

Sectional Complete Denture in a Patient with Sub Mucous Fibrosis - A Clinical Report

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Abstract

Microstomia is the term used to describe a condition of reduction in the size of the oral aperture which can be either acquired or congenital. Patients with microstomia have restricted mouth opening which causes difficulty in inserting and removing the prosthesis as a whole. Prosthetic rehabilitation of such patients is a challenge. Steps in the fabrication of complete denture like impression making and denture processing are modified in sectional complete denture. This enables the patient to use them in sections without much difficulty. This clinical report describes prosthodontic management of a completely edentulous patient with microstomia developed due to oral sub mucous fibrosis. Sectional maxillary denture was fabricated using a sectional impression tray technique. With the use of post and tubes in the palatal region, the denture could be easily inserted and removed in two parts. Mandibular denture was fabricated by the conventional method.

Keywords: Microstomia, Sectional denture, Sub mucous fibrosis, complete denture.

1. Introduction

Microstomia is defined as an abnormally small oral orifice. There are various reasons for microstomia. They are head and neck radiation, reflex spasm, surgically treated head and neck tumours, micro invasion of the muscles of mastication, connective tissue diseases, fibrosis of masticatory muscles, facial burns, reconstructive lip surgeries and diseases such as Plummer - Vinson syndrome, scleroderma or sub mucous fibrosis. Genetic disorders causing microstomia are partial duplication of chromosome 6q, hallopeau-Siemens- dystrophic epidermolysis bullosa, freeman-Sheldon (whistling face) syndrome, burton skeletal dysplasia [1, 2]. Oral sub mucous fibrosis is a slowly progressive chronic disease that affects oral mucosa as well as the pharynx and the upper two third of the oesophagus. There is substantial evidence that supports the role of areca nuts and tobacco chewing in the aetiology behind sub mucous fibrosis [3]. Oral complications are most commonly observed on the lips, buccal mucosa, retro molar area and soft palate. The initial lesions are paler mucosa, which may comprise white marbling. The most prominent clinical

findings appear later in the course of the disease and include fibrotic bands located beneath the atrophic epithelium [4]. An international consensus has been reached where at least one of the following characteristics should be present namely, palpable fibrous bands, mucosal texture feels tough and leathery and blanching of mucosa together with histopathologic features. (Atrophic epithelium with loss of rete ridges and juxta epithelial hyalinization of lamina propria) [5]

The patient presented in his report is found to have palpable fibrous bands in the buccal mucosa and involvement of pterygomandibular raphae compounding the difficulty of mouth opening. These clinical features are found to be consistent with sub mucous fibrosis which poses difficulties for prosthodontists in denture fabrication.

There are various treatment modalities in the management of patients with microstomia like the use of microstomia orthoses to expand the oral opening [6]. The oral opening may also be increased by use of stretching exercises. The use of an increasing number of tongue blades

to stretch the facial tissues can also be advised. If this is insufficient, a bilateral commissurectomy may be necessary. As surgical enlargement can lead to scarring which may further reduce the oral opening, it must be considered carefully. It is difficult to perform prosthodontic treatment for patients with microstomia, especially when the mouth circumference is smaller than 160 mm [7]. Making the impression presents initial difficulty in prosthetic rehabilitation. Several techniques based on flexible, modified standard trays and sectional trays have been proposed [8].

2. Case Report

A 55-year-old completely edentulous male patient reported to the Department of Prosthodontics, with a chief complaint of difficulty in chewing and restricted mouth opening. Patient wanted a set of new complete dentures. The maximum mouth opening of the patient was measured to be 27mm (Figure 1). Patient did not have any relevant medical history but gave the history of betel nut chewing since the age of 30. He was completely edentulous for the period of two years. On intra oral examination there was hardening of the skin and presence of tough fibrous bands in buccal mucosa and pterygomandibular raphe, loss of resilience, which interferes with speech, tongue mobility, and decreased ability to open the mouth. Both maxillary and mandibular residual ridges were resorbed. The old dentures which the patient was wearing were ill fitting due to short flanges for easy insertion and removal. He was able to insert the mandibular denture by rotating it in 90° but was having a great difficulty in insertion and removal of maxillary denture in spite of short flanges of the denture.

