

# Oral Submucosal Fibrosis-Early Diagnosis; A Key to Successful Management

\*                                  \*\*                                  \*\*\*  
Dileep Kumar, Aneel Kapoor, M. Imran Rathore

## ABSTRACT

**Objective:** To diagnose the cases of oral submucosal fibrosis in early stage in out patients department.

**Study design:** Descriptive study.

**Place & Duration:** Department of ENT, Muhammad Medical College and hospital Mirpurkhas, Pakistan from Jan 2013 to Dec 2014.

**Material & methods:** A total of 256 patients were registered through non-probability purposive technique in the outpatient department. Biopsy of all those patients was taken and checked if any of those patients has already developed malignancy, and in that case that patient was excluded from the study.

**Results:** Out of 256 patients which we registered, 170 patients were male and 86 were female. The age range was 7 years to 48 years. The burning sensation was the primary complaint in 86% of the patients. Restricted oral cavity opening was the chief complaint in 55% of the patients. Dysphagia was present in 60% and dryness of mouth was present in 67%.

**Conclusion:** Oral submucosal fibrosis (OSF) should be diagnosed as soon as possible so as early management can be done. It is seen that the prognosis of OSF depends upon the severity of disease at presentation. Greater the stage of disease the poorer the prognosis

**Key Words:** Oral Submucosal Fibrosis, Betel Liquid, Oral Cavity, Premalignant Lesion.

## INTRODUCTION:

Oral submucous fibrosis is a chronic disease of the oral cavity characterized by inflammation and progressive fibrosis of the submucosal tissues. The disease was first described by Schwartz in 1908 in Indian women living in East Africa. The most common cause is betel nut chewing. Other significant factors to be culprit are genetic factors, nutritional deficiencies, and ingestion of chilies. The term oral submucosal fibrosis derives from oral (meaning mouth), submucosal (meaning below the mucosa of the mouth), and fibrosis (meaning hardening and

scarring).<sup>1</sup> Chewable agents, primarily betel nuts (Areca catechu), contain substances that irritate the oral mucosa, making it lose its elasticity. Nutritional deficiencies, ingestion of chilies, and immunologic processes may also have a role in the development of oral submucous fibrosis. The oral submucosal fibrosis is believed to carry a potential to transform into malignant pathology with a percentage of 4.5 - 7.6. Clinically the disease is classified into 3 stages according to severity, the stage-1 stomatitis, stage-2 fibrosis and stage-3 leukoplakia<sup>2</sup>.

According to international data the disease is more common in south India<sup>3</sup> but due to the endemic migration of betel quid chewers the disease has become prevalent in many parts of the world, including the United Kingdom, South Africa, and many Southeast Asian countries. The male-to-female ratio of oral submucous fibrosis varies by region, but females tend to predominate. Studies in Pakistan reported a male-to-female ratio of 1:2.3.<sup>1</sup> Age of the patient ranges from 11-60 years<sup>1,4</sup> but the age group most likely to suffer are 45-54 years.<sup>1</sup>

- \* Assistant Professor, Department of ENT  
PUMHS, Nawabshah
- \*\* Assistant Professor, Department of  
Biochemistry Muhammad Medical College,  
Mirpurkhas
- \*\*\* Department of Anatomy, Muhammad Medical  
College, Mirpurkhas.

### Correspondence to:

**Dr. Dileep Kumar**

Assistant Professor, Deptt. Of ENT  
PUMHS.Nawabshah-SBA  
Email: pilotomnivore@hotmail.com

Betel quid is frequently used in Pakistan. It is mostly started by teenage boys. It is a broad term which includes in its subtypes; pan, gutkha, pan masala, pan Parag, mawa, and menpuri, Betel nut extracts increase the rate of cell division, reduce cell cycle time, induce DNA strand breaks, and induce unscheduled DNA synthesis<sup>5</sup>. The role of chilies in the development of OSF is controversial as there is comparatively less incidence of OSF in Mexico and South America where more spicy food is consumed but it is also believed that hypersensitivity reaction of oral cavity mucosa to chili probably leads to OSF.<sup>1</sup> The genetic factor is thought to be a major factor for the reason that OSF is found in a number of cases where there is no history of betel quid chewing,<sup>6</sup> excessive spicy food intake<sup>7</sup> or nutritional deficiency. Patients with oral submucous fibrosis have been found to have an increased frequency of HLA-A10, HLA-B7, and HLA-DR3 and an immunologic process are believed to play a role in the pathogenesis of oral submucous fibrosis<sup>8</sup>. 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.<sup>1</sup> Histological findings vary according to the stage of the disease<sup>9</sup>. The mainstay of treatment is avoiding of provoking factors, symptomatic medication, and steroids therapy, although other strategies are also applied in many regions but those are not approved yet.<sup>6</sup>

#### **MATERIAL & METHODS:**

The study was conducted at the department of ENT Muhammad Medical College and hospital Mirpurkhas, Pakistan. A total of 256 patients were registered through non-probability purposive technique in the outpatient department. The study was conducted from Jan 2013 to Dec 2014. The total duration of study is 2 years. The patients with any of the above-mentioned symptoms were further evaluated by a resident by filling a proforma which required the information Regarding the history of all risk factors, relative complaints, and specific clinical examination to evaluate the severity of oral submucosal fibrosis.

