

# Conservative management of tooth wear: A case series

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## Abstract

Tooth wears in general term means loss of tooth structure. Tooth loss increases with age and thus causes difficulty in chewing and increased sensitivity. Wear facets on the occlusal surface are subjected to high occlusal stresses leading to repeated dislodgment of the restoration. This article presents the use of bonded amalgam as a restorative material for restoring localized occlusal wear facets.

**Keywords:** Attrition; bonded amalgam; tooth wear; wear facets

## INTRODUCTION

Tooth surface loss or “tooth wear” refers to the pathological loss of tooth tissue by a disease process other than dental caries. According to Sturdevant, attrition is defined as the mechanical wear of incisal and occlusal surfaces as a result of functional or parafunctional movements of the mandible (tooth-to-tooth contact).<sup>[1]</sup> The common causes for attrition are parafunctional habits, bruxism, clenching, developmental defects, coarse diet, and natural teeth opposing porcelain.<sup>[2]</sup> The clinical appearance of attrition can vary from flattening of the cusp to involvement of the pulp.

Treatment for localized tooth wear without loss of occlusal vertical dimension, but with limited space available, would be direct or indirect restoration.<sup>[3]</sup> The restorative material that could be used for direct restoration would be glass ionomer cement, composites, or amalgam. This case series

presents the use of bonded amalgam as a restorative material in restoring wear facets on teeth caused due to localized attrition.

## CASE REPORTS

### Case I

A 70-year-old male patient reported to the department of conservative dentistry and endodontics with a complaint of sensitivity in the lower right and left back teeth on consuming hot and cold beverages. On intraoral examination, occlusal wear facets were present on teeth 36 and 46 [Figure 1a]. The pulp sensibility test was done using a cold test (Endo-Frost, Coltene, Germany) and electronic pulp tester (Parkell Electronics Division, New York, USA). Both the teeth responded within the normal limits. A treatment plan of bonded amalgam restoration was formulated for restoring occlusal wear facets on 36 and 46. On the first appointment, Informed consent was taken and 36 was treated by making three retentive grooves on the occlusal wear facet using a straight fissure diamond point (Horico, Berlin, Germany). The cavity was then dried using three-way syringes and isolated with cotton rolls. Luting glass ionomer cement (GC Corporation, Tokyo, Japan) was then mixed according to the manufacturer’s instructions

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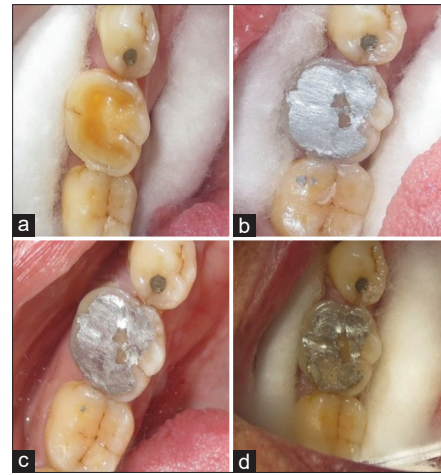
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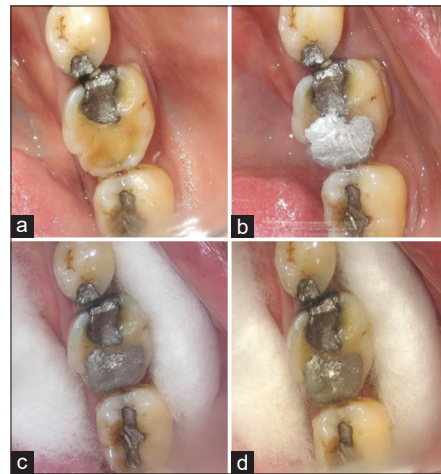
and applied using an applicator tip on the wear facets. Silver amalgam (Dentsply, Gurgaon, India) was then condensed into the wear facet before the glass ionomer cement was set. The restoration was then burnished using a ball burnisher and checked for the high points using articulating paper. The patient was asked to bite in centric and eccentric border movements and the bite was evaluated and high points were removed. The patient was then recalled after 24 h for final polishing of the restoration, which was done using amalgam polishing kit (Shofu Dental Corporation, NJ, USA) [Figure 1a and b]. The patient was then recalled after 48 h for the treatment of wear facet on 46 which was treated in the similar manner as above [Figure 2a and b]. The patient then reported after 6 months, the restoration was then evaluated margins of the restoration were intact [Figures 1c and 2c]. On radiographic evaluation, no secondary caries were seen, and no periapical pathology was noted. On the pulp sensibility test, the tooth responded in normal limits. The patient was then recalled at 18 months, and restoration was evaluated again and found to be intact with no periapical pathology and the tooth responded within normal limits to pulp sensibility [Figures 1d and 2d].

