An improvised sectional custom tray technique for patients with microstomia

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Abstract
Restoration and preservation of dentition in patients with microstomia is challenging. Restricted mouth opening hinders the use of conventional impression procedures and hence a sectional impression may be used. This case report describes an innovative method of making a custom made sectional impression tray, with a plaster index fabricated prior to sectioning of the tray which can be used to reorient the sectioned trays.

Key words: Index; Microstomia; Sectional tray.

Introduction
Good quality diagnostic casts are critical for treatment planning and fabrication of removable prosthesis, which could be achieved with the help of a conventional stock tray. Microstomia or an abnormally small oral orifice is often one of the sequelae of burns, postoperative head and neck trauma, surgical resection of facial tissues, oral neoplasms, scleroderma and oral sub mucous fibrosis. In patients with microstomia conventional impression making with a stock tray for prosthodontic treatment is an arduous task.

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Microstomic patients may experience a significant limitation of jaw opening, eccentric mandibular movements, and an overall jaw immobility. Surgery may be considered as a treatment option when the mouth circumference length is less than 160 mm (1) but inadequate rehabilitation of the surgical procedure may result in a scar. Several methods of prosthodontic treatment for patients with microstomia have been presented and numerous devices to expand oral commissure (2,3) have been described. In cases where surgical intervention is not advocated, sectional impressions gain importance in making primary and final impressions of the partially edentulous arches with acceptable accuracy.

This clinical report describes the prosthodontic treatment of a partially edentulous patient with microstomia induced by burns using a new sectional impression procedure.

**Case report**

A 47 year old partially edentulous female patient reported for replacement of the existing acrylic partial denture due to an increase in edentulous spaces. She had a maximum mouth opening of 45mm horizontally and 21mm vertically (figure 1). Extra oral examination revealed the presence of facial scars and taut facial muscles.

Medical history revealed that the patient had met with a fire accident 9 years ago affecting the lower face, neck and upper chest leading to scar tissue formation and had to be hospitalized for about 6 months during this period. Inadequate measures for oral hygiene maintenance at the time resulted in periodontal infection, mobility and subsequent loss of teeth. Intra oral examination revealed Kennedy’s class III modification 4 in the maxilla and Kennedy’s class IV in the mandibular arch and American College of Prosthodontists (ACP) classification was class III. Radiographic examination revealed loss of bone support of the existing dentition and poor prognosis of #12, #27 and #28. The patient was presented with various treatment options.
Sectional impression tray

However, the patient was unwilling to undergo any surgical procedures like bilateral oral commissurotomy (4) for improving the mouth opening or extraction of the teeth with poor prognosis due to previous traumatic experience. So a modified sectional impression procedure was planned.

Preliminary impression:
Metal custom trays of the smallest size available commercially were selected and the flanges of the tray were reduced until it could be inserted into the mouth of the patient and an impression was obtained using irreversible hydrocolloid (Jeltrate Plus, Dentsply caulk). Inadequate extension of the tray into the sulcus necessitated a secondary impression using sectional impression technique.

Sectional tray
A custom tray was fabricated with auto polymerizing resin (DPI-RR cold Cure, Mumbai) with wax spacer (The Hindustan Dental Products, India) to provide space for the elastomeric impression material. The custom tray was stored in water for a day to eliminate residual monomer and overcome the inherent polymerization shrinkage. A thin layer of petroleum jelly (Bioline, Bangalore,) was applied on the non-tissue surface of the impression tray and the tray was immersed into a mix of type II Dental stone (Dentico, India) to form an index (figure 2). The height of the index surrounding the flanges was kept below the height of contour of the custom tray to facilitate retrieval of the impression tray after the gypsum had set. The impression tray was then retrieved and the fit of tray in the plaster index was verified (figure 3). Impression tray was then sectioned with the help of a manual die cutting saw so that the gap between the sectional trays is minimum (figure 4). The plaster index helps in re orienting the sectioned impression trays in the same relation as the unsectioned tray three dimensionally.

Secondary impression
Border molding was done with the help of low fusing impression compound (DPI green stick compound, Mumbai).

Wax spacer was removed and tray adhesive (Caulk Tray Adhesive, Densply Caulk) was
Sectional impression tray

applied to facilitate retention of the elastomeric impression material to the custom tray and impressions were made using Type 2: Medium – Body vinyl polysiloxane Impression Material (Reprosil, Dentsply Caulk) as illustrated in figure 5. The excess set elastomeric material was neatly cut and the sectioned impressions were carefully repositioned in the plaster index. Type II dental stone was added to the index up to 3 mm below the borders of the impression. This helps in maintaining the sectioned impression in the desired position and serves as a beading around the impression. The impression was later boxed and master cast was obtained.

An interim acrylic denture was planned for this patient due to the presence of few teeth with poor prognosis. The subsequent protocol of denture fabrication was followed (figure 6). Home care instructions were given to the patient.

Discussion

Prosthodontic treatment of microstomia, whether congenital or acquired, has long challenged the ingenuity of the operator. Various methods for repositioning the sectioned impressions trays have been described in the literature which includes the use of metal snaps (5), pins oriented with acrylic resin block (6), lego blocks (1), dowel-plug-holes and screw-lock (7). In a case of microstomia where the mouth opening has already been compromised, the presence of any orienting device on the tray may further hinder the placement of the tray intra orally. In the above mentioned method, an orienting device on the tray is unnecessary and the plaster index serves as a horizontal and vertical position indicator. The mentioned technique’s precision was further enhanced by beading around the impression with type II gypsum, enabling pouring of the impression with the help of a vibrator without disturbing the orientation of the sectioned components.

Conclusions

The improvised sectional custom tray technique with a plaster index is a valuable alternative method of impression making in patients with microstomia, with acceptable accuracy.

References