First of all biopsy of all those patients was taken and checked if any of those patients has already developed malignancy, in that case that patient was excluded from the study. After establishing the diagnosis staging was done (Table-1 & 2) and informed consent was taken from those patients for inclusion in our research study. All those patients were advised to avoid all risk factors for that disease. They all were prescribed with single specific treatment for oral submucosal fibrosis and advised to followup in OPD every 2 weeks. These patients were again seen by a resident who assessed those patients regarding any improvement in disease. Those who got relief from the disease were advised to follow in OPD every 15 days for further 6 months to see if any patient develops the disease again. Those that did not get complete relief were advised to take medication for 6 months before labeled incomplete relief or no relief.

#### **RESULTS:**

Out of 256 patients which we registered, 170 patients were male and 86 were female. The age range was 7 years to 48 years. The complaint of burning sensation was primary complaint in 86% of the patients. Restricted oral cavity opening was the complaint in 55% of the patients. Dysphagia was present in 60%. Dryness of mouth was present in 67% of the patients. History of betel quid chewing was present in 96% of the cases. The habit of taking spicy food was admitted by only 40% of patients. The family history of OSF was present in 3 % of the patients. The erythematous mucosa was present in 55% of the patients. Vesicles in oral cavity were seen in 41% and mucosal petechia was seen in 65%. Blanching of the mucosa was seen in 70% of the cases while trismus was seen in 40% of the patients. Out of all trismus positive cases, 10% were having grade-4, 17% were having grade-3 trismus, 29% were having grade-2 and 44% were having grade-1. Leukoplakia was seen in only 26% of the cases. Hearing defects was seen in only 10% of the cases while articulation problem was seen in only 7% of the cases. 42% patients were in stage-1 of OSF, 30% patients were in stage-2 and 28% patients were in stage-3. 55%

**Table-1: Stages of Oral Submucous Fibrosis.**

Stage-1 Stomatitis <sup>4</sup>	Erythematous mucosa, vesicles, mucosal ulcers, melanotic Mucosal pigmentation, and mucosal petechia.
Stage-2 Fibrosis	Fibrosis occurs in ruptured vesicles and ulcers when they Heal, which is the hallmark of this stage.
a- Early lesions	blanching of the oral mucosa
b- Older lesions	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 Sequelae of oral submucous fibrosis	
a- Leukoplakia	It is precancerous and is found in more than 25% of individuals with oral submucous fibrosis.
b- Speech and hearing Deficits	It may occur because of involvement of the tongue and the Eustachian tubes.

**Table-2: Histological Findings at Different stages**

Very early stage	Fine fibrillar collagen, marked edema, large fibroblasts, dilated and congested blood vessels, and inflammatory infiltrates (primarily polymorphonuclear leukocytes and eosinophils) are found
Early stage	Early hyalinization is characterized by thickened collagen bundles, moderate numbers of fibroblasts, and inflammatory cells (primarily lymphocytes, eosinophils, and plasma cells).
Moderately advanced and Advanced Stage	Dense bundles and sheets of collagen, thick bands of subepithelial hyalinization extending into the submucosal tissues (replacing fat or fibrovascular tissue), decreased vascularity, no edema, and inflammatory cells (lymphocytes and plasma cells) are found.

of the patients got complete relief from the symptoms while 35% showed improvement in oral mucosa while 10% of the cases did not show any sign of improvement. It was found that those were at stage-1 of OSF at presentation got relief

from the disease in 96% of cases. Those at stage-2 got complete relief only in 30% of the cases signs of improvement in 65% of the cases and no relief in 5% of the cases. And those in stage-3 got relief in only 1.5% of the cases and rest of cases there was

no sign of improvement. As those cases were followed for further 6 weeks to see if there was recurrence, it was found that Stage-1 suffered patients were found with recurrence in 10% of the cases, stage-2 suffered patients were found recurrence in 78% of the cases and Stage-3 suffered patients were found recurrence in 100% of the cases.



