

## CASE REPORT

### A BAG OF TRICKS USING SECTIONAL DENTURES: PROSTHETIC REHABILITATION OF COMPLETELY EDENTULOUS PATIENT WITH MICROSTOMIA-A CASE REPORT

Neha Arora<sup>1</sup>, Nandeeshwar DB<sup>2</sup>, Tarun Kumar<sup>3</sup>, Sangeetha KM<sup>1</sup>

<sup>1</sup>Post Graduate, <sup>2</sup>Professor and Head, Department of Prosthodontics, Bapuji Dental College and Hospital, Davangere, Karnataka, India, <sup>3</sup>Post Graduate, Department of Oral Medicine and Radiology, Swami Devi Dyal Hospital & Dental College, Haryana (India)

#### ABSTRACT:

Reduced mouth opening poses a challenge and is often a daunting task for the operator to perform any intraoral procedures. Limited mouth opening can be caused by the head and neck radiation, surgically treated head and neck tumors, connective tissue diseases, facial burns, reconstructive lip surgeries and the most common factor oral submucous fibrosis. Reduced mouth opening in patients with trismus induced by submucous fibrosis, the procedure may be even more difficult to carry out impression procedures because of reduced tissue resiliency and obliteration of vestibular spaces. The present case report describes the fabrication of sectional dentures designed for edentulous patient after surgical removal of fibrous bands which was diagnosed as chronic areca-nut induced submucous fibrosis.

**Key words:** Microstomia, limited mouth opening, sectional dentures.

Corresponding Author: Neha Arora, Post Graduate, Department of Prosthodontics, Bapuji Dental College and Hospital, Davangere, Karnataka (India), E-mail dr.nehatarora271@gmail.com

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#### INTRODUCTION

Oral submucous fibrosis is a precancerous condition, affecting any part of the oral cavity and is caused by prolonged use of tobacco, areca nut, spices, etc. This condition is characterized by a burning sensation of the mouth, stiffening of certain areas of the oral mucosa with difficulty in opening the mouth. Rajendran, in 1994,<sup>[1]</sup> reported and named this condition as "atrophia idiopathica (tropica) mucosae oris" involving oral mucosa, palate, and pillars of the fauces. The characteristic finding observed in these patients is pale mucosa with loss of elasticity and resiliency. Formation of fibrous bands in sub mucous connective tissue was reported to be the root cause behind gradual reduction in mouth opening.

It has been reported that the limited oral opening may result from the surgical treatment of orofacial cancers, oral submucous fibrosis, cleft lips or scleroderma. One approach to the management of microstomia is the use of microstomia orthoses to expand the oral opening.<sup>[2, 3]</sup> The oral opening may also be increased by use of stretching exercises.<sup>[4]</sup> The use of an increasing number of tongue blades to stretch the facial tissues can also be advised.<sup>[4]</sup> Sectional dentures have been recommended connected by clasps. Mc Cord et al described a maxillary complete denture consisting of 2 pieces joined by a stainless steel rod with a diameter of 1 mm fitted behind the central incisors. Whitsitt and Battle introduced a procedure for primary

impressions of dentulous arches using putty silicone as a flexible tray,<sup>[5]</sup> washed with light body silicone to obtain more detail. Several techniques based on flexible, modified standard trays and sectional trays have been proposed.<sup>[6, 7]</sup>

In this present article, a different design for the fabrication of maxillary and mandibular sectional trays and sectional dentures using a snap attachment is described.

#### CASE REPORT

A 55-year-old completely edentulous male reported to the Department of Prosthodontics, Bapuji Dental College and Hospital, Davangere with a chief complaint of difficulty in chewing food and restricted mouth opening. Patient wanted a set of new complete dentures. He had a mouth opening of 24.45 mm (circumference was 110 mm). Patient did not have any relevant medical history but gave the history of areca nut chewing since the age of 24. He was completely edentulous for the period of one year. Intra oral examination revealed lack of elasticity and compressibility of the mucosa and hairy growth on buccal mucosa as it was tethered via nasolabial flap. But after surgical removal of fibrous bands, mouth opening was further reduced by scar contracture. Both, maxillary and mandibular residual ridges were resorbed. Patient wore a set of ill fitting complete dentures with short flanges for easy insertion and removal since six months. He was able to insert both the dentures by rotating it in 90 degrees but was having a great

difficulty in insertion and removal of dentures in spite of short flanges of the denture.

