

A Sectional Splint for Maintaining Surgically Enhanced Vertical Height in an Oral Submucous Fibrosis Patient: A Case Report

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Abstract Oral submucous fibrosis (OSMF) is a chronic inflammatory disease that results in a progressive juxta-epithelial fibrosis of the oral soft tissues, causing an increasing difficulty in mouth opening, chewing, swallowing and speaking. It is regarded as a precancerous and potentially malignant condition. The fibrosis of oral mucosa leads to limited mouth opening and difficulty in mastication. Prosthetic rehabilitation of patients with OSMF offers a formidable challenge due to the restricted mouth opening. Management of the limited mouth opening is usually by surgery. Herein, we describe a procedure to maintain the increased mouth opening that is achieved through surgery. Maintaining this opening would make it easier for any further prosthetic rehabilitation at a later stage.

Keywords Sectional splint · Oral submucous fibrosis · Gunning splint · Microstomia

Introduction

Oral sub mucous fibrosis (OSMF) is defined as a chronic disease of oral mucosa characterized by inflammation and progressive fibrosis of the lamina propria and deeper connective tissue layers. The pathogenesis of the disease is not well established, but is believed to be multifactorial [1]. It

was first reported in five Indian women in Kenya by Schwartz in 1952 [1] who named the condition as Atropica Idiopathica Mucosae Oris. In 1953 Joshi [2] described this condition as sub mucous fibrosis. It was studied extensively by Pindborg and Sirsat [3]. A condition resembling OSMF was described as early as 600 BC by Sushrutha. It was named as Vidari and has features of progressive narrowing of mouth, depigmentation of oral mucosa and pain on taking food [4]. The hallmark of the disease is sub mucosal fibrosis which affects most parts of the oral cavity, pharynx and upper third of the oesophagus leading to dysphagia and progressive trismus due to rigid lips and cheeks. The aetiology of oral sub mucous fibrosis is obscure. Some evidence suggest that it may be related to betel nut chewing, vitamin B deficiency, dietary components for example chillies and spices and genetic predisposition [5]. It is a potentially malignant disorder and a crippling condition of the oral mucosa [6]. The mucosa becomes blanched and opaque, fibrotic bands appear usually involving buccal mucosa, soft palate, lips and tongue causing restricted mouth opening which is a pathognomonic of this disorder [7].

Treatment Options for Oral Sub Mucous Fibrosis Include [8]

1. Medical management
2. Surgical management

Medical management involves

1. Oral administration of vitamin B-complex, Buflomedial hydrochloride and topical triamcinolone acetonide 0.1 %
2. Sub mucosal injections of (a) dexamethasone (b) hyaluronidase and/or combination of both (a) and (b) [9, 10] and (c) placentex [11]

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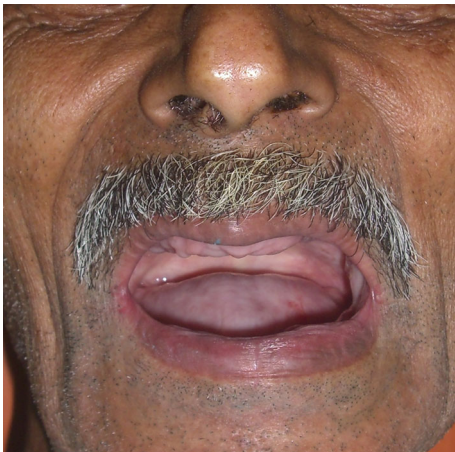


Fig. 1 Patient with limited mouth opening



Fig. 3 Self cure temporary base



Fig. 2 Edentulous cast

Surgical management involves the excision of fibrotic tissues and covering the defect with split thickness skin, fresh human amnion, or buccal fat pad (BFP) grafts [12]. Surgical intervention also enables increased mouth opening. However surgically induced mouth opening often undergoes relapse. This poses a challenging situation when denture prostheses fabrication is to be done later. Herein we describe a method to fabricate a specially designed splint to prevent the relapse of surgically treated case of OSMF.