**Figure 1: Fibrous Bands**

#### **DISCUSSION:**

In our study male were more likely to be diseased as compared to other international studies.<sup>9</sup> The teenager group was the major age group to suffer from OSF. This is possibly because of the reason that betel quid is used by them most frequently in this age. The stage of OSF was 1 in most of the cases and the history of their symptom was also short as compared to others. And we also come to know that stage-1 OSF is associated with good outcome. The patients with stage-3 OSF were mainly in older age group possibly because of longer duration of symptoms. The role of genetics still remained inconclusive as family history of OSF was positive in many cases but the History of betel quid chewing was also positive in those cases in contrast to a study where it was directly related with gene mutation.<sup>10,11</sup> It was very few times when there was no history of betel quid chewing, the habit of taking spicy food or signs of malnutrition, and family history were also positive for OSF. That strongly favors the presence of a genetic element in the pathogenesis of OSF. The role of spicy food intake in the pathogenesis of

OSF is also not well proven because no any directly proportional relation observed in our study which coincides with a study done in Mexico where the use of chilies is copious.<sup>12</sup> Malnutrition was present in most of the cases but the betel quid chewing indirectly leads to malnutrition by decreasing appetite and other factors. In some patients where the history of betel quid chewing was not positive, the malnutrition remained the possible cause of OSF possibly because of vitamin deficiencies as in one study in India.<sup>1</sup>

#### **CONCLUSION:**

Oral submucosal fibrosis should be diagnosed as early as possible so to initiate management. It is seen that the prognosis of OSF depends on the severity of disease at presentation. Greater the stage of the disease the poorer the prognosis. And the young generation has got a great number of sufferers. The early management heals the patients' disease and saves them from the much worse agony of cancer. The more potent and more common cause is betel Quid chewing which is used more frequently by young fellows. The health programs should be carried out to bring awareness about the harmful effects of betel quid usage. The future of a nation is highly dependent on the young generation. If the sense of realization is put in their minds we may come up with more advanced and healthy society.

#### **REFERENCES:**

1. Aziz SR. Oral submucous fibrosis: an unusual disease. *JNJDent Assoc.* 1997;68(2):17-9.
2. Delong L, Burkhart N. *General and Oral Pathology for the Dental Hygieneist.* 2nd ed. Baltimore: Lippincott Williams and Wilkins; 2013. p. 400-20.
3. Sharma R, Raj S, Miahra G, Reddy Y, Shenava S, Narang P. Prevalence of Oral Submucous Fibrosis in Patients Visiting Dental College in Rural Area of Jaipur, Rajasthan. *J Indian Acad Oral Med Radiol.* 2012;24(1):1-4.
4. Ahmad MS, Ali SA, Ali AS, Chaubey KK. Epidemiological and etiological study of oral submucous fibrosis among gutkha chewers of

- Patna, Bihar, India. *J Indian Soc Pedod Prev Dent.* 2006; 24(2):84-9.
5. Betel Quid with Tobacco (Gutka). Centers for Disease Control and Prevention. CDC. 16 Nov. 2014. Available at [http://www.cdc.gov/tobacco/data\\_statistics/fact\\_sheets/smokeless/betel\\_quid/](http://www.cdc.gov/tobacco/data_statistics/fact_sheets/smokeless/betel_quid/).
  6. Liao PH, Lee TL, Yang LC, Yang SH, Chen SL, Chou MY. Adenomatous polyposis coli gene mutation and decreased wild-type p53 protein expression in oral submucous fibrosis: a preliminary investigation. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2001;92(2):202-7.
  7. Seedat HA, van Wyk CW. Submucous fibrosis in non-betel nut chewing subjects. *J Biol Buccale.* 1988;16(1):3-6.
  8. Chiu CJ, Chiang CP, Chang ML, Chen HM, Hahn LJ, Hsieh LL, et al. Association between Genetic Polymorphism of Tumor Necrosis Factor- $\alpha$  and Risk of Oral Submucous Fibrosis, a pre-cancerous condition of Oral Cancer. *J Dental Res.* 2001;80(12):2055-9.
  9. Kadani M, Satish BNVS, Maharudrappa B, Prashant KM, Hugar D, Allad U, et al. Evaluation of plasma fibrinogen degradation products and total serum protein concentration in oral submucous fibrosis. *J Clin Diagn Res.* 2014;8(5):ZC54-7.
  10. Paul RR, Mukherjee A, Dutta PK, Banerjee S, Pal M, Chatterjee J, et al. A novel wavelet neural network based pathological stage detection technique for an oral precancerous condition. *J Clin Pathol.* 2005;58(9):932-8.
  11. Pindborg JJ. Oral submucous fibrosis: a review. *Ann Acad Med Singapore.* 1989;18(5):603-7.
  12. Pillai R, Balaram P, Reddiar KS. Pathogenesis of oral submucous fibrosis. Relationship to risk factors associated with oral cancer. *Cancer.* 1992;69(8):2011-20.