

Rehabilitation of partially edentulous patient with prefabricated stainless steel crowns incorporated in complete denture prosthesis

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Abstract: Rehabilitation of a patient with single tooth present on either side of edentulous arch can be done by various methods. But sometimes the patient is not willing to undergo time-consuming procedures of endodontics and fabricated prosthesis on the retained teeth, or the patient is medically compromised so that extraction of the tooth is not indicated. This report describes a novel technique for the fabrication of a complete denture by incorporating prefabricated stainless steel crowns in the denture, which will cover the retained teeth in the upper arch and will also aid in retention of the denture. An acrylic resin removable denture is fabricated. The stainless steel crowns are retained into the denture using molar band, which is soldered to the crowns and extensions are incorporated in the denture resin. The entire technique is inexpensive, helps in retaining teeth and demands less skill compared to semi-precision and precision attachments.

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I. Introduction

In the patients with partially edentulous arches with only single tooth or a few teeth present, we have to undergo treatment of the teeth to include them in making an overdenture. Either we need to endodontically treat these teeth or extract them. Sometimes dentures are made around these teeth without involving them in the denture. Peripheral seal may be inadequate in such cases. Hygiene becomes difficult due to food lodgement between the denture and teeth and eventually the teeth may become carious. Also the number of visits to the dental office and cost of treatment also increases due to procedures such as endodontic treatment, telescopic crowns or precision attachments. In this case report a novel method of customizing the denture by incorporating prefabricated stainless steel crowns in the denture which fit on the retained teeth has been shown.

This procedure is inexpensive and convenient for the patient and of ease for the operator. It also protects the retained teeth from caries as minimal or no tooth preparation is required and prevents food lodgment.

II. Case Report

A 65 year old female patient reported to the Department of Prosthodontics, MGV's KBH Dental College, Nasik with a complaint of ill fitting upper denture opposing a lower denture. On examination of the maxillary arch, only second molars were retained on either side of the arch and rest of the arch was edentulous. The mandibular arch was completely edentulous. The edentulous part of the maxillary arch was well-formed and the remaining molars were clinically sound [Figure 1]. Patient was not willing for endodontic treatment. A denture with incorporated prefabricated stainless steel crowns for maxillary arch and a complete denture was planned for the mandibular arch.



Figure 1: Intraoral view showing the maxillary arch with retained second molars. [Click](#)

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The primary impressions were made using irreversible hydrocolloid impression material (tropicalgin; Zhermack, Italy). The casts were prepared using type II dental plaster. Custom tray was fabricated on the primary cast with autopolymerising acrylic resin (Rapid Repair, Dentsply, Gurgaon, India). Border molding was carried out using low fusing green stick compound (DPI Pinnacle Tracing Sticks, the Bombay Burmah Trading Corporation, Mumbai, India). Final impression was recorded using light body addition silicone (Express TM light body, 3M ESPE, Seefeld, Germany) for maxillary arch and zinc oxide eugenol impression paste (DPI Impression Paste, the Bombay Burmah Trading Corporation, Mumbai) for mandibular arch.

Master casts were prepared using type III dental stone (Kalstone; KalabhaiKarson Pvt. Ltd., Mumbai, Maharashtra, India). On the cast prefabricated stainless steel crowns were selected and adapted according to the size and shape of the second molars on both sides of the maxillary arch. Extensions using molar bands (dental material orthodontic molar band; Hangzhou Nuoke Medical Instrument Co. Ltd, Zhejiang, China) were adapted on the palatal side and mesial and distal side of the crown, then spot welding was done to join the bands onto the crowns. The entire assembly was tried in the patient's mouth to assess its fit and the availability of the interarch space; it was then placed back onto the cast.



Figure 2: Selection of prefabricated stainless steel crowns and checking fit intraorally. [Click here to view](#)



Figure 3: Prefabricated stainless steel crowns adapted onto the cast and molar band extension spot welded onto them. [Click here to view](#)

Holes were made in the molar band extensions for mechanical locking of autopolymerising acrylic resin and then the temporary denture base and the occlusal rim were fabricated. The jaw relation was recorded followed by articulation and teeth arrangement. Try-in was done followed by acrylization with heat-polymerized acrylic resin (Trevalon; DENTSPLY India Pvt Ltd., Gurgaon, Haryana, India). Laboratory remounting, and finishing and polishing of the prosthesis were done.



Figure 4: Dewaxed flasks with crowns and holes in the molar band extensions for retention of denture resin. [Click here to view](#)



Figure 5: Completed denture which has stainless steel crowns incorporated in it. [Click here to view](#)

While denture insertion, overextensions were checked and fit of the crowns was reevaluated. The prosthesis was inserted in the patients mouth [Figure 6] with oral hygiene instructions and the patient was intimated about the importance of periodic checkups.



Figure 6: Intraoral view showing the prosthesis. [Click here to view](#)

III. Discussion

The concept of retained tooth support for complete dentures permits the dentist to assume a significant role in preserving natural teeth and supporting structures. In many instances, teeth that would otherwise be removed can be maintained to help support complete dentures. Even a single natural tooth can successfully help support a denture¹.

Periodontal condition of remaining teeth is an important determining factor for retaining them or extracting them. If the teeth are sound, they should be retained as long as possible.

Shetty et al, in his article has said that we can retain teeth and custom attachment denture can be used as a transitional prosthesis when the remaining teeth are expected to be lost in the near future². In the present article we have used prefabricated stainless steel crowns with extensions so they can be easily incorporated in our denture. The stainless steel crown for the permanent molar is designed so that it closely resembles the anatomy of a first permanent molar tooth and it also obtains its retention mainly from the cervical margin area³. The thin metal of the preformed crown margin is flexible enough to spring into and be retained by this undercut area^{4,5}. Maintaining oral hygiene and denture hygiene is also of ease for the patient and the prosthesis can easily be repaired or replaced in the future. This technique will also help to prevent caries as food lodgement around the tooth will be avoided. According to a recent study by Choi et al⁶ occlusal wear of opposing primary teeth is least in SSC crowns. Permanent teeth have thicker enamel and also are more mineralized so wear will be even lesser.

IV. Conclusion

This article describes an operator and patient friendly method to rehabilitate partially edentulous patient with prefabricated stainless steel crowns incorporated in complete denture prosthesis. The entire technique is inexpensive, and demands less skill from the dentist and the laboratory technician, compared to semi-precision and precision attachments.

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