

A Novel Technique to Achieve Stability and Retention of Complete Dentures in Compromised Maxillary And Mandibular Ridges: A Case Report

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Abstract

Complete denture therapy is an age old form of dental treatment. Ridge atrophy poses a clinical challenge towards the fabrication of a successful prosthesis. Extreme resorption of the maxillary and mandibular denture bearing areas results in sunken appearance of cheeks, unstable and nonretentive dentures with associated pain and discomfort. This article describes a case report of an edentulous patient with the history of oral cancer surgery in the disto-buccal area forming a soft tissue fold. A simplified technique of fabricating a complete denture was used for preservation of denture bearing areas.

Keywords: Ridge atrophy, Soft Tissue Extension, Modified Admix impression.

Introduction

Complete dentures are prone to a variety of displacing forces of differing magnitude as they are resting on oral mucosa and are in close proximity with tissues that are constantly changing due to the action of muscles. Consequently, for complete dentures to be retentive and stable, the retentive forces that hold the dentures in place must be greater than the ones aiming to displace it. Obtaining maximum stability and retention is one of the biggest challenges in complete denture construction. The success of a complete denture relies on the principles of

retention, stability and support. The prosthodontist's skill lies in applying these principles efficiently in critical situations. This article describes a case report of an edentulous patient with the history of oral cancer surgery in the disto-buccal area forming a soft tissue fold. A simplified technique of fabricating a complete denture was used for preservation of denture bearing areas.

Case Report

A 65-year-old male patient walked into the Department of Prosthodontics and Crown & Bridge with a chief complaint of missing teeth in upper and lower arch. On taking history it was found that the patient was treated for oral cancer few years back in maxillary left posterior region. On extraoral examination, it was observed that the patient had extremely sunken cheeks and the muscle tone was found to be normal.

On intraoral examination, it was found that in the maxillary arch patient has developed a soft tissue extension in the disto-buccal area of left side. After surgery, the residual alveolar ridge was found to be low well rounded and sulcus was obliterated with scar tissue formation (Fig.1). The soft tissue fold that was formed after the surgery could not be corrected as the patient was not willing for another surgical procedure. The mandibular residual alveolar ridge was found to be irregular and depressed (Fig. 2). On further examination, we observed that the patient's mouth opening was also reduced. Due to economical constraints and medically compromised situations, a complete removable denture was planned for replacement of missing teeth.



Fig.1



Fig.2

Technique

1. Preliminary impressions for maxillary and mandible arch were made using irreversible hydrocolloid in perforated edentulous stock trays. This irreversible hydrocolloid was material of choice because of its excellent flow and elastic properties.
2. For Maxillary arch, the custom impression tray was fabricated on primary cast using auto polymerizing resin for Minimal Pressure technique.
 - a) A 2mm thick wax spacer, 4 mm short of the estimated borders, covering the entire maxillary arch, except in posterior palatal seal area, was adapted.
 - b) A custom tray 2mm thick and 2mm short of the estimated borders was fabricated using auto-polymerizing

acrylic resin. Multiple escape vents of dimension 1 mm were made at a distance of 10 mm from each other, in the entire custom tray.

c) Incremental Border molding was done using green tracing sticks.

d) The tray was then painted with tray adhesive and allowed to dry.

e) The final impression was made using light body poly vinyl siloxane impression material (Fig. 3).

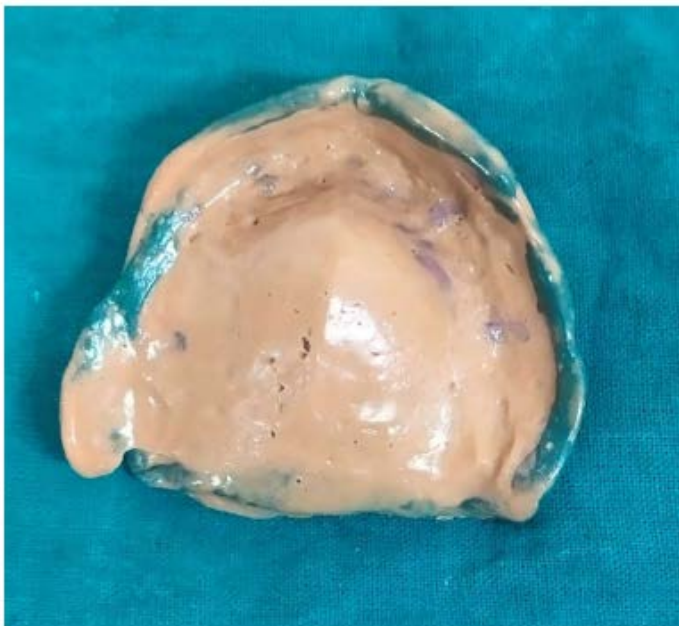


Fig. 3

3. For mandibular arch, the custom impression tray was fabricated on primary cast using auto polymerizing resin for modified admix technique.

