

Radicular Stud Attachment: An Alternative to Improved Retention and Esthetics

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Abstract With the increasing demand and popularity of dental implants, the use of removable partial dentures in replacing missing teeth has become less popular. One of the obvious limitations of RPD is the unsightly view of metal used for the retentive clasp and the difficulty in obtaining a good fit. This case report describes the use of a radicular stud attachment as an alternative method to obtain improved retention and esthetics.

Keywords Precision attachment · Dalbo Rotex · Radicular attachment · Intracoronal attachment

Introduction

Implant treatments have become very popular among clinicians nowadays. Though implantology has taken a centre stage as a well researched and predictable treatment modality, it too has its limitations. Despite the established limitations of implant and fixed prosthesis; to name it cost, age factor, tobacco smoking, poor bone quality [1]; the importance of RPD cannot be denied.

The obvious limitation of an RPD is the unsightly appearance of the metal retentive clasp especially in the esthetic zone. Hence options of other types of retainers in

the form of intra and extra coronal attachments should be considered [2].

One such attachment is the radicular stud attachment—Dalbo Rotex attachment (Dehura Dental Lab). It was designed by Hans Dalla Bona of Switzerland. It is a ball and socket type attachment with the male or female component soldered to a root cap coping or directly cemented to a prepared tooth. Because of its low profile it has a reduced crown to root ratio. It is rotationally and vertically resilient (Class V function) with a minimum vertical height of 3.5 mm. The male component is made of titanium alloy, is self-tapping, has a pressure relief groove, and possesses a slight conicity. These properties enable a nearly tension-free incorporation of the root canal anchor. The female component is made of nylon. Optional gold or titanium females can be used. It allows for a divergence of 15°. It also allows for good oral hygiene maintenance. However the lab procedures associated are technique sensitive and skill is required to provide effective retention and at the same time prevent tooth movement. It provides hidden retention as it is embedded in the acrylic plate (Fig. 1).

Case Report

A 48 year old female patient had reported to the Prosthodontic clinic with a partially edentulous condition. On examination the right maxillary and mandibular posterior arches revealed a distal extension situation. The left maxillary and mandibular arches revealed missing 25, 26, 34, 36, 37 and severely supra erupted 24, 27 and 35 (Figs. 2, 3). An orthopantomogram revealed no obvious pathologies. Various treatment options were discussed with the patient and the replacement of missing teeth with a removable partial denture was considered.

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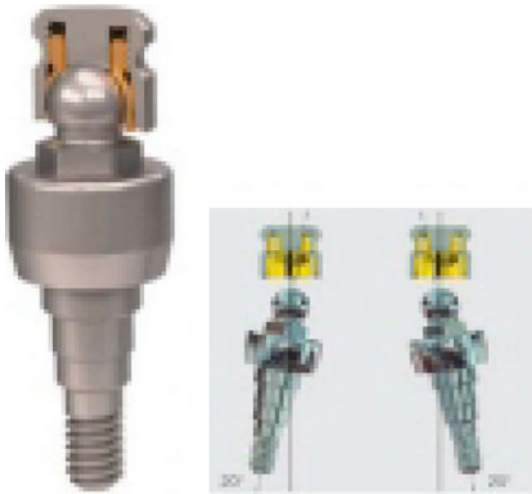


Fig. 1 Dalbo Rotex attachment



Fig. 2 Preoperative: right profile view

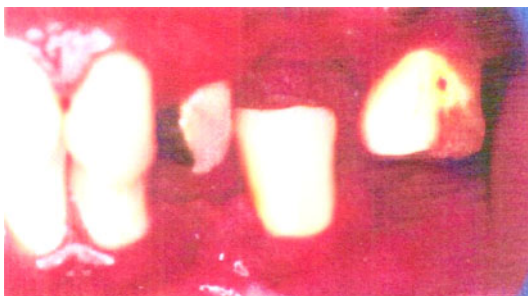


Fig. 3 Preoperative: left profile view

Procedure

Diagnostic impressions were made with alginate (alginoplast; Heraeus Kulzer, South Bend, Ind.) and diagnostic casts obtained with Type III dental stone (Labstone; Kalabhai Karson, Mumbai, Ind.). Preliminary surveying of the diagnostic casts were done and diagnostic mounting done to determine the treatment plan. Mouth preparation for a removable partial denture was executed. Tooth numbers

