The Saudi Journal for Dental Research (2014) 5, 93–97

King Saud University

The Saudi Journal for Dental Research

www.ksu.edu.sa
www.sciencedirect.com

CASE REPORT

Prosthetic management of microstomia with sectional denture

Laxman Singh Kaira *, **Esha Dabral**

Department of Dentistry, Veer Chandra Sing Garhwali Government Medical Sciences and Research Institute, Srinagar, Pauri Garhwal, Uttrakhand, India
Private Practionner, Srinagar, Garhwal, Uttrakhand, India

Received 25 November 2013; revised 3 January 2014; accepted 29 January 2014
Available online 22 February 2014

KEYWORDS

Oral submucous fibrosis;
Restricted mouth opening;
Sectional denture

Abstract Prosthetic rehabilitation of microstomia patients presents difficulties at all stages as the maximal oral opening is smaller than the size of a complete denture. Such a condition may often result from the surgical treatment of orofacial cancer, cleft lip, trauma, burns, Plummer–Vinson syndrome or scleroderma. Microstomia frequently leads to several incapacitating sequelae such as the inability to masticate, speech problems, impaired delivery of oral hygiene or dental care, and psychological problems secondary to facial disfigurement. This article focuses on fabrication of sectional trays and sectional dentures that could enable easier and competent in a patient with limited oral opening.

1. Introduction

Restoration and preservation of the dentition in patients with limited oral opening has been a challenging task for dentists. Microstomic patients may experience a significant limitation of mandibular opening, eccentric mandibular movements and an overall mandibular immobility. It has been reported that the limited oral opening may result from the surgical treatment of orofacial cancers, cleft lips, trauma, burns, Plummer–Vinson syndrome, or scleroderma.

The maximum oral opening that is smaller than the size of complete denture can make the prosthetic treatment challenging. Several techniques have been described for use when either standard impression trays or the denture itself becomes too difficult to place and remove from the mouth. Sectional dentures have been recommended, with the denture pieces connected by the clasps. Nair et al.[1] describe a maxillary complete denture consisting of 2 pieces joined by a stainless steel rod with a diameter of 1 mm fitted behind the central incisors. Bedard et al.[2] and McCord et al.[3] describe a sectional impression procedure for edentulous patient by using 2 plastic sectional impression trays assembled with Lego building blocks and autopolymerizing resin. In this paper, a different design for the fabrication of maxillary and mandibular sectional trays and a foldable maxillary and mandibular complete denture is described. Different management techniques to aid

* Corresponding author. Address: Type 2, House No. 4, Faculty Residence, VCSGGMSRI Campus, Srinagar, Pauri Garhwal, Uttrakhand, India. Tel.: +91 8755902525.
E-mail address: laxmansingh6@gmail.com (L.S. Kaira).
Peer review under responsibility of King Saud University.

Production and hosting by Elsevier

2352-0035 © 2014 Production and hosting by Elsevier B.V. on behalf of King Saud University.
http://dx.doi.org/10.1016/j.sjdr.2014.01.003

prosthetic rehabilitation in such cases include surgical modalities, but unwanted scar formation may further reduce oral opening.[4] The prosthetic rehabilitation of microstomia patients presents difficulties at all stages, from preliminary impressions to prosthesis fabrication. Making the ideal impressions is often encountered as the initial difficulty in treating these patients. However, recommended techniques for obtaining preliminary impressions for microstomia patients have included the use of modeling plastic impression compound, the use of stock impression trays with heavy and light body silicone impression materials and flexible impression trays with silicone putty material.[5] In prosthetic treatment, the loaded impression tray is often the largest item requiring the intra-oral placement. During the impression procedures, wide vertical and horizontal oral opening is required for proper tray insertion and alignment, but is not possible in patients with restricted opening.[6,7] The overall bulk and the height of typical impression trays make the recording of impressions exceptionally difficult if not impossible because the paths of insertion and removal of impressions are compromised by lack of clearance. A modification of the standard impression procedure is often necessary to accomplish this fundamental step in the fabrication of a successful prosthesis. This clinical report presented describes a simple, cost-effective and time-saving method for fabrication of custom sectional trays and prosthesis for a patient with limited oral opening.

