Overdenture Prosthesis: Alternative to Orthodontic and Orthognathic Surgery: A Case Report

SUMMARY

Overdenture prostheses are often used to overcome difficulty in using complete dentures, poor prognosis of supporting teeth of removable partial denture, the presence of severe attrition, congenital or acquired defects and Class III malocclusion. In Class III malocclusions, function and aesthetics are major overwhelming problems and can be solved within orthodontic treatment or orthognathic surgery; however, these treatments are difficult, expensive and long lasting. An alternative method, prosthetic treatment, can be easy, reversible and economic.

In the present case report, a skeletal Class III malocclusion patient was treated with prosthetic treatment.

Keywords: Class III malocclusion; Overdenture

Introduction

Solving of Class III malocclusion is still a big debate in prosthodontics. Therapeutic alternatives for dento-skeletal Class III malocclusions include orthodontic treatment in young patients and surgery in adults. For patients who have been presented with surgical-orthodontic plan, potential costs, risks and duration of treatment should be undermined, thus a prosthodontics alternative can provide welcome relief. Prosthodontic therapy is used as an alternative to other options, such as orthodontics and combined orthodontics/orthognathic surgery procedures, satisfying the aesthetic and functional requirements of the patient within stable occlusion. In addition, prosthodontic therapy is less invasive and remains somewhat reversible when compared with surgical options. When treatment has been completed, the patient has an opportunity to fully assess the prosthetic result and then, if dissatisfied, can still decide to accept orthodontic and surgical treatment. However, potential disadvantages of prosthodontic therapy include compromised aesthetics when the dentures are removed, and caries and periodontal diseases as results of poor hygiene.

A Case Report

This clinical report describes a patient with skeletal Class III who was treated with maxillary overdenture prosthesis. The patient was a 37-year-old man referred to our prosthodontic service for evaluation. His chief complaint was aesthetic and function deficiency. Cephalometric, panoramic and periapical radiographs were taken and Rickett’s cephalometric analysis was completed. The patient showed a mixed dental, skeletal malocclusion.

Intraoral examination revealed 8 permanent teeth in the maxilla (right incisors and premolars, left incisors, canine and second premolar), and 9 permanent teeth in the mandible (right and left incisors and canines, right first premolar and left premolars). On the basis of the radiographic, cephalometric and oral examinations, the patient was diagnosed with Class III skeletal malocclusion and partially edentulous maxilla and the mandible (Fig. 1). Treatment options were orthognathic surgery and implant surgery for fixed partial restoration. Financial constraints, fear of surgery and long term treatment restricted patient from choosing the most desirable treatment. Therefore, it was decided to make overdenture prosthesis that can significantly improve function and aesthetics.

Careful evaluation of factors relative to the vertical dimension of occlusion (VDO) is essential for appropriate treatment planning. Interim removable dentures (Fig. 2) for the maxilla and the mandible were fabricated with heat polymerized acrylic resin to provide aesthetic results, re-establish the occlusion and allow the patient to become familiar with overdentures before delivery prosthesis. The patient was instructed to wear prosthesis for 2 months. During that time VDO, aesthetics, phonetics and function
were evaluated. Because the patient responded favourably, a decision was made to reproduce the VDO and tooth positions in the definitive overdenture.

The prosthetic treatment consisted of metal copings of teeth retained in the maxilla in order to provide stability and retention for overdenture. Sound teeth beneath the overdenture prosthesis may develop caries lesions if oral hygiene was not good enough; so, it was decided to make metal coping to prevent risk of caries development under overdenture prosthesis. So the present teeth were prepared with chamfer finish lines. In addition, intracoronal attachment (Trietech, Chemiproduced & Vertrieb, GmbH & CoKG, Germany) were placed between maxillary left canine and second premolar and between right lateral incisors and first premolar for extra retention (Fig. 3). Metal copings were casted and adjusted for cementation at the time delivery of the overdenture prosthesis.

For the mandible, we decided to make a conventional partial denture. After adjustment metal copings, final impression was taken for framework with custom trays. The master casts were formed and surveyed to confirm the path of insertion and the framework outline was drawn. The unwanted undercuts were blocked. Then it was duplicated in refractory material. The duplicated casts were mounted in semi-adjustable articulator with a facebow and centric relation record. To record the desired VDO, 2 reference points were drawn on the patient’s nose and chin. The patient was asked to close into CR while the maxillary immediate provisional prosthesis (IPP) was in place. The distance between the 2 reference points was measured to restore the appropriated VDO. IPP were removed from the mouth, and the patient was guided to close in CR until the distance between the 2 references points on the patient’s nose and chin coincided with the distance reinsured previously with IPOP. This record was obtained with a silicone-based interocclusal recording material (Regibite, Promidice, Neumunster Germany).

A metal framework for maxilla was finished to a special master cast that accommodated the copings. The framework was adjusted and relieved as need in its adaptation to these parallel copings. Also the framework was adjusted for the mandible. The artificial teeth were arranged and tried-in to verify jaw relation records and obtain the patients’ approval before final processing. The prostheses were processed with heat polymerized acrylic resin (Meliodent, Heraeus Kulzer, Newbury Berkshire). The occlusion was adjusted and the prostheses were finished and polished. In this stage, for the maxilla, copings were cemented and dentures were adjusted and equilibrated as needed (Fig. 4). Patient used to tolerate the denture for the whole day; the denture was then controlled and natural occlusion harmonized.

Regular recalls were scheduled for 6 months, 12 months and 5 years later. There was no bleeding, no soft tissue inflammation beneath the overdenture prosthesis between 6 months and 12 months. At the end of the 5 years there was gingival inflammation under intracoronal attachment between left canine and second premolar (Fig. 5). Gingival inflammation was treated by laser (Er-YAG Cantac R12-Slovenia), and then overdenture prosthesis was polished (Figs. 6 and 7). The patient was satisfied with overdenture prosthesis during 5 year.
Discussion

The existing tooth position, the VDO established during the prosthodontic evaluation phase, and the uncertain prognosis and financial burden of combined orthodontic/orthognathic surgery, favour prosthodontic rehabilitation with overdenture prosthesis. Overdenture prosthesis in our patient improved retention, allowing aesthetic and functional rehabilitation. After the treatment, the patient can fully assess the prosthetic result and then, if dissatisfied, might still decide to accept orthodontic and surgical treatment.

Several disadvantages are associated with overdenture prosthesis, such as the compromised aesthetics when prosthesis is removed. Also, overdenture treatment may be related to caries and periodontal disease as a result of poor oral hygiene. To make metal copings on the sound teeth may prevent caries risks, although surgical procedures can be performed in both cases, overdenture prosthesis is usually the only viable treatment alternative when expenses and morbidity of the surgical procedures are taken into account.

Conclusion

This clinical report demonstrated that overdenture prosthesis is a relatively inexpensive method of treatment for with Class II malocclusion patients. Our patient, treated with overdenture prosthesis, described that the treatment improved aesthetics and oral function.

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References


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