

## Trismus appliance: a supplementary treatment option to conventional therapy for OSMF patient

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**ABSTRACT:** oral submucous fibrosis is a chronic disease affecting the oral cavity, it causes reduced mouth opening due to development of fibrous band in the oral mucosa. Various treatment modalities are available to treat the trismus cause due to the osmf, physiotherapy being one of them.

This case report demonstrate the use of intra oral appliance that can aid in increasing the mouth opening with the help of orthodontic wire.

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### I. Introduction:

Oral submucous fibrosis (OSMF) is a chronic disease affecting the oral cavity. Although occasionally preceded by and or associated with vesicle formation, it is always associated with juxtaepithelial inflammatory reaction followed by a fibroelastic change of the lamina propria, with epithelial atrophy leading to stiffness of the oral mucosa, causing trismus and inability to eat <sup>[1]</sup>. OSMF has a high rate of morbidity because it causes progressive inability to open the mouth,

Patients with OSMF often complain of sudden onset of inflammation or ulceration of the oral mucosa with vesicle formation and increased sensitivity or burning sensation when eating spicy foods that are followed by trismus, increasing difficulty in mastication, speech, and swallowing as well as possible decrease in auditory acuity. The most serious consequence of OSMF is malignant transformation or the development of squamous cell carcinoma of the affected tissues, which occurs in 3% to 6% of the cases.

Management includes cessation of habit and surgical release of fibrous bands followed by forceful opening of the mouth by coronoidectomy and coverage of surgical defects with nasolabial flap and postoperative active jaw physiotherapy for 6 months <sup>[3]</sup>. Surgery may induce scar tissue which reduces mouth opening due to scar contraction in mouth closing muscles <sup>[4]</sup>. Relapse is a common complication that occurs after surgical release of the oral trismus caused by OSMF <sup>[5]</sup>. A variety of jaw opening devices have been used to treat trismus <sup>[6]</sup>.

It is reported in the literature that use of oral stent is important to reduce the tendency of relapse postsurgical treatment and to prevent scar contraction and eventually prevents reduction in mouth opening. <sup>[2]</sup> This article shows noninvasive appliance that helps in improving the mouth opening by preventing scar contracture in patient who underwent surgery as well as helps in increasing the mouth opening in patient of OSMF undergoing only pharmacotherapy and physiotherapy without surgical intervention

### II. Case Report:

A 30 year old female patient reported to the institute with complaint of reduced mouth opening on through intraoral examination blanching was seen in the right and left buccal mucosa along with palate, reduced mouth opening was observed, with the interincisal distance being 18 mm. On palpation, all the findings were confirmed. The buccal mucosa was rubbery and inelastic, though fibrous bands were present. The diffuse white lesion seen on the palate, on taking personal history patient revealed that she has habit of chewing betel nut and tamarind seed 4-5 times a day since 10 years, thus confirming the provisional diagnosis to be oral sub mucous fibrosis .

**INVESTIGATION:** Patient was advised to undergo biopsy to confirm the diagnosis

### III. Treatment Plan:

The three main treatment modalities available to treat the patients of OSMF are medical therapy, surgical treatment and oral physiotherapy.

Patient was apprehensive about the surgical intervention thus conservative treatment plan was advised which included motivation and counselling of the patient to leave the habit, oral pharmacotherapy and physiotherapy using various appliance for improving the mouth opening

Oral appliances available in the market for trismus correction includes trismus tapered screw, screw type mouth gag, tongue blade etc.

Orthodontic wire have sufficient resilience and can generate enough force which can be utilized for improving mouth opening this case report attempts to demonstrate an appliance made of acrylic and stainless steel orthodontic wire that can be used as an adjuvant the conventional treatment options .



