few limitations such as root sensitivity and caries. However, its prevalence is limited to few cases.<sup>9,10</sup> Long term follow up of a grade III furcation defect with a regenerative attempt followed by resective therapy makes this report unique in the literature.

### CONCLUSION

The selection of cases for regenerative or resective therapy depends on the clinicians' knowledge and practice. Tunneling procedure showed a good periodontal maintenance in grade III FI cases. Only patients who are motivated for oral hygiene maintenance should be selected for tunneling procedure. However, further well conducted trials are needed to confirm the results obtained in the present report.

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