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Pin-Retained Restoration with Resin Bonded Composite of a Badly Broken Tooth

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I. Introduction

Extensive loss of crown of a toothleads to problems with retention subsequent restorations. In posterior teeth these can be alleviated by the use of dentine pins although their use is decreased (1).

Most of the teeth can be restored using amalgam or composites. But when the preparation size is very big due to caries or other reason and the remaining tooth structure is very less, it becomes difficult to achieve optimal resistance and retention form. In such cases, dentin lock and slots are prepared in the dentin. But when these retentive features are insufficient to provide desired retention, pin supported restorations are used. In these cases, pins support the restorative materials and resist their dislodgement in severely damaged teeth (2).

The modern resin composite is a mixture of resin and particular filler, handling characteristics of which are determined largely by the size of the particles and method of cure.

Uses of adhesive materials in dentistry include retention of restorations, reduction of microleakage, and reduction of recurrent decay. Cleanliness and biofilms are important factors to consider before using adhesive materials. For bonding success, the surface must be clean to allow intimate association of the adhesive (bonding material) and adherend (the surface) (3).

Dentinal bonding systems utilize two adhesive mechanisms: micromechanical bonding

and the formation of a hybrid layer. The hybrid layer is composed of resin and decalcified dentin. Both mechanisms occur at the same time, and neither relies on primary atomic bonds (3).

Two- and single-step systems simplify the dentin bonding process. They combine two or all of the three etch, prime and bond steps.

II. Patient's History And Clinical Assessment

A 31 years old female patient attended dental clinic with fractured distolingual cusp of the mandibular lower left second molar tooth. The tooth had class II mseio-occlusal amalgam filling for about four years. On clinical examination, there was no any sign of recurrent caries at the area of fracture. The patient did not have present and past history of pain, swelling and root canal treatment for that tooth.

After proper clinical and radiographical assessment of the tooth, a decision has been made to remove the old amalgam filling material to reassure that there was no caries lesion under the filling and to refill the tooth completely as the mesiolingual area was bare.

III. Restoration Procedure

After blocking inferior alveolar nerve, drilling of the amalgam filling started cautiously through using high speed flat ednded fissure. During drilling of the amalgam filling, distobuccal cusp of the tooth fallen too. Then we examined the tooth by using dental mirror and explorer. We explored the remaing cusps, by light touching the cusps (mesiolingual and mesiobuccal cusps) fractured too, leaving the tooth flat and cuspless. After removal of the amalgam, the cement liner was drilled too. No any carious lesion was seen.

Unsupported tooth structures were drilled in order to establish proper base for the future tooth restoration. A thin layer of calcium hydroxide was applied on the pulp area by aid of Dycal applicator. The areas of future insertion of dental pins was assessed and the areas holed by pinhole drill, using slow speed angle hand-piece with ample amount of water for cooling. The threaded pins inserted by finger by using pinhole screwdriver. The pins inserted about 1 mm away from the dentinoenamel junction in the dentine in order to prevent future cracking of the tooth. The seven threaded pins inserted into the holes inside the tooth carefully **Fig. 1**. Any pin that hindered the build-up procedure or required to be twisted was finished for proper contouring of the filling. The tooth color shade was selected by comparing the shade color from the shade guide.

The tooth was irrigated and separated from the adjacent tissues in order to be no contaminated by saliva, and establishing a dry environment for filling the tooth. The tooth was painted by microhead brush through Application of (P90 Self-Etch Primer). Primer on cavity surface agitated for 15 sec. the area was light

cured for 10 sec after drying with oil-free air. A matrix band was installed on the tooth by matrix retainer. The composite filling (Filtek™ P90) was applied incrementally on and around the tooth pulp roof and pins by using plastic instrument. Condensation was used for proper flow of the composite around the pins. Each increment was cured for about 10 seconds. Finally the excessive filling was removed and the tooth examined for high spots, and carving and polishing were accomplished by using finishing and polishing burs respectively **Fig. 2**.

IV. Discussion

A pin retained restoration is defined as any restoration which requires the placement of pin/pins in the dentin in order to provide sufficient retention and resistance form to the restoration.

Extensive tooth wear has multifactorial etiology (4) and the management of patients with worn dentition is a complex and difficult process. Moreover, the lack of evidence regarding the long-term outcomes of treatment methods and materials difficult the clinical decision-making (5). A treatment strategy based on direct adhesive restorations seems to make sense because it is more conservative and provides reversible restorative oral rehabilitation, allowing a thorough understanding of the etiology and development of occlusal anomalies over time (4).

Use of self-threading dentinal pins is also a suitable method to increase the long-term stability of resin-based restorations (6). This simple and low-cost procedure increases the retention of adhesive materials, reducing the risk of fracture failures (6,7). Additionally, this alternative therapeutic approach preserves the tooth structure and requires simple clinical procedures (7). However, to the best of our' knowledge, there is no other report in the literature describing the use of this technique in patients with severely worn dentition.

Although positive outcomes of the direct resin restorations were found in the reported case, further studies comparing the clinical performance of adhesive restorations with and without the addition of self-threading dentinal pins in patients with badly broken teeth (cusp-less molar teeth) are encouraged in order to confirm the positive advantages of this additional retention.

In this case, we followed the case for 6 months of duration. The patient did not report any history of pain and on clinical examination there was no any defect all around the restored tooth. In addition to that, the pulp vitality test revealed that the tooth was positive to thermal stimulation.

V. Conclusion

The pin-retained restoration for this badly broken tooth showed long prognostic outcome.

Figure 1: pin insertion into the badly broken tooth

Figure 2: final restoration

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