Pre prosthetic phase of treatment was carried out in the form of local injections of dexamethasone and chymotrypsin for the period of six months. Patient was also trained for stretching exercises using tongue blade for increasing his mouth opening. After 6 months mouth opening was improved by 2 mm but patient still had difficulty in inserting the dentures. After thorough clinical examination, the decision to fabricate sectional dentures was made.

## SEQUENTIAL STEPS

### 1. Preliminary impressions (Figure 1)

- Preliminary impression for maxillary arch was made in irreversible hydrocolloid (Hydrogum from Zhermack) using the smallest available stock tray (size-0) whose flanges were modified as required until it could be inserted in patients mouth.
- Preliminary impression for mandibular arch was obtained with a putty silicone impression material (Imprint, 3M ESPE, Germany) with the help of finger pressure.
- The impressions were poured in dental stone (Kalstone, Kalabhai Karson, Mumbai, India) to obtain primary cast.

### 2. Final impressions (Figure 2)

- Sectional custom tray was fabricated using autopolymerizing acrylic resin.(DPI RR cold cure, DPI, India)
- For fabricating maxillary sectional custom tray,4 metal dowel pins with special metal sleeve were incorporated, each 2.5mm in diameter; two of these pins were 25 mm long placed close to the midline and the other two were 15 mm long which were placed over the residual ridges.
- For mandibular tray, 2 pins were placed close to the midline.
- The acrylic resin trays were painted with petroleum jelly, and an acrylic resin block which slid tightly on the pins was prepared. The trays were sectioned into 2 pieces with a steel disc and then joined with the acrylic resin block,which slid onto parallel pins and trays were checked in patients mouth for proper extensions.
- Sectional border molding was performed with low fusing compound (DPI Pinnacle, India) and final impression was made with light body addition silicone. Two sections were rejoined outside the mouth and poured in a dental stone.

3. While making final impression, sections of the tray were inserted one after another before material in the first section was set in order to ensure merging of both the parts. Impression was removed in one piece. The

impressions were refined and the trays were assembled extraorally for pouring of the master casts after beading and boxing of the same.

### 4. Sectional record base fabrication (Figure 3)

- Two master casts were obtained from the polyvinyl siloxane impression.
- Temporary record bases were fabricated on obtained master casts using autopolymerizing acrylic resin utilizing same procedure as employed in fabrication of sectional custom trays.

### 5. Fabrication of wax rims and sectional jaw relations (Figure 4)

- On these sectional record bases, wax rims were fabricated and jaw relation were recorded using staple pins, after placing the individual sections intra-orally.
- Teeth arrangement was done using non anatomic teeth by the monoplane occlusal scheme to improve stability of the dentures since both the ridges were resorbed.

### 6. Try-in of waxed up sectional prosthesis (Figure 5)

- The transfer of jaw relation record to articulator, arrangement of teeth, and the try- in were carried out in the conventional manner.

### 7. Acrylization of the sectional prosthesis (Figure 6 A to F)

- Before acrylization of waxed –up sectional denture, the dowel pins were detached and replaced by 2 press buttons one for each waxed up record base and smoothed using acrylic stones and burs. The master cast was duplicated using the reversible hydrocolloid (agar) and kept aside for later use. The acrylization was carried out in the conventional manner:
  - a) The one half of the waxed up sectional prosthesis was placed on the original master cast and sealed with wax. One press button (male portion) of size 0 for each sectional record base were waxed in position, 4 to 5 mm from midline.
  - b) The above mentioned assembly was acrylized conventionally, after which the one half of the sectional prosthesis was recovered, polished, and finished. The one half of the sectional prosthesis was placed on the duplicated master cast and sealed with wax.
  - c) The one half of the sectional prosthesis, along with the duplicated master cast was duplicated again using reversible hydrocolloid (agar).
  - d) The other half of the sectional prosthesis was placed on the duplicated cast, and the female portions of the press buttons were fixed in their corresponding positions using cyanoacrylate cement.

e) Waxing and sealing of the other half of sectional prosthesis was carried out, ensuring complete coverage of the press buttons.

f) Acrylization of the above was carried out conventionally, followed by recovering, finishing and polishing the other half of sectional prosthesis.

