

# Prosthodontic management of a patient with limited mouth opening: A practical approach

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Dentists occasionally come across patients with constricted oral openings. As the size of the oral opening decreases, the difficulty of the required treatment increases. A maximal oral opening that is smaller than the size of a complete denture can make prosthetic treatment challenging. Several techniques have been described for such situations, where either standard impression trays or the denture itself becomes too difficult to place and remove from the mouth.

The literature contains various reports on the fabrication of sectional or hinged tray/complete dentures, utilizing various mechanisms for connecting each of the components.

A case report and technique of a simplified and practical design for fabrication of mandibular/maxillary sectional trays and complete denture have been presented here; this technique utilizes components that are commonly available, to simplify the treatment modality of limited oral access to the prosthesis.

**Key words:** Limited mouth opening, microstomia, sectional denture

## INTRODUCTION

Limited mouth opening (microstomia) can be defined as a reduction in the perimeter of the oral cavity<sup>[1]</sup> or an abnormally small orifice.<sup>[2]</sup> Limited mouth opening in itself is not a disease but manifests as a consequence of certain conditions, namely, surgical treatment of oro-facial carcinomas, cleft lip, trauma and burns, Plummer-Vinson's syndrome,<sup>[3,4]</sup> scleroderma, trismus,<sup>[5]</sup> temporomandibular joint dysfunction syndrome, rheumatism,<sup>[6]</sup> oral submucous fibrosis, or any damage to the masticatory muscles.

During a prosthodontic procedure, it is the loaded impression tray that forms the bulkiest item requiring intraoral placement. This, compounded by the presence of limited mouth opening, makes the task of obtaining a proper path of tray placement a difficult and challenging procedure.<sup>[7]</sup>

It is for the above-mentioned reason that many authors have advised and advocated sectional custom trays and collapsible denture systems. However, many of these systems require costly or complicated attachment devices, e.g., hinges,<sup>[3-7]</sup> locking levers,

orthodontic expansion screws, magnet systems, slide lock joints, etc.

An attempt has been made here to describe the fabrication of a sectional prosthesis that is practical, economical, and simple in design.

## CASE REPORT

A 75-year-old female patient reported to the Department of Prosthodontics, Bharati Vidyapeeth Dental College, Pune, for the purpose of receiving complete denture treatment [Figure 7].

On examination, she was found to have severe limitation in mouth opening in the range of 23 to 25 mm,<sup>[8]</sup> making the fabrication of complete denture quite difficult. It was therefore decided to fabricate a sectional prosthesis, after taking an informed consent from the patient for undergoing such a procedure.

## Technique

**1. Sectional stock tray fabrication [Figure 1]:** Since it was difficult to place the smallest stock metal tray in the patient's mouth, a sectional stock tray was fabricated by duplicating a size '0' maxillary and mandibular metal stock tray in acrylic (M. P. Sai Enterprise). This was then sectioned through the midline, after which cross-pin slots were placed on the handle of each tray using the Pindex®

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machine. The trays were then stabilized on the cast using sticky wax (M. P. Sai Enterprise). The cross-pins, along with the sleeves, were placed in position, petroleum jelly was applied on the surface of the tray that would come in contact with the other half, and the remaining portion of the tray was fabricated. To ensure tray stability, as well as uniformity of pressure and impression material, tissue stops were placed on the intaglio surface of the trays.

2. **Sectional primary impression [Figure 2]:** The sectional maxillary and mandibular primary impressions were then made using impression compound (Y Dents, MDM Corp.), after noting the important anatomical landmarks for accurate placement of the sectional stock trays. The impressions were then refined, making sure excess impression material that had flown past the midline had been trimmed to flush with surface of the tray. The trays were then reassembled extraorally, followed by beading, boxing, and pouring of the primary cast using model plaster (type II). Some authors recommend intraoral assembly of sectional trays. This can be easily done by sectioning the cross-pin to half its length and assembling the loaded tray intraorally.
3. **Sectional custom tray fabrication and final impressions [Figure 3]:** Spacer wax was adapted on the primary cast and tissue stops were placed. For each sectional tray, four tissue stops were placed. The sectional trays were then fabricated using acrylic tray material in a manner similar to that described in step 1. Border molding of maxillary and mandibular sectional custom trays was then completed in sections using low-fusing compound (D.P.I. Pinnacle), followed by the making of sectional final impressions using eugenol-free zinc oxide impression paste (Cavex, Holland). The impressions were refined and the trays were assembled extraorally for pouring of the master casts after beading and boxing of the same.  
Note: For proper recording of labial freni, custom trays should not be sectioned in exact equal halves.
4. **Sectional record base fabrication [Figure 4]:** Temporary record bases were fabricated on the obtained master casts using autopolymerizing acrylic resin. The record bases were recovered and sectioned through the midline. The sectioned halves were then connected using size '0' stainless steel press buttons (snap fasteners, Needle Ind.) and acrylic tabs.
5. **Fabrication of wax rims and sectional jaw relation [Figure 4]:** On these sectional record bases, wax rims were fabricated and jaw relation was recorded, after placing the individual sections intraorally.

6. **Try-in of waxed-up sectional prosthesis [Figure 4]:** The transfer of jaw relation record to the articulator, arrangement of teeth, and the try-in were carried out in the conventional manner.

7. **Acrylization of the sectional prosthesis [Figure 5]:** Before acrylization of the waxed-up sectional denture, the press buttons were removed and the record bases were smoothed using acrylic stones and burs. The master cast was duplicated using reversible hydrocolloid (agar) and kept aside for later use. The acrylization procedure was carried out in the following manner:

- a) The right half of the waxed-up sectional prosthesis was placed on the original master cast and sealed with wax. Three (1 in case of the mandibular sectional denture) new size '0' press buttons (male portion) were waxed in position, 4 to 5 mm from the midline.
- b) The above-mentioned assembly was acrylized conventionally, after which the right half of the sectional prosthesis was recovered, polished, and finished. The right half of the sectional denture was placed on the duplicated master cast and sealed with wax.
- c) The right half of the sectional prosthesis, along with the duplicated master cast, was duplicated again using reversible hydrocolloid (agar).
- d) The left 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 left half of the 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 left half sectional prosthesis.

8. **Sectional prosthesis placement [Figure 6]:** After ensuring the fit and stability of the sectional prosthesis, it was placed in the patient's mouth. The patient was thoroughly educated and instructed regarding the use of the prosthesis to ensure proper assembly of the same. Post-insertion and oral hygiene instructions were imparted, and routine follow-up appointments were scheduled [Figure 7].

## DISCUSSION

Simplified sectional tray design and ease of fabrication are the major advantages of this technique. This technique can be accomplished in any dental laboratory, without using complicated machinery or attachment devices for sectioning or assembling the trays/prosthesis together. The press buttons are available



Figure 1: Sectional stock tray fabrication



Figure 5: Acrylization of the sectional prosthesis



Figure 2: Sectional primary impression



Figure 6: Sectional prosthesis placement



Figure 3: Sectional custom tray fabrication and final impressions



Figure 7: Preoperative and postoperative view



Figure 4: Sectional record base fabrication

easily and at a nominal cost. In case of any damage, they can be replaced and relocated easily with the help of self-cure acrylic resin.

This technique shares disadvantages common to all sectional tray/prosthesis designs, namely, additional time, labor, and materials. However, to determine the long-term success of this technique, periodic recall, maintenance, and further improvements in design are needed.

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