

**An Innovative Technique of Impression Making in
Patient with oral Submucous Fibrosis and Microstomia :
A Case Report**

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ABSTRACT:

Oral submucous fibrosis (OSMF) is a precancerous condition, which causes difficulty in swallowing, chewing and speaking due to the presence of microstomia and due to tongue rigidity. Impression making and prosthetic rehabilitation in such patients are extremely difficult due to restricted mouth opening. It becomes a major challenge when the maximum mouth opening is less than the size of the tray used to make the impression. It becomes a cumbersome procedure to insert and remove the impression tray in such cases and hence various techniques for impression making are used in literatures. This article describes the fabrication of a split impression tray to make a secondary impression of an edentulous patient having OSMF with microstomia.

KEYWORDS: Oral Submucous Fibrosis, Microstomia, Restricted mouth opening, Split tray technique, Acrylic stent, Press button.

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INTRODUCTION:

It is a major challenge and requires a strenuous effort for an operator to carryout dental procedures in a restricted mouth opening patients. Limited mouth opening or microstomia can be defined as an abnormally small orifice¹ or as a reduction in the perimeter of the oral cavity². The predisposing factors and conditions of restricted mouth opening includes electrical, chemical and thermal burns, plummer-vinson's syndrome, scleroderma, Burton skeletal dysplasia, Freeman-Sheldon syndrome, Partial duplication of chromosome 6q, Rheumatitis, TMJ dysfunction syndrome, Oral Submucous Fibrosis (OSMF), Surgical treatment of oro-facial carcinoma, damage to the masticatory mucosa, Cleft lip^{3,4,5} etc..

Among these causes, most common reason for restricted mouth opening is OSMF. Oral Submucous Fibrosis (OSMF) is a chronic inflammatory disease that results in progressive juxtaepithelial Inflammatory reaction followed by a fibroelastic change of lamina propia with epithelial atrophy leading to stiffness of oral mucosa, causing limited oral opening (microstomia), burning sensation, difficulty in chewing, swallowing and speaking. It can be due to viral agents, carcinogens and immunological agents, genetic predisposition and alterations. It is also most commonly related to tobacco chewing and iron and Vit B complex deficiency, leading to initiation of OSMF⁶.

OSMF can lead to limited mouth opening due to stiffening of the cheek, fibrosis of the masticatory muscles, Connective tissue disease, Head and neck radiation, reflex spasm. Hardening of the skin & cheek and oral cavity results in difficulty in mouth opening and fibrosis of salivary gland can lead to limited salivary secretion in the oral cavity.

One of the significant diseases affecting the present generation is oral cancer and among them the most prevalent oral cancer is squamous cell carcinoma which accounts for 90% of oral malignancies^{7, 8}. Microinvasive squamous cell carcinoma is a poorly defined entity in the oral cavity, which develops from carcinoma in situ or severe dysplasia with focal and /or superficial invasion less than 2mm and no deeper than lamina propria and is horizontally spreading type. Most commonly it affects the lateral borders of the tongue, floor of the mouth and soft palate.

It becomes a great challenge for a prosthodontist to make the impression in patients with limited mouth opening in a conventional manner as it require multiple placement and removal of the impression tray loaded with impression material in small mouth orifice.

This article describes a unique way of fabrication of a split custom tray and making a secondary impression for an edentulous patient with Oral submucous fibrosis associated with microstomia and micro invasive squamous cell carcinoma.

CASE REPORT:

A 58 years old male patient was referred to Department of Prosthodontics, Sree Mookambika Institute OF Dental Sciences, Kulasekharam, for replacement of missing teeth. On intraoral examination, the patient had completely edentulous maxillary and mandibular arches and limited

mouth opening for the past 5 years. The mouth opening measured was 24mm (fig.1). Patient had history of severe burning sensation on taking food along with difficulty in mastication and speech. Patient had habit of pan chewing for 6 years and has quit the habit before 10 years. Greyish black pigmentation was present on the dorsal aspect of tongue and the left lateral aspects of tongue showed ulceration, which was indurated and non tender, of size 1*1 cm (fig.2) and restricted tongue movements, which was diagnosed as micro invasive squamous cell carcinoma and thick palpable fibrous bands on both right and left cheek mucosa suggestive of Grade IV OSMF (fig.3A and fig. 3B).

Various treatment options and prognosis of the treatment were explained to the patient prior to the commence of the procedure. The primary impression was made with Putty-Light body condensation silicone with stock tray (fig. 4). Since the orifice opening is limited and due to presence of thick band of fibrous cheek tissues, the repeated insertion and removal of conventional custom tray to make border molding for secondary impression will be difficult, hence secondary impression was made with sectional custom tray which was horizontally stabilized with acrylic stent and press button. Then the putty impression was poured with Plaster of Paris to make the primary cast. The techniques following that are:

TECHNIQUE:

1. Conventional custom tray was fabricated for secondary impression making in maxillary arch, as the size of the arch was small. Width of the tray was smaller in size than the width of the mouth opening, which facilitated easy placement and removal of maxillary special tray. Border molding and secondary impression was made with green stick compound and light body impression material respectively.
2. For mandibular arch, as the width of the arch is wider than the mouth opening, a sectional tray was planned to be fabricated for secondary impression making.
3. At first the primary cast was adapted with 2mm thick wax spacer and Autopolymerising resin was mixed and adapted using finger adaptation dough method over the entire mandibular ridge, followed by fabrication of handle for special tray.
4. On this special tray, 2 female part of press buttons was adapted on either side of the posterior part of tray with autopolymerising acrylic resin. And 2 acrylic stent was fabricated, containing 2 male part of press button on either end of stent to lock the female portion in the tray (fig.5A and fig.5B).
5. A groove was made around the handle of the tray and a 19 gauge orthodontic wire is bend to adapt the groove. Then the tray is sectioned into right and left halves at the centre at the handle area and secured with the orthodontic wire (fig.6).
6. Sectioned tray halves were tried in patient's mouth and corrected for the extensions and finally trial locking of the acrylic stent was done inside the mouth.
7. Border molding of the right and left half trays were carried out individually and locked extra orally for its precise approximation (fig.7).

