RESEARCH PAPER

A Modified Tunnel Tray Approach for Managing Mandibular Hyperplastic Tissue: A Case Report

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ABSTRACT

Background: Recording a mandibular edentulous ridge associated with hyperplastic or flabby soft tissue presents a challenge in complete denture prosthodontics. Conventional impression procedures may displace mobile tissues, resulting in an inaccurate impression and compromising denture stability.

Case presentation: This report describes a modified mandibular custom impression tray incorporating multiple tunnel-like openings and a central anterior attachment. The design is intended to facilitate controlled delivery of low-viscosity impression material to the affected tissue while allowing the remaining denture-bearing areas to be recorded. The approach aims to minimize unwanted tissue displacement during definitive impression making.

Conclusion: The tunnel tray approach represents a potential modification for selective recording of mobile mandibular tissues. Its clinical value requires assessment through documented patient outcomes, comparison with established impression techniques, and evaluation of the accuracy and reproducibility of the resulting impressions.

Keywords: Complete denture; mandibular hyperplastic tissue; flabby ridge; impression technique; custom impression tray.

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INTRODUCTION

Successful complete denture rehabilitation depends on accurate recording of the denture-bearing tissues, appropriate border extension, and optimal distribution of functional forces. These objectives become challenging when the residual mandibular ridge presents with mobile, fibrous, or hyperplastic soft tissue. Such tissues may be displaced during impression making and subsequently rebound towards their resting position, potentially affecting denture adaptation, support, and stability [1, 2].

Various impression approaches have been described for managing mobile tissues, including selective-pressure impressions, window techniques, modified trays with relief areas, and the use of low-viscosity elastomeric impression materials [3-5]. These methods aim to record the affected tissues with minimal distortion while maintaining an accurate impression of the remaining denture-bearing area.

Modified impression trays incorporating tunnels have also been described for mandibular flabby ridges [6]. the present report describes a multi-opening tunnel tray design intended to facilitate controlled access for impression material delivery in the management of mandibular hyperplastic tissue.

Case Report

A 70-year-old male patient reported to the Department of Prosthodontics, Crown & Bridge, Rishiraj College of Dental Sciences and Research Centre, with the chief complaint of difficulty in mastication due to the absence of teeth. The patient's medical and dental histories were recorded, followed by a thorough intraoral examination. Intraoral examination revealed a large, mobile mass of hyperplastic soft tissue extending over the crest of the mandibular residual alveolar ridge (Figure 1). The presence of this mobile tissue presented a clinical challenge for conventional impression-making, as pressure exerted during the procedure could displace the tissue and compromise the accuracy of the impression. Careful assessment of the mandibular ridge and the surrounding soft tissues was therefore undertaken to determine an appropriate impression technique.

Considering the altered anatomy of the mandibular residual ridge and the presence of mobile hyperplastic tissue, a conservative prosthodontic approach using a modified tunnel tray technique was planned (Figure 2). The technique was intended to facilitate impression-making while minimizing displacement of the hyperplastic tissue and improving the recording of the supporting tissues. The patient was informed about the proposed procedure, and written informed consent was obtained for treatment and publication of clinical photographs.

Technique

1. **Preliminary impression**: A preliminary impression of the mandibular arch was made using an impression compound (DPI, India) and stock tray. The preliminary cast was poured using type II dental plaster (Kalabhai Karson, India) and examined to identify the extent of the mobile or hyperplastic tissue.
2. **Tray design**: A custom mandibular impression tray was fabricated with multiple elongated openings arranged along the anterior and lateral portions of the arch using auto polymerizing resin (Primex, India). A central plastic tube attachment was incorporated into the design.
3. **Tray adaptation**: The tray was evaluated intraorally to verify seating, tissue clearance, and adequate extension. Any areas causing impingement on the hyperplastic tissue were relieved. Border extension was checked clinically.
4. **Border molding**: The borders were molded using a green stick compound, taking care to avoid excessive displacement of the mobile tissues.
5. **Definitive impression**: The definitive impression was made using addition silicone impression material (Light Body 3M ESPE US) for the affected tissue and the remaining denture-bearing areas. The material was introduced through the intended access openings according to the tray design (Figure 3). Care was taken to control material flow and avoid excessive pressure on the mobile tissue.
6. **Impression removal and evaluation**: After the material had set, the impression was removed carefully and examined for complete coverage, continuity, voids, distortion, and evidence of tissue displacement (Figure 4). Casts were poured using type III Dental Stone (Kalabhai Karson, India) and denture were fabricated with the conventional manner.

Discussion

Mobile or hyperplastic soft tissue can complicate impression making because pressure applied during the procedure may alter the recorded tissue morphology. Conventional impression techniques may therefore produce an impression that does not accurately represent the tissues in their resting condition. [1, 2]

Several modifications have been proposed to address this problem. Window techniques allow the affected tissue to be recorded separately, whereas selective-pressure approaches aim to distribute pressure preferentially over suitable supporting areas[3-5]. The previously described Tunnel tray technique is particularly relevant to the present approach because it also uses a modified tray to facilitate impression making over mandibular anterior flabby tissue[6].

