

Telescopic Overdenture Rehabilitation Following Hemimandibulectomy: Case Report

Dr. Ashwini Kini¹, Dr. Gaurang Mistry², Dr. Mishal De Souza³, Dr.
Swapnita Vaity⁴, Dr. Saba Supariwala⁵, Dr. Prerna Pandey⁶

¹²³⁴⁵⁶Department of Prosthodontics, D.Y. Patil (Deemed to be University) School of Dentistry
Email: ashwini.kini@dypatil.edu¹, gaurang.mistry@dypatil.edu², mishal.desouza@dypatil.edu³
swapnita.vaity@dypatil.edu⁴, sabasupariwala@gmail.com⁵, prerna.r.pandey@gmail.com⁶

*Corresponding author's Email: ashwini.kini@dypatil.edu

Article History	Abstract
Received: 06 June 2023 Revised: 05 Sept 2023 Accepted: 13 Dec 2023 CC License CC-BY-NC-SA 4.0	<i>Oral squamous cell carcinoma (OSCC) warrants extensive surgical resection of the affected areas of the oral cavity which takes a tremendous toll on the patient's functioning, aesthetic as well as social confidence. Replacement of such a large number of teeth along with portions of the alveolar ridge and mucosa warrants exuberant planning to ensure a satisfactory outcome in terms of function and patient comfort. The present case report describes one such case of OSCC that was treated with partial mandibular resection and had a large mandibular defect that was rehabilitated by means of a prosthesis using an interdisciplinary approach.</i> Keywords: Telescoping coping; Partial mandibulectomy; Oral squamous cell carcinoma.

1. Introduction

Oral squamous cell carcinoma (OSCC) is a global malice that has a particularly high incidence rate in Southeast Asian countries such as India, Pakistan, and Sri Lanka.[1] The condition, in itself being dreadful, warrants extensive surgical resection of the affected areas of the oral cavity. This subsequently takes a toll on the patient's functioning, aesthetic as well as social confidence.[2] To ward off all three, it is essential to meticulously plan the prosthodontic replacement of the lost tissues beforehand.

However, the replacement of such a large number of teeth along with portions of the alveolar ridge and mucosa warrants exuberant planning to ensure a satisfactory outcome in terms of function and patient comfort.[3] The present case report describes one such case of OSCC that was treated with partial mandibular resection and had a large mandibular defect that was rehabilitated by means of a prosthesis using an interdisciplinary approach.

The interdisciplinary nature of this case underscores the collaborative efforts between surgical and prosthodontic specialties, with a focus on preserving existing dentition and restoring optimal function. The case report aims to contribute valuable insights into the comprehensive management of patients with OSCC undergoing mandibular resection, providing clinicians with a reference for navigating the intricacies of prosthodontic rehabilitation in similar contexts.

Case Report:

A 30-year-old female patient, with a history of squamous cell carcinoma of the left buccal mucosa requiring surgical intervention and partial mandibular resection, sought treatment at the Department of Prosthodontics, D.Y. Patil University, School of Dentistry, Nerul, Navi Mumbai. Extraoral examination revealed facial asymmetry on the left side, a straight profile, and deviation of the mandible, with pronounced asymmetry during mouth opening. No temporomandibular joint abnormalities were detected, and the resection defect extended up to the mandibular midline, categorizing the patient's condition as Cantor and

Curtis Class III.^[4]

Intraoral examination disclosed a partially edentulous mandible with only mandibular right premolars and first molar being present (Figure). The left side of the mandible was entirely replaced by scar tissue which led to occlusal prematurities on the right side. To address these concerns, a comprehensive treatment plan was devised. The treatment began with endodontic procedures on the existing mandibular teeth followed by their preparation as abutments for primary copings. An elastomeric impression was taken using a light body impression material (Dpi Photosil Soft Putty & Light Body) and the resulting impression was cast in dental stone (Ultrastone; Kalabhai India Private Ltd.) to create a master cast.

