



## **Achieving an aesthetic smile and function with fixed and removable prosthesis using OT Strategy attachment- A Case Report**

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### **Abstract:**

Predictable and satisfactory restoration in a patient with a partially edentulous situation can be challenging especially when anterior segment of teeth is missing. Successful prosthetic rehabilitation can be done with various conventional and advanced treatment options. One of these treatment options is attachment retained removable partial denture. Most important factor for a successful attachment retained cast partial denture is proper selection of an abutment. Consideration of Abutment alignment, cross arch bracing, must be done with a thorough knowledge and understanding of Prosthodontic principles.

In this case report, a young patient presented with missing mandibular anterior teeth, unaesthetic and carious maxillary anterior teeth. The patient was concerned about esthetics as well as the function. Taking into consideration the above concerns maxillary anterior FPD and mandibular bilateral strategy attachment retained CPD was the chosen treatment option. There are various attachment systems developed which have been used for the rehabilitation of missing teeth. Every attachment system has its own set of advantages and disadvantages. OT STRATEGY attachments are the only attachments of this type to have a (patented) parallel support under the sphere. These attachments automatically align the retentive caps, which is an important factor for the insertion of the prosthesis. This will determine the duration of the caps and prevent the risk of wear to the spheres. The reduced dimensions of these attachments permit them to be applied in critical areas making them ideal for removable prostheses. It is the only OT attachment which resists lateral forces efficiently and indicated for anterior teeth. Considering the positive aspects, the chosen treatment modality proved beneficial in terms of both patient satisfaction and the overall success of the treatment.

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### **INTRODUCTION:**

The prosthodontic rehabilitation of anterior teeth should be esthetically acceptable and periodontally sound which requires a comprehensive approach to patient care.

Removable partial denture with attachments, especially the extracoronal type, is considered more efficient in providing retention and restoring function and aesthetics.<sup>1,2</sup>

The purpose of this article is to illustrate the use of new OT strategy attachment for aesthetic rehabilitation of missing mandibular anteriors.

### **Case Report:**

An 18-year-old female patient reported to the Department of Prosthodontics and Crown and Bridge, Postgraduate Clinic, Bharati Vidyapeeth Dental College and Hospital, Pune, India, with a chief complaint of missing lower anterior teeth and unpleasant smile along with difficulty in chewing and speech. While recording case history, the patient presented no significant medical conditions which will compromise the prosthodontic treatment plan.

Intra oral Examination showed missing mandibular anteriors (31,32,33,41,42,43) and carious maxillary 11,52,53. Prognosis of 52,53 was poor. 11 had class 5 caries. 62,63 were deciduous teeth. [Figure 1]

All the treatment modality options available which will address patients' complaints were discussed, including fixed implant-supported prosthesis, and mandibular attachment retained RPD.

Diagnostic impressions were made and casts were poured. Diagnostic jaw relation was recorded. Considering all the factors regarding patient's need, economic status, interarch space available and need of resisting lateral forces on anterior teeth during function, strategy attachment retained mandibular removable partial denture was the chosen treatment option.

Prognosis of 52, 53 was poor hence they were extracted and 4 unit FPD was the decided treatment option with complete coverage zirconia crowns with 21,62,63 to achieve the desired aesthetic results. For strategy attachment retained removable partial denture the clinical protocol taken into consideration was to choose two adjacent abutments on either side of the edentulous arch in mandible i.e. both premolars on either side.

Crown preparation of both the abutments with shoulder margins on either side was done and final impression was made with putty light body (3M ESPE, soft putty, light body Germany). [Figure 2,3] Temporization was done with Protemp (Protemp plus Temporization Material; 3M ESPE) and cemented with zinc-oxide non eugenol cement (RelyX Temp NE; 3M ESPE). After this, working cast was poured with type 4 die stone (Elite® rock, Zhermack, Italy) and articulated on the Stratos articulator with opposing maxillary arch. [Figure 4] At the same time, teeth preparation of 11, 14, 21, 62,63 for rehabilitation of upper arch was also started.

On the working cast, wax patterns were fabricated, strategy attachments were added on both the sides. Rests were prepared on lingual surfaces of wax patterns for improved support.[Figure 5] This was followed by casting and polishing. [Figure 6]

Ceramic layering was done according to the selected shade. [Figure 7]

Secondary metal reinforcement framework was designed over this and casted. [Figure 8] followed by insertion of yellow caps. [Figure 9] Trial of crowns and the reinforcement framework was done in patient's mouth. [Figure 10,11]

In the forthcoming appointment, the teeth arrangement was tried-in. Group Function occlusal scheme was given. [Figure 12] Metal reinforced framework, housing was incorporated into denture during final processing. The prosthesis was delivered to the patient.