## Case 2

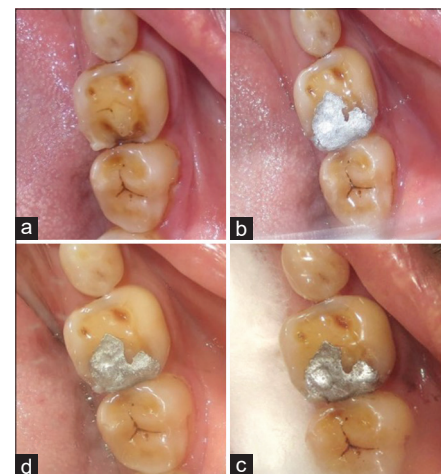
A 62-year-old male patient reported to the department of conservative dentistry and endodontics with a complaint of sensitivity in the lower right back tooth on consuming hot and cold beverages. On intraoral examination, an occlusal wear facet with a fracture of the marginal ridge was noted on tooth 46 [Figure 3a]. A pulp sensibility test was done on 46 using electronic pulp tester which showed a positive response confirming tooth to be vital. A treatment plan of bonded amalgam restoration was formulated for 46. On the appointment, Informed consent was taken and 46 was treated by making three retentive grooves on the wear facet using a straight fissure diamond point. The cavity was then dried using three-way syringes and isolated with cotton rolls. Universal Tofflemire matrix system (Hu-Friedy, Chicago, USA) was placed. Luting glass ionomer cement was then mixed and applied using an applicator tip, and amalgam was then condensed into the cavity before the luting glass ionomer was set as done for the case 1 [Figure 3b]. The restoration was then burnished using a ball burnisher and checked for the high points using articulating paper. The patient was asked to bite in centric and eccentric movements and the bite was evaluated and high points were removed. The patient was then recalled after 24 h for final polishing of the restoration was done using amalgam polishing kit. The patient then reported after 6 months, the restoration was then evaluated, and the margins of the restoration were intact [Figure 3c]. On radiograph evaluation, no secondary caries were seen and no periapical pathology was noted on 46. On the pulp sensibility test, the tooth



**Figure 1:** (a) Preoperative view of wear facet present on the complete occlusal surface, (b) immediate postoperative, (c) 6-month follow-up, (d) 18-month follow-up



**Figure 2:** (a) Preoperative view of wear facet present on the distal half of the occlusal surface, (b) immediate postoperative, (c) 6-month follow-up, (d) 18-month follow-up



**Figure 3:** (a) Preoperative view of wear facet present on occluso-proximal surface, (b) immediate postoperative, (c) 6-month follow-up, (d) 18-month follow-up

responded within normal limits using an electronic pulp tester. The patient was then recalled at 18 months and restoration was evaluated again and found to be intact with no periapical pathology and the tooth responded within normal limits [Figure 3d].

## DISCUSSION

Tooth wear in adults generally rises from approximately 3% in young people in their early age of 20s and to 17% in those over the age of 70.<sup>[4]</sup> Attrition occurs almost entirely on occlusal and incisal surfaces. However, it may also affect the buccal and palatal sides of the maxillary and mandibular anterior teeth in deep vertical overlap occlusal relationships.<sup>[5]</sup> Thus, leading to overall bite collapse and making it difficult for any restoration.

The restorative material that has been used for the restoration of wear facets include glass ionomer cement, composite, and amalgam. Glass ionomer cement has the advantages of chemical bonding to the tooth structure and fluoride release however, it has certain disadvantages like low abrasion resistance and high solubility when compared to resin composite and amalgam. Composite resins possess poor resistance against contact wear and may also be unretentive. Their value in restoring extensive tooth wear is therefore limited, particularly on occluding surfaces.<sup>[6]</sup>

In this case series, retentive grooves were incorporated to further increase the retention of the restoration. It has been shown that additional retention of the restorative material may be obtained by arbitrarily extending the preparation onto the facial and lingual surfaces.<sup>[7]</sup> In the present case series bonded amalgam was chosen as the restoration of choice because it offer advantages like good retention, less micro-leakage, decrease post operative sensitivity and reduction in cusp fracture.<sup>[8]</sup> It has been shown that the mechanochemical bonding and the sustained fluoride release due to glass ionomer used in bonded amalgam restorations are expected to be beneficial to increase the longevity by decreasing marginal leakage, fracture of the tooth, and postoperative sensitivity.<sup>[9]</sup> Amalgam over the years has shown to have a good wear resistance compared to that of composite.<sup>[10]</sup> Hence, bonded amalgam was chosen as a material of choice. However, studies have shown favorable results using composite as a restorative material on posterior teeth.<sup>[11]</sup> A previous study compared the wear analysis of amalgam, indirect composite, and direct composite, it was reported that indirect composite resin and amalgam had similar wear resistance and

superior to all the other direct composite materials used in the study.<sup>[12]</sup> Additional studies are required to compare the long-term prognosis of both bonded amalgam and composite restorations.

## CONCLUSION

Restoration of occlusal wear facet can be difficult owing to its repeated dislodgment. Bonded amalgam can be a solution for such cases as it provides a good seal and good fracture resistance under heavy occlusal load.

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## Conflicts of interest

There are no conflicts of interest.

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