Fig 1 :intraoral view

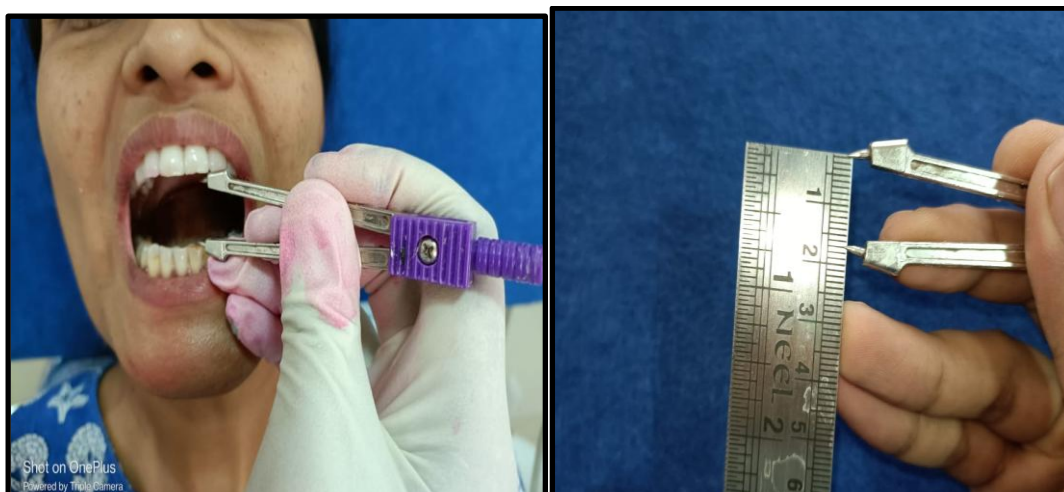


Fig 3&4 measurement of interincisal distance

### IV. Technique Of Fabrication:

- 1) Primary impression of maxillary and mandibular arch were made using alginate (tropicalgine zhemark) and cast was poured using type 3 dental stone (gold stone, Asian chemicals )
- 2) Casts were retrieved and bite was recorded at most comfortable mouth opening AND cast were mounted using the bite record on the hinge articulator.
- 3) Cast were removed from articulator along with the mounting disk.
- 4) On the posterior teeth of the both the cast undercuts were blocked and separating medium was applied.
- 5) Wire bending was done with 19 gauge stainless steel wire, 'V' shaped spring was made.
- 6) Self cure acrylic resin was adapted on the buccal, occlusal and palatal /lingual aspect of posterior teeth of both the arches.



**Fig 4: Bite registration and mounting**



**Fig 5&6: appliance fabrication**

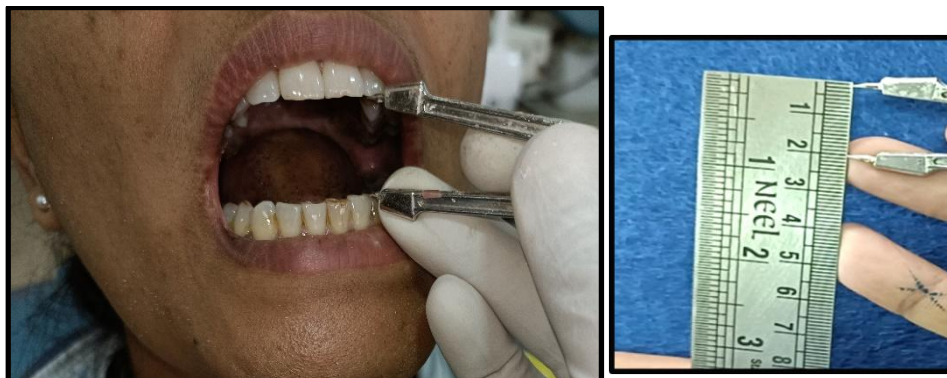
6) After curing of self-cure resin cast were remounted and occlusal thickness was adjusted as per desired mouth opening V-spring were adapted on the buccal aspect of the both the arches (one arm on maxillary arch and other arm on the mandibular arch buccal aspect) on both the side.

7) To prevent extrusion of the teeth, acrylic was adapted on the lingual and occlusal aspect of the teeth, final appliance was finished and polished and delivered to the patient.

Patient was advised to wear the appliance for 12 hours per day for first 2 week followed by 6 hours per day for 4 week .After end of 2 weeks patient was recalled and activation of the appliance was done by opening the loop of the v-spring. The increased mouth opening was evaluated after every 2 weeks. The mean mouth opening at the end of fourth week was found to be 20 mm, ie the mouth opening increased by 3 mm.



**Fig :7 Intraoral view of appliance**



**fig 8&9:post treatment followup**

## **V. Discussion:**

Oral submucous fibrosis (OSMF) is a chronic disease that produces scars, tissue fibrosis, and precancerous lesions. It frequently occurs in the buccal mucosa.

Causative factors of OSF include autoimmunity, vitamin B, C, and iron deficiencies, chewing betel nut, consumption of spicy foods, human papilloma virus (HPV) infection, and genetic mutations. Epidemiological studies have shown that chewing betel nut is one of the most significant risk factors for OSMF. Symptoms of OSMF include a wide range and includes burning sensation, vesicles formations, blanching of oral mucosa, reduced mouth opening.

Treatment of underlying cause should be the primary objective, stopping the habit of chewing betel quid and treating the underlying nutritional deficiency are the goal before initiating final treatment. Surgical medical and physiotherapeutic modalities are available for the treatment of OSMF patients.

Surgical treatment is aggressive and requires surgical release of fibrous bands followed by forceful opening of the mouth by coronoidectomy and coverage of surgical defects with nasolabial flap and postoperative active jaw physiotherapy for 6 months. medical management

Medical management includes Intralesional steroids such as dexamethasone are the main treatment modality. These are injected submucosally into the fibrotic bands weekly for 6 to 8 weeks with regular monitoring of mouth opening. They are commonly used with hyaluronidase, a proteolytic enzyme. Antioxidants like alpha lipoic acid and lycopene are also commonly used as first line of treatment.

Generally, Physiotherapy is incorporated in the treatment plan after surgical release of the fibrous band the devices available in the market are tongue blade trismus screw etc. physiotherapy is noninvasive and less traumatic to the patient. Studies have shown that intralesional injection of steroids and adjunctive physiotherapy helps in the improving mean mouth opening, tongue protrusion and cheek flexibility.

With the use of this appliance mean mouth opening was increased by 3 mm which was evaluated after 4 weeks of usage that is mouth opening increased from 17mm to 20mm. The use of this appliance for reversing the trismus lacks evidence so further study and improvement in design is needed to prove its efficacy

## **VI. Conclusion:**

The treatment of trismus can be done by nonsurgical method by using physiotherapy and pharmacotherapy and this device can act as a supplementary treatment option for patient with mild to moderate trismus. As this device is placed intraorally it can be given to the patient with impaired manual dexterity.

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