

A Simplified and Cost-Effective Treatment Approach for Combination Syndrome: A Case Report

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Abstract

Combination syndrome is a dental condition, mostly observed in patients with a completely maxillary edentulous arch and a partially edentulous mandibular arch persisting only the anterior teeth. Specific oral destructive changes are often seen in patients. The manifestation of this syndrome consists of resorption in the anterior maxillary ridge, overgrowth of tuberosities, and supra eruption of mandibular anterior and reduced alveolar ridge height in combination with hypertrophic and atrophic changes in the maxilla and mandible. Complications involved in chewing and mastication are of special apprehension in such a patient. Predictable prognosis can be offered by overdentures. This article attempts to provide a simplified and cost-effective approach to this type of treatment modality by a case report.

Keywords: *Combination syndrome; Cost-effective approach; removable partial dentures.*

Introduction:

The statement by Dr. Muller DeVan “Perpetual preservation of what remains is more important than the meticulous replacement of what is missing” still sounds factual.³ Overdenture is one such preventive treatment modality that helps in delaying the process of resorption thereby improving the denture foundation area, as well as enhancing the masticatory efficiency of the patient. In certain cases of Kennedy’s class I and class II rehabilitation of the edentulous space can be challenging where providing a fixed prosthesis may not be possible due to lack of sufficient amount of bone or cost-effectiveness. The removable partial denture retained with attachments is one of the treatment modalities that can facilitate both functional and aesthetic requirements. Various types of attachment systems are available for tooth-supported overdenture treatment modality. Among

various attachments, the Dolder bar and the Hader bar system are the most commonly used attachments for overdentures and implant-retained restorations.^{1,2}

All the attachment systems intent to provide better retention and support for the overdentures. In the case of mandibular overdenture the retention can be profoundly achieved by the support of natural tooth retained with bar or stud provided in the anterior region. But the disadvantage of these extracoronal attachments bar systems is that they are expensive. The concept of conventional tooth-retained overdenture is proved to be one of the simple and cost-effective treatment modality in comparison to the complex implant-supported overdentures. Bar attachments are more advantageous over other types owing to its splinting effect on the abutment teeth while eliminating the need for parallel abutments and guiding the prosthesis in place. So, bar-retained overdentures are the choices of treatment for most of the clinicians, but the only obstacle is its cost, leading to the constant need for technical innovations to better the existing modalities in terms of their availability and expense.

In the past, custom made header bars using plastic straws and custom made clips using gold alloys have been tried in an endeavor to avoid the costlier.

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The present article demarcates some of the necessary considerations in the treatment planning of a typical case of combination syndrome. Along with which the clinical report describes the complete treatment procedure for the patient, in which the mandibular tooth-borne overdenture is fabricated with a customized hader bar, customized clip and a metal base maxillary complete denture for better durability and proprioception. In consideration of periodontal health of remaining teeth and ridge form, overdenture with the hader bar attachment was planned. Customized hader bar and clip attachment was attempted owing to his financial constraints.

Case report: A 54-year-old male reported to the Department of Prosthodontics, Institute of dental sciences, Bhubaneswar, complaining of missing teeth and inability in mastication. The medical history of the patient was evaluated which was found to be of non-contributory. On intraoral examination it was observed that he had a completely edentulous maxilla with enlarged tuberosities with to some extent a resorbed anterior maxillary arch and a partially edentulous mandible with Kennedy's type II modification 1 comprising of supraerupted existing teeth i.e. 33,34,43,44 are present bilaterally. (Figure.1) The patient reported the extraction of lateral incisors bilaterally 3 weeks back. The patient gave a history of teeth loss since 5 years due to multiple caries and periodontal problems. On radiographical examination of abutment teeth were found periodontally compromised. On the evaluation of the patient's existing clinical condition, it was planned to construct maxillary metal base complete denture and mandibular tooth retained overdenture with an extracoronal attachment. The patient was unwilling for the options of implants because of the need for economic constraints, additional surgery and the unacceptable duration of treatment phase.

Technique: After oral examination the impressions were made and the casts were retrieved which were used for the assessment of the inter-arch distance. A tentative jaw relation was recorded and the casts were mounted on an articulator.¹ In the present case, a sufficient space was found to be there to accommodate bar supported overdenture, which facilitated to fabricate a customized metal-based complete denture for maxilla along with the bar attachment overdenture for the mandibular arch.

