

Metal mesh dentures- A case report

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ABSTRACT

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Acrylic resin used in the fabrication of denture bases is prone to fractures. Acrylic resin is a popular material since it fulfills the aesthetic demands of complete denture treatment, but it is not an ideal material as it does not fulfill the mechanical requirements of the complete denture prosthesis. The risk of fracture is great especially when the denture base is thin and masticatory forces are high. One of the many ways to address this problem is by the use of metal reinforcements. There are a variety of metal reinforcement options available. The case report presented uses an economical and less time consuming procedure to address this problem.

Introduction

The fracture of acrylic resin dentures is an unresolved problem in prosthodontics. Midline fracture was the most common problem in a recent denture survey, among these midline fractures 71% were seen in maxillary complete dentures and 29% were seen in mandibular dentures.[1] Despite advances in dental technology, it can be seen that the fracture of acrylic resin dentures remains a significant problem and the number of denture fractures has not decreased.[2] Denture fracture is usually mechanical or accidental.[3-4] In situations where extensive resorption of the residual ridge has occurred, it is not uncommon to have a buccolingual width of 5 mm or less.

The potential for denture fracture is therefore inherent.[5] A common site of fracture is along an anteroposterior line that coincides with the notch for the relief of the labial frenum of either the maxillary or the mandibular complete denture.[1] A denture repaired with heat-cured resin exhibits approximately 85% of its original strength, and an autopolymerizing repair has only 55% to 65% of the original heat-cured denture strength.[6] Fracture of repaired denture bases is not uncommon, so the denture base had been reinforced either with metal wires/ metal mesh to avoid further fracture incidence.

The ultimate goal of denture repair is to attain the original shape and strength of the denture with minimum cost and time.[2]

Case Report

A 55 year old male partially edentulous patient with good general health, psychologically well and conscious of his appearance, with history of fracture of maxillary and mandibular dentures (Figure 1) reported to the department of prosthodontics, Raichur for prosthesis, history revealed that he was partially edentulous for the past 3 months and was wearing a denture since 2 months.

On intra oral examination, there were many retained teeth, which were periodontally stable. Appropriate treatment plan was formulated taking into consideration, the episode of fracture of removable partial denture.



Figure 1. Fractured upper and lower dentures

Our objective was to enhance the fracture resistance of the denture. So, it was planned to fabricate cast metal denture, which was not cost effective for the patient. So keeping in mind the patient's concern about the cost and function, it was decided to fabricate a metal mesh denture. Considering the availability of the resources, it was planned to fabricate a metal mesh reinforced denture. The lower arch was completely edentulous.



Figure 2. Metal mesh adapted to master casts

Duplication of the master cast with alginate was done. A dental stone cast was poured, which was used to adapt the metal mesh. A pen was used to mark the size of the reinforcing mesh. The mesh was cut using a carborundum disc. The reinforcing mesh adapts to the cast by using mallet and plier. The size was adjusted

subsequently (Figure 2). The integrated reinforcing mesh must completely lie within the denture resin (Figure 3). Over dimensioning of the denture base is avoided owing to the small thickness of 0.4 mm of the mesh. The same mesh was incorporated during packing after following regular complete denture protocols. Denture insertion was done (Figure 4) and regular post insertion check ups were done.



Fig.3. Metal mesh incorporated upper and lower dentures



Fig.4. Post-insertion

Discussion

The most commonly used material to make complete dentures in clinical prosthodontic practice is acrylic resin. However, the fracture of acrylic denture bases is occasionally an unavoidable complication because the mechanical properties of acrylic resin may not be sufficient to withstand masticatory stress.[3,7,8] Jagger et al reported that despite the popularity of acrylic at satisfying aesthetic demands, it is still far from ideal in fulfilling the mechanical requirements of prosthesis.[8] There is great risk of fracture particularly if the thickness of the denture base is minimal.[9]

The fracture line coincides mostly with the notch for the relief of the labial frenum of either the maxillary or the mandibular complete denture.[1] Causes of these fractures include occlusal disharmony, excessive occlusal forces, flexure and fatigue of the denture base as a result of alveolar resorption, thin spots in denture base, and impact as a result of dropping the denture.[1,10] Broken acrylic resin dentures are repaired with autopolymerizing acrylic resin, heat-curing acrylic resin and recently with visible light-cured resin. Autopolymerizing resin repairs provide a rapid and economic convenience to patients.[11-13]

Unfortunately, the repaired units may lose some of their original transverse strength. Furthermore fracture of repaired dentures often occurs at the junction of old and new materials rather than through the center of repair.[14-16] Because, the fractures are common in dentures, PMMA has been reinforced either with metal wires or more recently with fiber strengtheners.[17] It has been reported that nickel, cobalt, and chromium used in a denture base alloy may cause not only local sensitivity such as gingivitis and

stomatitis but also sensitivity that results in eczema and dermatitis without mucosal manifestations. In the present study, a ready made mesh is used, it has holes for retention of the acrylic denture base which does not come in contact with the soft tissues and the small thickness of 0.4 mm of the mesh allows for easy manipulation and incorporation in the denture base without increasing its thickness.

Conclusion

This case report suggests an economical and effective solution for the common problem of denture fracture. This method is simple and not technique sensitive. It requires fewer visits, while maintaining original function and esthetics of the previous denture to which the patient is already adjusted. Thus, it is an overall benefit for the patient and the dentist.

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