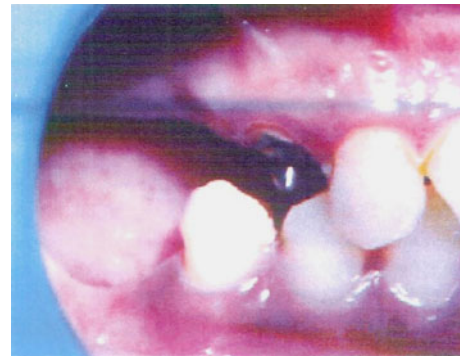


Fig. 4 Male attachment



Fig. 5 Male attachment



Fig. 6 Framework trial

14, 24, 27, and 35 were endodontically treated and reduced to gingival level to provide adequate inter arch space.

Post space was created on 14, 24, and 35 and the male component of the Dalbo Rotex attachment (Dehura Dental Lab) was cemented with glass ionomer cement (GC Fuji I, Gc Corporation, Tokyo, Japan); (Figs. 4, 5).

Further mouth preparation was done to receive the other components of the RPD. Definitive impressions were made with vinylpolysiloxane (Reprosil, Dentsply, USA) and the master casts surveyed to confirm adequate mouth preparation. Framework trial was done. (Figs. 6, 7).



Fig. 7 Framework trial

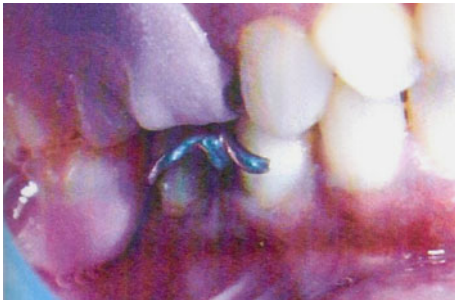


Fig. 8 Postoperative view



Fig. 9 Postoperative view

Functional impression of the edentulous area was made and the cast poured by the altered cast method. Bite blocks were prepared and face-bow transfer done. Interocclusal records were made to mount the casts on a semi-adjustable articulator (Hanau Wide Vue; Water Pik; Fort Collins; USA). Prosthetic tooth arrangement was done. Trial of the wax dentures were done and processed. The dentures were inserted and corrective occlusal adjustments were done. The female component was attached to the male component. A corresponding receptacle was prepared on the intaglio surface of the opposing dentures using a round bur. It was lined with autopolymerizing acrylic resin (Dental Product of India) to obtain a snug fit over the male

component. Hence the female component was adhered to the receptacle. (Figs. 8, 9).

Discussion

In an attempt to improve retention and esthetics of removable partial dentures, Goto and Tsai [3, 4] have used precision attachments in their construction. Jenkins categorized them into extra-coronal, intra-coronal, anchor, bar and auxiliary attachments [2] and according to their function as frictional retention, mechanical retention, magnetic retention [5] or screwed [6].

The Dalbo Rotex attachment [7] belonged to the intracoronal radicular stud attachment with the male or female component soldered to a root cap coping or directly cemented to a prepared tooth. Because of its low profile it had a reduced crown to root ratio. In addition to good retention, the use of this attachment enhanced the esthetics of the prosthesis compared to conventional clasps and also provided good oral hygiene maintenance. Other advantages included directing the forces towards the long axis of the tooth and better tolerance due to the reduced number of components. In the case of mandibular distal extensions a reduced posterior rotation was noticed.

Due to its technique sensitivity the use of this attachment had to be planned carefully to provide effective retention and to prevent tooth movement. It often succumbed to wear and was difficult to repair and replace as proved by Walton et al. [8].

Apart from improving esthetics and retention of removable partial denture, the availability of precision attachments have made designing of removable partial dentures more flexible. Various cases with esthetic and retention challenges can be solved with the correct selection of precision attachments. Thus, many unnecessary surgery and cutting of sound tooth for abutment preparation can be avoided in restoring missing teeth.

As a conclusion, removable partial denture still has a good place as a treatment option in replacing missing teeth. With proper case selection and treatment planning, precision attachments can be used to improve its retention and esthetics.

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