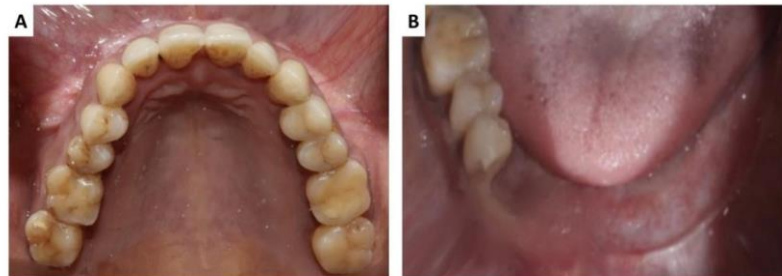


Figure 1: Pre-operative Occlusal view of A) Maxillary and B) Mandibular arches

A provisionalization phase involved the fabrication of a temporary record base with autopolymerizing acrylic (Acralyn 'R'), on which a wax occlusal rim was fashioned. The lip support was assessed on the resected side and contoured to the desired aesthetics. The tentative jaw relation was recorded and mounted on a three-point articulator to assess available inter-arch space. Subsequently, primary copings were crafted from nickelchromium alloy and cemented to the abutment teeth using type I glass ionomer luting cement (GC type I cement; Luting and Lining Cement; GC Corporation Tokyo, Japan).

The next phase involved the fabrication of secondary/telescopic copings and frameworks from a cobalt-chromium alloy. Intraoral assessments confirmed the fit of the telescopic copings. A pickup impression was then made to ensure a precision fit with secondary copings and framework. Jaw relations, along with a face-bow record, were transferred to Semi Semi-adjustable Corident (C.S.A-600) articulator. A try-in was conducted to verify vertical and centric jaw relations, esthetics, and phonetics. The final prosthesis was fabricated using heat-polymerized acrylic resin. The overall treatment procedures are comprehensively depicted in Figure 2.

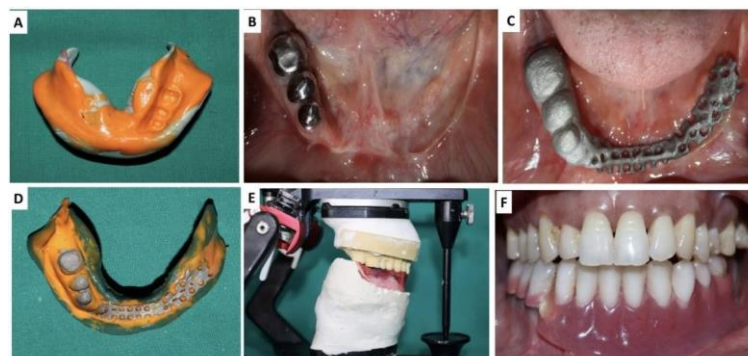


Figure 2: A) Elastomeric impression; B) Fabrication of primary copings; C) Attachment of telescopic framework; D) Pick-up impression; E) Transfer of jaw relation and face bow record; F) Final prosthesis in position

Upon completion, the telescopic overdenture was inserted, ensuring the desired friction fit. The patient received oral hygiene and maintenance instructions and was educated on the importance of regular check-ups for prosthesis maintenance. The comparative presentation of the patient's pre-prosthetic and post-rehabilitation smiles can be observed in Figure 3.



Figure 3: Comparative front extra-oral view of the patient A) Pre-operative and B) Postoperative

Discussion:

The Cantor and Curtis classification system emphasizes the severity of anatomical alterations, including facial asymmetry, mandibular deviation, and occlusal irregularities.^[4] Understanding the biomechanical implications of such changes is crucial for developing a prosthodontic strategy. The altered force distribution and loading patterns demand a careful approach to ensure optimal masticatory function and overall stability of the final treatment outcome.

The initial phase of endodontic procedures on the remaining mandibular teeth served a dual purpose. Salvaging these teeth as abutments for the prosthesis not only preserved existing dentition but also provided a biomechanically favorable foundation.^[3] The next discipline that closely follows endodontic treatment is the prosthesis replacement of the lost tissues.

Provisional restoration allows for the assessment and optimization of inter-arch space, crucial for the stability of the provisional prosthesis.^[5] Additionally, it serves as a diagnostic tool for monitoring the dynamics of the temporomandibular joint. Deviations noted during mouth opening in the extraoral examination prompted a careful evaluation of the joint's functions during the provisionalization phase of the present case. This proactive approach ensures that any emerging issues can be addressed promptly, contributing to the long-term success of the prosthodontic intervention.