The metal palate was customized in such a way that the metal loops were fabricated in a specific orientation and positioned upon the crest of the ridge providing an

interlocking mechanism for the acrylic, without creating any interference for the arrangement of artificial teeth. The primary impression of the maxilla was made with impression-compound, custom tray was made with auto polymerizing resin. Border molding was done followed by a secondary impression with zinc oxide eugenol which was poured with dental stone (type III). The final cast was retrieved from the impression and was duplicated to make a refractory cast (Figure 2a). The customization of this metal palate was carried out on this refractory cast.

Spacerwax was adapted over the palate that extends 2-3 mm beyond the crest of the ridge. 2-3 mm long loops were made up of wax were attached to the margins of the adapted palatal wax. It was made sure that all the loops should be 3-4 mm short from the sulcus area.⁴ The main function of these loops is to enhance the mechanical interlocking of acrylic to the metal base. This holds an importance that the loops should not be interfering with the acrylic border of the denture that extends to the sulcus. Towards the palatal side tiny loops were made palatal to the crest of the ridge. The loops were placed in such a way that it would not impede with the artificial teeth arrangement, and help in the flow of acrylic resin (Figure 2b). After the designing of the palate, wax sprues were attached, invested followed by casting. Following the casting and finishing of the metal base (Figure 2c), it was incorporated into the heat cure acrylic denture base. Later the occlusal rims were fabricated upon it.

For the mandibular arch, Root canal treatment was performed and post space was prepared in 33,34,43 & 44, keeping both the preparations parallel to each other so that a common path of insertion could be accomplished. Tooth preparation was carried out on both mandibular canines and right mandibular 1st premolar with a heavy chamfer finish line, which resulted in the optimal crown-root ratio and adequate clearance for overdenture prosthesis.³ An impression was made and poured with dental stone type II, upon which a custom tray was fabricated. Border molding was carried out using a green stick compound in the custom tray. Impression of post space and the mandibular ridge was made with polyvinyl siloxane as illustrated mandibular final impression that was made with polyvinyl siloxane impression material and it was poured into dental die stone. On the master cast, the pattern for the post was prepared using pattern resin and the coping was made over it using pattern wax.⁵

The wax pattern for the copings was made and a toothpick was shaped and was attached to the wax

patterns splinting the right and left abutment teeth to obtain more stability.⁵ Bar framework with metal housing mold was invested, burned-out and cast according to the manufacturer's instructions.⁷

The whole assembly was invested, burnout and cast in cobalt-chromium alloy, finished and polished. The casting was checked for a passive fit inside the patient's mouth.² After the metal try-in, the bars, with their respective copings, were again placed intraorally and checked. After this step, the bar, along with the metal copings, were luted onto the respective preparations and the respective tooth preparations with the help of glass ionomer cement and the undersurface of the bar was blocked (Figure 2d). The whole assembly was duplicated with the elastomeric impression material and was poured (Figure 2e). The remainder of the procedures up to try-in was carried out as the conventional method for complete denture (Figure 2f). After the fabrication of the mandibular overdenture, the inner surface at the site of the bar was trimmed about 1mm to make space for the custom clip (Figure 2g).

Later, the custom made plastic clip was placed on the cast bar in the patient's mouth and a pickup of the clip with soft relining material was done with the processed denture. The self-cure acrylic resin was replaced only on

the crest of the clip and relining material didn't cover the intaglio surface of the clip.

Following the maxillomandibular relations, records were obtained from the patient, the cast was mounted on the articulator, teeth arrangement was done for both maxillary metallic denture and the mandibular bar-retained over denture and the try-in was performed, followed by acrylization (Figure 2h, 3, 4). The patient was instructed with the method of wearing and removing the dentures. Post insertion followup was done within an interval of 1 to 2 weeks. After a follow-up of about 6 months, the patient reported better improvements in symptoms which he had previously mentioned (Figure 5).



Figure 1: Preoperative intraoral condition after 3 weeks of extraction of 12 and 22