Case Report

A 55 years old male patient reported to the department of OMR, Azeezia College of dental science and research with difficulty in mouth opening [20 mm] and burning sensation on eating spicy food since 3 years. Patient had a habit of chewing areca nuts with paan since 20 years. The case was clinically diagnosed and histopathologically confirmed as oral submucous fibrosis and was referred to the Dept of

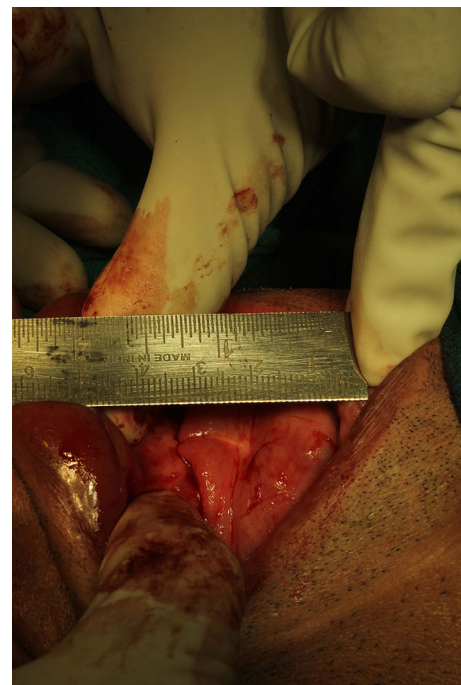


Fig. 4 Mouth opening attained after surgery

OMFS for management. The case was referred to the department of prosthodontics for the fabrication of a splint for maintaining the vertical height which was expected to increase after surgical intervention.

Presurgical Examination

Extra oral Examination

The mouth opening of the patient was restricted to 20 mm (Fig. 1).



Fig. 5 Recorded vertical height after surgery

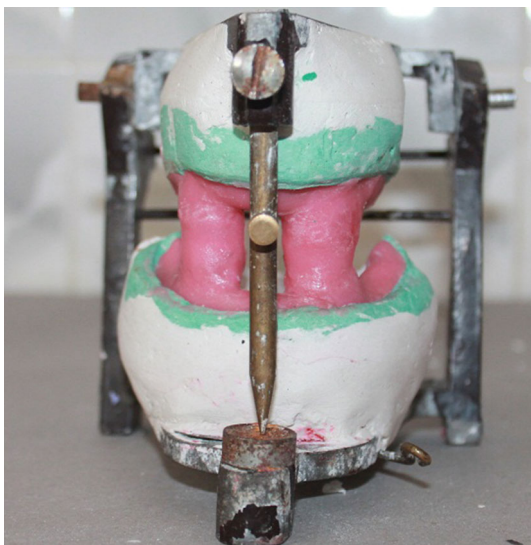


Fig. 6 Fabrication of single piece occlusion splint

Intraoral Examination

The patient had completely edentulous maxillary and mandibular arches. Right and left buccal mucosa appeared blanched with palpable fibrotic bands extending to buccal frenum on both side resulting in shallow buccal sulcus.

Clinical Procedures for Fabrication of Splint

The clinical procedure was divided into 3 stages

1. Presurgical
2. Surgical
3. Post surgical



Fig. 7 Splint in place post surgically

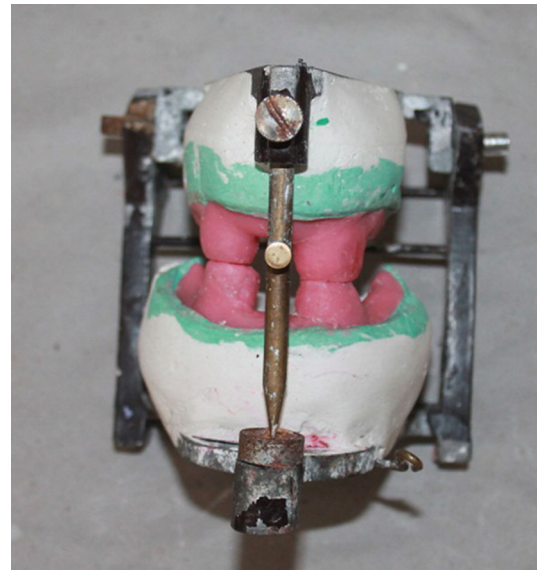


Fig. 8 Sectioned splint

Procedures at Presurgical Stage

Selection of Impression Trays

As the patient had restricted mouth opening, size 0 stock trays were used for upper and lower edentulous arches to record the primary impression. The impression material of choice was poly vinyl siloxane (putty consistency). Primary impression was recorded and cast obtained on dental stone (Fig. 2).

