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(CASE REPORT)

A case report sublingual crescent technique, a solution to severely resorbed mandibular ridge

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Abstract

Residual ridge resorption is a chronic, progressive, and irreversible condition primarily affecting edentulous patients. Those who wear dentures for a very long-time result in severe resorption. The traditional method of fabricating prostheses can be demanding for practitioners, requiring a high level of skill and expertise to achieve optimal results. Extending the anterior flange on the lingual aspect of the lower denture can significantly improve retention, providing a more stable and secure fit for the patient. This case report enhances the retention of the lower denture and achieves a successful complete denture wearer.

Keywords: Sublingual Crescent; Resorbed Ridge; Denture Retention; crescent technique; lingual flange

1. Introduction

According to the Glossary of Prosthodontic Terms, the sublingual crescent area is the crescent-shaped area on the anterior floor of the mouth formed by the lingual wall of the mandible and the adjacent sublingual fold.[1] Sublingual crescent extension is defined as the portion of the sublingual flange of the mandibular denture that covers the anterior region of the floor of the mouth. The lower complete denture fabrication is quite challenging for practitioners to achieve excellent retention and stability in the severely resorbed residual ridge. Atwood classified residual ridge resorption (RRR) into six orders, from the pre-extraction state (Order I) to the depressed mandibular ridge (Order VI).[2] The maxillary denture is more stable than the mandibular denture, and the success of the treatment involves the development of lingual retention.[3] Better retention and stability can be achieved by extending the sublingual flange in the lower denture; the active tongue plays a critical role in denture placement.[4] To overcome this problem, dentures are fabricated with contours harmonizing with the sublingual crescent technique.[5]

2. Case report

A 65-year-old male patient was referred to the Department of Prosthodontics, Sathyabama Dental College and Hospital, with a chief complaint of an unstable and loose lower denture for 7 months. History reveals he had been a denture wearer for the past 35 years. On clinical examination, the maxillary residual ridge was high and well-rounded, while the mandibular residual ridge showed a high degree of resorption. According to Atwood's classification, it falls under Order V. The treatment plan included a conventional tissue-supported maxillary complete denture and a mandibular complete denture with sublingual crescent technique for anterior lingual flange recording.

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Figure 1 Mandibular Arch with Severely Resorbed Ridge

2.1. Treatment plan

- Primary impression and diagnostic cast
- Border molding
- Sublingual extension
- Secondary impression
- Master cast
- Wax trial
- Denture processing

2.2. Technique

- A preliminary impression of the mandible was made using reversible hydrocolloid in a stainless-steel edentulous stock tray, using the admixed technique (3:7 ratio of impression compound to green stick compound).
- A diagnostic cast was prepared, and a special tray was fabricated using auto-polymerizing cold-cure acrylic resin on the primary cast without a spacer. The tray borders were refined to fit anatomical structures accurately, and excess material was trimmed to ensure proper fit.
- Border molding was performed using a conventional technique with low-fusing impression compound. It was initiated in the distolingual and labial aspects of the tray.

Figure 2 Border melded in distolingual and labial aspect of the tray

Figure 3 Recorded Sub Lingual Area

- Excess material in the alveolingual sulcus was removed using a BP blade. The sublingual extension was then initiated using the same 3:7 compound ratio. The compound was softened in hot water (140°F or 60°C), applied from the premylohyoid region of one side to the other, molded posteriorly to the tray border, and trimmed 2 mm short of the floor of the mouth. Mold the material and extend it downward and backward over the crescent area. The tray was placed in the patient's mouth, and the patient was instructed to gently press the tongue against the tray handle. After removal and cooling in water, the procedure was repeated until the sublingual area was properly captured.
- The impression compound was relieved in the frenum notch region using a No. 22 BP blade to avoid obstruction of sublingual duct openings, which could cause saliva pooling and discomfort.

Figure 4 Complete border molding

- The sublingual extension borders were examined. Overextended areas beyond the sublingual fold were trimmed. An additional low-fusing greenstick compound was added, and the patient was instructed to move the tongue (wipe the lower lip) to refine muscle movements.

Figure 5 Final impression made in zinc oxide eugenol paste

- Relief holes were created in the tray using a bur, and a secondary impression was made with zinc oxide eugenol impression paste, and the master cast was poured using dental stone.
- All subsequent steps were completed using the conventional method. A wax trial denture was placed to evaluate esthetics, phonetics, and occlusion.

Figure 6 Final Denture

- The final mandibular denture was fabricated using heat-cured acrylic resin and processed using a long curing cycle (9 hours at 74°C, followed by terminal boiling for 1 hour) for better polymerization.
- The completed denture, made of heat-polymerized PMMA, was evaluated intraorally and extra orally after finishing and polishing. Follow-up visits were scheduled at 1 week and 30 days to assess fit and patient comfort.

3. Discussion

In severely resorbed mandibular ridges, the sublingual extension technique offers a cost-effective alternative to implant-supported prostheses, especially for financially constrained patients.[4] Lewis first studied the anatomical complexity of the sublingual space, including genial tubercles and the sublingual fold.[7] Lawson highlighted the role of sublingual folds in forming an anterior lingual seal.[8]

Vo Krammer emphasized tongue movements such as swallowing during impression procedures to enhance flange accuracy.[5] Friedman noted the variability in the sublingual anatomy, reinforcing the need for patient-specific approaches.[9]

When implants are not feasible, the sublingual crescent extension technique offers a practical solution to improve denture retention. Care must be taken to avoid compressing sublingual ducts, which could lead to discomfort and swelling. Proper execution of this method can provide acceptable retention without compromising tongue movement and salivary gland function.

4. Conclusion

Patients with severely resorbed lower ridges often face limitations with implant placement and conventional border molding, resulting in poorly fitting dentures that hinder mastication and speech. The technique in question provides an alternative solution for these difficult cases, enhancing denture retention and facilitating effective rehabilitation.

Compliance with ethical standards

Disclosure of conflict of interest

There are no conflicts of interest.

Statement of informed consent

Informed consent was obtained from the patient included in the study.

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