

Modified impression technique for patient with microstomia

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Abstract

Routine custom trays are difficult to use to make impressions for patients with microstomia. Several types of split custom trays have been introduced to accommodate these situations. A method of fabricating mandibular and maxillary sectional trays and impression technique for a patient with small oral opening is described. Sectional maxillary and mandibular custom trays can enhance its stabilization during border molding and final impression making. Thus it helps in fabricating a better fitting complete denture for such patients and also makes the impression procedure easy for patient with limited opening as the tray can easily be inserted in two pieces.

Keywords: Impression, Microstomia, Sectional custom tray.

Introduction

Microstomia is defined as an abnormally small oral opening. It can be because of many causes such as trauma, injury to facial tissues as a result of animal bites electrical and thermal lesions, and chemical burns or genetic disorders like partial duplication of chromosome 6q Hallopeau Siemens-type recessive dystrophic epidermolysis bullosa Freeman-Sheldon (whistling face) syndrome, Burton skeletal dysplasia and diseases such as Plummer-Vinson syndrome or scleroderma. Other causes may be surgical treatment for maxillofacial cancers and reconstruction of oral defects.²⁻⁸

To fabricate complete dentures, impressions of the edentulous tissue and anatomical landmarks are necessary. Prosthetic management of microstomia patients is difficult at all stages. It may be difficult to make impressions and fabricate dentures using normal method.

Literature shows that different impression methods and designs have been used in the past. For impression procedures, sectional impression trays are advocated. Mirfazaelian,⁹ for example, used orthodontic expansion screws to fabricate sectional trays. Cura et al.¹⁰ used metal pins and an acrylic resin block to join the two parts of the impression trays used. Benetti et al.¹¹ used a flexible plastic tray intended for fluoride application to make the preliminary impression. Benetti et al. prepared a stepped butt-joint on one of the sections of tray to make a definitive impression.

This article describes report on fabrication of maxillary and mandibular sectional (two piece) custom made impression trays connected by rods and the elastomeric impression material for stabilization during border molding and final impression making.

Case Report

A female patient aged 50 years was came to the department of prosthodontic and crown and bridge for

the fabrication of complete denture. After taking medical history and clinical examination th diagnosis was that the patient is completely edentulous since 7-8 years and was a denture wearer since 6-7 years and wanted to replace the old denture as it was loose and teeth were attrited. The patient had extremely small complete dentures that were unserviceable. On examination it was found her oral opening was abnormally smallll, her oral opening was measured and was found to be 20mm (Fig. 1). Many treatment plans were made and told to the patient and the patient decided to go for the treatment described below.

Impression Technique

Primary impressions for maxillary and mandibular arches were made in the previous denture using irreversible hydrocolloid material. After making the preliminary impression it was poured and a stone cast was prepared for the fabrication of custom tray for making of final impression. Sectional impression trays were designed using autopolymerizing acrylic with two equal sections that could be seprated and then reunited to the right initial position. For each tray, a total of 4 metal rods were used(discarded bur metal handles) 2 of these rods were 20 mm in length and the other 2 were 10 mm in length. The self-cure acrylic resin and metal-bur rods were fitted symmetrically and parallel to the midline. In the mandibular tray the larger rods were kept close to the distal and the smaller rods near to the midline in the maxillary tray the smaller rods were kept over the residual ridges and the lareger rods near to the midline (Fig. 2,3). In order to orient these two pieces of tray at the same position inside the mouth elastomeric impression material (the putty consistency) was used over the rods to hold the two pieces together (Fig. 4,5).

The maxillary impression tray was inserted into the patient's mouth in two separate pieces: left and right. After placement these pieces were stabilized by means of elastomeric impression material block. Border molding was done and a zinc-oxide eugenol impression

paste was added in the impression tray which was then placed intraorally. After the impression paste set the elastomeric impression material block was detached from the rods and the right and the left pieces were removed separately by fracturing the impression material. The elastomeric impression material block was carefully fitted on the rods and after it was determined that the fracture line joined smoothly and impression was poured. Similarly the mandibular tray was inserted in two pieces and stabilized and the borders were molded and zinc oxide eugenole impression was made and poured in dental stone. Denture bases were made as a single piece and the occlusal rims were prepared over the denture bases and the maxilla-mandibular relationship was recorded with the conventional method and then articulated. The maxillomandibular relation recorded was a class III relationship hence the teeth arrangement was done in a class III manner and then complete denture try-in was done. As the patient was satisfied with esthetics and speech final denture was cured with the conventional method and was delivered to the patient and she was quiet satisfied (Fig. 6). Post operative instructions for the use and care of complete denture were given to the patient.

Discussion

Various pins, bolts, and Lego pieces have been used for the locking mechanism of sectional impression trays fabricated for patients with limited oral openings. While Watanabe et al.¹² used magnets the rods used in this procedure provided a more rigid method of connecting and stabilizing the two pieces. Sectional and collapsible dentures are generally used to provide prosthodontic treatment to patients with microstomia.¹⁰⁻¹² The plastic tray can be cut in two halves with the help of a disc. Three building blocks were selected to re-approximate sectional trays by Leuboke.¹³⁻¹⁴ A technique of pouring impression plaster onto the tissue surface of the patient's previous denture (constructed before microstomia condition set in) and a cast obtained on which special tray can be constructed was given by J. Fraser, Mc Cord et al.¹⁵ Whisitt JA and Battle LW gave the use of putty silicone as flexible tray.¹⁶ Cura C, Cotert HS and User A used acrylic resin block for stabilizing the two sections of the tray.¹⁰ For the patient described here, four parallel rods and an elastomeric impression material block fitted on these rods served as the locking mechanism. The tight fit of the elastomeric impression material block on the rods ensured accurate locking between the right and the left denture pieces. When the oral opening is limited joining the pieces of a sectional custom trays intraorally may be problematic. The two piece special impression trays described helps to record a secondary impression which is more accurate despite the difficulties associated with small oral opening for the patient presented the impression

could be easily removed from her mouth after the impression material had set.

Conclusion

Many authors have used various different techniques to prepare sectional impression trays for making impression for patients with microstomia due to various causes. In this case discarded metal bur handles were used as rods to stabilize the block because it was economical and easily available. Elastomeric impression material (putty consistency) for making a block to connect all rods and stabilize the sections was used as it is easy to handle as compared to acrylic resin.



Fig. 1: Pre-operative view showing small mouth opening



Fig. 2: Maxillary sectional custom tray with metal rods



Fig. 3: Maxillary sectional tray with putty block



Fig. 4: Mandibular sectional custom tray with metal rods



Fig. 5: Mandibular sectional tray with putty block



Fig. 6: Post-operative view with class III teeth arrangement

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