CASE REPORT

AN ALTERNATE AND VIABLE OPTION FOR MANAGEMENT OF LONG SPAN PARTIAL EDENTULISM – A CASE REPORT.

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ABSTRACT

Prosthodontic management for partially edentulous situations demand diverse treatment options. The long-span nature of the partially edentulous ridges complicate the senario due to unavailability of sufficient number of abutments to support the prosthesis and violation of stress mechanics which precludes the use of conventional removable and fixed partial dentures. This case report describes the management of a maxillary bilateral distal extension edentulous span with an extracoronal semi-precision attachment retained cast-partial denture as well as enhancing the esthetics and safe guarding functionality of remaining natural anterior teeth. The judicious use of attachments in such cases are beneficial as they are resilient and allow the prosthesis to distribute off axis loads away from the abutments to the underlying bone or tissues, generates cross-arch stability, esthetic, improved oral hygiene maintenance and economical thus alleviating both physiologic and psychologic upliftment for the patient

KEY WORDS

Semi precision attachment, Biomechanics, Preci-Vertix attachment, Distalextension, Long span edentulism

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INTRODUCTION

The design and maintenance of bilateral distal extension cases possess myriad challenges for clinicians, as they derive support from the teeth, the mucosa as well as the underlying residual alveolar ridges. They are often subjected to vertical, horizontal and torsional forces that have adverse effects during functional activities. To prevent displacement of the denture, conventional clasps have been widely used but often limited from an esthetic and functional perspective. To overcome such clinical challenges, implants placed bilaterally at the distal part of the denture bearing area often minimizes the potential for dislodgement.[1] The most frequently cited reasons for underutilization of implant therapy is that treatment cost is perceived to be too high. For reconstruction among these patients, fixed-type prostheses usually require more implants for support than removable prostheses, other factors such as insufficient bone volume and procedures to augment them requires multiple surgical procedures which are often declined by the patients. Thus a more convenient, inexpensive, less cumbersome treatment modality includes usage of a combined prosthesis with extra coronal semi precision attachment retained cast partial denture which counteracts and harmonizes the biomechanics, lessens damaging forces as well as enhance esthetics. Studies in literature shows a survival rate of such prosthesis to be of 83.35% for 5 years, 67.3% up to 15 years, and of 50% when extrapolated to 20 years, further validates such treatment outcomes.[2]

CASE REPORT

A 49 year old female patient reported to the Department of Prosthodontics and Crown & Bridge, Haldia Institute of Dental Sciences & Research with the chief complaint of difficulty in chewing and unacceptable appearance of her front teeth. After a thorough corroboration of history and clinical examination, it was found that the patient had several missing teeth both in the maxillary and mandibular arches. The reason was cited to be due to multiple carious lesions for which she underwent extraction with no significant complications. The


Figs 1 &2 :Pre-Operative Intraoral Frontal view and Pre-Operative orthopantomograph

patient had previously been restored with removable clasp retained dentures but was unable to wear them as they produced discomfort and significant displacement while chewing. A routine pre-operative radiographic assessment was carried out, clinical examination revealed satisfactory periodontal support of the remaining teeth with no sign of mobility or gingival defects (Figs 1 & 2). The mucosa over the edentulous span in both the arches were firm, resilient and had no signs of inflammation or other pathological abnormalities. Discussing the various treatment options, the patient declined the option of implant supported prosthesis due to economic reasons and wanted an alternate, more stable prosthetic option as she was dissatisfied with her existing removable clasp retained dentures. After obtaining patient's consent, a combined prosthesis with semi precision attachment retained cast partial denture was formulated.