The proposed multi-opening design provides multiple access points along the tray and may facilitate the controlled placement of impression material. Its potential advantages include a simple tray configuration, localized material delivery, and the possibility of reducing direct loading of mobile tissues. These advantages, however, remain proposed benefits until demonstrated clinically and compared with established techniques.

The technique is operator-dependent. Inadequate tray clearance, uncontrolled material flow, excessive pressure, or incomplete recording of the peripheral tissues may compromise the impression. The design should therefore be adapted to the location and extent of the affected tissue rather than applied routinely to all edentulous mandibular ridges.

Importantly, clinically identified hyperplastic tissue should not automatically be classified as a flabby ridge. Persistent, atypical, ulcerated, or otherwise suspicious lesions require appropriate diagnostic assessment, and

histopathological examination should be considered when indicated. The impression technique does not replace diagnosis or treatment of the underlying tissue condition.

The principal limitation of this report is that the available photographs demonstrate the tray design but do not, by themselves, establish the quality of the definitive impression, subsequent denture performance, or patient satisfaction. Future evaluation should document impression accuracy, tissue response, denture retention and stability, and patient-reported outcomes.

CONCLUSION

A modified multi-opening tunnel tray may provide an alternative approach for delivering impression material during the management of selected mandibular edentulous ridges with mobile or hyperplastic tissue. Its clinical usefulness depends on accurate diagnosis, appropriate tray adaptation, controlled material delivery, and careful impression evaluation. Further clinical documentation and comparative assessment are necessary before superiority over established impression techniques can be claimed.

Figures:

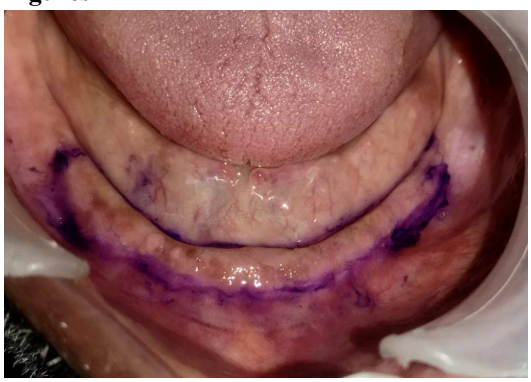


Figure 1: Intra Oral View of Marked Hyperplastic Tissue

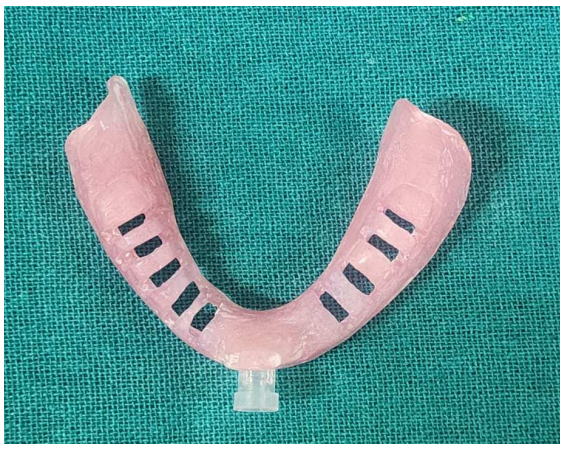


Figure 2: Modified impression tray with Anterior Opening



Figure 3: Impression Procedure Using Tunnel Tray Technique

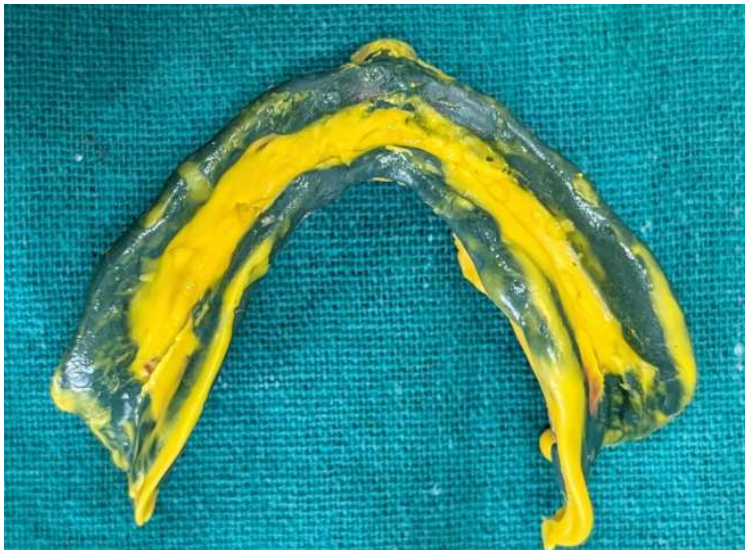


Figure 4: Final Impression

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