

# CASE REPORT

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## FURCAL OBLITERATION FOR ADVANCED FURCATION INVASIONS USING GLASS – IONOMER RESTORATIVE MATERIAL.

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**ABSTRACT:** Periodontal disease involving the furcation of multi-rooted tooth often complicates the treatment and prognosis of the affected tooth. Multiple modalities have been utilized over the years with unpredictable success. Class I and Class II Furcation invasions are amenable for regeneration; however, advanced invasions do not respond well to surgical techniques and are best treated by non-surgical mode or by extractions. Furcal obliteration by biocompatible material like Glass-Ionomer can seal the furcal niche and offer functional and maintainable state of teeth involved. The present case utilizes furcal obliteration method using Glass ionomer cement for grade III Furcal invasions in maxillary molar teeth. One year post operative follow up showed satisfactory results. This may prove to be an economical and less invasive option for advanced furcation involvements.

**KEYWORDS:** Furcation invasions, furcation therapy, furcal obliteration, glass ionomer cement.

**INTRODUCTION:** Furcation involvement connotes the attachment loss in the bifurcation and trifurcation of the multirouted occurring due to inflammatory periodontal disease. The teeth with furcation involvement undergo extensive and rapid attachment loss and are lost with greater frequency than the single rooted teeth [1]. The therapy of furcation involvement depends primarily on the extent of disease, on the strategic importance of affected tooth, degree of patient co-operation and compliance [2]. Patients with advanced furcation involvements experience concerns like recurrent abscess formation, gingival bleeding and inability to maintain oral hygiene in the affected areas, thereby further encourage periodontal breakdown and perish the hope of survival of tooth. The management of advanced furcation invasions has historically been less than predictable [3].

Ideally, the most favourable outcome of any therapy would be the regeneration of the lost attachment apparatus. Class I and Class II furcation invasions are amenable for regeneration. However, predictable regeneration cannot be achieved in advanced furcation invasions due to the complexity of furcation morphology [4]. Multiple modalities have been utilized over the years ranging from non-surgical therapy [3], surgical therapy utilizing regenerative methods using grafts and membranes [5,6,7], root resection [8], tunnel procedure [9] with unpredictable success. The patients are most often offered options which are unpredictable, more invasive and expensive.

Several studies in the past have reported the use of materials like amalgam, polymeric reinforced zinc oxide eugenol, glass ionomer and resin ionomer restorative materials to treat advanced furcation invasions [10, 11, and 12]. Some studies in the past have also suggested the use of Glass ionomers in specific periodontal conditions like advanced furcation invasions. A study by Breault et al utilized resin ionomers to treat maxillary II furcations and to repair areas of root resorption [13].

Biocompatible materials like Glass ionomer cement could serve as a treatment option to seal the furcal niche thereby eliminating a potential plaque retentive area, facilitating easy maintenance

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by the patient and offering a functional and maintainable state of teeth involved. The biocompatibility of glass ionomer has been proven through radiographic and histological evidence [14, 15, 16]. Van Swol et al on comparing amalgam, zinc oxy phosphate cement and glass ionomer in the treatment of surgically created furcation defects in non-human primates found greatest biocompatibility with glass ionomer on histological evaluation as compared to others. Radiographic evaluations showed that among all the materials, glass ionomer showed only slight radiolucent changes which were less likely to progress with time [10].

Drago suggested histological evidence of epithelial and connective tissue adherence to resin ionomer restorative materials utilized subgingivally. Better tolerance by the gingival tissues and biocompatibility were also reported by the author [15]. Lagou utilized a glass ionomer restorative material to fill furcation defects and found the biomaterial to be biocompatible [17]. Anderegg and Metzler found that placing resin ionomer into furcation defects improved the prognosis of affected tooth facilitating simplified future maintenance [12].

In the present case report, there was no attempt to regenerate any tissue but to seal the furcal entrance from bacterial and food debris retention. This study utilized a glass ionomer restorative material (GG Fuji II, GC Corporation, Tokyo, Japan) which was packed in to the furcal invasions of maxillary left & right first molar teeth. The post operative findings at various intervals showed satisfactory results improving the prognosis of teeth, enabling easier home care due to limited surface area of the furcation left to be cleaned.

**CASE REPORT:** A 62, year old, non-smoker, systemically healthy patient presented with Class III furcation defects in relation to maxillary right and left first molar teeth.(Fig.1) The chief concerns were abscess formation ,food lodgment, and inability to maintain oral hygiene with these areas. Intraoral examination revealed that both teeth exhibited probing depths of (>6 mm), Naber's probe encountered a horizontal probing depth of 8mm (Fig.2), grade I mobility and gingival inflammation and bleeding. There was persistent abscess formation in relation to maxillary left first molar. Both the teeth were vital and devoid of periapical radiographic changes. Extraoral examination revealed no abnormality.

Thorough scaling and root planing was achieved and patient was placed on maintenance duration for 6 weeks. The areas were re-assessed for inflammation and tooth mobility at the maintenance visit. Re-evaluation revealed persistent clinical findings and patient found home care difficult for the areas with furcation invasions.

