

Making impressions in a patient with microstomia

Case Report

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Introduction

An abnormally small oral orifice is called microstomia.¹ Patients with microstomia have a limited mouth opening and therefore a limitation of access to the oral cavity.²

- Microstomia is a common occurrence with trauma, surgical resection, and burns to the mouth and surrounding tissue.³ It is often seen in patients suffering from scleroderma or patients treated surgically for removal of malignant lesions, traumatic injuries or congenital deformities.⁴ Patients with trismus may experience a marked restriction of jaw opening and overall mandibular immobility.⁵
- Patients with microstomia may undergo surgical enlargement of oral aperture. Surgical enlargement must be considered carefully because, if the rehabilitation of the surgical operation is not sufficient, a scar may result. Without surgical operation it is very difficult to perform prosthetic treatment for patients with microstomia, especially when the mouth circumference length is less than 160 mm.²
- The fabrication of dental prostheses for patients with microstomia has long been a problem for dentists. Several methods of prosthodontic treatment for such patients have been presented, and numerous devices to expand oral commissure has been described. In prosthodontic treatment, the loaded impression tray is the largest item requiring intraoral placement. This, compounded by the presence of limited mouth opening and limitation of access to the oral cavity, makes the task of obtaining a proper path of tray placement a difficult and challenging procedure.
- It is more difficult to insert the tray than to remove it from the mouth. When the tray is placed in the mouth, the operator usually stretches one corner, making the oral opening still smaller. During removal, the orbicularis oris can be stretched beyond the limit of the patients normal function. In this situation, the muscles sphincteric shape allows the operator additional maneuverability.
- The length of the flanges should be designed conservatively. In the laboratory, the tray is usually placed and removed from the cast in a vertical motion. In a mouth with limited opening, a more horizontal motion must be used. The clinical realities of the patients limitations must be recognized while designing the tray.
- Because the tray is not used unloaded, flange length is increased when the impression material is introduced into the tray and the impression is made. The two piece tray should be designed so that it fits precisely and separates easily in the mouth. Any locking mechanism that serves to aid fit but limits separation should be avoided.
- It is for the above mentioned reason that many authors have advised and advocated the use of flexible trays, sectional trays etc. However many of these systems require costly or complicated attachment devices like hinges, locking levers, orthodontic expansion screws, and slide lock joints.
- Most of the techniques described in literature have disadvantages such as, it can either be used for maxillary or mandibular arch, edentulous or the dentulous patients, are expensive, and require additional time, materials and labour.

Objectives

Most of the techniques described in literature have disadvantages such as, it can either be used for maxillary or mandibular arch, edentulous or the dentulous patients, are expensive, and require additional time, materials and labour.

Material and Methods

Clinical Report:

- A 60 year old female patient sought complete denture prosthetic treatment at the Dept of prosthodontics, Goa dental College and hospital, Goa.
- On examination, it was observed that the patient had maximal mouth opening of 36 mm, and the mouth circumference length less than 100 mm. She was diagnosed as having microstomia as a natural consequence of the aging process. Making impression in this patient was a challenge, since it was difficult to place the smallest stock tray in the patients mouth. It was decided to make the diagnostic cast with a nonrigid tray.¹⁰ The preliminary impression had to be accurate enough to fabricate the modified custom tray to be used for the final impression.

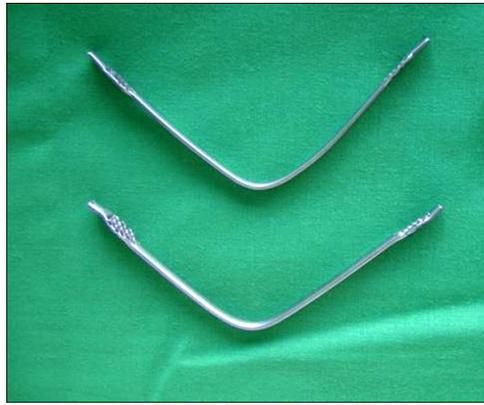


Fig. 1: Dowel pins

Fig. 2: Horseshoe shape metal bar



Fig. 3-4: Patient with limited mouth opening

Preliminary Impression:

Sufficient amount of silicone putty material was mixed to cover all important anatomic regions of the arch. Well kneaded silicone putty material was adapted into the patient's mouth. After the material set, it was removed from the mouth and any excess material was trimmed with surgical blade # 15. Monophase impression material was used to obtain a more detailed impression. Preliminary cast was poured in dental stone.



Fig. 5-6: Flexible trays for primary impression

Custom Tray Fabrication:

Material required for the fabrication of the custom tray were:

1. Autopolymerizing acrylic resin and wax spacer.
2. Dowel pins with antirotational mechanism.
3. Metal bar bent in horseshoe shape.

