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Case Report

Enhancing retention of overdentures with semi precision Attachments- a case series

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ABSTRACT

Treating a partially edentulous arch with only few remaining teeth poses a restorative challenge to the clinician. Overdentures have been the choice of treatment in patients with partially edentulous arches, particularly in mandibular jaw as they provide advantages such as improved proprioception, decreased ridge resorption, better retention, stability and support. With the advances in technology, use of state of the art attachments has improved retention, stability and support as compared to a conventional denture. In this article, cases of overdenture with different attachments for given clinical scenarios have been presented.

Introduction

The loss of teeth is generally associated with esthetic, functional, psychological and social impairment of individual's life which may have great impact of the patient's self-esteem and health. Dental caries and periodontal breakdown are attributed to be the main cause for loss of teeth which are associated with factors like educational level, access to health care services and financial resources.[1] Complete edentulism can thus substantially affect oral and general health as well as overall quality of life.[2] In today's world preventive prosthodontics is playing a very important role as it emphasizes the importance of any procedure that can delay or eliminate future prosthodontic problems.[3] Preventive prosthodontics advocates use of overdenture as one of the treatment modalities by practicing dentists. It is further emphasized that patient treated with overdenture demonstrates less vertical alveolar bone resorption in comparison to conventional dentures and in turn preserves the residual alveolar bone. Usually the choice of attachment is determined according to number, distance and location of remaining natural teeth or the discretion of the prosthodontist on his clinical experience. Thus, preservation of tooth along with the use of state of the art retention system i.e. precision or semi precision attachments is an effective way to improve the retention and support of the prosthesis.[4] The aim of this clinical report is to present two cases of oral

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Case 1

Fig: 1 Diagnostic Jaw Relation to evaluate the prosthetic space

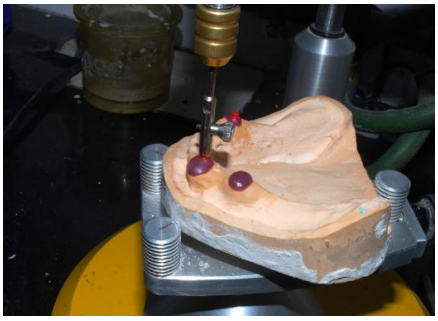

Fig 2: Placement of Semi Precision Micro OT attachment with Parallelometer to attain parallelism

Fig 3: Mandibular Denture with Indirect Pick up of Framework, Metal Housings and Nylon Sleeves

rehabilitation of maxillary and mandibular tooth-supported over dentures using semi precision attachments.

Fig 4: Cementation of cast Semi Precision Micro OT Attachments

Fig 5: Final Prosthesis in situ

Case Report 1: Mandibular Overdenture With Semi Precision Micro ot Attachments

A 65-year-old female patient with no relevant medical history reported to T.P.C.T's Terna Dental College, Nerul, Navi Mumbai with a chief complaint of replacement of missing teeth. Patient had undergone extraction of carious multiple teeth which were not restorable about 1year ago. On intra oral examination, teeth present were 13,23,33,35 and 43. After performing all the investigations, various treatment options ranging from interim partial denture to conventional complete denture, tooth or implant supported overdenture were suggested to the patient. The patient did not desire to undergo any further surgical procedure but nevertheless wanted a well

retained prosthesis. Hence it was decided to rehabilitate the patient with overdentures.

Case 2

Fig 6: Pretreatment Intra Oral View

Fig 7 A: Attachments Checked with Silicon Putty Of Trial Arrangement to Evaluate their Position

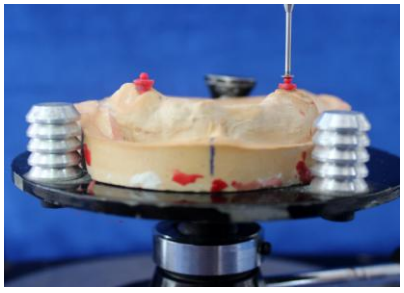

Fig 7 B: Parallel positioning of Attachments using surveying tool

Fig 8 A: Trial of Finish Attachments and Framework

Treatment procedure: the treatment procedure was divided into following phases:

Phase 1: Pre prosthetic Phase

Phase 2: Prosthetic Phase

Fig 8 B: Luting of Semi Precision Attachments

Fig 9: Indirect pick up of metal framework, metal housings and nylon sleeves

Fig 10: Final Prosthesis in situ

Phase 1: Pre Prosthetic Phase

After a diagnostic jaw relation, prosthetic space was evaluated to decide if sufficient space was available for use of additional retentive aids such as attachments (Fig 1). Once the prosthetic space was evaluated, all remaining teeth were root canal treated.

