



ORIGINAL RESEARCH PAPER

Prosthodontics

HINGED COMPLETE DENTURE FOR OSMF PATIENT- A CASE REPORT

KEY WORDS: Sectional Special tray, Sectional denture bases, Hinged Denture, Die Pins, Hinge, OSMF

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ABSTRACT

Limited mouth opening is a clinical condition dentists occasionally come across. Limited mouth opening can arise due to many medical conditions. This case report describes construction of a hinged complete denture for a patient with oral submucous fibrosis. The intermediate laboratory procedures were modified to avoid the strain to the patient because of the reduced mouth opening and also to enable fabrication of dentures with more precision and comfort.

INTRODUCTION:

Limited mouth opening or trismus is an occasional clinical challenge faced by a prosthodontist. Trismus or limited mouth opening can be created by conditions like orofacial cancers, head and neck radiation, reconstructive lip surgery, burns, trauma, micro invasion of muscles of mastication, scleroderma, Plummer Vinson syndrome, OSMF, temporomandibular joint (TMJ) dysfunction syndrome and genetic disorders.¹ Oral submucous fibrosis (OSMF or OSF) is a chronic, complex, premalignant (1% transformation risk) condition of the oral cavity, characterized by juxta-epithelial inflammatory reaction and progressive fibrosis of lamina propria and deeper connective tissue. As the disease progresses, the jaws become rigid to the point that the person is unable to open the mouth. The condition is remotely linked to oral cancers and is associated with areca nut or betel quid chewing, a habit similar to tobacco chewing, is practiced predominantly in Southeast Asia and India.²

A maximal oral opening that is smaller than the size of a complete denture can make prosthetic treatment challenging. Several techniques have been described for use when either standard impression trays or the denture itself becomes too difficult to plate and remove from the mouth.

Many authors have advised and advocated sectional custom trays and collapsible denture systems. However, many of these systems require costly or complicated attachment devices, e.g., hinges, locking levers, orthodontic expansion screws, magnet systems, slide lock joints, snap buttons etc.3-7 McCord et al⁸ described 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.

This article aims to describe the fabrication of a hinged prosthesis that is practical, economical, and simple in design.

CLINICAL REPORT:

A 47 year old female patient reported to the Department of Prosthodontics, Dayananda Sagar Dental College, Bangalore, India, with the chief complaint of missing upper and lower teeth and wanted replacement of the same. She gave a history of eating betel nut twice daily for the past 20 years.

On examination it was found that the patient had heavy vertical fibrotic bands and homogenous leukoplakia in the right & left buccal mucosae which lead to reduced mouth opening of 2.4cm. In addition, her angle of the mouth would often bleed on opening the mouth wide. Hence, she was diagnosed as a case of chronic oral submucous fibrosis with bilateral angular cheilitis.

Patient was first educated and motivated to quit the habit of betel nut and was referred to Dept. of Oral Medicine for treatment of OSMF. However, the patient refused to take treatment for OSMF and insisted on replacement of teeth.

Due to reduced mouth opening, the treatment plan for this patient included sectional maxillary and mandibular custom trays for secondary impression, sectional denture bases for jaw relation and try in procedures, followed by fabrication of hinged maxillary and mandibular complete dentures for easy insertion and removal of denture.

PROCEDURE:

Primary impression for maxillary and mandibular arch was taken with impression compound using smallest size edentulous stock tray (Y-Dent; MDM Corp.) and primary cast was poured in Type II Dental Plaster (Dentico; Neelkanth Mine Chem.). (Fig: 1)



Autopolymerizing acrylic resin special tray was constructed and was split into two at the centre using a metal disc to get thinnest possible separation between the two halves of the sectioned special tray. These halves were then connected with die pins using acrylic resin. Two die pins, one in the incisor region and one in the palatal region was placed in the upper tray to have an anti-rotational effect. One die pin in the incisor region was placed for the lower tray. They were liable to be reoriented into a single tray even after sectioning (Fig: 2).



