A Digital Workflow for the Retread of an Acrylic Implant-Supported Fixed Prosthesis: A Case Report

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Introduction

Debonding, fracture of veneering material, and wear of denture teeth are the common complications in the acrylic resin teeth on implant-supported fixed prosthesis. Changes in occlusal vertical dimension may alter the occlusal scheme and guidance, which could affect speech and esthetics. Repeated debonding or fractures may lead to material weakness, which often presents challenges for clinicians and dental technicians.

Objective

The purpose of this case report is to demonstrate a digital workflow for the retread* of an acrylic implant-supported fixed prosthesis with efficient scanning, designing, and fabricating a well-fitting, esthetic approach.

**The clinical and laboratory process of removing worn acrylic resin veneering material from an implant-supported prosthesis and replacing it with new material at the original or corrected vertical dimension of occlusion (VDO), while maintaining the original metal framework.*

Clinical Report

a) An 83-year-old Caucasian male presented to UB Advanced Prosthodontic Clinic. This patient had been treated by one of the graduate students approximately 15 years ago. The physical examination revealed a visible crack at positions #12-13 and a history of recurrent fractures in this area.

b) A 54-year-old Caucasian male presented with worn-down maxillary denture teeth. He reported that his maxillary teeth look short and worn. The patient has had this prosthesis for more than 10 years.

(a)

(b)

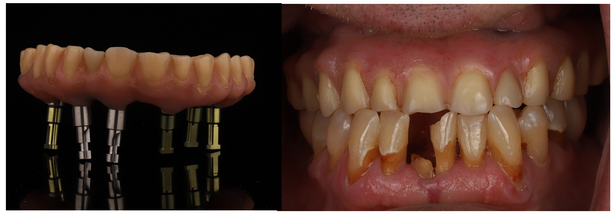


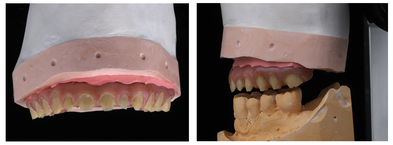
Figure 1. Pre-op Defective Implant Supported Fixed Prosthesis; Extra and Intra-oral photograph

Materials and Methods

1. The fractured denture teeth were carefully removed from the prosthesis.
2. Preparation of the prostheses was done to allow adequate space and improved retention for the acrylic material.

(a)

(b)



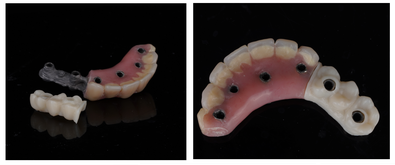
3. The digital impressions were made using a scanner. (TRIOS3; 3Shape, Medit T710; Medit)
4. Denture teeth were designed using a CAD program (exocad CAD software; exocad GmbH).

(a)

(b)

5. The design was milled to create a replacement of the defective part. (Ivotion®; Ivoclar)
6. A universal primer was applied to the sandblasted metal bar, and the new denture teeth were bonded to the implant-supported fixed prosthesis using resin cement. (Monobond Plus®; Ivoclar, QYK-SET; Holme Dental)

(a)



(b)

Result

The patients returned for a 48-hour follow-up appointment and reported no problems and adapted well to the repaired prosthesis. Clinical evaluation shows improvements in speech, mastication, and overall comfort. The patients were satisfied with the functional, esthetic outcomes, the comfort, and efficiency experienced throughout the treatment process.

(a)

(b)

Fig 5: (a) Definitive Full Arch Fixed Prosthesis Extra-Orally Right Lateral View; (b) Definitive Full Arch Fixed Prosthesis Extra-Orally Frontal View; (c) Definitive Full Arch Fixed Prosthesis Extra-Orally Left Lateral View.

Discussion

This technique demonstrates a digital workflow that minimizes the need for conventional methods in repairing implant-supported metal-acrylic fixed prostheses. This approach may help in addressing complications such as acrylic fractures or denture teeth wear. By using precise digital tools, clinicians can achieve a stable, esthetic repair with enhanced durability.

Conclusion

Repairing prostheses can be challenging due to the weaker point from denture fracture. This digital workflow provides a reliable method for managing and repairing recurrent fractures in implant-supported metal-acrylic fixed prostheses, potentially reducing the likelihood of future failures in the same area.

References

1. Drago, C. and L. Gurney (2013). "Maintenance of implant hybrid prostheses: clinical and laboratory procedures." J Prosthodont **22**(1):
2. Balshi TJ, Wolfinger GJ, Alfano SG, Balshi SF. The Retread: A Definition and Retrospective Analysis of 205 Implant-Supported Fixed Prostheses. Int J Prosthodont. 2016 Mar-Apr;29(2):126-31. doi: 10.11607/ijp.4277. PMID: 26929948.20