After completion of mandibular rehabilitation, bisque trial of layered zirconia crowns was done in maxillary anterior teeth. [Figure13] After doing required corrections in bisque trial final glazing was done. Final Cementation of crowns was done with resin cement. (3M ESPE Relyx U200). [Figure 14]

### **Discussion:**

Proper case selection, diagnosis, and treatment plan are important aspects of Prosthetic rehabilitation. Every patient has a differential diagnosis that requires a structured treatment plan. Although implant-supported restorations are increasingly used to restore partially or completely edentulous teeth, the traditional partial removable dental prosthesis remains a treatment of choice because of its lower cost and insufficient alveolar bone.<sup>3</sup> Attachment retained Removable partial dentures, especially the extracoronal type are considered more efficient in restoring function, resisting forces and providing retention and stability.<sup>4,5</sup> In conventional Cast Partial Denture, clasp assemblies and rests may be visible and unesthetic whereas attachments get enclosed within contours of the part of the prosthesis.

In this case report, OT Strategy (Rhein83), vertical micro-sized (1.8 mm) castable sphere was used. Sphere has an advantage of increased shear force strength, prevention of rotation of female cap and increased lateral stability. OT Strategy caps are manufactured from an elastic material that increases the contact zone with the sphere, giving friction and mechanical retention. Rhein83 has female caps with elastic retention with the intention of eliminating as much vertical stress and trauma to the restoration as possible.<sup>6</sup> In this case, rests were also prepared on lingual surfaces of the pfm crowns for improved support and stability to prevent lateral forces. Furthermore, with this attachment prosthetic space can be managed efficiently, thus providing good esthetic results. Oral hygiene maintenance is implemented using daily oral hygiene measures by the patient and a professional cleaning by a dental hygienist can be carried out every 4–6 months.<sup>7</sup>

### **Conclusion:**

The aim of this clinical report is to demonstrate the use of OT-strategy attachment and to incorporate metal framework in mandibular removable partial denture. This newly designed attachment is useful in providing a significant amount of retention and resistance to lateral as well as vertical forces and mainly indicated for anterior teeth.

**Declaration of patient consent:**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed

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Figure 1- Post -operative image



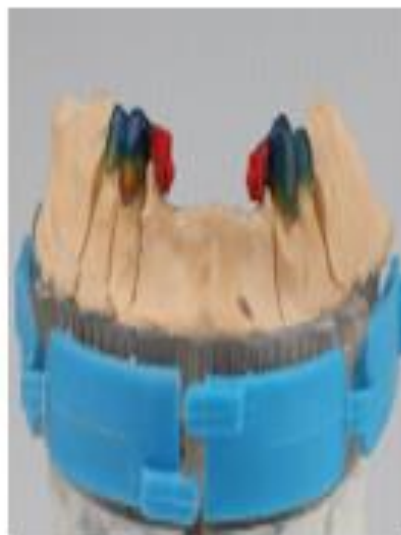
Figure 2 – Putty light body impression



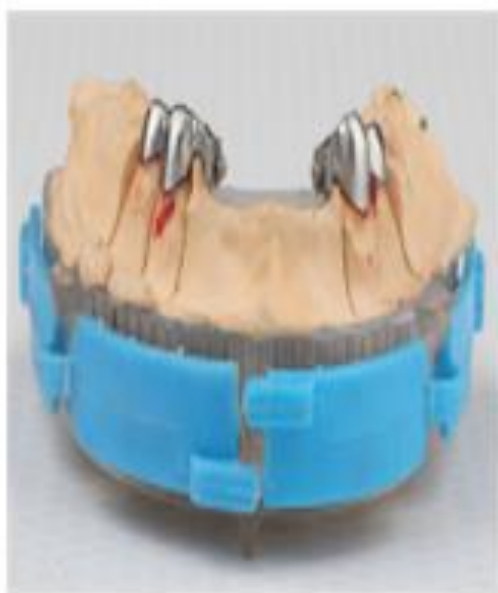
Figure 3 – Teeth preparation



**Fig 4 -Articulation**



**Fig 5 - Wax Pattern Fabrication**



**Fig 6 - Casting & Polishing**



**Fig 7 - Ceramic Layering**



**Fig 8 – Metal reinforcement framework**



**Fig 9 – Insertion of yellow caps**



**Fig 10 - Trial of crowns**



**Fig 11- Trial of metal reinforced framework**



Fig 12 – Teeth arrangement Try in



Fig 13 –

Mandibular denture insertion & maxillary bisque trial



Fig 14 – Final