

Clinico-Pathological Study of Oral Submucous Fibrosis and Its Correlation with Oral Cancer

Sandeep Thakre^{1*}, Rajesh Badal², Babulal Patidar³, Achal Gupta⁴

¹Assistant Professor, Department of Surgery, Gajara Raja Medical College Gwalior, India

²Senior Resident, Department of Surgery, Gajara Raja Medical College, Gwalior, India

³Senior Resident, Department of Surgery, Gajara Raja Medical College, Gwalior, India

⁴Professor and Head, Department Of Surgery, Gajara Raja Medical College, Gwalior, India

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*Corresponding author

Sandeep Thakre

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Abstract: Sub mucous fibrosis is an insidious chronic disease affecting any part of the oral cavity and sometimes the pharynx. The letter sub epithelial and sub mucous fibrosis leads to stiffness of the oral mucosa and deeper tissues with progressive limitation in opening of the mouth and protrusion of the tongue, thus causing difficulty in eating, swallowing and phonation. The first mention of a condition resembling OSMF was made by sushrutha (an ancient Indian doctor as vidari). Since the time it was first described in the modern literature in 1952 by Schwartz. In 1952, Schwartz described five Indian women from kenyya with a condition of th e oral mucosa including palate and pillars of the fauces, which he called ‘atrophia idiopathica mucosa oris’. OSF first described in India by Joshi in 1953. It is a disease of unknown etiology endemic in India, but the predisposing factors in the cases so far studied are local irritants of oral mucosa like betel nut, chilies and tobacco. The alkaloid (Arecolin5, The flavanoid11 catechin) and tannin content of areca nuts (betel nuts) are responsible for fibrosis. Genetic and environmental factors influence its development (HLA10, DR3, and DR7). Immunological studies have shown raised IgA, E, and D values³⁷ while IgG and M are usually normal.

Keywords: Submucous Fibrosis, chronic disease, oral cavity, mouth, sushrutha.

INTRODUCTION

Oral submucous fibrosis (OSF) is a premalignant condition caused by betel chewing. OSF causes significant morbidity. After transformation into squamous cell carcinoma (SCC), it is also responsible for mortality.

The combination of areca nut and tobacco has led to a sharp increase in the frequency of OSF [1].

In its early stages the palate looks white due to fibrous tissue [2-4]. Patients may be asymptomatic and detected only by chance during routine dental checkup. As the disease progresses, fibrous tissue forms arches extending from the anterior pillars and tonsillar fauces into the soft palate and buccal mucosa. When palpated from outside, the cheek feels tough and thickened, the

soft palate shows restricted mobility and has a hard rubbery feel. The uvula is small and distorted.

In the later advanced stage of OSF, Sub epithelial and sub mucous fibrosis leads to stiffness of the oral mucosa and deeper tissues with progressive limitation in opening of the mouth and protrusion of the tongue, thus causing difficulty in eating, swallowing and phonation.

Definition and clinical manifestation of the disease are summarized in table

very early (stage I)	early (stage II)	mod advanced (stageIII)	Advanced (IV)
A finely fibrillar collagen with marked edema	the juxta epithelial area shows early hyalinization	The collagen is moderately hyalinized	The collagen completely hyalinized
The fibroblastic response is strong	plump young fibroblasts are present in moderate no	The fibroblastic response is less. marked, the cell present being mostly adult fibrocytes	The hyalinized areas are devoid of fibroblasts
The blood vessels are sometime 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 narrow
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

Classification

Numerous classification systems have been proposed so far, the latest ones being that by Kerr *et al.* [5] and by Chandramani *et al.* [9].

Kerr *et al.* [5], the proposed grading system for OSMF [5]

- Grade 1 – Mild: Any features of the disease triad for OSF (burning, depapillation, blanching, or leathery mucosa) may be reported – and inter-incisal opening > 35 mm
- Grade 2 – Moderate: Above features of OSF + inter-incisal limitation of opening 20-35 mm
- Grade 3 – Severe: Above features of OSF + inter-incisal opening < 20 mm
- Grade 4A – OSF + other potentially malignant disorder on clinical examination
- Grade 4B – OSF with any grade of oral epithelial dysplasia on biopsy
- Grade 5 – OSF + oral squamous cell carcinoma.

The classification proposed by More CB *et al.* [6] closely suits the Indian population and could be utilized in the future studies to standardize reporting.

