



## REVIEW ARTICLE

# A Short Review on OSMF: Oral Sub Mucous Fibrosis

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## Abstract

Oral submucous fibrosis (OSMF) is a premalignant condition caused by betel chewing. OSMF is a premalignant condition that can lead to oral cancer. A risk that is further increased by concomitant tobacco consumption. OSMF is a diagnosis based on clinical symptoms and confirmation by histopathology. Major constituents of betel quid are arecoline from betel nuts and copper, which are responsible for fibroblast dysfunction and fibrotic band formation. Drug therapy include antifibrotic, anti-inflammatory, and antioxidants, homemade remedies including turmeric and tulsi . Prevention is most important in case of OSMF , because severe cases of OSMF are irreversible.

**Keywords:** OSMF, betel, oral disease, oral cancer, tobacco, fibrosis

## 1 | INTRODUCTION:

Oral submucous fibrosis is a chronic disease affecting the oral mucosa, as well as the pharynx and the upper two-thirds of the esophagus. There is substantial evidence that lends support to a critical role of areca nuts in the etiology behind oral submucous fibrosis (1). It is complex condition of the oral cavity. In simple word patients jaw become rigid to the point that he/she is unable to open mouth. This is common oral cavity problem among south Asian problem strongly associate with the practice of chewing areca nut and betel quid. People who have strong habit of chewing Pan, Pan Masala, Gutka, Mawa and Mainpuri tobacco have strong chances of having OSMF. Patients with OSMF have complaint of reduced mouth opening.

**Background:** In 1952, Schwartz coined the term atrophica idiopathica mucosa oris to describe an

oral fibrosing disease he discovered in 5 Indian women from Kenya (2). Joshi subsequently coined the termed oral submucous fibrosis (OSF) for the condition in 1953 (3). Oral submucous fibrosis is a chronic debilitating disease of the oral cavity characterized by inflammation and progressive fibrosis of the submucosal tissues (lamina propria and deeper connective tissues). Oral submucous fibrosis results in marked rigidity and an eventual inability to open the mouth. (4) The buccal mucosa is the most com-

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monly involved site, but any part of the oral cavity can be involved, even the pharynx.

**Etiology & Pathogenesis:** The pathogenesis of the disease is not well established, but the cause of oral submucous fibrosis is believed to be multifactorial. Factors include areca nut chewing, ingestion of chilies, genetic and immunologic processes, nutritional deficiencies, and other factors.

Previous studies on the pathogenesis of OSF have suggested that the occurrence may be due to:

- Clonal selection of fibroblasts with a high amount of collagen production during the long-term exposure to areca quid ingredients (5)

- Stimulation of fibroblast proliferation and collagen synthesis by arecanut alkaloids (6)

- By decreased secretion of collagenase (7)

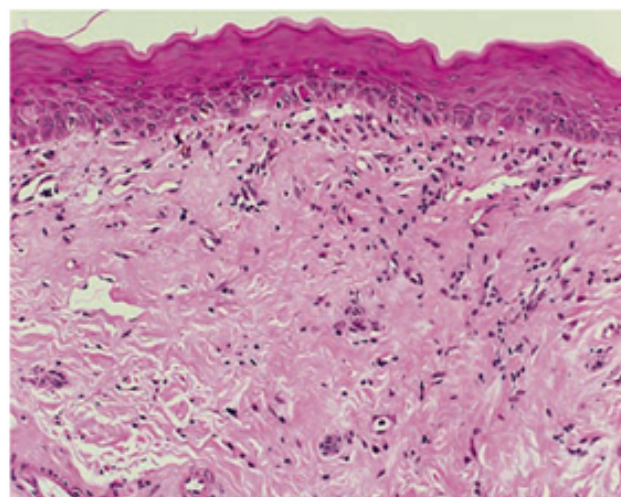
- And by an increase in collagen cross-linkage as caused by upregulation of lysyl oxidase by OSF fibroblasts (8)

- Smoking and alcohol consumption alone, habits common to areca nut chewers, have been found to have no effect in the development of oral submucous fibrosis, but their addition to areca nut chewing can be a risk for oral submucous fibrosis. (9)

- A genetic component is assumed to be involved in OSF Patients with increased frequency of HLA-A10, HLA-B7, and HLA-DR3 reported in people without a history of betel nut chewing or chili ingestion. (10, 11)

- Iron deficiency anemia, vitamin B complex deficiency and malnutrition are promoting factors that derange the repair of the inflamed oral mucosa, leading to defective healing and resultant scarring (10)

**Histopathology :** Microscopically, the principal feature is atrophy of the epithelium and subjacent fibrosis Figure 1 (12). Epithelial dysplasia occasionally may be evident. The lamina propria is poorly vascularized and hyalinized; fibroblasts are few. A diffuse mild to moderate inflammatory infiltrate is present. Type I collagen predominates in the submucosa, whereas type III collagen tends to localize at the epithelium–connective tissue interface and around blood vessels, salivary glands, and muscle. (12)



