

# Managing a Grossly Mutilated Mandibular Molar Using a Customized Orthodontic Molar Band under Magnification - A Case Report

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**Abstract:** A post endodontic restoration with bacteria-tight seal is essential for a successful endodontic treatment. Post endodontic restoration of a grossly decayed tooth is a challenging clinical situation. Post and core followed by crown placement is the traditionally used method for rehabilitation of a severely mutilated tooth. In several cases due to the unavailability of tooth structure for post space preparation and crown placement the only available treatment option becomes extraction of the tooth. This case report deals with such a clinical scenario where crown placement was not feasible. Since the patient was only 16-years old and had undergone extraction of several teeth on the opposite quadrant due to ameloblastoma, preserving the remaining teeth was of high priority. The alternative treatment option was a properly contoured fluid-tight post endodontic restoration using an adhesive restorative material. Composite is an adhesive restorative material that has shown to have high fracture resistance. Due to the unavailability of crown structure for the placement of matrix band, we have used a modified orthodontic molar band for the reconstruction of the tooth and reported a 6-month follow-up.

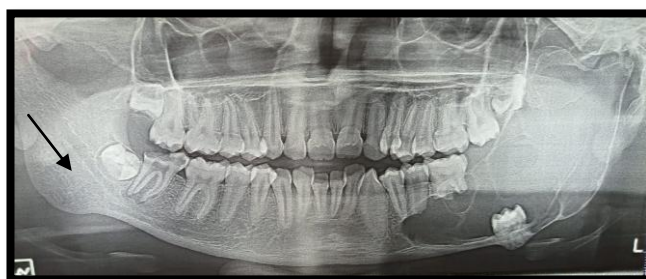
**Keywords:** Composite resin, Grossly-mutilated tooth, Rehabilitation, Modified Orthodontic-molar band

## 1.Introduction

A high-quality root canal filling and a bacteria-tight post-endodontic restoration are required for apical lesion healing<sup>[1]</sup>. A good post-endodontic restoration has a bigger impact on the long-term outcome than a good root canal filling<sup>[2]</sup>. Over a 2–10 year period, the survival rates of endodontically treated teeth range from 86 percent to 93 percent<sup>[3]</sup>. In general, teeth repaired with posts had more tooth structure damaged prior to the post-endodontic restoration than other teeth, which could affect the teeth's fracture resistance. Adhesive composite MOD restorations can achieve up to 87 percent of a root canal treated tooth's initial rigidity<sup>[4]</sup>. Composite is an adhesive restoration that, when properly isolated, has shown to be more resistant to the fracture of residual tooth structure than non-adhesive restorative materials<sup>[5]</sup>. Hence the aim of this Case-Report is to emphasize on the ability of direct composite restoration, when used as a post-endodontic restoration had long term fracture resistance.

## 2.Case Report

A 16-year-old female patient reported to Sri Ramakrishna Dental College and Hospital with a chief complaint of pain and swelling in the left lower back tooth region for the past 6 days and food lodgment in the left lower back tooth region. On clinical examination, Patient had a diffuse extraoral swelling in the left lower third of her face. Intraoral examination revealed a swelling involving the buccal mucosa and vestibule in relation to 35, 36 and 37. After clinical, histopathological and radiographic examination (**Figure 1**) it was diagnosed as ameloblastoma and the patient was referred to the Department of Oral and maxillofacial surgery for further management. The lesion was managed surgically by extraction of teeth in the affected site and marsupialization followed by providing the patient with an obturator for the surgical site. After which the patient was recalled for follow-up and review.



**Figure 1:** Pre-op OPG showing ameloblastoma of left side and grossly destructed 47

During the review visit, patient developed pain the right lower back tooth region where the patient had complained of food lodgment initially and the patient was referred to the Department of Conservative Dentistry and

Endodontics for the management of 47. The young patient was apprehensive and had discomfort due to the presence of obturator and draining of discharge from the surgical site. Patient was counselled and reassured of the treatment

outcome. After gaining patient confidence, intraoral examination was done which showed a grossly mutilated tooth with swelling and sinus opening in relation to 46 (Figure 2).



**Figure 2:** Clinical examination under magnification showing grossly destroyed 47

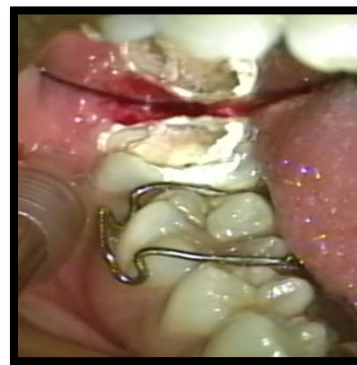
OPG showed radiolucency involving pulp with periapical radiolucency suggestive of a periapical pathosis. Since the tooth was grossly destroyed, placement of crown was not possible, considering the thin enamel wall, removal of which could lead to fractured of crown en-mass. But extraction of the tooth was avoided considering the age of the patient and the number of teeth that was previously extracted during the management of ameloblastoma.