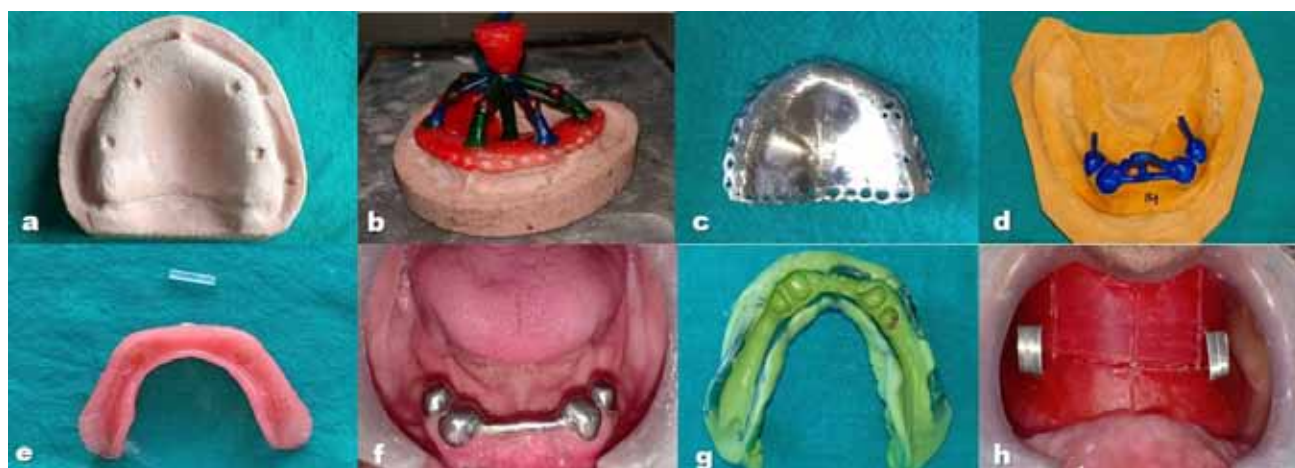


Figure 2a. Duplicated refractory cast; 2b. Sprue attachment to spacer wax; 2c. Maxillary complete metallic denture base; 2d. Wax pattern of metal copings and bar attachment with sprue; 2e. Mandibular overdenture with customized plastic clip retained in soft liner; 2f. Bar retained overdenture with metal copings; 2g. elastomeric impression of mandibular arch; 2h. Maxillomandibular relation record



Figure 3. Wax try-in



Figure 4. Complete rehabilitation



Figure 5. Post-operative photograph.

Discussion

Various extracoronal attachment systems that are easily available in the market are used for the fabrication of overdenture. Among all, dolider and hader bars are the most commonly used extraoral attachment systems

for the overdentures.⁷ Overdenture with attachments can redirect the occlusal forces away from the weak supporting abutment teeth and onto a soft tissue or redirect them toward stronger abutments thereby resulting in superior retention. Bar exhibits more cross-arch involvement and allows occlusal forces to be shared between the abutments.³ The bar attachment provides a slight amount of vertical as well as rotational movement of the denture which almost acts as a stress breaker.⁷

This case involved the preservation of two canines and one premolar for mandibular overdenture in providing support, retention, stability and comfort superior to that of a conventional complete mandibular denture. In this clinical case, the mandibular anterior ridge allowed an easy fabrication of the bar joint. In this case metal bar was used as a male component splinting the abutments with a female component that has been embedded in the tissue surface of the denture base by following the indirect technique.⁴ The splinting somehow reduces the torquing of the remaining root structure. There are several advantages to this procedure – ease of incorporation of clip attached to the metal superstructure helps in providing accurate fit and thus minimizing the damage to the definitive prosthesis, thereby providing adequate strength.⁸ The retention clips can be easily replaced, further relining and repairing would not compromise or risk the fracture of the dentures.³ The only disadvantage of the technique includes the extra steps during fabrication and limited applicability in patients with reduced interarch space. It is the most acceptable treatment for those who cannot afford the high implant cost and also those who are medically unfit to undergo surgery. The tooth-supported overdenture forefront the preventive prosthodontic modalities; this requires more innovation to make it the most beneficial and economical regular clinical practice.

For the maxilla, metal-based dentures were fabricated as a treatment option as it has advantages such as its adequate strength, better adaptation to the supporting tissues, enhanced plaque control, good thermal conductivity, minimal dimensional changes, and absence of interference to phonetics due to lightweight. Whereas only disadvantage associated with these dentures is difficulty in fabrication. Nevertheless; they may be indicated when polymer-based systems fail to provide acceptable physical properties.^{9, 10}

Summary: To overcome the sequential destructive changes of the combination syndrome the prosthodontist

try certain treatment planning which may require a multidisciplinary approach, keeping in mind the functional, esthetic and economic requirement of the patients. In underdeveloped or developing economies, where the patient's willingness to pay is very low, the clinicians must utilize their knowledge to make sophisticated systems more economical.¹⁰

Conclusion

Therefore, this article presents a case report for a patient with combination syndrome that was treated with a significant treatment planning in a cost-effective method. The objective of these removable partial dentures is retention, stability, support and esthetics. The above-described method is a cost-effective technique and fulfills all the objectives.

Conflict of Interests: None

Ethical Permission: Approved

Funding: Nil

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