Phase 2: Prosthetic Phase

The abutments were now prepared to gingival level with a well-defined heavy chamfer finish line. A post space was then prepared in all the abutment teeth.

Border molding was carried out on a custom tray using Type I B low fusing impression compound (DPI Pianncle tracing sticks, DPI). Post space was recorded in wash impression which was made using ultra-light body wash impression material (AquasilUltraX LV smart wetting impression material, Densply). Due to presence of labial undercut, a gum fit mandibular overdenture with semi precision micro OT Equator attachments was planned. A facebow transfer was done and jaw relation was recorded. Waxed up denture evaluated in the patient's mouth. A putty index was made of the waxed up denture to decide the position of attachments. These attachments were placed parallel to each other using parallelometer(Fig 2). These were then casted and finished. A metal framework was fabricated to improve the strength of the mandibular denture. These attachments along with the framework were tried in the patient's mouth to verify jaw relation. Acrylization was done using high impact heat cured polymethylmethacrylate resin (Lucitone, Ivoclar) in which the metal framework, metal housings and nylon sleeves were indirectly picked up (Fig 3). The attachments were then luted onto the abutments (Fig 4). Denture insertion was done (Fig 5). Patient was giving instructions about usage and maintenance of denture. Importance of 24-hour recall and periodic recall visit was explained to the patient.

Case Report 2: Maxillary Overdenture With Semi Precision Mini Ot Attachments

A 72-year-old male patient reported to T.P.C. T's Terna Dental College, Nerul, Navi Mumbai with chief complaint of replacement of missing teeth. Patient had undergone extraction of multiple teeth due to poor periodontal health about 3 months ago. On intra oral examination, teeth present 13,22,23,33, 43, and 44 (Fig 6). After diagnostic investigations, it was decided to rehabilitate the case by an overdenture with mini OT Equator attachments.

The treatment procedure for this case also remained the same as discussed in previous case report until trial insertion. After which a putty index of trial denture was made to decide the position of the maxillary attachments (Fig 7 A). With the help of dental surveyor the positioning of the attachments was done to achieve desired parallelism (Fig 7 B). The attachments were casted and finished. Now the framework was fabricated using prefabricated connectors joined to each other by pattern resin (GC Fuji, Japan). These were then casted and finished. The attachments with the framework was then tried in patient's mouth to evaluate the fit (Fig 8 A). Acrylization was done using high impact heat cured polymethylmethacralate resin (Lucitone, Ivoclar). The framework with metal housings were indirectly picked up in the denture base (Fig 8 B). Nylon sleeves were then fitted into the framework. The attachments were luted (Fig 9). Denture insertion was done (Fig 10). 24-hour recall and weekly recall was done. Instruction for hygiene and maintenance was given to the patient.

Discussion

Preventive prosthodontics emphasizes the importance of any dental procedure that can delay, minimize or eliminate future problems. Tallgren concluded that anterior mandibular ridge resorbed four times faster than maxillary ridge with conventional denture.[2] It was concluded in a 5-year follow up study that patients treated with overdenture therapy had a chewing efficiency which was one-third higher than that of complete denture wearer.[5,6] The use of teeth as overdenture abutment is beneficial to the patient. The

psychological aspect of patients losing teeth should not be underestimated and has been well documented. The use of select teeth in strategic positions greatly improve the final treatment result in terms of overdenture stability and retention. The choice of micro OT semi precision attachment in mandibular arch in Case Report 1 is justified as the prosthetic space available was sufficient. Presence of labial undercut in mandibular arch led to choice of gum fit denture. Without attachments the retention of mandibular denture would be compromised. In Case Report 2 the prosthetic space available in maxillary arch was favorable for mini OT semi precision attachments. Use of metal framework in both cases greatly improved the strength of denture. The choice of these specific attachments in these clinical cases were considered because these attachments exhibit a simple design, easy maintenance and allows multi directional movement of retentive housing. It is also necessary to inform the patient that the elastic inserts of these system are affected by wear, resulting in a gradually loss of retention. Finally, the most important requirement for the success of overdenture therapy is the patient's awareness to maintain oral hygiene of remaining teeth used for support and/or retention.

Summary

Compromised retention in complete denture is a common complaint among edentulous patients. With inception of osseointegrated implants, the concept of implant supported overdenture has become immensely popular. Tooth-borne overdenture attachment therapy is a treatment option rarely chosen in today's aggressive marketing of implant supported prosthesis. However, considering the Indian scenario and bearing in mind the Devan's dictum of preservation of tissues overdenture therapy still remains a viable treatment option for an able prosthodontist. The incorporation of attachments in overdenture into everyday practice definitely opens new horizon in planning dental treatment and satisfying the patient in terms esthetics and function.

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