Border moulding was done alternately for each sectional custom trays using low fusing compound (DPI; Pinnacle, India) and then reunited extraorally to check for any excess material in the centre.(Fig:3)

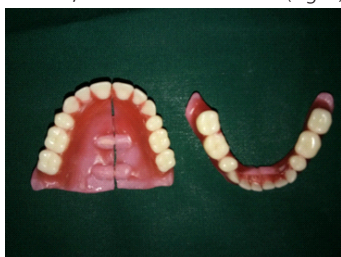


Following this, secondary impression was made using zinc-oxide eugenol impression material (DPI, India) in each of the sectional trays. The secondary impressions were reunited after cutting away the excess material in the centre using sharp blade. The impressions could then be reunited in a single impression with the guidance of die pins. (Fig: 4)



The master cast was poured with Type III dental stone (DPI, India). After obtaining the maxillary and mandibular master casts, denture bases were fabricated with Autopolymerizing acrylic resin and then were sectioned at the midline using metal disc. After sectioning the two ends were rejoined from midline using die pins incorporated in autopolymerizing acrylic resin blocks. On these sectional record bases, occlusal rims were fabricated. For jaw relation procedure the record bases were reunited intraorally and jaw relation was recorded by nick and notch method. The denture bases were then removed separately from mouth, reunites and the jaw relation record was assembled using the nick and notch guides.

The occlusal rims after jaw relation were transferred to the secondary cast and articulation followed by teeth setting was done in conventional manner. Wax trial was done using the sectional method and reoriented inside the patient's mouth and checked for occlusion, phonetics, and aesthetics as usual (Fig: 5).



The trial bases after wax try-in were returned to the articulator, the dowel pins and the acrylic resin blocks were trimmed out and wax up was done. The split trial bases were reunited using wax to make them as a single denture. Flasking was done and the denture was processed using heat cure acrylic resin (DPI, India). After processing, the dentures were retrieved, finished, and polished and then again sectioned from the midline with the help of thin metal disc bur. (Fig: 6)



A stainless steel hinge was fitted with autopolymerizing acrylic resin in the centre of the axis connecting the halves of the dentures. As a result the dentures could be folded inwards to allow for easy insertion and removal of dentures. (Fig: 7, 8)



Denture insertion was done and home care instructions (oral hygiene instruction, insertion, and removal of prosthesis) were imparted to the patient. (Fig: 9)



The patient was reviewed after 24 hours, 1 week, 1 month and 3 months to check for comfort and tissue reaction. Patient's response toward the dentures was good and highly satisfactory.

DISCUSSION:

Normal mouth opening is essential for the function of speech, nutritional needs, dental hygiene, facial expression and social interaction.9 Limited mouth opening manifests as a consequence of certain medical conditions. In such clinical situations, prosthodontic procedures need to be altered right from the impression making procedure to the final prostheses.

Ansgar Cheng et al., fabricated collapsible complete denture in a case of limited mouth opening patient. As per Ansgar Cheng et al., collapsible hinged mandibular complete denture is kept stable by tongue pressure in lateral direction and resistance provided by ridge slopes. According to authors though the procedure was found to be time consuming, the result was outstanding. So, the goal of prosthodontic treatment include: providing lip support, improving articulation, reducing drooling and regaining favourable aesthetics. 10

This technique provides cheaper alternative to costly attachments, metal denture bases and other expensive equipments and can be fabricated in any dental laboratory. Hence, simplified sectional tray design and ease of fabrication are the major advantages of this technique. The hinges are readily available at a nominal cost. In case of any damage, they can be replaced and relocated easily with the help of self-cure acrylic resin. The disadvantages of this type of technique are that the hinges might lose their retention over the years. Although stainless steel hinges are used, their resistance to corrosion in the patient's mouth is questionable. Moreover, the autopolymerizing resin used in this technique is not a long term solution due to its less strength and high monomer content.

However, to determine the long-term success of this technique, periodic recall, maintenance, and further improvements in design are needed.

CONCLUSION:

Severe reduction of oral opening renders access to the oral cavity

difficult for dental procedures. This paper describes the impression procedure for a patient with restricted mouth opening using a sectional impression tray and fabrication of hinged maxillary and mandibular denture. Figure 9 presents a patient who has been wearing hinged dentures successfully for the past 1 year.

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