a) A 4mm thick wax spacer was adapted 2mm short of the estimated borders, covering the entire mandibular ridge.

b) A custom tray 2mm thick and 2mm short of the estimated borders was fabricated using auto-polymerizing acrylic resin. Multiple escape vents of dimension 1 mm were made at a distance of 10 mm from each other, in the entire custom tray.

c) The mandibular custom tray was painted with tray adhesive and allowed to dry.

d) Putty consistency of poly vinyl siloxane was mixed, loaded on the tray and placed in patient's mouth.

e) The material was molded following the conventional techniques of tongue movements and the limiting structures.

f) The impression was observed for proper extensions and the tissue surface was scraped to make space for the final impression.

f) The final impression was made using light body poly vinyl siloxane impression material (Fig. 4).



Fig. 4

The maxillary & mandibular final impressions were poured using Type III dental stone and master casts were fabricated (Fig. 5).

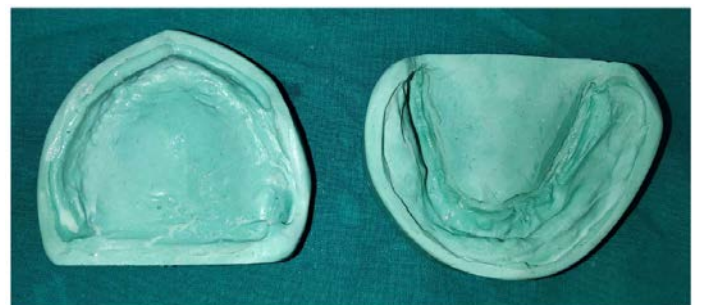


Fig. 5

5. Record bases/wax rims were constructed for recording the Jaw Relation.

6. Try-in was done verifying the lip support, Centric Relation, Vertical Dimension, Occlusal plane, retention and stability etc.

7. Dentures were fabricated by using conventional compression molding technique using heat cure acrylic resin.

8. Finishing and polishing was done in the usual manner (Fig. 6).



Fig. 6

At the time of insertion of maxillary denture, following modifications were done to utilize the undercut created by the soft tissue fold in the operated area.

1. The denture flange on affected side was roughened and thinned out.

2. A permanent heat cure acrylic based soft liner was applied judiciously on the prepared denture flange.

3. Denture was seated in patient's mouth.

4. Soft liner was molded intraorally by manipulation of tissues in that area.

5. Maxillary denture was removed and examined for the extensions and continuity of soft liner with the heat cure acrylic base (Fig7).

6. It was observed that the retention and stability of maxillary denture was markedly increased by the use of soft liner in that area.

7. The mandible denture was found to be stable despite the compromised foundation.

8. Follow up was done (Fig.8).



Fig. 7



Fig. 8

Discussion

M.M Devan has rightly said that "In all our prosthodontics triumphs, it is perceptual preservation of what is remaining rather than meticulous replacement of what is missing". This holds true especially, in such cases where there is compromised stability and retention for complete removable dentures due to obliteration/infringement of the supporting tissues. In the maxillary arch, the peripheral seal is obtained by proper recording the labial and buccal sulcus and additional seal is obtained through posterior palatal seal area. The disto-buccal pouch area

holds an important role in providing stability in complete removable dentures by impeding the lateral movements.

This distobuccal pouch area is limited by the coronoid process of mandible therefore this area is recorded by asking the patient to open the mouth wide and then close slightly, moving the mandible side to side. For proper retention of complete removable dentures, stability is an important factor. Therefore, it is paramount for the Prosthodontist to record the disto-buccal pouch area in the maxillary arches specially in compromised cases. In this case because of scar tissue formation and disruption in the support area especially in the distobuccal pouch area of the maxillary arch, limited peripheral seal was obtained resulting in compromised retention and stability, using the conventional technique for denture fabrication. The soft tissue fold in disto-buccal pouch area along with reduced mouth opening further complicated the situation.

Therefore, using permanent heat cure acrylic base soft liner, we were able to engage the undercut created by the soft tissue fold, obtaining stability and retention for the maxillary denture. The mandibular ridge was irregular and depressed, making it difficult to obtain good stability and retention. Therefore, modified admix technique using putty and light body consistency of poly-vinyl siloxane impression material in a custom tray was used to obtain optimum stability and retention in such compromised conditions. A simple approach made it possible to overcome the restrictions and enabled us to rehabilitate the functions and esthetics in compromised patients with complete removable dentures.

Conclusion

Prosthodontic rehabilitation of a patient with compromised edentulous ridges in a conventional manner is a difficult task. Modifications in the treatment procedures should be considered to fulfil the patient's functional and esthetic desires.

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