

Case Report

Management of a Failed Hybrid Implant Full-arch Prosthesis- A Case Report

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Abstract :

Background: Biological and technical hardware complications in implant-retained prostheses are well documented in the literature. The most frequently reported failures are on the immediate or delayed factors after implant placement. Even when the implant has successfully osseointegrated, there is a chance that the prosthesis can fail if the treatment planning and occlusal aspects are not well studied. Management of failed cases is rarely reported. In this case report, the authors present a failed implant prosthesis and how it was managed well with a more permanent solution. **Case presentation:** A 55-year-old, male retired bank manager, reported with the chief complaint of frequent fracture of the maxillary acrylic hybrid implant prosthesis that was delivered 6 months ago. He wanted a replacement for the fractured upper maxillary acrylic hybrid prosthesis. On clinical evaluation, the upper maxillary implant prosthesis was opposing the natural tooth, an anterior bridge, and two posterior implants in the lower right and left of the first and second molar region. The patient was happy with the lower restorations. **Conclusion:** The design of the final restoration based on biological, mechanical, technological, and patient factors should be ideally planned during the initial treatment planning stage itself. In case a prosthesis fails the underlying cause should be analyzed and retreatment planning is to be done.

Keywords: Hybrid Implant prosthesis; Complications; Malo bridge; Case Report.

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Introduction:

Failures in implant-retained prostheses can be due to immediate or delayed implant placement failures. In a few instances, though the implant placement is successful the prosthesis can fail due to several factors such as biological (Plaque deposition), mechanical wear or fracture, technological defects, and patient factors such as faulty occlusion. Bragger et al observed that of all the prosthesis failures, 70% are due to mechanical reasons¹. Apart from

the final restoration other restorations in the mouth also depend on the outcome. Some observations indicate that immediate implant placement soon after tooth extraction causes less vertical and horizontal changes². Mechanical failures can be due to the large force generated or because of the lack of proper occlusal contacts. When designing a final restoration and selecting the materials, it is important to consider the location, the opposing teeth, and the amount of occlusal force that can be generated in

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individual cases. Though all the factors are taken into consideration, and if the analysis of occlusion is not critically evaluated the restoration will fail. The present case report aims to describe a repeated mechanical failure of a final hybrid prosthesis, which led to patient dissatisfaction, and how it was managed with a permanent solution with a one-year follow-up.

Case report:

A 55-year-old, male retired bank manager, was referred by a general dentist with the complaint of frequent fractures of acrylic from the maxillary hybrid implant bridge that was delivered 6 months ago. A fixed ceramic implant bridge was already present at the lower left first molar (36), lower left second molar (37), Lower right first molar (45), and lower right second molar (47). He has already had a fixed bridge in the lower anterior for the past 5 years and is happy with it. The referring dentist provided the post-surgical radiograph **Figure 1** and the post-prosthetic image on the day of delivery **Figure 2**. The patient's chief complaint was the continuing repairs that had to be done in the denture on different teeth and the gingival area of the prosthesis within the few months of prosthesis insertion. The patient requested a repair again and wanted a permanent solution to the fracture of the prosthesis issue. On clinical examination, the fracture of the anterior lateral incisor was observed in **Figure 3**. This fracture was repaired temporarily with a cold cure. **Figure 4**. The patient did not return for a new prosthesis until another area of the prosthesis fractured after 6 months **Figure 5**.

On clinical evaluation, the molar teeth had fractured off, the entire upper denture teeth were abraded, and the composite sealing of the screw access holes had been dislodged with the prosthesis looking stained and unpleasant. **Figure 6**. Treatment planning was done, and it was decided with the patient's consent to proceed with a Malo Bridge. Malo bridge was decided as already the implants were placed and the only option left was to have a strong prosthesis that can be easily repaired without the removal of the entire prosthesis.

An impression was made with an open stock tray. The existing hybrid prosthesis was used to make a jaw relation record using bite registration paste. After the jaw registration, the existing hybrid prosthesis was removed by clearing the remaining acrylic over the screw holes and untorquing the screws. The removed

prosthesis was sent to the lab **Figure 7**. The present prosthesis helped in confirming the jaw relation, esthetic, and lip support. A jig try-in was conducted with castable UCLA abutments **Figure 8**. The passive fit was ensured by taking periapical radiographs. A framework was made in Cobalt chromium and was tried in the mouth for passive fitting which was ensured with a radiograph. This cast metal framework had metal struts that resemble individually prepared teeth, popularly known as Malo bridge, on which individual crowns could be later fixed. **Figures 9 & 10**. The framework has channels through which the implant screws could be accessed and torqued. This would help in unscrewing the framework for oral hygiene maintenance by the dentist. The crowns were luted with temporary cement individually so that they could be easily retrieved, repaired, and refixed if a ceramic fracture occurs. **Figure 11**. The gingival region of the prosthesis was made with Adoro Gingiva Ivoclar Vivadent. The patient was very satisfied and happy with the final restoration **Figure 12**. Follow-up after one year showed the prosthesis was intact with no fractures **Figure 13**.

