



A TECHNIQUE FOR USING MAXILLARY SOFT TISSUE UNDERCUT IN DENTURE PLACEMENT: A CASE REPORT.

Dental Science

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ABSTRACT

Rehabilitation of large edentulous space in the anterior maxilla presents many challenges. Undercut may develop at the time of extraction if extraction sockets are not compressed adequately. The buccal undercut of the maxillary tuberosity, together with the reduced width of the buccal vestibule can complicate denture fabrication. This clinical report describes an alternate denture design in which optimal flange height and thickness can be achieved in situations where patient has anterior undercut in maxilla and reduced vestibular width.

KEYWORDS

Undercuts denture design, resilient liner, denture, partial, removable

INTRODUCTION:

Anterior undercut of maxillary ridges are frequently encountered and may complicate successful fabrication of complete denture. Undercut may develop at the time of extraction if extraction sockets are not compressed adequately. The other common reason for anterior undercut development is patient with flared teeth. Developmental prominence of premaxilla with well developed alveolar process may also cause undercuts in the anterior maxillary region.

Management of this situation generally includes alteration of denture bearing area, Planning of the path of insertion, use of resilient lining material and blocking out undercuts on the cast. Alteration of the denture bearing area by surgical means is not indicated in medically compromised patients and also most of the times the patients are reluctant to subject themselves to the traumatic experience of surgical procedure. Planning of the path of insertion by surveying is preferred way of managing anterior undercut. Good border seal in this situation is generally achievable. Use of resilient lining material is a novel means of managing undercut. Abrams reported the use of resilient lining material supported by a flexible base, but in cases where width of the vestibule is limited such a bilaminate periphery may be too thick.¹

Sectional dentures and hinge mechanism can also be used to incorporate an undercut into the design of a denture thereby increasing retention.^{2,3} However, this complicates the design and the processing technique and also it increases the cost of the treatment. Blocking out the undercut on the cast is also an acceptable method. Full available height of the vestibule can be achieved by this method but a reduced border seal may accompany such a denture base adaptation.^{4,5}

In cases where width of the vestibule is very less it is not possible to give labial flange of denture without changing the profile of the patient.

This clinical report describes an alternate denture design in which optimal flange height and thickness can be achieved in situations where patient has anterior undercut in maxilla and reduced vestibular width.

CLINICAL REPORT:

A 46 year old female patient reported to the dental hospital with the chief complain if ill-fitting and unaesthetic maxillary denture. Intra-oral examination revealed severely resorbed maxillary ridge and mandibular ridges with a severe undercut and reduced vestibular width in the anterior region. (Fig. 1)



Figure 1: Severely Resorbed Ridges

It was decided to treat this patient with a denture consisting of an unconventional labial flange for the maxilla. Diagnostic model was prepared and it was sectioned in the anterior region. Section of the stone model showed 3-5 mm undercut and 3 mm vestibule width.⁶

Primary impressions were made and the casts were prepared. Custom tray with 1.5 mm spacer was prepared. After border molding, final impressions were made using Quadra functional hydrophilic Addition Reaction Silicone⁸ (Aquasil Monophase, Dentsply CAULK) and master cast were obtained. Undercuts were blocked with wax and denture bases were prepared with self polymerizing acrylic resin. At the jaw relation appointment occlusion rims were fabricated and labial flange from right canine to left canine region was removed from maxillary denture base since there was very small vestibule width and with labial flange and it was difficult to maintain normal profile of the patient. Tentative jaw relation was recorded and transferred to the articulator. Anterior teeth arrangement was done in the conventional manner and posterior teeth were made monoplane to achieve less interferences and more stability in denture therefore less resorption of the residual ridges.⁷ Posterior teeth were arranged and wax up was done. At the time of next appointment verification of jaw relation record was done and patient consent was taken that she is satisfied with the aesthetics and phonetics. With the aim of maximizing the border seal to ensure retention, anterior and posterior vibrating lines were marked in the mouth (Fig. 2) and transferred to the denture base and then to the master cast (Fig. 3). Scraping of the master cast was done at posterior palatal seal area.



Figure 2: Posterior Vibrating line transferred to Marked in Mouth

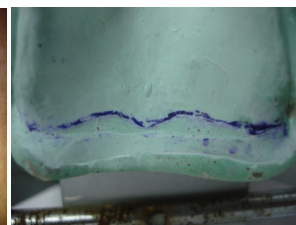


Figure 3: Posterior Vibrating line Master Cast

In order to compensate for the loss of labial flange two 21 gauge orthodontic wires were adapted from canine region to labial frenum and sealed with wax (Fig. 4).



Figure 4: Tissue Surface of the Maxillary Denture showing the Labial Flange

Wire was placed 1 mm away from the sulcus depth. Trial denture was placed on the master cast and distal end of the wires were attached to it through wax. Small amount of wax was added at the mesial end of the wire loop to support the frenum. Flasking was done and denture was processed. Deflasking and finishing was accomplished in the conventional manner. Acrylic piece which was adjoining two wire pieces was sectioned to create frenum relief and they were reshaped and polished.

After placement of maxillary and mandibular denture the occlusion was evaluated for discrepancies and corrected (Fig. 5). Patient instructions were given.



Figure 5: Post Insertion of Maxillary Denture with Labial Flange

DISCUSSION:

The method described in this article allows duplication of labial flange with wire to reduce the thickness of labial flange and enhance retention for the complete denture. Both clinical and laboratory steps are easy to perform and no special equipment is needed for this procedure. Insertion and removal of this denture was easy and it was less traumatic for the patient.

Disadvantages include less strength of the labial flange and chances of distortion of wire pieces. Trimming, finishing and polishing is difficult at the region of wire and that needs special care.

SUMMARY:

This clinical report presents a method for fabricating a less thickness and flexible labial flange. This flange extends into the area of anterior undercuts to achieve maximum vestibule height and minimal thickness. Rationale for using wire flexible flange is to aid in retention in the absence of a definitive labial flange.

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