Fabrication of Record Bases

Record bases were fabricated on the primary cast using self cure acrylic resin material (Fig. 3). The tray extension was

checked on the patient on the same day to relieve any over extension. Occlusal rims were fabricated with an arbitrary value.

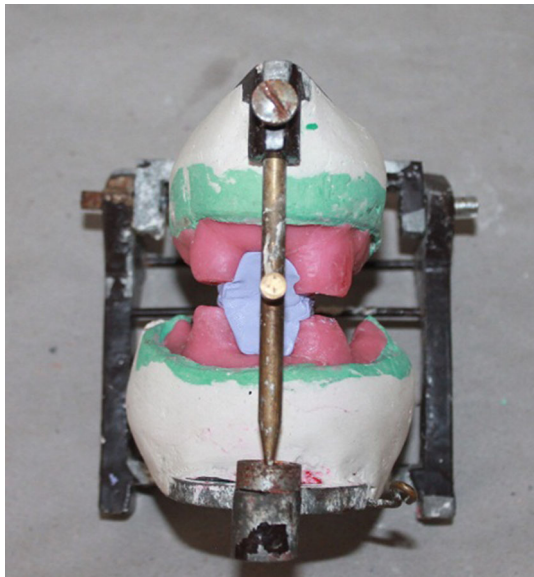


Fig. 9 Recorded new vertical height

Procedures at Surgical Stage

Recording of Vertical Height

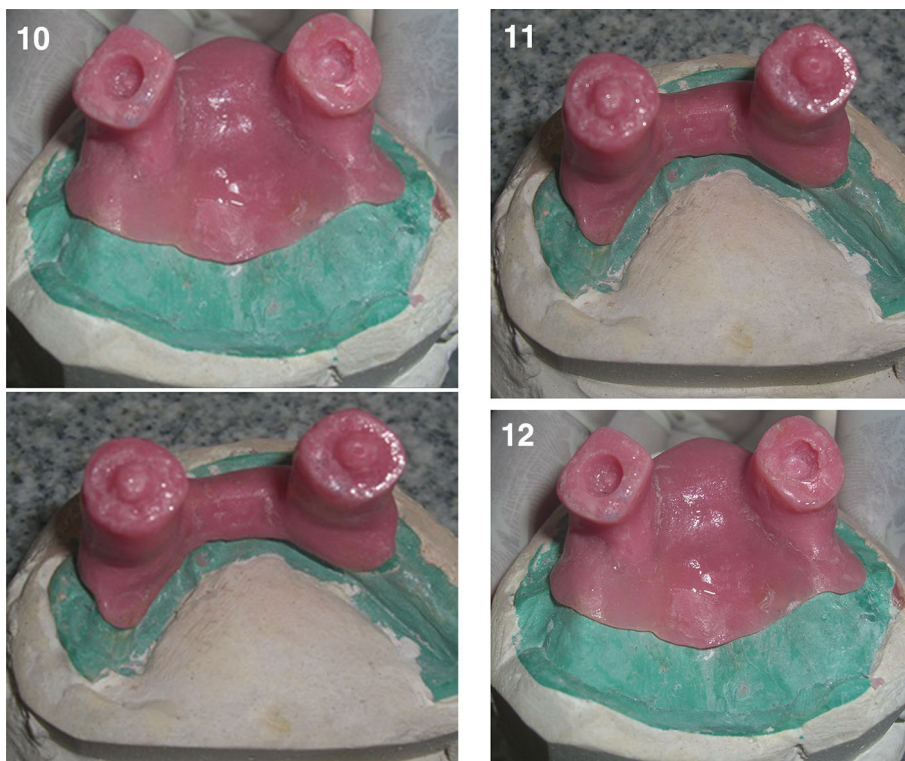
Surgery was done on the patient under general anaesthesia to remove the fibrotic bands. The newly achieved mouth opening recorded after surgery was approximately 40 mm (Fig. 4). This mouth opening was transferred to the record bases by progressively adding putty material over the occlusion rims till the surgically enhanced vertical height was attained. The upper and lower cast were mounted on a mean value articulator based on the increased postsurgical value of mouth opening (Fig. 5).

