Breaking The Stress -A Case Report

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Abstract

The correct choice of treatment for any patient depends on a thorough History , Examination, and on making correct Diagnosis and Prognosis.While planning a Fixed partial denture, many factors are taken into consideration.Special consideration is given to position and periodontal condition of abutment teeth.Generally when one or two teeth are missing and if the abutments areperiodontallysound, then Fixed-Fixed type of bridge in which rigid connectors are planned. When any one of the abutments areperiodontally weak then ,Fixed-movable type of bridge in which non-rigid connectors are planned.Rigid connectors are avoided, because it causes tipping or lateral movement of theperiodontally weak abutment and Pier abutment , as it acts as a fulcrum.This case report presents a clinical situation, where one of the abutment isperiodontally weak, in Maxillary arch and hence a non-rigid connector in the form of Extra-coronal attachment is planned.

Keywords : Rigid connectors,Non-Rigid connector, Extra-coronal attachments.

Introduction

Diagnosis and Treatment planning plays avery important role in designing of a Fixed partial denture. For deciding which type of connectors and retainers are to be fabricated,certain factors are taken into consideration like span length,position and periodontal condition of abutment teeth,caries, occlusion,bone loss, clinical height of abutment teeth etc.

Biomechanical factors such as overload, leverage, torque, and flexing induce abnormal stress concentration in a fixed partial denture. Stress concentration is found in the connectors of the prosthesis and in the cervical dentin area near the edentulousridge[1]. Connectors, the portion of a fixed dental prosthesis that unites the retainers and pontics are considered as lifegaurds of abutments, since under occlusal load maximum stresses are concentrated on them.The occlusal forces applied to a fixed partial denture are transmitted to the supporting structures through the pontics, retainers and connectosr. Selection of the right type of connector make a real difference between success and failure. We are more accustomed to the use of rigid connector in clinical practice since its placement requires minimum technical and laboratory expertise[2]. But the real problem arises when we encounter a pier abutment and a weak abutment[2]. Natural tooth located between terminal abutments that serve to support a fixed or removable dental prosthesis is known as pier abutment[3]. Restoration of three or mre missing teeth with one of the terminal abutment periodontally weak and an intermediate pier abutment with a rigid fixed partial denture is not an ideal treatment. When an occlusal load is applied to the weak abutment, when rigid connector is planned,there is more damage caused. Thus, tensile forces may then be generated between the retainer and abutment at the other end of the restoration. It has been reported that rigid connectors with pier abutments are associated with higher debondingrates . Thus, these restorations may result in marginal leakage and caries. The existence of the malaligned abutment, where parallel preparation might result in devitalisation. Such situation can be solved by the use of non-rigid connectors [Precision attachments as connectors].[3]This form of a connector acts as a sress -breaking device which allows limited movement at one end of the joints between pontic and retainer. The movable joint of a non-rigid connector gives full support to the pontic against vertical occlusal forces. This prevents the movement of one retainer ,transmitting the forces directly to another and breaking the cement seal.There are many ways of providing a movable joint which allows limited movement between pontic and retainer.Some of these can be fabricated in the laboratory but there are many

prefabricated movable joints or precision attachments. These attachments can be Intra-coronal or Extra-coronal. Careful judgement is essential in deciding when and which form of Exracoronal attachment is to be use.

Case Report

A 45 year old female patient reported to the Department of Prosthodontics,D.Y. Patil School of Dentistry ,Navi- Mumbai with the chief complaint of replacement ofmissing-teeth. On examination 15,16 were missing and 17 present. IOPA revealed good periodontally sound 15,16 but some bone loss around 17. All the various possible treatment modalities were discussedwith the patient. The patient did not agree for the implant due to surgical intervention. The patient agreed for fixed partial denture with Casted attachments andceramometal restoration.

Procedure

The tooth preparation of , 13,14,15 was done as per biomechanical principles of tooth preparation. Gingival retraction was done using Retraction cord(ultrapek 000) and cord packing instruments. Thetwo stage impression technique was followed using elastomeric impression material, 3M (Impregum).The metal casting was done in two segments, one segment including dovetail extension on the distal of first premolar coping[mesial segment] and the other segment having the counter part of dovetail in the pontic which replaced second premolar and first molar[distal segment]. The two segments were checked on the cast for fitting of dovetail and counter part of it. The fitting of metal copings and dovetail like attachment was checked in the mouth. Bisque trial was done. The final layering of ceramic and glazing ofthe prosthesis was done .Themesial segment was cemented first followed by cementation of distal segment.

Discussion

The weaker the abutments are, the greater the need for resiliency or free movement to direct the forces away from the abutments to the supportive bone and tissues[4].

The nonrigid connector is a broken stress mechanical union of retainer and pontic ,instead of the usual rigid con-nector[5].The most commonly used nonrigid design consists of a T-shaped key that is attached to the pontic,and a dovetail keyway placed within a retainer[6]. A nonrigidcoonector transfers shear stress to supporting bone rather than concentrating it in the connectors.It appears to minimize mesiodistal torqueing of the abutments while permitting them to move indepen-dently.Thesize,shape, and type of the connector play an important role in success of a fixed partial restorations.

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Figure Legends

Fig - 1Right lateral view
Fig - 2 Left lateral view
Fig - 3 Maxillary occlusal view
Fig-4 Tooth preparation with gingival retraction cords
Fig- 5 Metal Trial Showing Dovetail extension
Fig - 6 Maxillary Occlusal View
Fig-7 Prosthesis showing housing of attachment
Fig- 8 Try-in
Fig- 9 Final prosthesis cementation
Fig - 10 Right lateral view after cementation


Fig - 1


Fig - 2


Fig - 3


Fig - 4


Fig - 5


Fig - 6

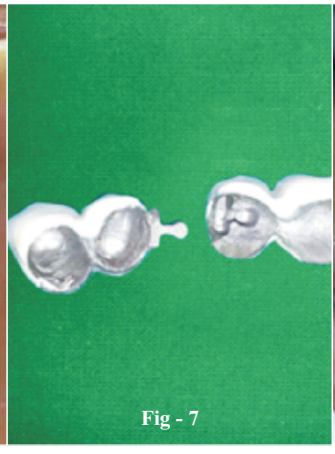
Fig - 7


Fig - 8


Fig - 9


Fig - 10