**FIGURE 1:** Submucous fibrosis showing epithelial atrophy over fibrotic submucosa. (12)

**Epidemiology:** Areca nut–derived products are commonly used by several hundred million individuals in the southern parts of Asia. Oral complications are most commonly observed on the lips, buccal mucosa, retromolar area, and soft palatal mucosa. The habit of chewing betel quid, containing fresh, dried, or cured areca nut, and flavoring ingredients is widespread in India, Pakistan, Bangladesh, and Sri Lanka and in immigrants coming from these regions. Tobacco is often used in conjunction with betel quid. The habit is more common among women in some geographic areas, which is also reflected in the gender distribution of oral submucous fibrosis. The global incidence of oral submucous fibrosis is estimated at 2.5 million individuals. The prevalence in Indian populations is 5% for women and 2% for men. Individuals in less than 20 years old seem to be affected more commonly by oral submucous fibrosis than individuals in other age groups. (1)

## 2 | CLINICAL PRESENTATION:

OSMF is seen typically between the ages of 20 and 40 and is often associated with the habitual use of compounds containing areca (betel) nut and tobacco in various forms, including a quid form (paan) and a powdered form (gutka), where these are placed in the oral cavity for extended periods of time and often are

replaced up to several times per day. Oral submucous fibrosis presents as a whitish yellow change that has a chronic, insidious biological course. It is characteristically seen in the oral cavity, but on occasion it may extend into the pharynx and the esophagus. Submucous fibrosis occasionally may be associated with vesicle formation. Over time, the affected mucosa, especially the soft palate and the buccal mucosa, loses its resilience and shows limited vascularity and elasticity. This process then progresses from the lamina propria to the underlying musculature. Fibrous bands are readily palpable in the soft palate and the buccal mucosa. The clinical result is significant trismus with considerable difficulty in eating.

Patient may give you , history of either all or few of these symptoms that include –

1. Inability to open the mouth (trismus) due to fibrosis
2. Pain or burning sensation upon consumption of spicy food stuffs
3. Increased salivation
4. Change of gustatory sensation
5. Hearing loss may occur due to stenosis of the eustachian tubes
6. Dryness of the mouth
7. Dysphagia to solids (if the esophagus is involved)

### 3 | CLASSIFICATION IN OSMF:

#### A. According to clinical & physical findings

**Stage 1** - Stomatitis includes erythematous mucosa, vesicles, mucosal ulcers, melanotic mucosal pigmentation, and mucosal petechia.

**Stage 2** - Fibrosis occurs in ruptured vesicles and ulcers when they heal, which is the hallmark of this stage. Early lesions demonstrate blanching of the oral mucosa.

Older lesions include vertical and circular palpable fibrous bands in the buccal mucosa and around the mouth opening or lips, resulting in a mottled, marblelike appearance of the mucosa because of the vertical, thick, fibrous bands running in a blanching mucosa. Specific findings include the following:

Reduction of the mouth opening (trismus)

Stiff and small tongue

Blanched and leathery floor of the mouth

Fibrotic and depigmented gingiva

Rubbery soft palate with decreased mobility

Blanched and atrophic tonsils

Shrunken budlike uvula

Sinking of the cheeks, not commensurate with age or nutritional status.

**Stage 3** - Sequel of OSMF includes -

Leukoplakia is precancerous and is found in more than 25% of individuals with OSMF. Speech and hearing deficits may occur because of involvement of the tongue and the eustachian tubes. (13)

**B. According to surgical management of trismus: (14)**

**Group I:** IT is the earliest stage and is not associated with mouth opening limitations. Patients with an interincisal distance of greater than 35 mm.

**Group II:** Patients with an interincisal distance of 26-35 mm.

**Group III:** These are moderately advanced cases. This stage refers to patients with an interincisal distance of 15-26 mm. Fibrotic bands are visible at the soft palate, and pterygomandibular raphe and anterior pillars of faucets are present.

**Group IVA:** Trismus is severe, with an interincisal distance of less than 15 mm and extensive fibrosis of all the oral mucosa.

**Group IVB:** Disease is most advanced, with premalignant and malignant changes throughout the mucosa. (14)

**C. Histological Classification in OSMF: (15)Table 1**

**Investigations in OSMF:**

1. Complete Hemogram

**TABLE 1**

Very early (stage I)	Early (stage II)	Moderately advanced (stage III)	Advanced (stage IV)
A finely fibrillar collagen, dispersed with marked oedema	The juxta-epithelial area shows early hyalinization	The collagen is moderately hyalinized	The collagen is completely hyalinized
The fibroblastic response is strong	Plump young fibroblasts are present in moderate numbers	The fibroblastic response is less marked, the cells present being mostly adult fibrocytes	The hyalinized areas are devoid of fibroblasts
The blood vessels are sometimes normal, but more often they are dilated and congested	The blood vessels are dilated and congested	Blood vessels are normal or constricted	Blood vessels are completely obliterated or narrowed
Inflammatory cells, mainly polymorphonuclear leukocytes with an occasional eosinophil, are present	Inflammatory cells are mostly mononuclear lymphocytes, eosinophils, and an occasional plasma cell	Inflammatory exudates consist of lymphocytes and plasma cells, although an occasional eosinophil is seen	Inflammatory cells are lymphocytes and plasma cells(15)

