

# Custom Sectional Impression Tray With Sectional Handle for Microstomia Patients

Ramesh Kunusoth <sup>1</sup>, Shreya Colvenkar <sup>2</sup>, Suman Thotapalli <sup>3</sup>, Aditya Mohan Alwala <sup>1</sup>, Rathod Prakash <sup>1</sup>

Review began 09/04/2022

Review ended 09/18/2022

Published 09/21/2022

© Copyright 2022

Kunusoth et al. This is an open access article distributed under the terms of the Creative Commons Attribution License CC-BY 4.0., which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

1. Department of Oral and Maxillofacial Surgery, MNR Dental College and Hospital, Sangareddy, IND 2. Department of Prosthodontics, MNR Dental College and Hospital, Sangareddy, IND 3. Department of Prosthodontics, SB Patil Dental College and Hospital, Bidar, IND

**Corresponding author:** Shreya Colvenkar, drcolvenkar@gmail.com

---

## Abstract

Microstomia presents a unique challenge to the dentist as well as the patient. Microstomia patients often face difficulty in inserting or removing removable dental prostheses due to constricted opening of the oral cavity. Dentists often face difficulty in inserting impression trays in these patients because of the limited mouth opening. Standard impression procedures need to be modified in such patients. This article describes a simple design for the fabrication of a sectional handle for a definitive impression in microstomia patients. The sectional handle could be sterilized and reused.

---

**Categories:** Preventive Medicine, Quality Improvement, Dentistry

**Keywords:** impression, handle, impression tray, sectional, microstomia

## Introduction

Microstomia is defined as a small oral aperture, and it can cause not only functional impairment but cosmetic problems as well. Functional impairments such as problems with speech, food intake, and compromised oral hygiene have been reported in patients with limited mouth opening. Microstomia can be acquired or congenital, the latter being rarely reported. Acquired microstomia can be caused due to burns [1], physical or chemical trauma [2], head and neck radiotherapy [2], injury, surgical treatment of oral cancers [3], or clinical manifestation of systemic diseases like scleroderma.

Various treatment modalities have been described in the literature for the management of microstomia patients, including surgery and microstomia orthoses. Dentists face difficulty during the fabrication of dentures for these patients because of their limitation in mouth opening. The primary hurdle during denture fabrication is the insertion of a standard stock tray and a custom tray. A review of the literature shows various designs for connecting sectional trays [4-10].

This technical report describes a simple technique for designing a cobalt-chrome sectional handle for a custom impression tray. This customized handle can be sterilized and reused.

