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# Sectional Tray Approach for Cheek Bumper Prosthesis in a Patient with Oral Submucous Fibrosis

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**Abstract:** ***Oral submucous fibrosis is a precancerous condition commonly presenting with trismus due to fibrosis of the submucosal tissue in the oral cavity. In dentate individuals, postsurgical injury by teeth to oral mucosa can lead to ulceration and subsequent infection at the reconstructed site. In patients with reduced mouth opening induced by submucous fibrosis, the impression making procedure may be difficult to carry out due to reduced tissue resiliency and obliteration of vestibular spaces. In this case report, the fabrication of protective appliance in the form of cheek bumper in dentulous patients with sub mucous fibrosis, which play a dual role of both protecting the flap and assisting the healing process by utilising a sectional custom tray impression method has been described.***

**Keywords:** cheek bumper, sectional tray, oral submucous fibrosis

## 1. Introduction

Oral submucous fibrosis is a precancerous condition commonly presenting with trismus due to fibrosis of the submucosal tissue in the oral cavity. An overall 7-30% malignant transformation has been reported which makes it to be classified under potentially malignant disorder.[1]Therefore, an immediate intervention either in terms of medical or surgical are mandatory once it has been diagnosed.Surgical intervention for the removal of circum oral band and improving the mouth opening can be done through transoral fibrotomy procedure followed by reconstruction with local flaps. These local flaps are subjected to chronic irritation from adjacent teeth, which can lead to an ulceroproliferative lesion mimicking a malignancy arising from an existing potentially malignant disorder.

To prevent further trauma from cheek bite leading to possible malignant transformation, an early prosthetic intervention is absolutely essential. Thus impression making cannot be delayed until the mouth opening has been improved with screw gag. Prosthesis in the form of a protective appliance that plays a dual role of both protecting the flap and assisting the healing process is indicated. Reduced mouth opening hinders conventional dental treatment and hence, alternative treatment procedures have to be chosen while managing such situations. Difficulties in impression making due to reduced access to the oral cavity can be overcome by using sectional trays. Various types of sectional trays held together by different mechanisms have been designed and described in literature.

This clinical report elaborates an effort to overcome the limited mouth opening of a patient with OSMF by a two piece sectional tray for fabrication of a protective prosthesis in the form of cheek bumper.

## 2. Clinical Report

A 40 year old man diagnosed with Oral Submucous Fibrosis (OSMF) was referred from the Department of Oral and Maxillofacial Surgery to the Department of Prosthodontics, Government Dental College, Kottayam for management of a non-healing ulcer on the right buccal mucosa in the first post-operative week which occurred as a sequelae to the surgical treatment (Fig.1 Pre operative view).

Patient had a history of chronic betel quid chewing for the past 15 years. His initial chief complaint was burning sensation of buccal mucosa and restricted mouth opening. The presenting clinical findings were suggestive of OSMF which was later confirmed by an incisional biopsy. The patient was treated with fibrotomy following reconstruction of the defect with buccal fat pad. Post operatively a painful non healing ulcer developed over the local flap due to there was chronic irritation from the adjacent teeth which later developed into painful non healing ulcer.

The patient referred to the Department of prosthodontics with diffuse oedema of right side of the face with, interincisal mouth opening restricted to 14mm.Intraorally a 1.5x1.5cm ulceroproliferative lesion was present at the junction of local flap and normal mucosa along the line of occlusion in relation to maxillary molars. Histopathololgic examination confirmed the lesion to be an epithelial hyperplasia that probably arose from a traumatic cheek bite. Prosthesis with an acrylic extention in the right buccal vestibule was planned to reduce the incidence of cheek biting and to improve the healing of ulcer.

Maxillary and mandibular preliminary impressions were recorded in irreversible hydrocolloid (Algitex, DPI, India) using stock trays. Since the maxillary impression was inadequate to record distobuccal region, a two piece sectional tray was designed for maxillary final impression. (Fig.2 Preliminary impression and casts)

A custom impression tray using autoplymerizing acrylic resin (DPI RR cold cure) was fabricated in two segments. The second segment extended 2mm medially over the first segment along the midline to enable proper orientation of both the segments. For vertical stabilisation a dowel pin was fitted vertically in the palatal midsection of the first segment using autoplymerizing resin. This pin was made to pass through the corresponding hole placed in the second segment. Horizontal stabilization was achieved by two 0.8

mm round stainless steel wires of length 1.5cm, extending from second segment to engage the orientation grooves placed in the first segment. (Fig.3 Sectional custom trays with stabilization pins)

