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Restoring orthodontically mistreated anterior quadrant using non rigid connector

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ABSTRACT

The excessive flexing of the long-span fixed dental prosthesis, which varies with the cube of the length of span, can lead to material failure of fixed dental prosthesis or to an unfavorable response. Tooth movements in divergent directions create stresses that are transferred to the abutments and cause failure of the weaker retainer. Non rigid connectors transfer shear stresses to supporting bone and permits abutments to move independently. This clinical report describes the prosthodontic management of an earlier orthodontically mistreated patient with edentulous span on both sides of a pier abutment, with a fixed partial denture having a non-rigid connector.

INTRODUCTION

The use of rigid connectors in 5-unit fixed dental prosthesis with a pier abutment can result in failure of weaker retainer in the long run as the pier abutment acts as a fulcrum.[1] Non-rigid connector placed on the distal aspect of pier seems to reduce potentially excess stress concentration on the pier abutment.It is indicated in 1) Lone standing abutment (pier abutment) with edentulous spaces on either side allowing physiologic tooth movement and relieve stress[2]. 2) When it is impossible to prepare two abutments with common path of placement [3]. 3) When prognosis of an abutment is uncertain,in such cases if the abutment fails only a portion of FPD needs to beremade [3]. 4) In the mandibular arch, FPD consisting of anterior andposterior segments, a non-rigid connector is indicated as the mandible flexes mediolaterally during opening and closing strokes [3].

CASE REPORT

A 24 Year old male patient was brought to the dept of prosthodontics after incomplete orthodontic treatment.

Phase of orthodontic correction

History of missing lateral incisors bilaterally and rotated canines was given .The treatment plan must have included fixed mechanotherapy by MBT therapy.The treatment went for two years and the patient lost the patience and left it in between due to lack of confidence in the dentist.The orthodontic treatment was done by a local practitioner so photos could not be retrieved.

Phase of Prosthodontic correction

The patient presented to the dept as shown in the figure

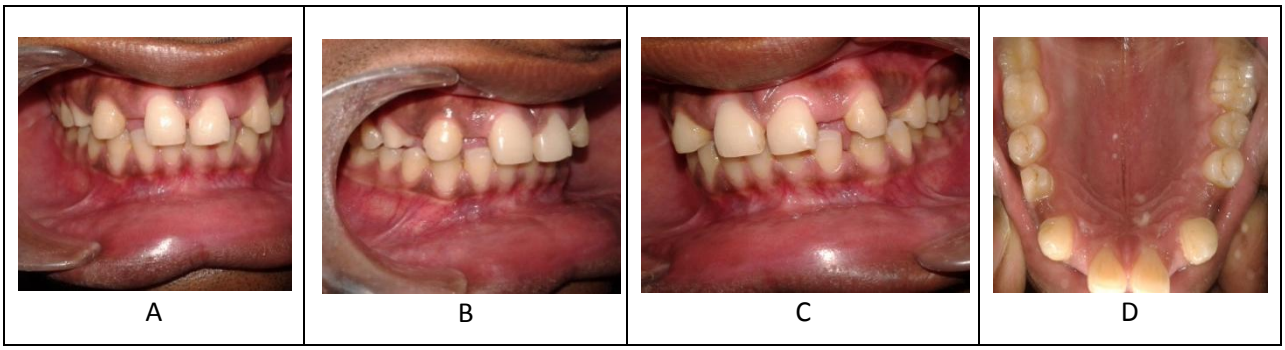

Fig 1

Missing laterals bilaterally and spacing between canine and first premolar

Treatment plan

It included non rigid connectors on both side since there was long edentulous span with one abutment bearing all the forces. Lone standing abutment (pier abutment) with edentulous spaces on either side allowing physiologic tooth movement should be relieved from stress. The step by step procedure is as follow:

Fig 2

The tooth preparation for the abutments was done followed by impression procedure and master cast fabrication and Provisional restoration was cemented.

The non-rigid connector design to be incorporated was prepared in wax pattern

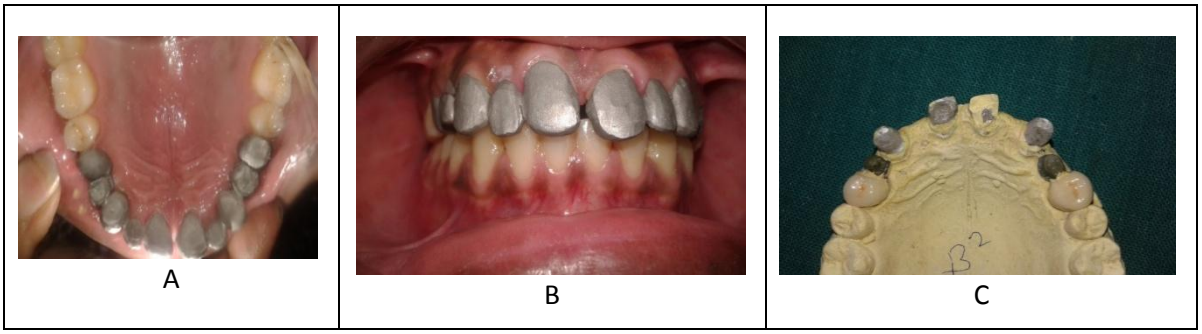

Fig 3

The design of non-rigid connector incorporated consists of a mortise (female component) prepared within contours of the retainer and a tenon attached (male component) attached tothe pontic . Accurate alignment of mortise is crucial. Metal try in was done after casting

. Then ceramic facing was added

Fig 4

A

B

C

D

Fig 5

At the time of cementation, mesial unit segement was placed first followed by cementation of distal segment. The patient was content and happy with the treatment.

DISCUSSION

Pier abutments act as a Class I fulcrum lever system when the teeth are incorporated in a fixed partial denture with rigid connectors. The potential stress from pier abutments needs to be dissipated. A non-rigid connector can be incorporated on the distal portion of the pier abutment to act as a stress relief point. W. Oh, N. Götzen and K.J. Anusavice4 in their study suggest that stresses are better distributed with broadly curved connectors than through the use of more sharply curved connector geometries. PV Badwaik, AJ Pakhan5 described the use of NRCs in posterior segmen. Nidhi Kathuria1*, Rahul Prasad2 incorporated a balancing phenomena with Tenon on mesial and distal side. As the teeth were misaligned the preparation for FDP got complicated and it was avoided by NRC. The component parts did not have a common path of placement and therefore segmenting of long span FDPs with shorter components resulted in compensating the difference in resistance and retention form between the abutments. Connector size, shape and position influence the success of FPD [6]. Rigid and non-rigid designs both have effects on stress distribution in fixed partial denture with pier abutment. The present case report gives an interdisciplinary approach of solving the esthetic problems.The canines were derotated to provide space for laterals and to avoid extra forces on the abutment

CONCLUSION

It has been recommended that the use of this type of internal interconnection might allow retrievability of the prosthesis as well as reducing overloading of the abutment teeth[7]. The conventional use of a non-rigid connector aids in compensating for the difference in the resistance and retention form between the abutments

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