2. Toluidine blue test

3. Biopsy :- Incisional biopsy

4. Immunofluorescent test:

(a) Direct

(b) Indirect

### Management of OSMF:

Eliminating causative agents is part of the management of submucous fibrosis. Therapeutic measures include local injections of chymotrypsin, hyaluronidase, and dexamethasone, with surgical excision of fibrous bands and submucosal

placement of vascularized free flap grafts. All methods of treatment, including surgical modalities, however, have proved to be of only modest help in this essentially irreversible condition.

### 1. Lifestyle Changes:

Avoid areca nut & other chronic irritant such as hot and spicy food.

Advice green leafy vegetables.

Intake of Vit. A, B complex rich diet & high protein diet.

Minimizing consumption of spicy foods, including chiles.

Maintaining proper oral hygiene.

Avoid hot fluids like tea, coffee

Avoid alcohol

### 2. Physiotherapy:

It includes forceful mouth opening, repeated blooming of balloons, heat therapy.

### 3. Medical Management:

**Steroids:** In patients with moderate OSF, submucosal intralesional injections given. Topical application of steroids may help, prevent further damage. The recommended dose is 75 to 100 mg twice a week for 4 to 6 weeks.

**Placental extracts:** Sur in 2003 reported that the rationale for using placental extract (PE) in patients with OSMF derives from its proposed anti-inflammatory effect prevents the mucosal damage. (16) Recommended dose of placental extract is 2ml twice weekly for 4 to 6 weeks.

**Hyaluronidase:** The use of topical hyaluronidase shows significant improvement than steroids alone. The recommended dose is 1500 i.u twice weekly for 4 to 6 weeks. According to Karkar in 1985 the combi-



nation of steroids and topical hyaluronidase showed better long-term results than either used alone. (17)

**IFN-gamma:** It plays a role in the treatment of patients with OSMF because of its immunoregulatory effect. IFN-gamma

is a known antifibrotic cytokine. (18)

**Supplements:** Administration of Antioxidants OD for 6 – 8 weeks.

Administration of Lycopene OD for 6-8 weeks

**4. Surgical Management:** Measures such as forcing the mouth open and cutting the fibrotic bands have resulted in more fibrosis and disability. Submucosal resection of fibrotic bands and replacement with a partial thickness skin or mucosal graft have also been attempted along with procedures such as bilateral temporalis myotomy. At a retrospective glance, surgery seems to be a poor option in the overall management of the disease. (8)

Surgical treatment is indicated in patients with severe conditions. These include:-

**Simple excision of the fibrous bands:** Excision can result in contracture of the tissue and exacerbation of the condition.

**Split-thickness skin grafting following bilateral temporalis myotomy or coronoidectomy:** Trismus associated with OSMF may be due to changes in the temporalis tendon secondary to OSMF; therefore, skin grafts may relieve. (19)

**Nasolabial flaps and lingual pedicle flaps:** Surgery performed only in patients with OSMF in whom the tongue is not involved. (20)

**5. Home remedies:** Tulsi and turmeric (curcumin) along with life style modification is safe and efficacious remedy for the treatment of all grades of OSMF in all age groups with no limitation to its use. Tulsi and turmeric can provide a safer, low cost, and effective alternative to the present conventional treatment, which can be useful in a country like India. Mix 1 gm of turmeric powder and 1 gm of tulsi powder in glycerine to make a paste. The patients were instructed to apply this paste all over the oral mucosa 4-5 times per day and not to eat or drink anything for next 15 minutes. (21) Herbal treatment can provide a safer, low cost, and effective alternative to the present conventional treatment, which

can be useful in a country like India. Further studies are going on to assess the comparative efficacy with already existing treatment for OSMF.

**6. Conselling of the patient:** Sometimes a psychological conselling of the patient is required in advance cases of OSMF, as patient thinks they are going to suffer from oral cancer or they are going to die because of this condition. So, family support and social support along with conselling of patient becomes important in some advance cases.

#### 4 | CONCLUSION:

OSF is a disease with a high degree of incidence. It also carries a significant morbidity rate from oral cancer. The treatment of patients with oral submucous fibrosis depends on the degree of clinical involvement. If the disease is detected at a very early stage, cessation of the habit is sufficient. Most patients with oral submucous fibrosis present with moderate-to-severe disease. Severe oral submucous fibrosis is irreversible. Current modern day medical treatments can make the mouth opening to normal minimum levels of 30 mm mouth opening with proper treatment.

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