



ORAL SUBMUCOUS FIBROSIS- CURRENT CONCEPTS OF AETIOLOGY AND MANAGEMENT

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ABSTRACT

Oral submucous fibrosis (OSMF) is a debilitating, potentially cancerous oral condition, caused primarily by chewing areca nut and its mixtures, as demonstrated by numerous epidemiological studies and other corroborative evidence. The condition may sometimes extend beyond the mouth to the oesophagus. OSMF is well established as a condition with high malignant potential and is considered irreversible. It is most common in the countries of south-east Asia and shows greater predisposition towards the Indian ethnic group. Despite its prevalence and association with a significantly increased risk of cancer, its etiology is still not clear. It could lead to a spectrum of oral deformities ranging from inability to open mouth, tongue depapillation, hoarseness of voice to malignancy, which is why it has been grouped as a pre-malignant condition.

Key words: Oral Submucous Fibrosis (OSMF), Medical Management, Surgical Management.

INTRODUCTION

The oral submucous fibrosis (OSMF) as defined by Pindborg and Sirsat as an insidious chronic fibrotic disease that involves the oral mucosa and occasionally the pharynx and upper third of oesophagus. OSMF is characterized by a juxtaepithelial inflammatory reaction followed by fibroelastic changes in the submucosa and epithelial atrophy, that leads to stiffness of the oral mucosa causing trismus and inability to eat [1]. The etiological factors are excessive consumption of spicy food, nutritional deficiencies like chronic iron and vitamin B complex deficiency, areca nut chewing habits [2].

OSMF has been reported almost exclusively among Indians living in India and among other Asiatics with a reported prevalence ranging up to 0.4% in Indian rural population. This condition affects approximately 0.5% (5 million people) of the population in the Indian subcontinent. The major presenting complaint is a progressive inability to open the mouth due to the accumulation of inelastic fibrous tissue in the juxta-

epithelial region of the oral mucosa. This severely impairs eating and oral hygiene care. The epithelium overlying the fibrous condensation becomes atrophic in 90% of cases and is the site of malignant transformation in 4.5% of patients [3].

Etiology

Since many years there have been suggested various predisposing factors for oral submucous fibrosis like areca nut/betel nut, tobacco, lime, malnutrition, immunological disorders, collagen disorders, capsaicin (a prime component in chillies), etc; association of areca nut catechu in the occurrence of Oral Submucous fibrosis has been proved by many studies. It's been shown that areca nut plays a role in OSMF by generating free radicals as well as by causing immunosuppression. Commercially available of economical sachets of gutka, paan contains areca nut cut in to small pieces coated with various Chemicals and have strong association with this.

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Arecanut: The betel nut has psychotropic and anti helminthic property due to presence of areca alkaloids. Four alkaloids have been conclusively identified in biochemical studies, arecoline, arecaidine, guvacine & guvacoline, of which arecoline is the main agent. Recently suggested pathogenesis of oral submucous fibrosis is by dual action of areca nut [4]. It is suggested that arecoline not only stimulates fibroblastic proliferation and collagen synthesis but also decreases its breakdown. This suggests that arecoline is the active metabolite in fibroblast stimulation. Arecanut plays a role in OSMF by generating free radicals as well as by causing immunosuppression. Recent evidence suggests upregulation of the copper-dependent extracellular enzyme lysyl oxidase by fibroblasts in oral submucous fibrosis is important, leading to excessive crosslinking and accumulation of collagen [5].

OSMF is thought to be caused by the chewing of areca nut but research has shown patients presenting with OSMF who do not report having an areca nut habit, this further adds to the mystery surrounding OSMF and its etiology. Chewing of areca nut may be an important factor in the etiology of OSMF.

Tobacco & Lime: The commercially freeze dried products such as Pan masala, Gutka and Mawa (areca, tobacco and lime) have high concentrates of areca nut per chew and appear to cause OSMF more rapidly than by self prepared conventional betel quid which contain smaller amounts of areca nut[6]. These are known irritants and causative factors in oral malignancy. They may act as local irritants.

Chillies: Chillies are thought to irritate the oral mucosa and cause an inflammatory reaction and along with continued use of chillies and other spices, continued irritation of the mucosa causes chronic inflammation which leads to fibrosis formation.

Nutritional deficiency: A subclinical vitamin B complex deficiency has been suspected in cases of OSF with vesiculations and ulcerations of oral cavity [7]. The deficiency could be precipitated by the effect of defective nutrition due to impaired food intake in advanced cases and may be the effect, rather than the cause of the disease.

Immunological disorders: Raised globulin levels are indicative of immunological disorders. Serum immunoglobulin levels of IgA, IgG and IgM are raised significantly in oral submucous fibrosis [8]. These raised levels suggest an antigenic stimulus in the absence of any infection. Circulating autoantibodies are also present in some cases of oral submucous fibrosis

CLINICAL MANIFESTATIONS

Early OSMF includes a burning sensation in the mouth when consuming spicy food, appearance of blisters especially on the palate, ulcerations or recurrent

generalized inflammation of the oral mucosa. The most common initial symptoms of submucous fibrosis are burning sensation of the oral mucosa aggravated by spicy food (42%), followed by either hyper salivation or dryness of the mouth (25%)[9].

