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Prosthodontic Management of Oral Submucous Fibrosis

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ABSTRACT:

In the field of removable prosthodontics, rehabilitation of patient with microstomia presents a challenge at all stages. The management of such patient requires different approach, compared to conventional denture fabrication. This clinical report describes the fabrication of sectional single complete denture for patient with microstomia due to oral submucous fibrosis. The sectional prosthesis was fabricated into two pieces which were held together by magnets, enabling the patient to insert and remove the denture with ease.

KEYWORDS: Sectional Denture, Magnets, Oral Submucous Fibrosis, Restricted mouth opening

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INTRODUCTION

Microstomia is defined as an acquired or congenital condition involving a reduction in the perimeter of the oral cavity or an abnormally small oral aperture. Various conditions manifesting microstomia include fibrosis of masticatory muscles, orofacial burns, reconstructive lip surgeries, scleroderma, cleft lip, trauma, head and neck radiation and Oral submucous fibrosis (OSMF).

This article describes a clinical report of fabrication of sectional denture for a patient with microstomia due to OSMF where limited mouth opening will not allow the use of conventional single complete denture.

CASE REPORT

A 45-year-old male patient reported to the Department of Prosthodontics, TAMIL NADU GOVERNMENT DENTAL COLLEGE, CHENNAI with the chief complaint of difficulty in mastication since 2 years. On intraoral examination, restricted mouth opening in the range of 22 to 23mm was found, making the fabrication of conventional single complete denture quite difficult. Hence it was planned to fabricate a sectional prosthesis, after taking an informed consent from the patient for undergoing such a procedure.

Extraoral Examination

The patient had limited mouth opening of 22 mm with bilateral angular cheilitis.

Intraoral Examination

The patient had completely edentulous maxillary and dentulous mandibular arch. Palpable fibrotic bands extending from right buccal frenum to vestibule resulting in shallow sulcus was noticed; also the mucosa appeared to be blanched on right side.



Fig 1 : Extra oral examination

1. **Primary impression-** Since it was impossible to insert a tray of suitable size into the patient's mouth, primary impression of maxillary and mandibular arches were taken with size 1 & size 0 trays respectively, with medium fusing impression compound (ROLEX) and irreversible hydrocolloid respectively fig 2a&b

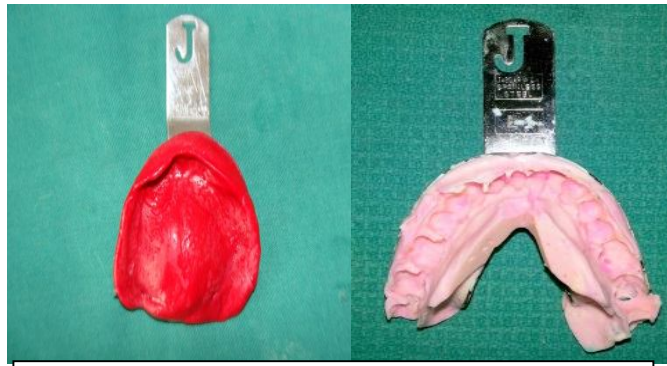


Fig 2 a & Fig 2 b - irreversible hydrocolloid

2. **Sectional custom tray fabrication and final impression-** A special tray with wax spacer was fabricated in autopolymerizing resin (HIFLEX) primary cast. Special tray was then sectioned through the midline using a disc. The dowel pins fig 3a were attached to one half of the tray with autopolymerizing resin. Petroleum jelly was applied on the remaining portion of dowel pin and then autopolymerizing resin was added to it so that the two halves were held together by means of dowel pins fig 3b. To ensure the tray stability, uniformity of pressure and impression material, 4 tissue stops were placed on the intaglio surface of the tray. Border moulding of the maxillary sectional trays was then completed in sections using putty elastomeric material (photo seal) fig 3c followed by sectional final impressions using light body elastomeric impression material (Aquaseal) fig 3d. The impressions were refined and then master casts were obtained.