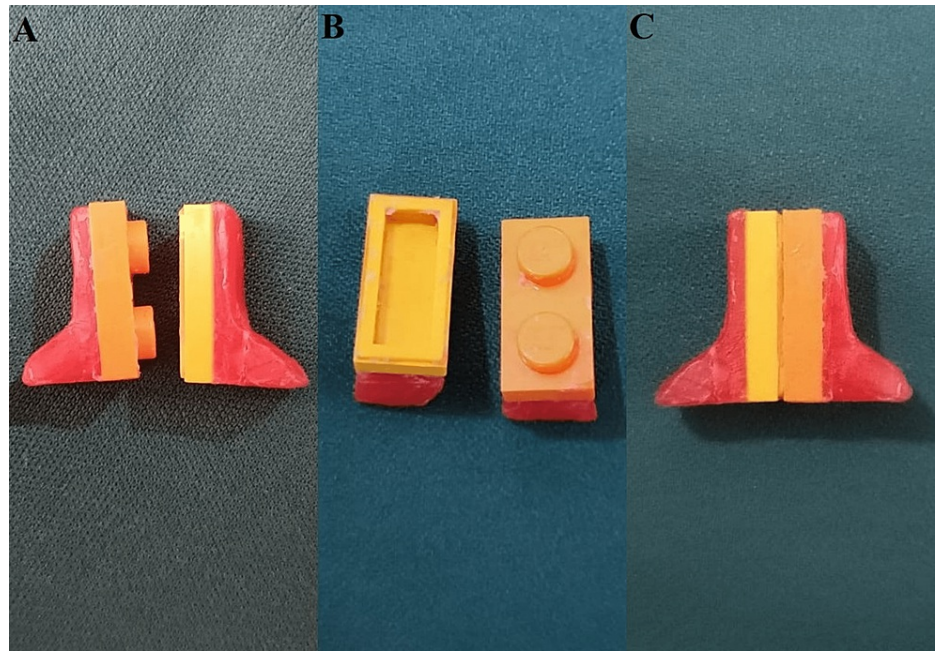
## Technical Report

### Handle design

The handle is designed in two parts: it has a male and a female unit. The male and female units are made with wax and lego blocks. Lego blocks are attached to it such that they correctly interlock (Figure 1).

#### How to cite this article

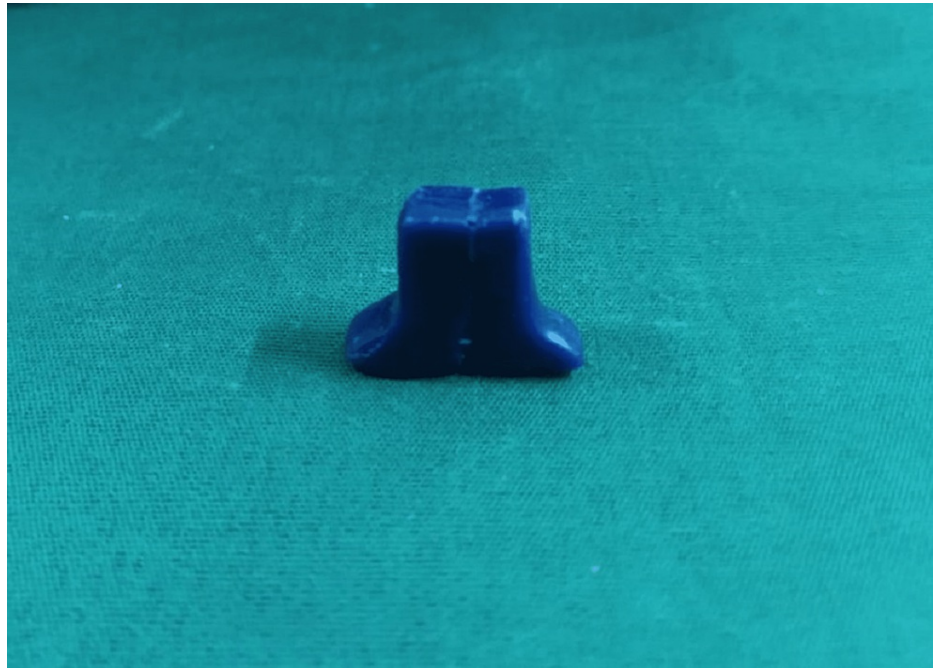
Kunusoth R, Colvenkar S, Thotapalli S, et al. (September 21, 2022) Custom Sectional Impression Tray With Sectional Handle for Microstomia Patients. Cureus 14(9): e29433. DOI 10.7759/cureus.29433