**8. Sectional prosthesis insertion (Figure 7)**

- After ensuring fit and stability of the sectional prosthesis, it was placed in patient's mouth.
- Cuspal pattern was evaluated and the occlusal interferences were removed using articulating paper.

The patient was thoroughly educated and instructed regarding use of the prosthesis, to ensure the proper assembly of the same. Post -insertion and oral hygiene instructions were given , and the routine follow- up appointments were scheduled. Subsequently patient has been followed up for the last one and half years and he is using the prostheses comfortably. During the follow up appointments, it was observed that there was no untoward compression of soft tissues in the midline.



**Figure 3:** Sectional record base fabrication



**Figure 4:** Fabrication of wax rims and sectional jaw relations



**Figure 1:** Preliminary impressions



**Figure 5:** Try-in of waxed up sectional prosthesis



**Figure 2:** Sectional custom tray



**Figure 6 (a):** Acrylization



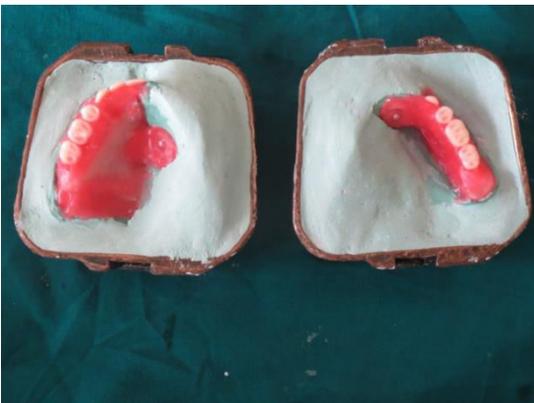
**Figure 6 (b):** Acrylization



**Figure 6 (c):** Acrylization



**Figure 6 (d):** Acrylization



**Figure 6 (e):** Acrylization



**Figure 6 (f):** Acrylization



**Figure 7:** Insertion

#### DISCUSSION

In cases where microstomia is not manageable with surgery or dynamic opening devices, modified impression techniques and prosthesis design facilitates rehabilitation. Suzuki et al. constructed a sectional and collapsible denture for the partially edentulous patient with microstomia.<sup>[8]</sup> Some authors have described the method of fabricating only the collapsible denture while others have described only sectional.<sup>[9,10]</sup> Prosthetic management of microstomia patients presents difficulty at all stages, starting from preliminary impressions to fabrication of prosthesis. The overall bulk and the height of impression trays make the recording of impressions extremely difficult because the paths of insertion and removal of impressions are compromised by lack of clearance. The use of sectional impressions which may be recorded in two or more parts and then relocated in two or more parts and then relocated outside the mouth is a useful technique to adopt for such patients. The trays can be provided with fins, pins, lego pieces stepped or butt joints to facilitate the relocations.<sup>[11]</sup> In the dental literature, there are few articles describing the method of making impressions for sectional dentures. In the present scenario, locking mechanism is provided by acrylic resin blocks for sectional trays which slid onto parallel dowel pins and the impression was removed in one piece utilizing this innovative locking mechanism to maximize the accuracy. Stud attachment by Bredent was

tried initially but it made the record base bulky and hence the press button attachment was planned to use. Cost effectiveness, ease of insertion and removal and provision of maximal coverage for retention, support, and stability can be regarded as the advantages of this kind of sectional denture. The abovementioned technique is an innovative, practical and economical solution for the patients having microstomia.

### CONCLUSION

The advantages of using this technique as follows:

- The technique can be accomplished in any dental clinic, without using complicated machinery for sectioning or assembling the trays/ prosthesis together.
- The press buttons are easily available at a nominal cost. They can be replaced easily with the help of self cure acrylic resin in case of any damage.

Additional time, labour, and materials are some of the limitations of this technique. However, to determine the long term success of this technique, periodic recall, maintenance, and further improvements in design are required.

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