Hence, Root canal therapy (RCT) was initiated with no further delay. Rubber dam placement was not possible in this case because of the thin remaining walls. A 10 # K file was used to establish patency of the canals, initial apical file of #15 k file was used for working length determination and the canals were enlarged upto #F1 protaper gold and Calcium hydroxide [Ca (OH)<sub>2</sub>] intracanal medicament was placed for a duration of 12 days with a change of dressing after 6 days from initial placement. Medication was prescribed and patient was recalled for review. On the 13<sup>th</sup> day from initiation of RCT, patient was asymptomatic and the intraoral examination showed complete closure of the sinus opening. Master cone was verified and the tooth was obturated using 25# 6% gutta-percha points, temporary restoration was done using IRM (Figure 3). Since there was gingival overgrowth distal to 47, patient was recalled after 5 days for gingivectomy.



**Figure 3:** RVG showing Obturation 47 with temporary coronal seal

On the recall visit, gingivectomy was done and a temporary restoration was given using zinc oxide eugenol (Figure 4).



**Figure 4:** Distal margin of tooth exposed after gingivectomy

During the next visit, there was healing of gingiva and clear visibility of tooth margins. Post and Core was not giving due to unfavorable occlusal scheme of the patient hence reconstruction of tooth was planned using Posterior Bulk-Fill composite resin. Stabilization of conventional matrix band and retainer was difficult in this case because of the presence of obturator and severe gag reflex and sectional matrix band placement could not be done due to unavailability of tooth structure for ring placement. Hence, we designed a customized matrix band for this tooth without the use of retainer. Molar band was opted because of the rigidity which would aid in stabilization of the band during placement of composite (Figure 5).





**Figure 5:** Modified orthodontic Molar band- stabilized using gingidam

The size of the molar band was selected based on the mesiodistal and Bucco-lingual width of the tooth. The buccal tube and hook portion of the band was cut out and the sharp margins were rounded before adaptation to the tooth. After placement, the band was mildly recontoured and good adaptation was achieved without the use of a retainer. The margins of the tooth were beveled to achieve greater surface area for bonding. Bulk fill composite was used for reconstruction of tooth; under a magnification of 3X under Dental operating microscope (DOM) to achieve intricate marginal seal (**Figure 6**). After final curing, the molar band was removed with ease and the finishing and polishing of restoration was completed and occlusion was established.



**Figure 6:** Reconstruction of 47 using bulk fill composite resin

Patient was recalled and reviewed after 6 months; clinical examination revealed asymptomatic tooth with no evidence of fracture. Radiographic examination showed intact margins of the composite restoration (**Figure 7**).



**Figure 7:** Post-op RVG showing 6-month follow-up

### 3. Discussion

Previously, it was believed that endodontic treatment makes the tooth more brittle and susceptible to failure.<sup>[6]</sup> In a matched-pair study of vital and endodontically treated human teeth, Papa et al, however, reported no significant differences in moisture content. In a study comparing full coverage crowns with direct composite restoration, it was seen that crown coverage did not enhance the clinical performance of endodontically treated and restored teeth when compared with placement of a direct composite restoration over a 3-year time span.<sup>[7]</sup> A Cochrane systematic review by Sequeira-Byron et al. (2015) compared single crowns with direct fillings for the restoration of root filled teeth, concluding that there is insufficient evidence to assess the effects of crowns or direct fillings on root filled teeth.<sup>[8]</sup> Hence, in this case, crown placement was delayed considering the age of the patient.

Fiber post-insertion did not increase fracture resistance in any of the wall thickness groups statistically. Posts do not appear to strengthen endodontically treated teeth, according to the literature<sup>[9][10][11]</sup>. They are, however, still considered necessary for the restoration's retention, particularly in the case of severely damaged teeth<sup>[12,13]</sup>. Other studies, on the other hand, have found that endodontically treated teeth without fibre posts have similar fracture resistance to those with a post. This could be due to the fact that a larger portion of the tooth structure is removed during post placement<sup>[14-16]</sup>. The different conditions of these studies and the method of fracture can be attributed to the reason for controversy among the above findings, in addition to the type of restorative materials<sup>[17]</sup>. Considering this, to avoid the further removal of excess tooth structure, the use of bulk-fill composite resin was preferred.

Customization of molar band for use as space maintainer was reported in a previous study by RL Beemer.<sup>[18]</sup> Use of a modified orthodontic molar band was opted considering the stiffness and the inability to use conventional matrix and retainer systems because of unavailability of tooth structure for support.

### 4. Conclusion

From this case report it was inferred that a properly contoured margin can be achieved using customization of an orthodontic molar band in clinical situation where using a conventional matrix band with retainer or sectional matrix band with ring placement was not possible. All grossly destructed root canal treated tooth do not require traditional approach of post and core followed by full coverage crown. Hence, in a grossly destructed tooth with minimal structure remaining for full coverage restoration, a direct composite restoration with modified molar band can be used to achieve precise contacts and contours. Thus, it can be considered a successful alternative treatment option. Further studies using direct composite restoration for crown rehabilitation needs to be carried out to support the conclusion of this case report.

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