The teeth present in the maxillary arch were 11, 12, 13, 14, 15, 21, 22 and 23. For evaluation of available space for the attachments, a diagnostic impression was made of the arches with irreversible hydrocolloid impression, a tentative jaw relation was made at existing occlusal vertical dimension and inter-arch space measured in the premolar region was found out to be 15 mm which was deemed adequate for the use of semi precision attachments in the maxillary arch (Fig 3). Diagnostic casts were articulated, and the treatment was carefully planned. Taking into account patient's esthetic concern, a diagnostic wax-up was also done on the mounted casts (Fig 4). A template was fabricated from the mock up for future fabrication of provisionals and as an added aid in judging the space required for the extracoronal attachments.

TECHNIQUE

- Maxillary teeth were prepared with the help of cutting indices made from the wax up to prevent over contoured restorations (Figs 5 & 6). After necessary gingival retraction and fluid control, impressions were made with polyvinyl siloxane impression material. The impressions were inspected and when deemed satisfactory were poured in gypsum product type IV, to obtain definitive casts.

- Subsequently crowns were milled in wax for maximum guiding plane surface (Fig 7). The wax patterns were cut back to receive porcelain fused to metal crowns. Burnout plastic male (Preci-vertix standard attachment) with built in paralleling mandrel was attached to the distal surface of thewaxed abutment using a dental surveyor, placed slightly lingual to the center of the proximal contour. This ensured that the bulk of the matrix did not create interferences (Fig 8). The height of the standard plastic male was 5.0 mm which was sufficient to provide lateral stabilization to the prosthesis.

- The entire wax pattern along with the male parts of Preci-vertix attachment was invested and casting was done inCo-Cr alloy (Fig 9). It was inspected for any

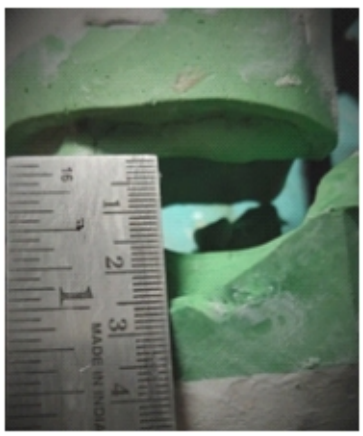


Fig 3: Measurement of interarch space

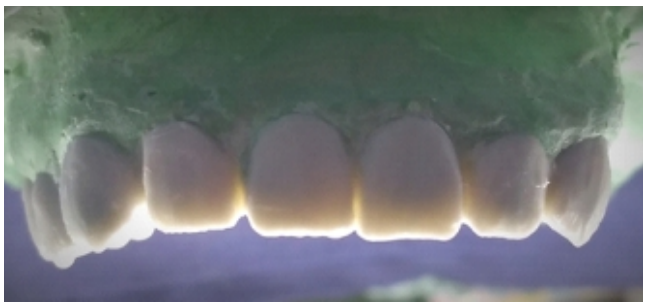


Fig 4 : Diagnostic wax-up

Fig 5: Teeth preparation

Fig 6 : Gingival retraction

Fig 7: Wax pattern build-up

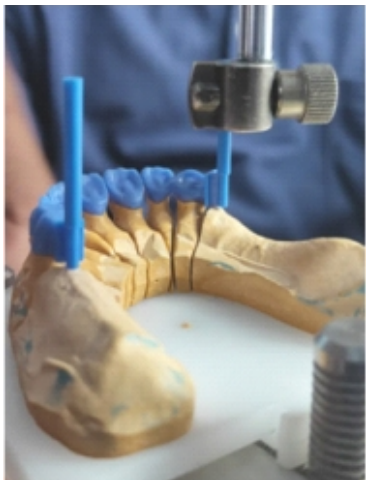
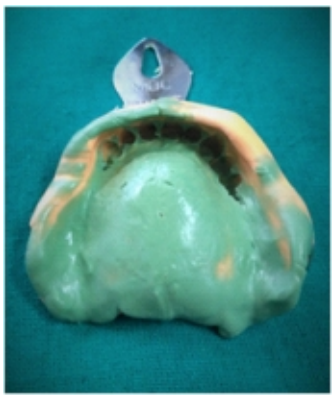