The choice of materials in prosthodontic rehabilitation is a pivotal decision. The selection of nickel-chromium alloy for primary copings in the present case was grounded in its biocompatibility, strength, and precision in fabrication.^[6] These properties are essential for ensuring the durability and stability of the prosthesis. Subsequently, the use of cobaltchromium alloy for secondary/telescopic copings and frameworks is based on its resilience and ability to achieve a precision fit. The material's resistance to wear and corrosion is crucial for the sustained success of the prosthesis under the demanding conditions imposed by the oral environment.^[7]

The pick-up impression minimizes potential complications associated with a compromised fit, such as microbial infiltration and mechanical instability. The intraoral assessments during the try-in phase provide a solid basis for verifying vertical and centric jaw relations, optimizing occlusion, and ensuring esthetic harmony.^[8] The final prosthesis, fabricated using heat-polymerized acrylic resin, aligns with the biocompatibility and esthetic integration with the remaining dentition and facial features.

Patient education is a cornerstone of successful prosthodontic outcomes. Providing detailed oral hygiene and maintenance instructions is essential for preventing complications related to the prosthesis and ensuring its longevity.^[9] Patient compliance with regular check-ups contributes to early detection of any potential issues, allowing for prompt intervention and maintenance. This proactive approach is rooted in the principles of preventive dentistry and is crucial for the overall health and sustainability of prosthodontic restoration.

Conclusion:

The multifaceted management of a patient with SCC-induced mandibular resection is rooted in interdisciplinary management. Each phase of the treatment plan, from the initial endodontic procedures to the material selection and precision fit considerations, is guided by a thorough understanding of biomechanics, material science, and oral physiology. This detailed scientific approach contributes not only to the successful rehabilitation of the patient but also to the evolving literature on prosthodontic considerations in complex cases of OSCC treated with surgical resection.

References:

1. Ferreira e Costa R, Leão ML, Sant'Ana MS, Mesquita RA, Gomez RS, Santos-Silva AR, et al. (2022). Oral Squamous Cell Carcinoma Frequency in Young Patients from Referral Centers Around the World. *Head and Neck Pathology*. 16(3):755-62.
2. Villaret AB, Cappiello J, Piazza C, Pedruzzi B, Nicolai P. (2008). Quality of life in patients treated for cancer of the oral cavity requiring reconstruction: a prospective study. *Acta otorhinolaryngologica italica*. 28(3):120.
3. Pace-Balzan A, Shaw RJ, Butterworth C. (2011) Oral rehabilitation following treatment for oral cancer. *Periodontology 2000*. 57(1):102-17.
4. Suganna M, Chowdhary AK, Banerjee S, Sulok S, Kumar R, Ahmed R. (2011). Prosthodontic Rehabilitation of Cantor and Curtis Class II Mandibular Defect using Cast Partial Denture Therapy: A Case Report. *Journal of Advanced Medical and Dental Sciences Research*. 1;7(4):26-9.
5. Schwedhelm ER. (2007) Direct technique for the fabrication of acrylic provisional restorations. *The Journal of Contemporary Dental Practice*. 1;7(1):157-73.
6. Roberts HW, Berzins DW, Moore BK, Charlton DG. (2009). Metal-ceramic alloys in dentistry: A review. *Journal of Prosthodontics: Implant, Esthetic and Reconstructive Dentistry*. 18(2):188-94.
7. Yildirim B, Paken G. (2019). Evaluation of the marginal and internal fit of implant-supported metal copings fabricated with 3 different techniques: an in vitro study. *Journal of Prosthodontics*. 28(3):315-20.
8. Chang TL, Fenton AH. (2012) Prosthesis insertion and follow-up appointments. *Prosthodontic Treatment for Edentulous Patients: Complete Dentures and Implant-Supported Prostheses*. 30:255-80.
9. Anusavice KJ. (2012). Standardizing failure, success, and survival decisions in clinical studies of ceramic and metal-ceramic fixed dental prostheses. *Dental materials*. 1;28(1):102-11.