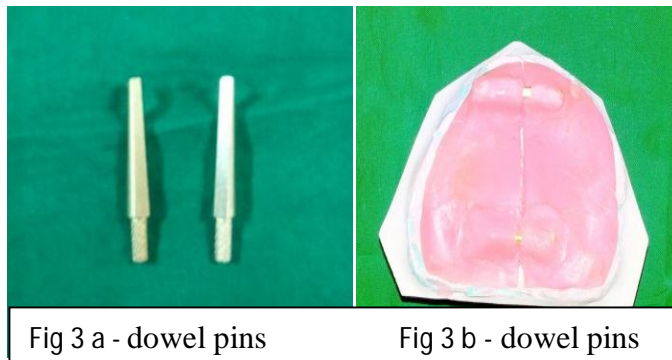


Fig 3 a - dowel pins

Fig 3 b - dowel pins



Fig 3 c - photoseal

Fig 3 d - Aquaseal

3. Sectional record base fabrication - Temporary record bases were fabricated on the master cast using autopolymerizing acrylic resin and were again sectioned through the midline. The sectioned halves were then connected using size '0' stainless steel press buttons (snap fasteners, Needle ind) fig 4a. These press buttons are commercially available, and have a male and female part, the male part were attached to one half of the record base ,then petroleum jelly was applied around the male part and then female part was attached over it. Then the two halves were joined using autopolymerizing resin fig 4b.



Fig 4a - snap fasteners

Fig 4b - Needle ind

4. Occlusal rim fabrication and sectional bite registration- On these sectional record bases , wax rims was fabricated and bite registration was done after placing the individual sections intra-orally.

5. **Try-in of prosthesis**- The transfer of bite registration record to the articulator, arrangement of artificial teeth , and the try- in were carried out in the conventional manner.

6. **Acrylization of prosthesis**- Before acrylization of the waxed-up sectional denture, the press buttons were removed and acrylic portion was smoothed using acrylic stones and burs. The master cast was duplicated using reversible hydrocolloid (agar) and kept aside for later use. The acrylization was carried out in the conventional manner.

7. **Magnet attachment to sectional prosthesis**-The maxillary single complete denture was splitted in the midline ,two magnets (Cobalt Samarium magnets)fig 5a were fixed to one half along the midline, petroleum jelly was applied on the same half and other two magnets were attached over it. Then the other half of prosthesis was fixed with the previous half using autopolymerizing resinby placing it over the duplicated master cast fig 5b.

8 **Prosthesis insertion**- Fit and stability of the sectional prosthesis was checked (Fig 6). Instruction regarding the use and assembly of the sectioned denture was given to the patient, followed by post - insertion and oral hygiene instructions. Routine follow- up appointments were scheduled and observed for 6 months.



Fig 5a - Cobalt Samarium magnets Fig 5b - duplicated master



Fig 6 - sectional prosthesis

DISCUSSION

Limited mouth opening in patients is a very common occurrence which presents challenges for fabrication of conventional dentures, hence modified techniques have to be used .

Various management techniques are described which include use of dynamic bite openers, surgery, and modification of denture design. Yenisy et al described sectioned mandibular denture with a lingual hinge placed at the midline¹.

The first commissural splint was suggested in 1975, for the management of burns to the lip, which provide resistance to scar contraction to prevent microstomia².

In the year 1983 Naylor and Manor et al described an oral augmentation exercise to increase the vertical opening in microstomia patients by placing a small bundle of tongue depressor between the occlusal surface of the dentures or the natural dentition³.

Robert .J.Luebke described sectional stock tray system for making preliminary impressions. The advantage of this system was improved fit of the tray for the edentulous arches because the two halves were fitted to each side of the arch providing better anatomical adaptation⁴.

In the year 1989 McCord et al described a complete sectional denture for microstomia patients which was designed in 2 halves , where both halves were joined together by stainless steel post⁵.

Whale et al in 1992 described a mandibular swing lock complete denture which incorporates a cast Chromium framework with a lingual hinge and a conventional labial swing lock⁶.

Use of microstomia **orthoses** to expand the oral opening has also been explained as a conservative mode for managing patients with microstomia⁷.

Sectional collapsed complete denture as described by Watanabe uses lingual and palatal midline hinges and a cast iron –platinum magnetic attachment , there are various commercially available magnetic attachment systems which can be used in clinical dentistry for treatment of patients with limited mouth opening⁸.

Sectional collapsed denture using Co-Cr-Mo alloy was suggested by Geckili et al in 2005⁹.

CONCLUSION

Reduction in oral opening compared to normal (35-40mm) presents challenge for fabrication of prosthesis. In this clinical report the use of sectional tray and record base design together with ease of fabrication are the major advantages. This technique can be employed in regular dental practice , without need of complicated machinery or attachment devices. The magnets are easily available at a nominal cost furthermore in case of any damage they can be replaced. This technique shares disadvantages common to all sectional tray/ prosthesis designs, such as additional time, labour , and materials. Hence, to determine the long term success of this technique , periodic recall , maintenance and further improvements in design are required.

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