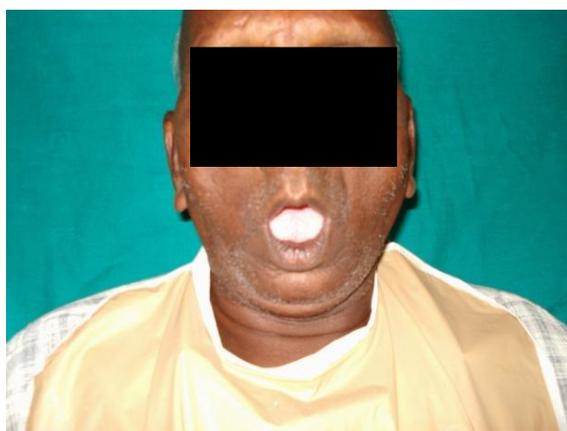


Figure 1: Patient with limited mouth opening

After thorough clinical examination, the decision to fabricate maxillary sectional denture was made, as it is very difficult for the patient to wear a conventional complete denture. The consent for the fabrication of sectional complete denture was taken from the patient after explaining to him the complete treatment plan.

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2.1 Step by step procedures

2.1.1 Preliminary impressions

Preliminary impression for maxillary arch was obtained by custom trays made intra orally using green stick compound. Locking rivets were used to connect the sectional trays. The tray was cut transversely in two sections with a disk following a line that bisected the tray into two halves with key ways for mechanical interlocking. The preliminary impression of maxillary arch was made in irreversible hydrocolloid by inserting one part of the tray in the mouth followed by another before material in the first part was set. Impression was removed in one piece to minimize error. Mandibular impression was made as a whole as the tray can be rotated 90 degrees intra orally. Maxillary and mandibular primary casts were obtained (Figure 2).



Figure 2: Preliminary casts

2.1.2 Final impressions

Sectional custom tray was fabricated using auto polymerizing acrylic resin. The tray was fabricated in two sections held together by locking rivets placed at the posterior portion of the anterior segment and the locking mechanism extending in the anterior portion of the posterior segment (Figure 3). Border moulding was done separately for the two sections using low fusing compound (Figure 4).

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Final maxillary impression was made in polyvinyl silicone. While making the final impression, sections of the tray were inserted one after another before material in the first section was set in order to ensure merging of both the parts. Impression was removed in one piece. Mandibular impression was made in zinc oxide eugenol paste (DPI) after completing border moulding with low fusing compound.