Procedure at the Post Surgical Stage

Fabrication of Surgical Splint

The aim of this splint was to maintain the postoperatively increased vertical height. The splint was fabricated by removing the wax portion of the occlusal rim and creating two vertical pillars on the canine premolar region using self cure acrylic resin (Fig. 6). This creates a space in the anterior region for providing nutrient supply for the patient without removal of the splint. The splint was inserted on the patient within 2 hours post surgically (Fig. 7).

Fig. 10–12 Key and key hole pattern



The splint given was a single piece splint as the patient was in a semi conscious state post surgically. Giving a sectional splint immediately after surgery may cause the splint to dislocate as the patient was semi conscious.

Modification of the Splint

Modifications were made on the splint after a period of 48 hours. The foremost change done was the sectioning of the splint into a lower part and an upper part. This was done by splitting the vertical pillars horizontally using a disc (Fig. 8). A new jaw relation was recorded using the split splints with putty elastomeric impression material to record the maximum possible vertical height attainable by the patient in a conscious state (Fig. 9). The vertical pillars were built up to the new height on the mounted articulator. A key and keyhole design was created with the key on the lower splint and the keyhole on the upper splint, on the pillars, for the proper placement and locking of the sectional splints in patient's oral cavity (Figs. 10, 11, 12). The lower splint was lined with Ufi Gel P soft liner [VOCO Germany] material to provide a cushioning effect. The splints were placed in position (Figs. 13, 14, 15). The patient was advised to use the splint for 6 months and was recalled for the evaluation of vertical height (Fig. 16) which was found to be maintained at 40 mm.

Discussion

Microstomia or limited mouth opening is common in patients suffering from oral submucous fibrosis. This condition poses problem during each step of prosthetic reconstruction [12]. An opening smaller than 25 mm can make prosthetic treatment challenging. Different techniques have been described in literature for increasing the mouth opening in both totally edentulous as well as dentulous patients [13]. While managing the dentulous patients is relatively easy, the totally edentulous patients present a challenging preposition. Various techniques have been described in literature for the management of totally edentulous cases: for example use of dynamic bite openers, or modified dentures [14] and gunning splint [15] (uniblock as well as split block). If patient have more than 25 mm of opening a sectional complete denture can be fabricated [16]. However in the present case these techniques could not be used because the above mentioned techniques have some draw backs. While the conventional gunning splint and dynamic mouth opener would require an additional surgical appointment for the removal of the wires that have to be used to retain the occlusal splints in place. The modified dentures would require additional time for fabrication during which period the height might relapse. This



Fig. 13–15 Sectional splint in patient's mouth

paper describes a method of fabricating a novel sectional splint for the purpose of maintaining the vertical height obtained after surgery. Although this splint resembles the conventional gunning splint it differs from it in being not wired to the jaws. A sectional splint can be used to maintain the vertical height achieved during surgery and later complete denture prosthesis can be fabricated without difficulty.

Conclusion

Prosthetic rehabilitation of oral sub mucous fibrosis patients is difficult because of their limited mouth opening. Surgical intervention is very important for proper rehabilitation as it helps to increase mouth opening. But relapse of



Fig. 16 Increased vertical height

the surgically induced mouth opening is common and the mouth opening may again be restricted.

Proper planning is very important for the maintenance of the vertical height created after surgical intervention. Here we have designed a simple sectional splint to maintain the mouth opening of the patient obtained after surgery. The importance of the sectional splint is that patient is able to remove it easily if needed and can reinsert without any difficulty. If a single piece splint was given, it is very difficult for the patient to remove and reinsert. A soft liner is added to the intaglio surface of the splint to give a cushioning effect and prevent further trauma to the tissues.

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