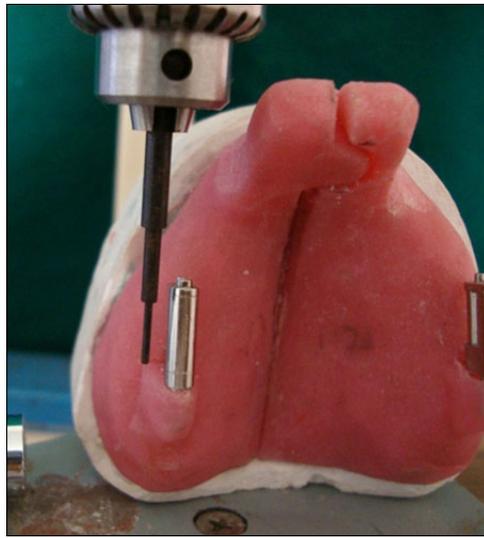


Fig. 7-8: Dental surveyor is used to analyse the parallelism of the dowel pin position

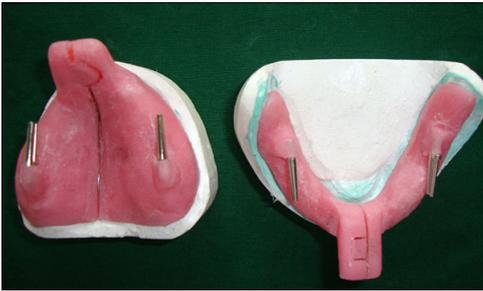


Fig. 9: Dental surveyor is used to analyse the parallelism of the dowel pin position

Procedure:

1. The conventional custom tray with spacer was fabricated, and it was sectioned in the midline using a diamond disc.
2. An interlocking design was incorporated in the tray handle.
3. Dowel pins with antirotational mechanism were used to serve as a key and key way mechanism.
4. Dowel pin was secured to the two halves of the tray using autopolymerizing acrylic resin. Their parallelism was evaluated with a dental surveyor.
5. A metal bar bent in horseshoe shape was used to form the locking component. This was attached to the keyway portion of the dowel pins on both the tray halves using autopolymerizing acrylic resin.



Fig. 10



Fig. 11

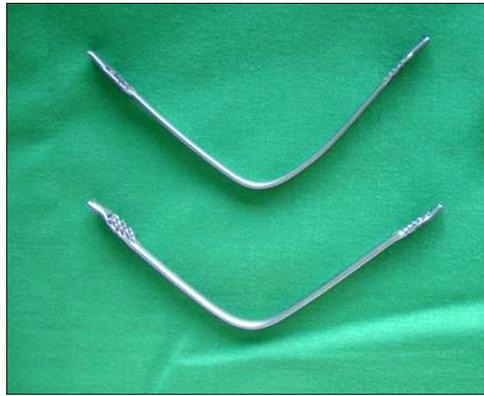


Fig. 12-13: The metal bar is bent in the form of a horse shoe. It is then secured with autopolymerizing resin to the keyway portion of the dowel pin



Fig. 14: Two halves of the tray

Fig. 15: Locking segment



Fig. 16: Assembled split custom tray

Border molding:

- 1) One half of the custom tray was border molded sectionally using low fusing stick compound.
- 2) The other half was then inserted in the mouth for border molding, with the first half still in the mouth.
- 3) Both the tray halves were removed from the mouth, tempered, and simultaneous border molding carried out.

Final impression:

- 1) Zinc oxide eugenol paste was used as it is easier to trim the impression without distorting it. Impression was made with the first half of the tray. After removing it from the patient's mouth, the impression material was trimmed so that it was flush with the medial edge of the tray.
- 2) The impression tray or material that would contact the second half of the tray were lubricated and reinserted in the mouth.
- 3) The second tray half was loaded with the impression material and inserted in the patient's mouth.
- 4) It was ensured that there was proper locking of the two tray halves and the material was allowed to set.
- 5) The tray was unlocked and the two halves were removed individually.
- 6) The tray was then reassembled outside the mouth.
- 7) The cast was poured after beading and boxing the impression.



Fig. 17-18: The tray is disassembled, removed from the mouth and then reassembled outside the mouth

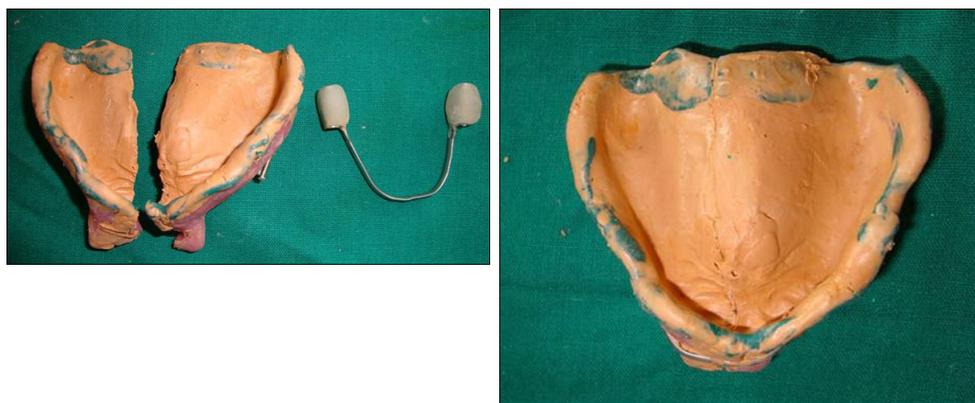


Fig. 19

Fig. 20

Results

Impression making was accomplished with ease in a patient with microstomia, using flexible tray for the primary impression and sectional impression tray for the final impression. Advantages of the technique includes better stability of the tray parts due to the antirotational locking mechanism, economic, easily available materials were used for the custom tray fabrication, it was simple to fabricate the tray as well as secure the locking component, less cumbersome and less time consuming compared to all the earlier tray designs.

