ABSTRACT
Unilateral or bilateral undercuts on the buccal aspect of the maxillary tuberosity are frequently encountered and these may complicate the success of a complete maxillary denture. The common management of such situation includes the surgical reduction of the bony extension with alveoloplasty. But this treatment option is not always feasible due to systemic complications, time constraints or patients willingness. This case report describes non invasive treatment options which are available for such situations, the rationale for the design, the use of soft resilient denture flanges and the novel laboratory procedure for incorporation of soft resilient denture flanges in the undercut area.

Key words: maxillary tuberosity undercut, soft permanent liner, combination syndrome.

INTRODUCTION
The conventional removable complete dentures fabricated by heat cure acrylic resins are most commonly used for prosthodontic rehabilitation of completely edentulous patients. Unilateral or bilateral undercuts on buccal aspect of the maxillary tuberosity are frequently encountered. However they are utilized for extra retention, but may hinder the success of complete maxillary denture due to difficulty in placement and removal of dentures. The management in these situations includes an alteration of denture-bearing area, adaptation of denture base, careful planning of path of insertion, and use of resilient lining materials. Although elimination of undercuts with surgical procedure of alveoloplasty results in a good border seal but this is not always possible either due to systemic complications or patient’s consent[1].

In such situations, the prosthodontic management of severe bilateral undercuts becomes the mainstay of treatment. Sectional lining of denture base with a resilient lining material in area of undercut can allow the engagement of undercut with resultant increased denture retention [2,3]. A pre-planned rotational path of placement may be used when a unilateral undercut of tuberosity occurs [4], thus allowing buccal undercut to aid in retention due to good...
border seal. Abrams [5] reported on use of resilient lining material which was supported by a harder but flexible base, resulting in a bilaminate periphery. Other methods include: sectional dentures [6] or hinge mechanisms [7]. These options are complex and may require specialized technical skills.

In the present case report, the severe bilateral undercuts were treated with alternative method of fabrication of denture with permanent heat cure soft resilient liner. The combination of materials, i.e. the rigid base where it needs to be strong and flexible when in contact with soft tissues makes up hybrid denture.

CASE REPORT

A 48 yrs female reported to the Department of Prosthodontics, Sri Guru Ram Das Institute of Dental Sciences, Sri Amritsar, with the chief complaint of replacement of teeth in upper jaw and lower posterior region of mouth. On taking history, it was revealed that the patient got her teeth extracted 10 months back and no relevant medical history. On intraoral examination maxillary edentulous arch with bilateral tuberosity undercuts and mandibular partially edentulous arch were observed.

The maxillary tuberosities were covered by firmly attached and well keratinized gingival mucosa. (Fig1) On surveying of diagnostic cast, the amount of the undercut on right and left tuberosity were measured to be 3.0mm and 3.5 mm respectively. Patient was advised to undergo alveoloplasty for tuberosity undercuts, but she was reluctant to undergo any surgical treatment.

Thus considering the situation, hybrid denture with heat cure acrylic resin lined with heat cure permanent soft liner was planned.

Preliminary impressions were made with soft putty addition silicone (fig 2). After obtaining the diagnostic cast and fabrication of special tray, the border molding was done with soft putty addition silicone definitive impression was made.
with light body addition silicone (fig 3,4). The maxillomandibular relations were recorded, teeth arrangement and trial was done.

**Specialized laboratory procedure:**
- 1.5 mm soft vaccumform sheet was adapted over master cast, to provide the space for soft liner.(fig 5)

Figure 5: Vaccumform sheet adapted over master cast

- Vaseline was applied over the adapted vaccumform sheet and Heat cure acrylic resin was packed over the adapted sheet and trial closure was done.

- After opening the flask, the vaccumform sheet spacer was removed carefully and about 1-2mm of borders of heat cure acrylic resin was carefully trimmed to obtain a butt joint between soft liner and acrylic resin. (Fig 6)

- Then, the adhesive was applied over the acrylic resin to obtain the bond between the soft liner and the acrylic resin (fig 7).

- The soft liner (molloplast b) was packed over the acrylic resin and the flasks were closed.(fig 8). The processing was done by placing flask in cold water and heating it up slowly to 100°C for approximately 2 hours. After curing, the flask was allowed to cool slowly.

The hybrid denture was thus obtained with heat cure acrylic resin and permanent soft liner.(fig 9)

The denture was inserted and instructions for denture hygiene and maintenance of soft liner were given to the patient.

**MAINTENANCE OF SOFT RESILIENT LINER:**

The patient was instructed that the denture should be rinsed after every meal and debris removed by brushing with a soft brush, liquid soap and cold water. The denture should be soaked in an alkaline hypochlorite solution for 20 minutes in the evening. The patient was instructed that heavy smoking, fruit juices, tea, coffee, and wine cause discoloration and staining of denture.

The patient was followed up after 1 day, 1 week, 1 month, 3 months and 6 months. The patient was satisfied with the function and esthetics of denture(fig 10).

**DISCUSSION**

Out of various applications of the permanent soft liners, the rationale of using permanent liner for the bilateral sever undercuts was to aid retention by ensuring a seal around the entire border of the denture[8,9].

Lammie and Storer (1958) suggested that soft lining material may be indicated in the treatment of areas of bilateral undercuts, where placing a rigid acrylic resin denture is difficult and there is a problem of retention[10]. Its use in this situation allows the denture to be placed over the prominence and since the soft material is elastic, it will spring back into close contact with the undercut area. Not only does this prevent air entrapment under the denture from reducing the retention, but the retention will be increased as the material will need to be deformed to remove the denture.

Some authors [11] also concluded that the peel strength of various silicone based soft liners on the denture base resin (PMMA) had been increased while the curing was done simultaneously.

With the long term use of single maxillary complete denture opposing mandibular removable partial denture, may lead to the combination syndrome[12]. Prosthodontic management or prevention of such condition may involve the redistribution and redirection of forces. The use of soft denture lining material can be recommended in such condition to distribute functional load. Soft denture liners are applied to the intaglio surface of dentures to achieve a more even force distribution, to reduce localized pressures and to have a cushioning effect between the denture and underlying denture bearing tissues [13].

Regarding the oral health related quality of life, denture relining with a soft liner also has been found to have a positive impact on the perceived oral health of edentulous patients [14]. Some authors [15] also investigated the colonization potential of the soft liners by microorganisms. They concluded that the fewer adherences of microbes on the silicone based soft liners over the PMMA based ones, were because of their surface roughness.

**CONCLUSION**

Thus, this case report presented the novel material with novel technique of relining the denture base, so that the combination of both, provided the apt treatment for given situation. The use of permanent soft liner in severe bilateral tuberosity undercut, provides the advantage of an optimal flange extension, thickness, and an excellent border seal and thus the retention can be achieved. This design is especially useful where surgical intervention has been contraindicated.

**REFERENCES**


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