**FIGURE 1: Sectional handle with lego blocks**

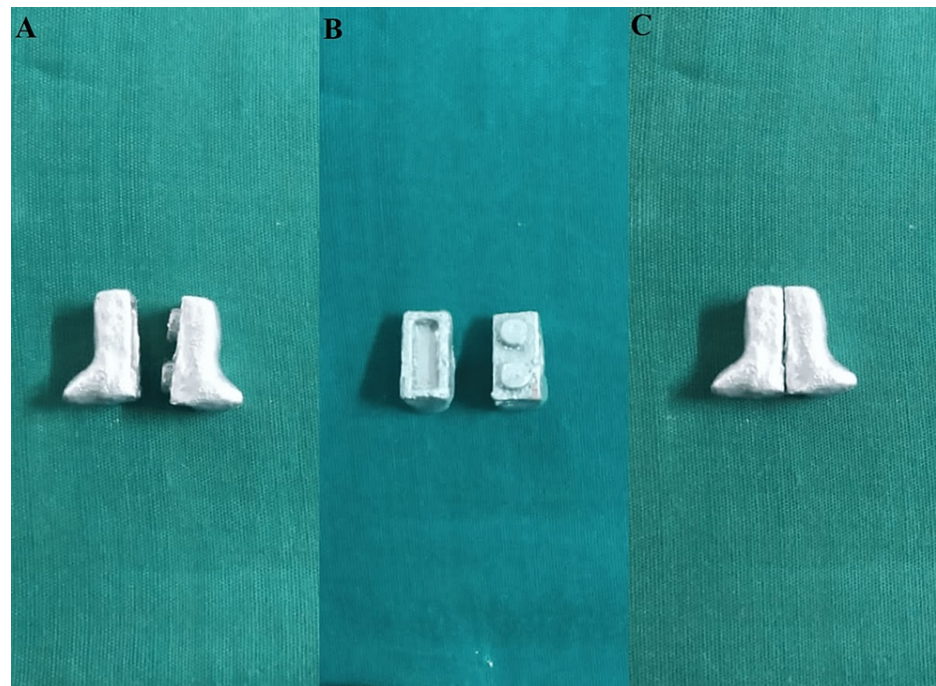
A: male and female segments; B: inner surface; C: interlocked handle

Both the male and female units are duplicated in inlay wax (Figure 2).



**FIGURE 2: Sectional handle in inlay wax**

They are then invested and cast in a cobalt-chromium alloy (Figure 3).



**FIGURE 3: Sectional handle**

A: male and female segments; B: inner surface; C: interlocked handle

### Fabrication of custom impression tray and secondary impression

The mandibular tray is fabricated in two sections. Apply separating media (Cold Mold Seal, DPI Pvt. Ltd, Mumbai, India) to the cast and adapt wax spacer over it and section in the midline. Fabricate the right half of the tray with auto-polymerized acrylic resin (DPI RR Cold Cure, DPI Pvt. Ltd) and attach the male unit of the handle in the anterior region of the tray. On completion of setting reaction, apply the separating medium along the midline of the right half of the tray. Fabricate the left half of the tray with auto-polymerized acrylic resin.

Attach the female unit of the handle to the left half of the tray such that it correctly interlocks with the male unit of the handle (Figure 4).





**FIGURE 4: Custom impression tray with interlocked sectional handle**

Carry out the same procedure for the attachment of the handle for the maxillary tray together with the posterior lock. Check the tray intraorally for correct extensions. Carry out border molding for each half of the tray with low-fusing impression compound. Following this, make secondary impressions with zinc oxide eugenol impression paste (DPI impression paste, DPI Pvt. Ltd). Load the impression paste into the right half of the tray and insert it in the patient's mouth followed by the left half of the sectional tray with the impression paste. On setting the impression material, separate sectional trays intraorally and reassemble them externally.

## Discussion

Microstomia presents a challenge to the patient as well as the dentist. Dentists need to make changes in conventional procedures during denture fabrication. Various sectional and collapsible dentures have been described in the literature. Sectional dentures are connected with the help of different attachments that lock the dentures in place [5-10].

The primary hurdle during the fabrication of dentures is making an impression. Limited oral opening causes difficulty in the insertion and removal of the impression tray. The key requirement of the sectional tray is the ease of reassembling and disassembling the tray in the patient's mouth. Hence, the locking mechanism should be simple and not complicated. The main advantage of this design is that it could be easily reassembled and disassembled in patients' mouths as well as outside. Both elastomeric and non-elastomeric impression materials can be used with this technique.