Clinical staging

- Stage 1 (S1) – Stomatitis and/or blanching of oral mucosa
- Stage 2 (S2) – Presence of palpable fibrous bands in buccal mucosa and/or oropharynx, with/without stomatitis
- Stage 3 (S3) – Presence of palpable fibrous bands in buccal mucosa and/or oropharynx, and in any other parts of oral cavity, with/without stomatitis
- Stage 4 (S4) (a) – Any one of the above stage along with other potentially malignant disorders e.g., oral leukoplakia, oral erythroplakia, etc.
- Stage 4 (S4) (b) – Any one of the above stage along with oral carcinoma.

Functional staging

- M1. Inter-incisal mouth opening up to or > 35 mm
- M2. Inter-incisal mouth opening between 25 mm and 35 mm
- M3. Inter-incisal mouth opening between 15 mm and 25 mm
- M4. Inter-incisal mouth opening < 15 mm.

A proposed modification for the latest classification is inclusion of dysplasia as suggested by Kerr *et al.* [5] to better categorize and manage patients [7].

Its exact role in the pathogenesis of this disorder is unclear, especially since the disease can occur in the absence of any such chewing habit. However, recently reported in vitro experiments, Canniff JP *et al.* [10] suggest that crude extracts prepared from varieties of areca nut act as potent stimulators of collagen synthesis in human.

METHODS AND MATERIALS

My study consists of 50 random cases of oral submucous fibrosis attended general surgery and ENT OPD during Oct. 2010 to Oct. 2011 in J.A. Group of Hospitals, Gwalior (M.P.)

The patients were examined for any general disease and a detailed local examination was carried out.

MATERIALS

Diagnostic criteria

Diagnosis was mainly based on history and clinical examination of patients. A careful history was taken regarding main presenting complaints which were found to be burning sensation, trismus, difficulty in protruding the tongue, blanched leathery floor of tongue.

Attention was paid to their personal chewing and dietary habits, like chewing of betel, tobacco, betel nuts, and taking food containing too much of chilies. In general examination special attention was paid to mouth opening, ankyloglossia, and fibrous changes of oral cavity [8].

Exclusion criteria

- Aphthous ulcer
- Scleroderma
- Stomatitis and other diseases affecting to oral cavity.
- Leukoplakia

METHODS

General examination

All patients were examined for any systemic disease.

Local examination

A detailed examination of oral cavity and pharynx, carried out for trismus, ankyloglossia and tuff leathery texture of oral cavity.

Investigations

Blood examination

- RBC count and haemoglobin for anaemia.

- Total and differential W.B.C. count

Biopsy

- Biopsies of all patients taken from the representative area of fibrosis in oral cavity

RESULT

The present study comprises of fifty cases of submucous fibrosis of oral cavity attended the surgery outpatient department and ENT OPD of JAH group of Hospitals, Gwalior for various complaints like burning in mouth, trismus, pain in throat, difficulty in swallowing and inability to protrude the tongue. About 1% of patients attended OPD for mention complaints found to have oral submucous fibrosis. After taking proper history particularly for personal oral habits, thorough examination of the patients done, they were investigated like haemoglobin percentage, PCV, E.S.R., total and differential WBC count, blood sugar, urine examination, were done. All cases were subjected to biopsy from the representative area of fibrosis of oral cavity.

Following observations were made during the study

Table-1: Age distribution of oral submucous fibrosis

Age group (years)	No. of cases	Percentage
0-10 years	0	0%
11-20	1	2%
21-30	15	30%
31-40	22	44%
41-50	8	16%
51-60	4	8%
61 years and above	0	0

(P value highly significant)

The age of the patients varied from 20 years to 60 years, the youngest patient being a 20 years old boy. The maximum number of cases i.e. 22 or 44% occurred

in the age group of 31-40 years. The mean age involved was 36 years.

Table-2: Sex distribution of OSF

Gender	No. of cases	%
Male	40	80
Female	10	20
Total	50	100

(P value highly significant)

Out of 50 patients there were 40 male and 10 female.

Male to female ratio of OSF is found to be 4:1 in present study.

Table-3: Age & Sex wise distribution of OSF

Age group (yrs)	Male	Female	Total
0-10	0	0	0
11-20	1	0	1
21-30	15	0	15
31-40	16	6	22
41-50	7	1	8
51-60	1	3	4
>60	0	0	0
Total	40	10	50

Highest number of cases seen in 31-40 year of age, both male & female cases found to be highest in this age group. The age of female varied from 31-60 years.