Discussion:

A hybrid prosthesis is a prosthesis in which the acrylic teeth and the resin denture surfaces are heat cured onto a metal framework. This prosthesis is screwed onto the implants. In this case report of a hybrid prosthesis, which was delivered underwent repeated failure of the acrylic denture framework. On further evaluation concerning the reasons for failure, it was observed that the bulk of the acrylic material was not sufficient to withstand the enormous occlusal forces generated by the opposing natural teeth and implant bridges. Another reason for the failure is that for a Hybrid Prosthesis (Metal + Resin) an inter-arch distance of 14-18 mm is required. When the interarch distance along with the choice of prosthesis design is not taken into consideration, prosthesis failure can occur as in this case. The above reasons were thought to be the chief reasons concerning the breakage of acrylic from the metal framework. It was further decided to do a complete rework of the present case. The choice of the new restoration was considered initially by measuring the interarch distance from the implant platform to the occlusal plane of the opposing arch on mounted models. The present degree of residual ridge resorption was calculated

to decide the choice of the prosthesis in fully edentulous patients. Wang et al observed that the commonest failures in the implant in private practice over 5 years were screw loosening, decementation, esthetic complication, veneer chipping or fracture, and food impaction³. Pjetursson et al in their study of implants placed before the year 2000 and after the year 2000 indicated that though the survival rate increased the esthetic, biological, and technical complications were still high for implants placed after 2000⁴. Paspapyridiakos observed that the most frequent problem in prosthesis failure was the fracture of prosthetic material⁵. Advantages of Malo Prosthesis include ease of fabrication and intraoral repair without unscrewing the complete prosthesis. Many authors have successfully placed the Malo bridge and reported the ease of repair^{6,7}. The repeated fracture problem as seen in this case was rectified using a Malo prosthesis in the upper arch against a combination of natural teeth and implant prosthesis in the lower arch.

Conclusion:

- Beginning with the end in mind is the dictum to be followed in implantology.
- The success of a good prosthesis depends on the number, location, and distribution, along with the inclination of implants that are required to withstand occlusal loading in functional and parafunctional movement.
- An in-depth treatment planning taking all factors into consideration including the occlusion adds longevity and patient satisfaction in implant-supported restorations.

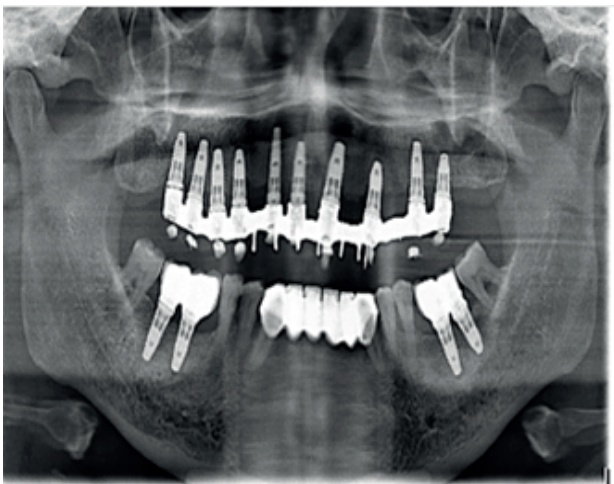


Figure:1 Preoperative Hybrid Maxillary prosthesis



Figure 2: Postoperative Hybrid maxillary prosthesis



Figure 3: Fractured lateral incisor on the prosthesis.



Figure 4: Repaired lateral incisor.



Figure 5: Repeated fracture of prosthesis

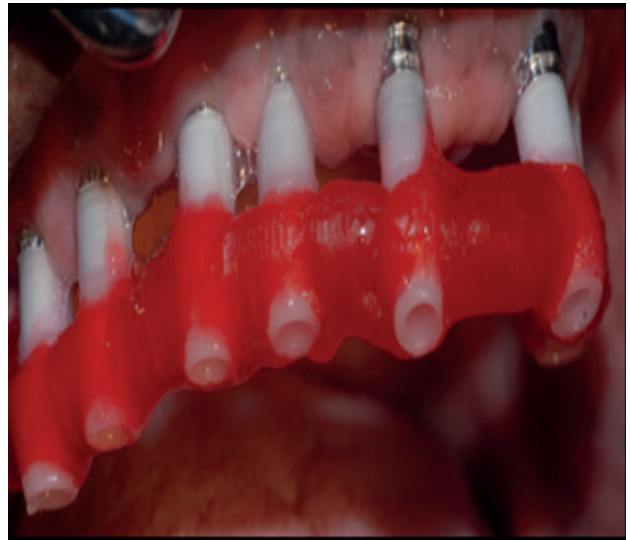


Figure:8 Jig try in with UCLA abutments



Figure 6: Abraded and stained prosthesis



Figure 9: Tissue surface view of the framework



Figure7: Removed hybrid prosthesis.



Figure 10: Occlusal view of the framework



Figure 11: Individual crown cementation



Figure 12: Completed Maxillary Malo bridge.



Figure 13: After a one-year follow-up of Malo bridge in Occlusion

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Authors' contribution:

Data gathering and idea owner of this study: EK and LM

Study design: EK

Writing and submitting the manuscript: HI HA and LM

Editing and approval of final draft: LM

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