

**SECTION TO SUCCESS' PROSTHODONTIC MANAGEMENT OF LIMITED MOUTH  
OPENING – A CASE REPORT**

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Article Received on 07/05/2021

Article Revised on 28/05/2021

Article Accepted on 18/06/2021

**ABSTRACT**

Prosthetic rehabilitation of a limited mouth opening poses a challenge in all the stages of treatment. Patients suffering from Oral submucous fibrosis usually have severe restriction of mouth opening due to formation of thick fibrous bands on the buccal mucosa. Impression making in such small oral opening usually requires special techniques. This article demonstrates a unique yet simple technique to fabricate a sectional custom tray to rehabilitate patient with partially edentulous maxillary and completely edentulous mandibular arch who was diagnosed with OSMF.

**KEY WORDS:** Microstomia, sectional tray, submucous fibrosis.

**INTRODUCTION**

Microstomia is condition in which the mouth opening of an individual is severely reduced. This may be due to surgical, radiation, trauma or sometimes congenital. Oral submucous fibrosis is one of the common condition which causes microstomia. This condition is characterized by thick bands of fibers in buccal mucosa and vestibule leading to restricted mouth opening.

The common cause of OSMF include, autoimmunity, vitamin B, C, and iron deficiencies, chewing betel nut, consumption of spicy foods, human papilloma virus (HPV) infection, and genetic mutations. This is a chronic disease that produces scars, tissue fibrosis, and precancerous lesions.<sup>[1]</sup> Prosthetic rehabilitation of patients with limited mouth opening presents difficulties at all stages right from the preliminary impressions to insertion of prostheses. Because such patients have small oral opening, it may be extremely difficult to make impressions and fabricate dentures using conventional methods.<sup>[2]</sup>

Different management techniques described are surgeries, use of dynamic opening devices and modification of denture design. In prosthetic treatment, the loaded impression tray is the largest item requiring the intra-oral placement. During impression procedures, wide mouth opening is required for proper tray insertion

and alignment, which is not possible in patients with restricted mouth opening.<sup>[3]</sup>

This article describes a unique technique for the fabrication a sectional custom tray for making final impression for a patient with limited mouth opening caused due to OSMF.

**CASE REPORT**

A 56 year old female patient reported to Department of Prosthodontics, Sri Hasanamba Dental College, Hassan with a chief complaint of missing tooth in her upper and lower arches. The patient was diagnosed with OSMF previously and was undergoing treatment for the same with intra-lesional corticosteroids and hyaluronidase injections. The intraoral examination revealed limited vertical mouth opening of 30mm (**Fig 1a**) and inter-commisural length of 40mm (**Fig 1b**) along with completely edentulous mandible and partially edentulous maxilla. The intraoral examination revealed blanching of mucosa and on palpation, thick fibrotic bands were seen which involved buccal frenum and vestibule bilaterally with a shallow sulcus in the mandibular left and right distobuccal regions. After discussing various treatment plans, the patient agreed to the treatment plan to rehabilitate with mandibular complete denture and maxillary removable partial denture prosthesis using customised special tray for final impression.

The preliminary impression for maxillary arch was made by using stock tray which was customised by trimming, to fit in to the limited mouth opening. Impression was made with irreversible hydrocolloid impression material. The primary impression for mandibular arch was made using impression compound. (*Fig 2a & 2b*) Impression were poured and primary cast were obtained. A sectional custom tray was fabricated for making a final impression of the maxillary arch and mandibular custom tray was prepared by using conventional method.

#### **Fabrication of maxillary sectional special tray**

A 2mm spacer wax was adapted on the primary cast which covered both dentulous and edentulous portion of the cast, special tray was fabricated by sprinkle on method using auto polymerising resin. Once the material was set, the tray was sectioned in the midline using a straight bur to get two halves. To stabilise the anterior portion of the tray, two tick buttons were placed on either side of the sectioned tray and a acrylic block was placed which connected the two halves on the tick button. To stabilise the posterior portion of two halves, two die pins were placed on either halves at the middle portion of the tray and were connected with acrylic blocks similar to the anterior portion. These detachable acrylic blocks also served the purpose of handle during retrieving the tray as a single unit. (*Fig 3*)

#### **Modified Final Impression Technique**

The fit of both the sections of the tray was checked intra-orally and the path of insertion and removal was verified. The sectional border moulding was performed individually in right and left halves of tray by using