A literature search has revealed various connecting mechanisms such as hinges [4], snap buttons, locking levers [5], plastic blocks [6,7], orthodontic expansion screws [8], magnet systems [9], and parallel pins [10] for fabricating sectional trays. Snap buttons and parallel pins require precision in securing the trays firmly. Locking levers is technique-sensitive and a little complicated. Magnets tend to lose their magnetism with time and need to be remagnetized.

In this technique, the tray is designed in wax using lego blocks. It is then cast with cobalt-chromium alloy. The main advantage of a sectional handle is that it can be sterilized and reused in the future. It can be easily fabricated with materials readily available in a dental laboratory.

The sectional handle is prefabricated, and hence it is easy to make a sectional tray in a very short time for microstomia patients. The sectional handle is cheap and made from durable material.

## Conclusions

Patients with microstomia presenting for prosthetic rehabilitation pose a challenge to the clinician. Getting an accurate impression is the first and crucial step in denture fabrication. Sectional trays should have a

simple locking mechanism. The sectional handle is easy to reassemble and disassemble in the patient's mouth. This technical report describes an economical, quick, and easy method for the fabrication of a sectional custom tray for microstomia patients. It can be sterilized and reused in the future.

## Additional Information

### Disclosures

**Human subjects:** All authors have confirmed that this study did not involve human participants or tissue.

**Animal subjects:** All authors have confirmed that this study did not involve animal subjects or tissue.

**Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

### References

1. Maragakis GM, Garcia-Tempone M: Microstomia following facial burns. *J Clin Pediatr Dent.* 1998, 23:69-74.
2. Engelmeier RL, King GE: Complications of head and neck radiation therapy and their management . *J Prosthet Dent.* 1983, 49:514-22. [10.1016/0022-3913\(83\)90314-1](https://doi.org/10.1016/0022-3913(83)90314-1)
3. Dado DV, Angelats J: Upper and lower lip reconstruction using the step technique . *Ann Plast Surg.* 1985, 15:204-11. [10.1097/0000637-198509000-00003](https://doi.org/10.1097/0000637-198509000-00003)
4. Conroy B, Reitzik M: Prosthetic restoration in microstomia. *J Prosthet Dent.* 1971, 26:324-7. [10.1016/0022-3913\(71\)90075-8](https://doi.org/10.1016/0022-3913(71)90075-8)
5. Baker PS, Brandt RL, Boyajian G: Impression procedure for patients with severely limited mouth opening . *J Prosthet Dent.* 2000, 84:241-4. [10.1067/mpr.2000.109187](https://doi.org/10.1067/mpr.2000.109187)
6. Luebke RJ: Sectional impression tray for patients with constricted oral opening . *J Prosthet Dent.* 1984, 52:135-7. [10.1016/0022-3913\(84\)90196-3](https://doi.org/10.1016/0022-3913(84)90196-3)
7. Suzuki Y, Abe M, Hosoi T, Kurtz KS: Sectional collapsed denture for a partially edentulous patient with microstomia: a clinical report. *J Prosthet Dent.* 2000, 84:256-9. [10.1067/mpr.2000.109631](https://doi.org/10.1067/mpr.2000.109631)
8. Mirfazaelian A: Use of orthodontic expansion screw in fabricating section custom trays . *J Prosthet Dent.* 2000, 83:474-5. [10.1016/s0022-3913\(00\)70044-8](https://doi.org/10.1016/s0022-3913(00)70044-8)
9. Colvenkar SS: Sectional impression tray and sectional denture for a microstomia patient. *J Prosthodont.* 2010, 19:161-5. [10.1111/j.1532-849X.2009.00529.x](https://doi.org/10.1111/j.1532-849X.2009.00529.x)
10. Kumar S, Arora A, Yadav R: Prosthetic rehabilitation of edentulous patient with limited oral access: a clinical report. *Contemp Clin Dent.* 2012, 3:349-51. [10.4103/0976-237X.103635](https://doi.org/10.4103/0976-237X.103635)