Clinically both trays were evaluated for stability and extention. Sectional border moulding of the first segment was made using polyvinyl siloxane impression material. Following this procedure, lining impression of the first segment was done with addition silicone – monophase (Elite HD, Zhermack – Badia Polesine) impression material. Once the impression material set, the second segment, loaded with addition silicone - light body (Elite HD+, Zhermack – Badia Polesine) was placed over the first segment. Once the light body set, impression was removed as a single unit from patient's mouth. In this case, though insertion of impression tray as a single unit was difficult, this hindrance was not experienced while removing the tray as single unit from patient's mouth. Hence the final impression was removed from the mouth in one piece[2].Maxillary definitive cast was obtained from final impression. (Fig.4 Sectional Maxillary final impression)

For fabricating intraoral appliance, an acrylic palatal plate having buccal shield was planned. On the right side, two modified pin head clasps of 0.8mmround stainless steel wire were incorporated for engaging the interproximal area. A buccal shield of dimension 2cm high and 3cm long extending from first premolar to third molar was fabricated using clear autoplymerizing acrylic resin. The outer surface of the buccal shield was slightly convex to keep the buccal mucosa away from occlusion. The appliance was finished, polished and checked for extensions in patient's mouth. The efficiency of buccal shield to protect the ulcerated mucosa was verified clinically. At the time of insertion instructions were given. (Fig.5 a. Cheek bumper b. at the time of insertion)

At 1 week follow up appointment, patient was evaluated and a reduction in the size of ulcer was noticed. On the 10$^{th}$ day, complete resolution of ulcer was noted.( Fig.6 Review after 1 week and 2 week ).Once the ulcer was completely healed a screw gag was fabricated for the patient to increase the mouth opening. A mouth opening of upto 19 mm was obtained following the use of screw gag. (Fig .7 Use of screw gag and increse in mouth opening)

## 3. Discussion

Prosthodontic rehabilitation of patient with limited mouth opening presents challenge for the clinician. Microstomia may be the sequelae of orofacial burns, carcinoma, cleft lip, trauma, scleroderma, Plummer Vinsons syndrome, genetic disorders, surgery, or natural ageing processes[3].Many authors have suggested different ways of making an impression in patients with restricted mouth opening. Benetti et al[4] prepared a stepped butt-joint in a sectional tray handle to make the definitive impression. Geckili[2] et al fabricated two-piece custom-made tray with anterior and posterior parts connected by vertical rods, and removed final impression from the patient's mouth as a single unit. Locking lever mechanism[5], press button[6], and orthodontic expansion screws[7] have also been used for joining the tray sections.

This article describes a method for fabricating a custom sectional tray for dentulous patients with limited mouth opening. The advantages of such a custom tray include patient convenience, simplified insertion of the two separate segments, decreased patient trauma, and precise intra- and extraoral assembling of the tray sections.The disadvantage of the present technique may be additional time, cost, and effort for making a sectional tray.[8]

Cheek bumpers are modifications of the lip bumpers first described by Korn and Melson[9]. Lip bumpers are simple functional appliances used to eliminate the lower lip biting habit in children and to increase mandibular arch length[10].In 1989, they were modified with the buccal shield to further improve both the efficiency of the appliance and increase patient comfort. This new design eliminated tissue irritation by keeping the cheek muscles away from the appliance[11].

In this case discussed, prosthesis using clear autopolymerized acrylic resin with a buccal shield placed in the vestibule, not only successfully prevented cheek biting but also facilitated provided healing of ulcer.

## 4. Summary

In patients where cheek biting occurs in grafted tissue, attempts must be made to promote quick healing and uptake of the grafted tissue by preventing cheek biting during the early healing phase.

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**Figure 1:** Pre operative view

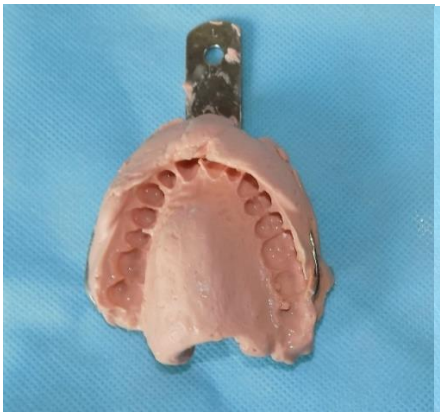

**Figure 2:** Preliminary impression and casts

**Figure 3:** Sectional custom trays with stabilization pins

**Figure 4:** Sectional Maxillary final impression and cast

**Figure 5:** a) Cheek bumper b) At the time of insertion

**Figure 6:** a) Review after 1 week b) Review after 2 week

**Figure 7:** a) Initial mouth opening b) Use of screw gag

c) increase in mouth opening