Fig 8: Attachment Of Male Component To The Wax Pattern And Verification Of Parallelism

Fig 9 :Metal copings

Fig 10 A,B :Completed Ceramisation



Figs 11 &12 : Cementation Of Final Restorations And Definite Impression

Fig 13: Pattern Fabrication For Cast Framework

Fig 14 A, B : Metal framework try-in and jaw relation

Fig 15 A, B, C : Post – Operative Intraoral Frontal and Lateral Views

BEFORE AFTER

Fig 16 : Evaluation of Pre-operative and Post-operative Frontal views

voids, discrepancies, sandblasted and subsequent veneering of porcelain was performed. The palatal surfaces were finished in metal to provide stable contacts and an unhindered anterior guidance (fig 10 A,B).

- The finished prosthesis (individual crowns and the abutted ones with the male portion of the attachment) was tried in the patient's mouth. After evaluating the margins and fit they were cemented with Glass ionomer cement and impression was made in polyvinyl siloxane impression material to obtain the cast for fabrication of the framework as depicted in (Figs 11 &12).

- Female polypropylene hader clips were attached to the cast male component. Wax-up of the cast framework was completed on the refractorycast (Fig 13), indirect laboratory pickup was performed and the entire cast partial framework was cast in Co-Cr alloy.

The trial of the framework was performed (Fig 14 A, B) and subsequently jaw relations were recorded and proceeded with teeth arrangement.

- Teeth arrangement was done and after trial, processing of the denture was done in conventional fashion in heat cure acrylic resin and the final prosthesis was inserted, patient instructions were given, and slight occlusal adjustments were made and periodic follow ups were performed (Fig : 15 A,B,C). The final esthetics and functionality of the restoration with the fixed and removable component was achieved satisfactorily. (Fig : 16)

DISCUSSION

Edentulism leads to an acknowledged crippling of oral function with both, esthetic and psychological changes. The aim of prosthetic reconstruction is to preserve and restore health, esthetics, and function. Attachments have a number of desirable qualities that indicate their use in place of conventional clasp retained removable partial dentures, primarily being esthetic upliftment. A major advantage of the use of attachments is that the point of force application to the tooth is more apical, thus shortening the lever arm and decreasing damaging forces. To minimize the masticatory load over the terminal abutments, and redirect the forces to the residual ridge thus preventing the torqueing of the abutment teeth, justifies the use of resilient attachments. Attachments also provide better cross-arch force transmission and stabilization than clasps, but this is determined by the type of attachment used, the number of guiding surfaces and the design and adaptation of the framework and the attachment.[3] In this particular case, Preci-Vertix (Ceka) attachments were used that provided frictional retention to the maxillary cast partial denture as they are extra-coronal devices in which exchangeable polypropylene clips of various colours are used to vary the retention force. The only factor of concern is that the female polypropylene clips are susceptible to wear and tear over the duration of long usage, and mandates its replacement. The maximum suggested duration of time to white caps or clips (standard retention) in mouth is 12 months.[4] The tissue under a passive, free-movingattachment is generally healthy as a result of the vertically-directed physiologic stimulation during function.[5] Another important aspect which promoted the use of such attachments is the availability of inter arch space which was much more than what is required, as the bare minimum requirement is 4 mm further clarifies its application.

LIMITATIONS

Though the whole treatment modality is inexpensive, more patient compliant, less cumbersome still it is not an exception without limitations. The parts of the attachment system requires very precise, skillful and controlled placement, failure of which can lead to damaging effects on the abutments.

CONCLUSION

This case report illustrates the option of using a removable prosthesis attached to a fixed prosthesis as a viable treatment option. With proper case selection and treatment plan, precision attachment such as Preci-Vertix attachments system can be used to improve retention, esthetics, and function of removable partial denture. The above mentioned procedure allows fabrication of very functional and comfortable prosthetic solution for the bilateral distal extension cases to covet patient dissatisfaction and avoidance of complex surgeries.

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