1. Blanching, i.e., marble-like appearance of the oral mucosa and stiffness of the oral mucosa
2. Trismus
3. Burning sensation in the mouth when consuming spicy food
4. Appearance of blisters especially on the palate, ulcerations or recurrent generalized inflammation of the oral mucosa
5. Reduced mobility of the soft palate and tongue
6. Excessive salivation
7. Defective gustatory sensation and dryness of the mouth
8. Intolerance to eating hot and spicy foods
9. Mild hearing loss due to blockage of Eustachian tube

In advanced OSMF, oral mucosa becomes blanched and slightly opaque and white fibrous bands appear involving the buccal mucosa, lips, soft palate, faucial pillars and tongue. With progressive fibrosis, the stiffening of certain areas of the mucosa occurs difficulty in opening the mouth, inability to whistle or blow out a candle and difficulty in swallowing [10]. In severe submucous fibrosis, the patient cannot protrude the tongue beyond the incisal edges and there is a progressive closure of the oral opening. The oral mucosa is involved symmetrically and the fibrous bands in the buccal mucosa run in a vertical direction. The density of the fibrous deposit varies from a slight whitish area on the soft palate causing no symptoms to a dense fibrosis causing fixation and shortening or even deviation of the uvula and soft palate [11].

Depending on if the OSF patient chews the areca nut or swallows it after chewing, the fibrotic change in the mucosa can also occur in the pharynx or oesophagus [12]. Some OSMF subjects showed unilateral fibrosis in the mouth. On examination one side of the buccal mucosa was fibrosed where as other side was completely normal. The patients used to keep the gutkha on the fibrosed side for few minutes and after that partially swallowed and partially spitted out.

DIFFERENTIAL DIAGNOSIS

Some differential diagnoses for OSMF could be leukoplakia due to smoking, tobacco keratosis (from smokeless tobacco), plaque-type lichen planus, or chronic hyperplastic candidiasis. The difference between smoking-related leukoplakia, hyperplastic candidiasis, and tobacco keratosis compared to OSF is that the leukoplakia, keratosis, and candidiasis will be painless (OSMF can be painful); they will also have a different histological appearance when biopsied [13]. Oral submucous fibrosis has a characteristic clinical appearance and there are very few conditions that need to be differentiated from it. One is

oral manifestation of scleroderma. Compared to submucous fibrosis, however, the occurrence of scleroderma is rare. Usually pale mucosa seen in anemic conditions may be mistaken for oralsubmucous fibrosis. More often, pale mucosa, coupled with pigmentation seen in anemic conditions, may be mistaken for blanching in submucous fibrosis.

DIAGNOSTIC CRITERIA

The presence of palpable fibrous bands is a diagnostic criterion for submucous fibrosis. The fibrous bands occur especially in the buccal mucosa retromolar areas, and around the rima oris [14]. When the tongue is affected, it is devoid of papillae and becomes smooth. Its mobility, especially the protrusion, is impaired. The opening of the mouth is restricted. Some investigators adhered to the earlier signs and symptoms such as pain, history of vesicles and ulcers, and blanching of the mucosa for diagnosis of OSMF.

LABORATORY INVESTIGATIONS

Some oral submucous fibrosis studies have reported the laboratory findings in including decreased hemoglobin, iron, protein and vitamin B complex levels and increased erythrocyte sedimentation rate.

MANAGEMENT

Restriction of the habit

Reduction or even elimination of the habit of areca nut chewing is an important preventive measure. The

preventive measure should be in the form of stoppage of the habit. Patients should be explained about the disease
 -Abstention from chewing areca nut (also known as betel nut) and tobacco.

-Minimizing consumption of spicy foods, including chilies, Maintaining proper oral hygiene.

-Supplementing the diet with foods rich in vitamins A, B complex, and C and iron.

Medical Care

Medical treatment is symptomatic and predominantly aimed at improving mouth movements. The medical management has been summarized in the following table 1 [15].

Surgical Care

Surgical treatment is indicated in patients with severe trismus and/or biopsy results revealing dysplastic or neoplastic changes. Surgical modalities that have been used include the following: Simple excision of the fibrous bands, excision of bands with myotomy with or without coronoidectomy, coverage of the raw area with skin grafts, fresh amnion, collagen membrane, buccal pad of fat, local flaps or vascularised free flaps, followed by active post-operative jaw physiotherapy with anti-oxidants and proper nutrition and regular follow-ups to ensure maintenance of oral opening and early detection of malignant changes if any [16].

Use of lasers for band excision also has been documented. Coverage of the area with fibrin glue or Absorbable.

Table 1. Treatment modality for OSMF

Treatment	Treatment details
Micronutrients and minerals	Vitamin A, B complex, C, D and E, iron, copper, calcium, zinc, magnesium, selenium and others
Milk from immunized cows	45 g milk powder twice a day for 3 months
Lycopene	8 mg twice a day for 2 months
Pentoxifylline	400 mg 3 times a day for 7 months
Interferon gamma	Intralesional injection of interferon gamma (0.01- 10.0 U/mL) 3 times a day for 6 months
Steroids	Submucosal injections twice a week in multiple sites for 3 months/ Topical for 3 months
Placental extracts	
Turmeric	Alcoholic extracts of turmeric (3 g), turmeric oil (600 mg), turmeric oleoresin (600 mg) daily for 3 months
Chymotrypsin, hyaluronidase and dexamethasone	Chymotrypsin (5000 IU), hyaluronidase (1500 IU) and dexamethasone (4mg), twice weekly submucosal injections for 10 weeks

CONCLUSION

Oral submucous fibrosis is one of the most poorly understood and unsatisfactorily treated diseases. The younger the age, the more rapid the progression of the disease. Because of the significant cancer risk among these patients, periodic biopsies of suspicious regions of the oral mucosa are essential for early detection and management

of high-risk oral premalignant lesions and prevention of cancer.

Dentists can play an important role in both the education of patients about the perils of chewing betel quid and in the early diagnosis of such high-risk premalignant lesions and cancer.

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