2. Case report

A 55 years old female patient suffering from microstomia and poor manual ability resulting from systemic sclerosis was referred to the Department of Prosthodontics, Institute of Dental Sciences, Rohailkhand University, Bareilly for prosthetic rehabilitation.

2.1. Intra oral examination

The important orofacial manifestations include fibrosis of the salivary and lacrimal glands, and symptoms consistent with dry mouth or xerostomia. The diameter and circumference of her mouth were 36 and 27 mm, respectively. Mucosa appeared blanched with palpable fibrotic bands extending to right buccal frenum vestibule involving buccal frenum with shallow sulcus on right side of maxilla.

2.2. Extraoral examination

Patients develop dry eyes with keratoconjunctivitis sicca.

2.3. Procedure

2.3.1. Sectional primary impressions

Two similar stock trays are selected and sectioned antero- posteriorly in such a way that excess tray after the handle is removed from right side of tray 1 and left on tray 2. Impressions are made separately of left and right side of the oral cavity using irreversible hydrocolloid material (Alginate, Zelgan 2002, Dentsply, India; batch no. Z090218) (Fig. 1) and the cast obtained from impression 1. This cast oriented to impression 2 and remaining portion is poured in Model plaster (type II) to obtain the final primary cast.

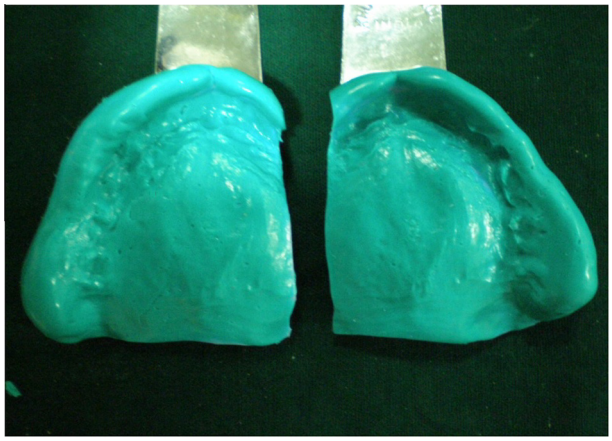

Figure 1 Sectional trays and sectional primary impression.

2.3.2. Sectional custom tray fabrication and final impression

A special tray with wax spacer was fabricated in acrylic (M.P. Sai Enterprise) on primary cast. This special tray was then sectioned through the midline, after which cross-pin slots were placed on the handle of each tray using the Pindex machine. The trays were then stabilized on the cast using sticky wax (M.P. Sai Enterprise). The cross pins, along with sleeves, were placed in position, petroleum jelly was applied on the outer surface of 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, 4 tissue stops were placed on the intaglio surface of the trays (Fig 2a and b). Border moulding of the maxillary and mandibular sectional trays was then completed in sections using low fusing compound (DPI Pinnacle), followed by the making of sectional final impressions using eugenolfree zinc oxide impression paste (Cavex, Holland) (Fig. 2c and d). The impressions were refined and the trays were assembled extraorally for pouring of the master casts after beading and boxing of the same.

2.3.3. Sectional record base fabrication

Temporary record bases were fabricated on the obtained master casts using autopolymerizing acrylic resin. The record base 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.

2.3.4. Fabrication of wax rims and sectional jaw relations

On these sectional record bases, wax rims were fabricated and jaw relation were recorded, after placing the individual sections intra-orally (Fig. 3).

2.3.5. Try-in of waxed up sectional prosthesis

The transfer of jaw relation record to the articulator, arrangement of teeth, and the try-in were carried out in the conventional manner.

2.3.6. Acrylisation of the sectional prosthesis

Before fabrications of dentures by conventional technique, the press buttons were smoothened using acrylic stones and burs. The master cast was duplicated using reversible hydrocolloid