Conclusions

In prosthodontic treatment, the loaded impression tray is the largest item requiring intraoral placement. This compounded by the presence of limited mouth opening and limitation of access to the oral cavity, makes the task of obtaining a proper path of tray placement a difficult and challenging procedure.

Essential landmarks required for the successful fabrication of a prosthesis must be identified. In a patient with restricted opening, it is difficult to obtain the perfect impression that captures all possible anatomic details. Priorities must be established according to the prosthodontic need of the individual patient.

During impression procedures, wide mouth opening is required for proper tray insertion and alignment. Because this is not possible in patients with restricted opening ability, a modification of the standard impression procedure is often necessary to accomplish this fundamental step in the fabrication of a successful prosthesis.

Advantages of the technique includes better stability of the tray parts due to the antirotational locking mechanism, economic, easily available materials were used for the custom tray fabrication, it was simple to fabricate the tray as well as secure the locking component, less cumbersome and less time consuming compared to all the earlier tray designs.

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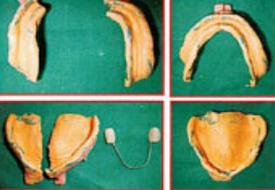
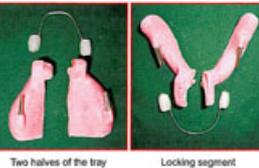
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Poster Faksimile:

Making Impressions in a Patient with Microstomia

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<p>1. INTRODUCTION</p> <p>Microstomia - an abnormally small oral orifice. Causes - trauma, burns, scleroderma, normal aging. Clinical Challenge - in prosthodontic treatment, the loaded impression tray is the largest 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. Clinical Report - this clinical report describes modifications in preliminary and final impression techniques for edentulous patient with microstomia. Preliminary impressions using flexible silicone putty tray and final impression using a novel sectional custom tray are described.</p>	<p>5. SECTIONAL TRAY FABRICATION</p> <p>Dental surveyor is used to analyse the parallelism of the dowel pin position.</p> 	<p>8. ASSEMBLED SPLIT CUSTOM TRAY</p> 
<p>2. MATERIALS AND METHODS</p> <ul style="list-style-type: none"> ✓ Autopolymerizing acrylic resin ✓ Dowel pins ✓ Stainless Steel Metal bar ✓ Diamond disc <p>Conventional custom tray was sectioned in two halves, and the sections were united with a rigid locking component fabricated with dowel pins and horseshoe shaped metal bar. The tray could be disassembled and inserted in the mouth and then reassembled outside the mouth.</p> 	<p>6. LOCKING SEGMENT</p>  <p>The stainless steel metal bar is bent in the form of a horseshoe. It is then secured with autopolymerizing resin to the keyway portion of the dowel pin. This locking component is then slid over the key of the dowel pin on the split custom tray.</p>	<p>9. BORDER MOLDING AND FINAL IMPRESSION</p> <p>Lowfusing Impression stick is used for border molding the tray. Final impression is made with zinc oxide eugenol impression paste. The tray is disassembled, removed from the mouth and then reassembled outside the mouth.</p> 
<p>3. CASE PRESENTATION</p> <ul style="list-style-type: none"> ✓ 60 year old female patient, ✓ Limited mouth opening, ✓ Completely edentulous upper and lower arches <p>It is difficult to perform treatment in patients with mouth circumference length less than 180 mm without surgical intervention.</p> 	<p>7. COMPONENTS OF THE TRAY DESIGN</p>  <p style="text-align: center;">Two halves of the tray Locking segment</p>	<p>10. DISCUSSION</p> <p>During impression procedures, wide mouth opening is required for proper tray insertion and alignment. Modification of the standard impression procedure is often necessary in a patient with microstomia to accomplish this fundamental step in the fabrication of a successful prosthesis.</p> <p>Advantages of the technique include:</p> <ul style="list-style-type: none"> Better stability Economic Easily available materials Simple tray fabrication Less cumbersome and less time consuming
<p>4. PRIMARY IMPRESSION</p> <p>Addition silicone putty impression material adapted to the ridges with finger molding. Once set the excess trimmed with a surgical blade # 15. Monophase impression material is used to obtain a detailed impression.</p> 	<p>11. CONCLUSION</p> <p>Flexible putty tray is used to make the primary impression which could be used successfully for both dentulous and edentulous patients. The innovative split custom tray design is suited for making final impressions in patients with microstomia requiring complete denture prosthetic treatment.</p>	