

Case Report

Mandibular Denture Repair with Metal Reinforced Orthodontic Wire: A Case Report

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Abstract: Acrylic removable dentures fracture frequently during use through heavy masticatory force or accidental damage. The goal of denture repair is to attain the previous shape and strength of the denture with minimum cost and time. Various techniques and materials have been used to repair dentures. Broken acrylic resin dentures are repaired with auto-polymerizing acrylic resin, heat-cure acrylic resin and metal inserts. In this case we have used an orthodontic wire for additional strength and to repair the mandibular denture.

Keywords: Fractured Denture, Orthodontic wire, Increase Denture Strength

INTRODUCTION

The number of denture fractures has not decreased and still remains a significant problem. Denture fracture is usually accidental or mechanical.^{4, 5} Mechanical causes are due to faulty fabrication, design and poor material choice. The reinforcement of acrylic resin with glass fibers in the form of a woven mat has been demonstrated to be a satisfactory way of producing a resin with improved mechanical properties.⁶ Metals can be added in the form of wires, plates or fillers to increase the transverse strength of acrylic resin. Metal inserts have been known for their use in reinforcing the mandibular denture base improving fracture resistance, dimensional stability, accuracy, weight of the denture bases. In the following case report we used an orthodontic wire to repair the mandibular denture for better strength and retention.

CASE REPORT

A 48 year old male patient reported to Department of Prosthodontics with a fractured mandibular denture (Fig. 1) and wanted repair of the same immediately. Treatment planned for the patient was to use the orthodontic wire to reinforce and repair the denture.



Figure 1: Fractured Mandibular Denture

PROCEDURE:

1. The fractured mandibular denture was assembled as close as possible with the help of sticky wax and glue (Fig. 2).



Figure 2: Sticky wax and glue used to assemble denture

2. Separating media was applied on the intaglio surface of the denture so that it could be easily removed from the cast (Fig. 3).



Figure 3: Cast Poured

3. The denture was removed from the cast. The denture was disassembled from the fractured area and replaced on the cast once again (Fig. 4).



Figure 4: Fractured dentures replaced on the cast

4. A groove approximately 5 mm wide was made in the lingual surface of the mandibular denture. An orthodontic wire was placed in the groove. The wire is used for better strength to prevent repeated fractures (Fig.5).



Figure 5: Use of an orthodontic wire

5. Self cure acrylic powder and monomer was used to cover the wire and cover the fractured area (Fig. 6).



Figure 6: Use of self cure acrylic over the orthodontic wire.

6. The denture was finished, polished and delivered to the patient (Fig. 7). Denture insertion was done strictly following the denture insertion protocols as well as post insertion instructions given to the patient. The patient was reviewed 24 hours post insertion and examined as well as patient opinion recorded. Recall visit were also

done after 1 week intervals and the denture is inspected thoroughly for fracture lines. No evidence of craze lines is evident and denture was functioning well under the occlusal loads even after six months recall visits.



Figure 7: Finished and Polished Denture

DISCUSSION

Denture fractures due to accidents such as expelling the denture from the mouth while coughing or dropping the denture. A study showed that mandibular complete denture fracture decreased following internal metal reinforcement.⁷ The metal inserts are also to be used when edentulous ridges are irregular or compromised, because all denture base adjustments are done in the acrylic.

A disadvantage is the added expense of the prosthesis for the patient. Auto-polymerizing resin repairs provide a rapid and economic convenience but unfortunately the repaired dentures lose 40% to 60% of their original transverse strength.⁸ Precautions can be taken to reduce the incidence of denture fractures through maximal denture retention and stability, uniform occlusal loading and balanced articulation. Use of high strength polymers (high-impact resins), a good processing technique to eliminate surface defects and inclusions within the denture base are some of the ways. In this case we used an orthodontic wire to increase strength and retention of the denture.

CONCLUSION: Some of the materials have an excellent balance of impact resistance and flexural properties, however, most are not acceptable because of their processing characteristics. Reinforcement with a metal wire increases the impact and tensile strength.⁹ Today's need is to construct a denture that is strong, stable and

functional. The inherent strength of such a denture makes it possible to meet the patient's needs. In the above case report a metal insert was used to repair the mandibular denture which was not sensed by the wearer as it was inserted in the middle layer of denture.

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