Figure 3: Maxillary sectional tray with locking rivets

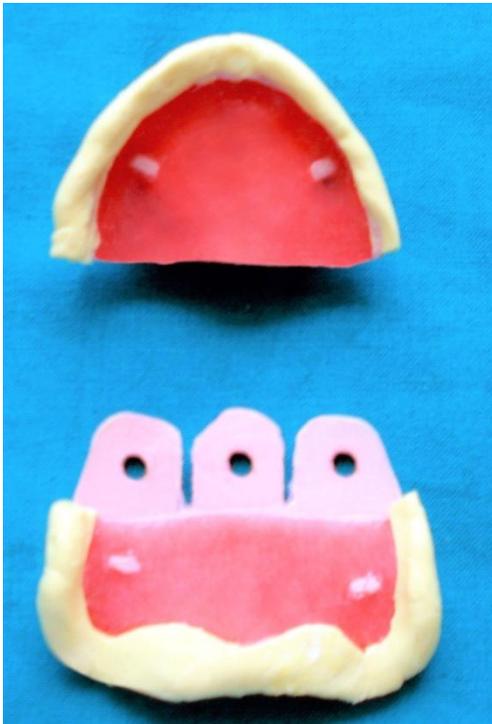


Figure 4: Sectional border moulding



2.2 Laboratory procedure

Two master casts were obtained from the final impressions. The design was such that the left side fitted into a bevelled recess in the right side to give a more accurate location. Both halves were joined rigidly by a stainless steel post and tubes (Figure 5). The tubes were incorporated within the complete denture palate one on either side. The post is attached to the tube on right side so that it can be slid to fit accurately with the tube on the left (Figure 6, 7). Modelling wax sheet was adapted on the right half of any one of the two master casts. Stainless steel tube is incorporated here. Other cast was kept aside to be used for the final processing. This half was processed to fabricate the permanent heat cure sectional record base. By keeping the fabricated section of the record base on the cast, modelling wax sheet was then adapted on the remaining half of the cast. Post and the second tube were incorporated in the wax sheet to fit precisely over their counter parts. This section of the record base was then fabricated in heat cure acrylic resin. Both the sections were processed separately to obtain the sectional permanent record base with attachments.

Figure 5: Post and tubes



Figure 6: Maxillary cast with sectional denture



Figure 7: Two sections of maxillary denture base

2.3 Jaw relation and teeth arrangement

Maxillary occlusal rim was fabricated in two parts on the permanent sectional record base. The rims were assembled in the mouth for recording maxillo-mandibular relation. Teeth arrangement was done using semi anatomic teeth.

2.3.1 Processing and denture insertion

Processing to incorporate maxillary teeth was carried out in two separate flasks. Curing cycle for the second processing was of longer duration at lower temperature (figure 8, 9). The sectional maxillary denture and conventional mandibular denture was delivered to the patient after finishing and polishing. Cuspal pattern was evaluated and occlusal interferences were removed using articulating paper. Stability of the maxillary denture was evaluated using a disclosing paste (fit checker, GC). Paste was applied in the midline. Denture was inserted in the mouth and alternate digital pressure was exerted. After the material was set, both the sections were evaluated in the midline for pressure spots. Minor corrections were done. Disclosing paste was applied again and stability was evaluated during various functional movements. Slight discrepancy was found in the midline which was corrected. This was done to ensure there was no rocking in the midline during function. Disclosing paste was also used on the intaglio surface of the maxillary denture to rule out any soft tissue compression in the midline.



Figure 8: Flasking of maxillary trial denture



Figure 9: Dewaxing

Patient was trained to place maxillary denture in two parts (figure 10). Subsequently patient has been followed up for the last two years and he is comfortably using the prostheses. During follow up appointments, it was observed that there was no untoward compression of the soft tissues in the midline.



Figure 10: Patient inserting maxillary denture in sections

3. Discussion

Prosthetic management of microstomia has advanced over the past forty years. There were many techniques explained in the literature regarding construction of sectional complete dentures like the one with hinge and stud attachments, with press buttons and with the use of magnets [9, 10]. The technique described in this case report is a very cost effective option as compared to other techniques. The other advantages include simplified tray manipulation and decreased trauma, and precise intraoral positioning of tray and stability. The disadvantage of this technique is the resistance to corrosion of these post and tubes intraorally is questionable and need to be replaced regularly.

The use of sectional impressions recorded in two or more parts intra orally and then relocated outside the mouth is a viable option adopted for such patients. The

trays can be provided with fins, pins, or butt joints to facilitate accurate relocations. Use of flexible trays is another option. A swing lock or simple hinge can be used to connect the two segments in a collapsible denture [11]. There are several commercially available magnetic attachment systems for use in clinical dentistry which can be used successfully for microstomia patients. Implant supported prosthesis has also been advocated for the management of edentulous patients with limited mouth opening [12].

4. Conclusion

Prosthetic rehabilitation of patients with sub mucous fibrosis and limited mouth opening was a challenge in all stages, right from preliminary impressions to insertion of the prostheses. A simple and cost effective treatment option presented here was found to be very useful and effective for the patient and also in achieving the goals of prosthodontics.

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