

Precisional Attachment for Fixed-removable Prosthesis with Distal Stress Eliminator–DSE Hinge

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Abstract

Attachment systems have been historically employed as a means of improving the retention and stability of tooth supported prosthesis in edentulous or nearly edentulous arches. The demand for fixed and removable partial prosthodontics has increased significantly. This increased demand is spurred by the rise in life expectancy in developed countries and the retention of more natural teeth [1]. It is estimated that this trend will continue as people live longer, thus have a greater desire for more elective esthetic procedures [2]. The current case report introduces a technique of treating a old patient with complicated problems of bad condition of remaining teeth with partially tulous arch. In this study a new precession attachment (DSE-Hinge) design was used to make prosthodontics.

Keywords

Prosthesis; Distal Stress Eliminator; DSE Hinge

Introduction

The dental professional must be able to relate to the patients concerns, both physically and psychologically. Treating partially edentulous situations can be challenging particularly distal extension situations where a fixed prosthesis is not indicated. Implant supported fixed partial denture is an option but this is sometimes not possible due to economic reasons. In these situations, Acrylic or Cast Partial Dentures are preferred, with barely satisfactory esthetical results. Clasp retained partial dentures undergo multiple adjustments and repair. The dentist has an alternate treatment option in the form of attachment retain partial denture to the patients. Attachment retain partial denture gives patient comfort, esthetics and function. Studies have shown that the survival rate of attachment retained partial denture for 5 years is 83%, of 67% up to 15 years and of 50% up to 20 years [3,4]. An attachment is a connector consisting of two or more components. Precision attachment: a retainer consisting of a metal receptacle (matrix) and a closely fitting part (patrix). The matrix is usually contained within the normal or expanded contours of the crown on the abutment tooth/dental implant and the patrix is attached to a pontic or the removable dental prosthesis framework, one component of which is fixed to an abutment and the other is integrated into a removable dental prosthesis in order to stabilize and/or retain it. Semiprecision Attachment-a laboratory fabricated rigid metallic extension (patrix) of a fixed or removable dental prosthesis that fits into a slot-type keyway (matrix) in a cast restoration, allowing some movement between the components [6].

- Intra coronal attachments: Are mainly used in connecting units of fixed partial prosthesis, retaining restorations with distal extension or bounded removable prosthesis.
- Extra coronal attachments: These types of attachments provide stability and attention for removable distal extension prosthesis.
- Stud attachments: Usually in the form of ball and socket, this attachment serves primarily for over denture stabilization and retention of the prosthesis. Swiss logic, ZAAG, Zest anchor is example of stud attachments.
- Bar attachments: Originally used for splinting groups of teeth, currently used for over denture retention and stabilization.

Hinge type of attachments resists any lateral tipping, rotational, and sliding forces. Hinge resilient attachments provide almost 30-35% load relief to the supporting implant. Each time one utilizes an attachment that provides hinge resiliency, the vertical components of the masticatory forces are shared between the attachments, and the posterior portions of the residual ridge, the buccal shelf, and retro molar pad [7]. Distal Stress Eliminator DSE-Hinge: it is an auxiliary type of attachment that is used in conjunction with conventional partial dentures [8] (Figure 1). The use of "fixed bridge" connected to the "DSE-Hinge" attachment made the attachment have strong retention derived from good properties for abutment teeth and utilizations of unfavorable undercut by preventing unidirectional path of insertion which limits

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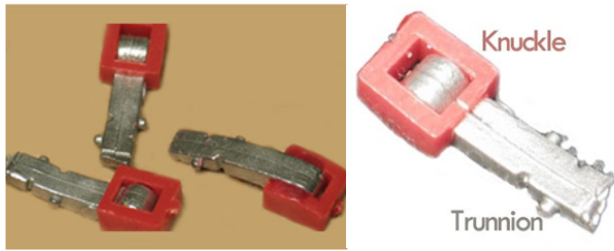


Figure 1: Distal Stress Eliminator-DSE Hinge

available undercut, and the use of this type of attachment "Buccalnatural undercut" being correctly used [9]. Aims of study were to use new precession attachment (DSE-Hinge) design to make prosthodontic appliance more comfortable, and esthetically acceptable than traditional design removable partial denture.

Case Report

A 65-year-old male patient was referred to the Department of Prosthodontics, College of Dentistry, University of Mosul with a chief complaint of missing teeth in the upper and lower jaw. On clinical examination we found that the remaining natural teeth are upper left 3.4 and lower left 3 and lower right 2.3.4 and he wishes to replace his teeth (Figure 2). Remaining teeth were periodontally sound and can be utilized as an abutment



Figure 2: Preoperative photograph

for precision attachment. Treatment was planned as precision attachment with Distal Stress Eliminator–DSE Hinge for the lower jaw and partial denture for the upper jaw.

Technique

Tooth preparation was done for the lower teeth to receive metal ceramic crowns. Gingival retraction was done and Two steps final impression was recorded by using silicone impression-material Polyvinyl siloxane (PVS) impression material. Type IV die stone is poured and interocclusal records were made. Wax patterns were prepared for metal ceramic crowns and with the help of dental cast surveyor precision attachments were attached to the distal aspect of the distal abutment. After construction of fixed bridge with DSE-Hinge attachment Vitallium alloy, (Figure 3). Try-in step was done to check the appliance in the patient mouth, (Figure 4) and a pick up impression was made (3M ESPE Dental products). Attachment retain partial dentures were fabricated (Figure 5). After placement of prosthesis intra orally (Figure 6), each three months for one year follow up was done.



Figure 3: The porcelain fused to metal crowns



Figure 4: Try-in step was done to check the appliance in the patient mouth

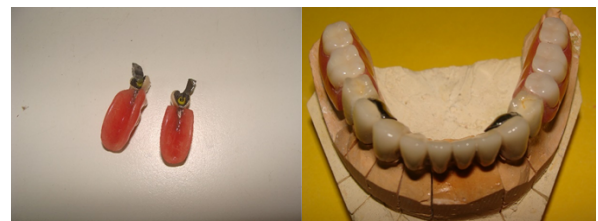


Figure 5: Attachment retain partial dentures were fabricated



Figure 6: Placement of prosthesis intra orally

Patient remarks about esthetic, function, retention, and stability, were better than the previous conventional removable prosthesis.

Discussion

The extra-coronal precision attachment serves to be an acceptable option of treatment. The major drawback with a RPD is the continuous loss of teeth after the restoration. Moreover, plaque retention, fracture of the component, periodontal breakdown of the abutment teeth or unacceptable esthetics adds to the failure of these prosthesis [10]. The treatment option for a fixed prosthesis, and RPD with hinge attachments has been achieved as an alternative treatment to conventional denture [11]. The patient in this clinical report was satisfied with function, esthetics, and decreased compression of the edentulous ridge in function. These results depend on the patients remark, that an improvement in chewing efficiency, and function was observed. Chewing movements became more balanced, stabilizer, and regular than those executed with RPDs [12]. Apart from improving aesthetic and retention of removable partial denture, the availability of the precision attachments have made designing of removable partial denture becomes more flexible [13].

Conclusion

Removable partial dentures fabricated with precision attachments are the viable options for patients in whom fixed prosthesis, where implants are contraindicated. Attachment DES-Hinge can be used to improve retention and aesthetic of Vitallium alloy removable partial denture, proper diagnosis and periodic recall preventative therapy will result in successful treatment and preservation of the patient's existing dentition.

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