8. Wax spacer was removed from the tray and both the halves were loaded with light body impression material and placed inside mouth simultaneously and locked with the acrylic stent and the handles with orthodontic wire. Followed by functional movements to record the denture base area.
9. Once the material was set, impression was taken slowly by rotating the tray from the mouth (fig.8).

Then both maxillary and mandibular impressions were poured with Type III Dental stone and the master cast was fabricated. Followed by Jaw relation (fig.9), try-in (fig.10) and insertion (fig.11A and Fig.11B).

DISCUSSION:

Impression making in restricted mouth opening patients is challenging as they require accuracy and precision. The present case report described a simplified technique to record the secondary impression with split tray which is locked with horizontal acrylic stent and press button. The press buttons incorporated into the both sides of tray helped to secure the split trays precisely. Reinforcement devices also provide support to the impression when they are poured with dental stone for making master cast. It takes advantages of the flexibility of the impression material while it is being used and the rigidity of the reinforcing material while the impression is being poured.

Various mechanisms were described in literature for limited mouth opening cases like orthodontic expansion screws⁹, hinges¹⁰, magnet systems^{11,12}, locking levers¹³, paralleling pins¹⁴, stainless steel post¹⁵. Kumar et al described sectional custom tray fabrication stabilised with die pins for impression making in Oral submucos fibrosis patient. Conroy and Reitzik used impression compound to make sectional impression. First, one side of the arch impression is made and it was trimmed at the midline. After applying the petroleum jelly on this impression, it is repositioned in the mouth, followed by impression making of the another half. Then both halves were taken out and joined to pour the cast.

Watanabe et al. described prosthesis for completely edentulous patient with microstomia with a cast iron platinum magnetic attachment system incorporated into sectional complete dentures. Naylor and Manor described a technique for the construction of flexible prosthesis for the edentulous patient with microstomia that may be used to perform an oral augmentation exercises to increase the vertical opening.

In this case report complicated locking devices were avoided and a simplified technique is carried out for the horizontal stabilization of the sectional tray.

CONCLUSION:

The difficulty of the treatment procedure increases as the mouth opening decreases, especially when the mouth opening is less than 160 mm. Simple alterations done in procedures help to overcome the patient and clinical difficulties in microstomia patients. The present case report explained about

method to obtain accurate impression in OSMF patient with microstomia by using simplified split tray technique reinforced with acrylic stent and press buttons. This simple and logical sectional tray designs are easy to fabricate, require inexpensive locking mechanisms and require less time for its fabrication.

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FIGURES:

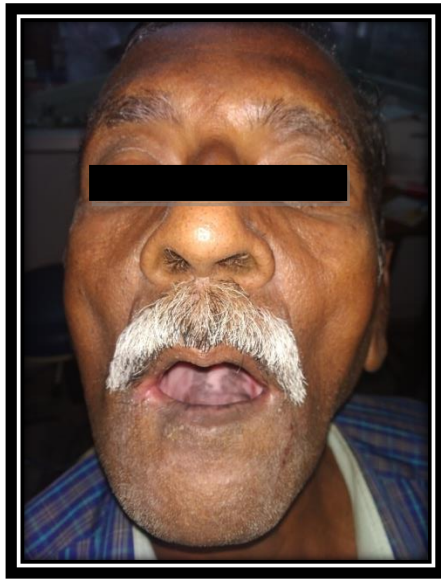


Fig.1. Restricted mouth opening of 28mm



Fig.2. Lesion on the left lateral aspect of the tongue suggestive of micro invasive squamous cell carcinoma



Fig.3A and Fig. 3B. OSMF on Right and Left Cheek mucosa



Fig. 4. Primary impression with condensation silicone



Fig. 5A and Fig.5B. Mandibular tray with Acrylic stent and press button

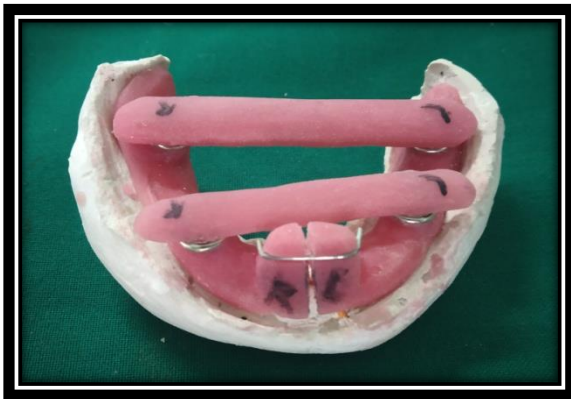


Fig.6- Split impression tray secured with 19 gauge orthodontic wire at the handle



Fig.7- Right and left segments of the tray secured after individual border molding for its precise approximation



Fig. 8- Completed Secondary impression with light body impression material



Fig. 9. Jaw relation



Fig. 10. Try in



Fig.11A and Fig.11B - Insertion