No female patient was found below 31 years of age. The mean age of presentation of OSF in female was found to be slightly later (40 years) than male (31 years).

Table-4: Distribution of symptoms in OSF

Symptoms	No. of cases	Percentage
Burning sensation	42	84%
Trismus	38	76%
Ulceration off and on	32	64%
Pain in throat and TM joints	6	12%
Ankyloglossia	2	4%
Dysphagia	2	4%
Dryness of mouth	2	4%
Pain in corresponding ear	2	4%
Total	50	100%

(P value highly significant)

In present study burning sensation was the most common symptom and present in 84% of cases.

& on, pain in throat and TM joint, ankyloglossia, dysphagia, dryness of mouth and pain in corresponding ear.

Trismus was second most common symptom and present in 76% of cases followed by ulceration off

Table-5: OSF - Clinical signs

Clinical sign	No. of cases	(%)
Changes in colour of buccal mucosa (pale)	50	(100%)
Palpable fibrous bands in oral cavity	50	(100%)
Trismus	38	(76%)
Pallor of palate	38	(76%)
Pallor of pillar	34	(68%)
Edema	15	(30%)
Atrophy of uvula	10	(20%)
Induration	5	(10%)
Ankyloglossia	2	(4%)
Vesicles	0	0

(P value highly significant)

On oral cavity examination paleness of buccal mucosa found in all patients.

Palpable fibrous band also present in 100% of cases followed by trismus (38%) and pallor of pillar (38%).

Ankyloglossia was present in only 4% of cases while vesicles were absent in all the patients.

Table-6: Histopathological changes in OSF

Changes	No. of cases	Percentage
Hyperplastic epithelium	49	98%
Capillary dilatation	44	88%
Collagen hyalinisation	42	84%
Mononuclear infiltration	18	36%
Polymorph infiltration	10	20%
Fibroblasts	8	16%
Keratinization	3	6%
Cellular dysplasia	1	2%
Malignant changes	1	2%

Hyperplastic epithelium found in 49 cases (98%) followed by capillary dilatation 44 cases (88%), collagen hyalinisation 42 cases (84%), mononuclear infiltration 18 cases (36%), polymorph infiltration 10 cases (20%), fibroblasts 8 cases (6%), keratinization 3 cases (6%), cellular dysplasia 1 case (2%). Malignant changes was present in 1 case (2%)

DISCUSSION

Prevalence of disease in India varies from 0.2-1.2% in different region of country. In present study 1% of population attended ENT OPD having oral submucous fibrosis which is slightly higher than study of Marathe *et al.* [11] (0.97%).

In present study the majority of the patients i.e. 22 or 44% were in the age group of 31-40 yrs.

Main symptom is burning sensation in the mouth. The later symptoms were stiffening of certain areas of oral mucosa leading to difficulty in opening the mouth & whistling. Some local irritant like chillies, chewing of Pan (Beteal leaf) along with lime and tobacco and keeping a bolus along with supari (Betal nut) were the common habits among the cases

In our study one (2%) patient had invasive squamous cell carcinoma along with OSF and one (2%) patient having cellular dysplastic changes showing its relation with oral cancer however study needs longer follow up to calculate malignancy conversion rate in OSF.

CONCLUSION

- Submucous fibrosis is commonly seen in younger age group between 31-40 yr the youngest one was 20 yr old boy.
- Sex ratio showed male predominance in the ratio of 4:1 (40 male & 10 female).
- Females were affected in slightly later age group (Avg. 40 yrs) than male (Avg. 31 yrs).
- Pan masala, smoking and smoking + pan masala are the predilection factors in all the cases either alone or in combination.
- The burning sensation in the mouth is the most common first symptom. While gradual difficulty in opening the mouth is the second most common

symptom which gradually increases with severity of the disease.

- Paleness of mucous membrane was constant finding in all the patients followed by palpable fibrous bands, trismus and pallor of palate.
- Buccal mucosa, palate, and tonsillar pillars were affected in this given order.
- Histological changes show hyperplastic squamous epithelium, capillary dilatation and collagen hyalinization with varying amount of cellular infiltration.
- 1 case (2%) had cellular dysplasia and 1 case (2%) had invasive squamous cell carcinoma.
- Disease is probably a premalignant condition but needs further evaluation.

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