The patient gave consent to the treatment protocol utilizing Glass ionomer cement to be sealed in to the defect following a flap reflection. Under local anaesthesia using 2% lidocaine with a concentration of 1:200000 epinephrine and all aseptic precautions, continuous suction was applied to keep the surgical site clean. Sulcular incisions were made and full thickness flaps were elevated. (Fig.3, 4) The furcation defects were meticulously scaled and root planed with hand instruments. Degranulation of the surgical sites revealed a grade III furcation involvement with maxillary left and right molar teeth (Fig. 5, 6).

Glass ionomer restorative material (GG Fuji II, GC Corporation) was packed in the furcal niche using plastic instruments from all the aspects of furcation after obtaining thorough isolation. (Fig.7, 8) The excess material was removed and smoothed with fine grit points (Fig.9), following which the gingival flaps were sutured in their original position by interrupted method using 4 0 silk

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sutures(Fig.10) and a periodontal dressing was applied over the site (Fig. 11). Patient received post operative instructions and prescriptions regarding the use of chlorhexidine gluconate 0.2% and analgesics. The sutures were removed after a week and the patient was reassessed on a weekly basis for 1st month and later at 3months, 6 months and 1 year.

Clinical re-evaluation at the recall visits revealed a residual probing depth of 3 mm, healthy gingival tissues (Fig.12) and absence of gingival bleeding. There was no recurrence of abscess formation in relation to maxillary left first molar tooth.

Radiographically, there was no evidence of any peri apical changes in relation to both the furcal obliterated teeth at the post operative visits at 1, 3, 6 months and 1 year. (Fig.13, 14) Both the teeth were asymptomatic and functional. Patient acceptance to the treatment was better.

**DISCUSSION:** An open furcation is subjected to plaque accumulation and serves as an ideal local environment for multiplication of microorganisms. Patients with advanced invasions often fail to establish adequate plaque control even after meticulous professional oral prophylaxis. Advanced furcal invasions further complicates the treatment and prognosis of affected tooth. The response to various surgical modalities is unfavourable. The long term retention of teeth with advanced furcal invasions has always been a challenge [1].

The current norm in Periodontics is regeneration. However, expecting regeneration in advanced invasions still remains an elusive goal. The use of biocompatible biomaterials like glass ionomer restorative materials to treat advanced furcation invasions have been reported in the past [10, 13]. Various studies have suggested glass ionomer restorative material to be an ideal subgingival restorative material because of adhesiveness, better biocompatibility, fluoride release, absence of microleakage and near insolubility in oral fluids [11, 13, 16]. Glass ionomer offers conducive properties like ease of placement, does not require complete coverage by gingival flap, evidence of formation of long junctional epithelial attachment [14] and lower cost.

There was no attempt to regenerate the attachment apparatus in this present case. However, by obliterating the advanced defects, retention of the teeth was achieved with satisfactory results.

**CONCLUSION:** Obliteration of furcal defects can be done in cases that are deemed to have poor to hopeless prognosis or where the clinician finds them suitable.

Within the limitations of the current case report, it can be concluded that furcal obliteration of the advanced defects using Glassionomer restorative material can be considered as a cost effective treatment option.

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Fig1  
Pre-operative view - Horizontal probing depth as measured by Nabers probe with maxillary left and right first molar.

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Fig.3 Sulcular incisions



Fig.4 Full thickness flap elevated



Fig.5  
Elevation Class III in relation to  
maxillary left first molar



Fig.6  
Debridement of the furcation defect



Fig.7  
Defect with 26 restored with Glass ionomer restorative material



Fig.8



Fig.9 Excess material trimmed and  
polished with diamond grits with tooth 16



Fig.10 Interrupted silk 4 Sutures placed

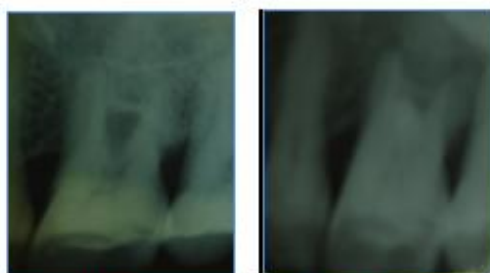


Fig.11 Periodontal dressing placed

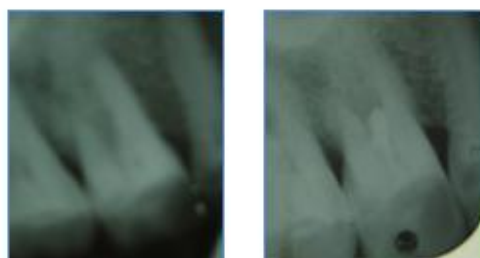
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At 7<sup>th</sup> day At 6 months  
Fig.12 Post operative view



At baseline At 6 months  
Fig.13 Pre & Postoperative radiograph with tooth 26



At baseline At 6 months  
Pre & Postoperative radiograph with tooth 16

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