

A Rehabilitation of Partially Edentulous Anterior Maxilla with Soft and Hard Tissue Deficiency Using a Detachable Fixed Partial Denture: Case Report

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ABSTRACT

Background: Prosthesis is a therapeutic replacement of an absent part of the human body. It should restore the esthetics, function, maintenance of hygiene and stress distribution and in case of oral cavity the phonetics. A common sequel following loss of teeth is loss of hard and soft tissue. Restoration required not only a compensation of lost teeth but the latter as well. Fixed removable partial denture is indicated in patients requiring a replacement of considerably lost height and width of the residual ridge where the extensive span of the fixed partial denture will cause deleterious effects on the abutment teeth. It is a good option for a patient demanding a fixed restoration for a long edentulous span.

Keywords: long span edentulous, soft and hard tissue deficiencies, Andrew's bridge, detachable fixed partial denture.

INTRODUCTION

A successful restoration satisfies esthetic, biological and functional requirements of the portions of the stomatognathic system being replaced. Prosthetic rehabilitation using fixed prosthesis not only involves a consideration of the present abutment teeth but should consider the contour of the residual ridge. Restoration of the residual ridge defects due to trauma, surgical removal of tumors or improper handling of the tissues during extractions is a challenging task for any prosthodontist. Anterior ridge defects are the most complicated to restore prosthetically to the patients' expectation and require tremendous amount of treatment planning along with an artistic insight for fabricating the restoration. Patients in today's world demand fixed restoration. When large defects exist the fixed option leads to excessive load

on the abutment teeth as well as cannot provide adequate support to give an esthetically pleasing outcome. The use of a meld of fixed and removable prosthodontics can be used to treat such cases, Andrew's bridge system being a classical example¹.

CASE REPORT

A 35 year old female patient reported to the department of prosthodontics with a chief complaint of missing maxillary anterior teeth. Detailed history revealed the presence of a cyst in the region. A surgical resection of the cyst was carried out along with the involved teeth. Patient was advised an interim Removable Partial Denture (RPD) during the healing phase. Due to the associated disadvantages the patient did not comply with the removable treatment option and wanted a fixed replacement of the lost teeth. Extra orally,

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Fig 1:Pre operative view



Fig 4:Pick up impression of the metal framework.



Fig 2: Prepared abutment teeth to receive PFM restorations



Fig 5:Try in.



Fig 3: Try in of metal framework.



Fig 6: Cemented bar attachment in the mouth.



Fig 7: Occlusal view of final andrew's bridge



Fig 8: Frontal view of the restoration



Fig 9: Satisfied patient.

reduced lip support in anterior region was seen (Fig.1). Intra-oral examination revealed missing 11,21,22,23. A considerable loss of the height and width of the residual ridge was observed (Siebert's Class III)². Asymmetry across the midline in the maxillary arch was seen when viewed occlusally.

A CBCT was advised to verify the available treatment options. Treatment options for the

maxillary arch included implant supported FPD with autogenous bone graft, a fixed-removable partial denture and a conventional RPD. The adjacent teeth showed good amount of bone support and periodontal health. Fixed partial denture was not considered as the asymmetry of the arch due to the defect would cause torquing forces which would transmit undue forces to the abutment teeth as well as not satisfy the esthetic concerns of the patient due to deficient lip support. The excessive bone loss would require increase in length of pontics which would also lead to esthetic failure³.

A conventional removable cast partial denture did not satisfy the patients requirement of a fixed treatment objective and if maintenance was not adequate it would lead to decalcifications, caries as well as affect the overall periodontal health. After a thorough explanation of the various treatment alternatives to the patient, a fixed removable prosthesis was planned for rehabilitating the partially edentulous state of maxilla.

PROCEDURE

Patient was advised oral prophylaxis in the phase 1 therapy followed by oral hygiene instructions. Diagnostic casts were obtained and were articulated to check for the availability of adequate space for the attachment. Endodontic treatment of the abutment teeth was planned to avoid any post restorative problems. 12,13,24 and 25 were prepared to receive a PFM restoration which would be connected using the bar attachment(fig 2). Temporization was done of the prepared teeth using tooth colored self-cure acrylic resin by indirect technique. The master casts were poured using Type-IV gypsum product.

Wax copings were fabricated for abutment teeth 12,13,24,25 and they were connected with two prefabricated castable plastic bar attachment (OT Bar Multiuse, Rhein 83) which merged at centre to compensate for the acute angle of the residual ridge. The bar was placed such that 2-3 mm of space was left between the bar and the crest of the alveolar ridge to facilitate maintenance of hygiene by the patient. The above assembly was cast in cobalt chromium alloy using conventional casting procedures. The obtained metal framework was

tried for evaluating the fit of the casting (fig 3). Shade selection was done. With the framework in place a pick up impression was made with polyvinyl siloxane using single step putty wash technique to record the exact relation of the casting to the oral structures (fig 4).

Ceramic build up of the retainer teeth was done according to the shade obtained. The obtained cast was duplicated and the wax pattern for the superstructure was fabricated and the framework was cast. Teeth were arranged on the framework in wax for trial (fig 5). Once the trial was done and obtaining the patients consent processing of the acrylic part was carried out. The retentive nylon clip was inserted in the housing. The fixed retainer portion was cemented on to the retainer teeth using type I glass ionomer cement. After the initial set the excess cement is removed and the female portion is pressed on to the male retainer (fig 6,7,8,9). Patient was given instructions regarding the placement and maintenance of the prosthesis.

DISCUSSION

About 9% of the patients with anterior teeth missing do not have ridge defects. Of all the defects the incidence of class III defects is the highest⁴. The absence of adequate amount of bone for implants to be considered as a treatment option, autogenous bone grafting along with soft tissue regeneration was to be done followed by implants post maturation. Combined defects involving height and width of the ridge pose serious problems for the restoring prosthodontist. Dr. James Andrews of Amite Louisiana (Institute of Cosmetic Dentistry, Amite, LA, USA) first introduced a fixed-removable prosthesis also known as Andrew's Bridge⁵. This comprises of a fixed retainers luted to the existing teeth and a detachable pontic assembly⁶.

The Detachable pontic assembly allows maintenance of adequate oral hygiene. Porcelain fused to metal (PFM) or full veneer metal, which are permanently cemented to the abutments serve as the retainers which are joined with prefabricated castable bars and then cast, or a prefabricated metal bar is soldered to the metal copings after casting. The retention of the removable pontics is by a nylon clip on the intaglio surface which fits the bar attachment. The various advantages of this type of system include:

Reduced denture bulk, occupying minimal vertical and horizontal space. Four different curvatures of the bar follow the ridge and permit use of the bar anteriorly. Various lengths replace one to four teeth. The denture provides good retention with little wear. It provides high tensile and yield strengths. It permits replacement of missing alveolar structure for esthetic reasons. Special transfer sleeves for each bar are provided so that a duplicate removable prosthesis can be made quickly⁷.

A favorable property of the Andrews bar system is that it can be removed by the patient thereby providing access for maintaining hygiene around the abutments and surrounding tissues. Moreover, the pontic assembly can be relined as the ridge resorbs⁸.

CONCLUSION

A perfect diagnosis and meticulous treatment planning is the key to any successful treatment. A perfect understanding of the concepts and a visualization of the consequences of a particular treatment before the start of the procedure is utmost important. Restoration of large defects using Andrew's bridge system has been a boon to the patient as he can receive a semi fixed option which is less bulkier than the removable counterpart.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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