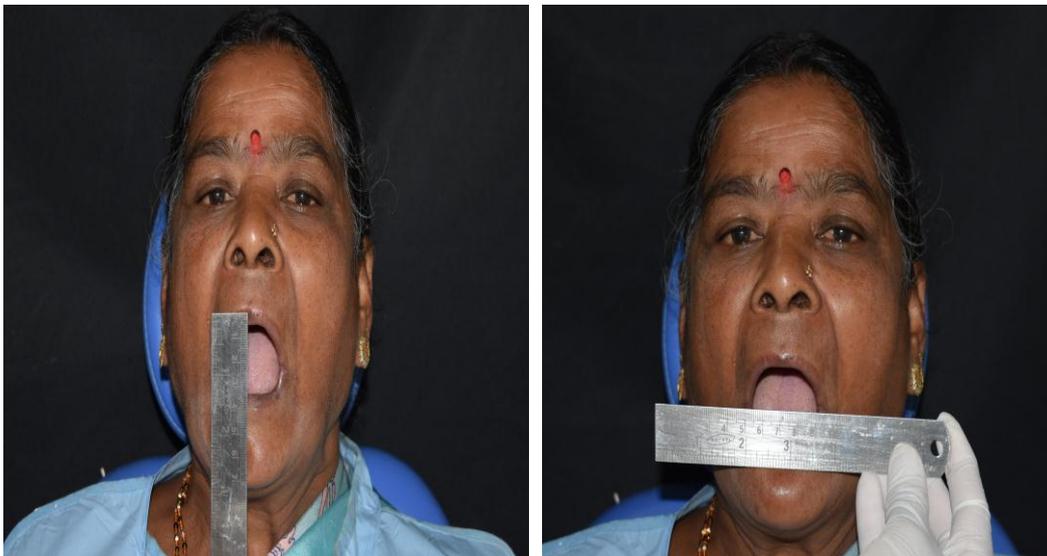
conventional method with low fusing compound. The excess material was trimmed from trays to get a proper fit when both the halves were in place on ridge. The wax spacers were removed from both the halves and access holes were made. Tray adhesive was applied, light body addition silicone was loaded on the right half of the tray and final impression was made. Once the material was set, the excess material was removed. The left half of the tray was loaded with the material and the impression was made with the other half in the mouth. Once the material was set, the acrylic blocks were stabilised on the tray intraorally and the tray was retrieved as the single unit. (*Fig 4a & 4b*)

The impressions were poured with Type III dental stone using beeding and boxing method and the master cast was obtained.

The mandibular border moulding and final impression was made in the conventional manner by using low fusing compound and zinc oxide eugenol paste.

As the patient was undergoing the treatment for OSMF, some improvement was seen in mouth opening. Hence a conventional removable partial denture was fabricated on the maxillary arch and complete denture was fabricated on the mandibular arch. The denture demonstrated adequate retention and patient was satisfied with the prosthesis. The patient was advised to follow strict oral hygiene protocol and was recalled bi-annually to evaluate the fit of the prosthesis. (*Fig 5*)

**CONFLICT OF INTEREST:** None declared.



**Figure 1a and 1b: Pre-Operative Intraoral and Extraoral Pictures.**



Figure 2a & 2b: Mandibular And Maxillary Primary Impression.



Figure 3: Sectional Maxillary Special Tray.



Figure 4a & 4b: Maxillary Final Impression Joined With Acrylic Blocks.



**Figure 5: Post-Operative Intraoral View Of The Patient.**

## DISCUSSION

Impression making is one of the most important and basic step in fabrication of a prostheses. When it comes to challenges in making an impressions, limited mouth opening can be one of them. Limited mouth opening may be due to various reasons like, surgical treatment for orofacial cancers and reconstruction of lip defects, surgical treatment of orofacial neoplasm and cleft lips etc.<sup>[4]</sup> Pharmacological and surgical treatments are often employed to increase the mouth opening which could aid the prosthodontist.

Many authors have suggested different impression making techniques in cases of microstomia. McCord *et al* (1989)<sup>[5]</sup> proposed a sectional complete denture technique for patients with restricted mouth opening which was designed in two halves, with one side fitting in a bevelled area in the other side to give a accurate location Both halves were joined rigidly by a stainless steel post that was inserted into three tubes within the complete denture palate. The post, which was removable, was attached to the right maxillary incisor, which served both as a tooth and handle for the post.<sup>[3]</sup>

Al-Hadi and Abbas (2002)<sup>[6]</sup> demonstrated a primary impression technique by using impression compound in mandibular edentulous ridge for patients with limited mouth opening due to surgically induced microstomia. The mandibular ridge was divided into three parts, one anterior and two posterior extending between the canines. Impression compound was shaped to correspond to these segments to obtain segmental impressions. They were poured in dental plaster. The special trays were fabricated, tried, and impressions were made individually. The three segments of the impression were stabilized in the mouth with compound before they were withdrawn as one impression. This impression was poured, and a special segmental tray was fabricated on this cast for secondary impression.<sup>[4]</sup>

Naylor and Manor (1983)<sup>[7]</sup> described a technique for the construction of a flexible prosthesis for the edentulous patient with microstomia that may be used to perform an

oral augmentation exercises to increase the vertical opening.<sup>[3]</sup>

In the present case, a modified sectional final impression was made using split special tray. After fabrication of special tray, it was sectioned in the midline to get left and right parts. The two sections were stabilised using tick buttons and self cure acrylic block in the anterior region and sleeves in the middle third of the tray. Border moulding and final impression was done using convention technique on both right and left sides and retrieved as the single unit.

The impression making becomes more challenging as the mouth opening circumference length starts decreasing especially when it becomes less than 150mm. Other treatment modalities like surgical intervention should be considered to increase the mouth opening without which it becomes almost impossible rehabilitate such cases. The risk of scar tissue formation should also be considered as a side effect of surgery which again may cause difficulties in rehabilitation.

## CONCLUSION

Surgical intervention must be considered to improve the mouth opening and flexibility of the oral tissues in order to carry out conventional methods of impression making which in turn reduces the operator time and patient discomfort. However, in this case the patient did not consent for the surgery to improve the mouth opening. Hence, a sectional impression technique was used to make the secondary impression of partially edentulous maxillary arch using customised sectional impression trays and conventional technique was used to rehabilitate completely edentulous mandible.

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