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Original Research

Does Clinical Staging and Histological Grading Show Parallelism In Oral Submucous Fibrosis? A Retrospective Study from an Indian City

Manish Narayan[1], Dominic Augustine[1], Tina Elizabeth Jacob[1], Kumar Chandan Srivastava[2], Deepti Shrivastava[3], Shylaja Narayan[4]

[1]*Department of Oral and Maxillofacial Pathology, Bangalore Institute of Dental Sciences, Karnataka, India*
[2]*Department of Oral Medicine and Radiology, Rajah Muthiah Dental College and Hospital, Tamil Nadu, India*
[3]*Department of Periodontology, Rajah Muthiah Dental College and Hospital, Tamil Nadu, India*
[4]*Department of Forensic Medicine and Toxicology, Vydehi Institute of Medical Sciences and Research Centre, Karnataka, India*

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Corresponding Author:
Dominic Augustine, MDS
Assistant Professor
Department of Oral and Maxillofacial Pathology
Bangalore Institute of Dental Sciences & Hospital
Hosur main road, Lakkasandra, Bangalore – 560029
Karnataka. India
Email: dominic2germain@gmail.com

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Abstract

Objectives: Oral submucous fibrosis is a common oral health problem in India. This study was conducted to correlate the histopathological diagnosis with habits and clinical findings in patients suffering from oral submucous fibrosis (OSF).

Methods: The study group comprised of randomly included 40 patients. A comparison between clinical staging (a method used to find out the stage of disease using tests which include physical examination) and histopathological grading (grading is a measure of the cell appearance in pathology) was done in each case. Fisher's exact test was done to obtain statistical analysis.

Results: Among 15 cases of clinically diagnosed stage I lesions, 4 (10%) were grade I, 6 (15%) were grade II and 5 (12.5%) were grade III. Among 23 cases of stage II lesions 6 (15%) were diagnosed as grade I, 7 (17.5%) as grade II, 7 (17.5%) as grade III and 3 (7.5%) as grade IV. Among 2 cases of stage III both were diagnosed as grade II respectively.

Conclusions: There was no correlation between clinical staging and histopathological grading of oral submucous fibrosis. The test results were statistically not significant. (p=0.635) This may be due to difference in severity and extent of fibrosis in different parts of the oral mucosa.

INTRODUCTION

In 1952, Schwartz coined the term atrophica idiopathica mucosa oris to describe an oral fibrosing disease he discovered in 5 Indian women from Kenya [1]. Joshi subsequently coined the termed oral submucous fibrosis (OSF) for the condition in 1953 [2].

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. The buccal mucosa is the most commonly involved site, but any part of the oral cavity can be involved, even the pharynx [3].

The aim of this study was out to assess the correlation between clinical staging and histopathological grading in OSF.

MATERIALS AND METHODS

From the archives of the Department of Oral Pathology and Microbiology, The Oxford Dental College & Hospital, Bangalore, India, a retrospective review of 40 cases (Stage I: 15 cases, Stage II: 23 cases, and Stage III: 2 cases) of oral submucous fibrosis was done. A comparison between clinical staging (Table 1) and histopathological grading (Table 2) was done in each case.

Table 1. Clinical classification system for the surgical management of trismus [4]

Group	Mouth opening
I	>35mm
II	25-35mm
III	15-25mm
IV	2-15mm

Table 2. Histopathological Grading [5]

Grade	Histopathological findings
I (Very early)	Fine fibrillar collagen with marked edema. Blood vessels are normal sometimes dilated and congested. Inflammatory cells are neutrophils and occasional eosinophils.
II (Early)	Juxtaepithelial hyalinization. Collagen is separate with plump fibroblasts. Blood vessels are dilated. Neutrophils, eosinophils and plasma cells are present.
III (Moderately advanced)	Hyalinization, spindle shaped fibroblasts, eosinophils and plasma cells are present.
IV (Advanced)	Collagen completely hyalinized. Hyalinized area devoid of fibroblasts. Blood vessels obliterated. Lymphocytes and plasma cells are present with loss of pigmentation.

Based on these criteria, patients were clinically examined, and subsequently biopsy samples were obtained from the patients after an informed consent.

To determine the association between variables, data analysis and Fisher's exact test was done.

A p-value <0.05 was considered statistically significant for overall comparisons.

RESULTS

The clinical staging of the 40 cases were as follows; Stage I: 15 cases, Stage II: 23 cases, Stage III: 2 cases. Among clinically diagnosed cases, only 4 cases of Stage I and 7 cases of Stage II correlated with histopathological grading. Among the remaining 11 cases of clinical Stage I, 6 cases diagnosed as histopathological grade II and 5 cases as grade III. Among the remaining 16 cases of clinical Stage II, 6 cases were diagnosed as histopathological grade I, 7 cases as grade III and 3 cases as grade IV. 2 cases of clinical stage III OSF diagnosed as histological grade II. The p value was found to be 0.635 which was not significant.

On oral examination, white fibrotic bands and pigmentation on buccal mucosa, and blanching on palate were seen in our patients (Figure 1a and 1b). On the basis of clinical symptoms, patients were usually suffered from difficulty in opening of the mouth (Figure 2).

Figure 1a: White fibrotic bands and pigmentation on buccal mucosa.**1b:** Blanching on palate.

On histopathological examination, epithelial atrophy, juxtaepithelial hyalinization, melanin incontinence, and fibrosis in the subepithelial connective tissue were seen in our cases (Figure 3a and 3b).

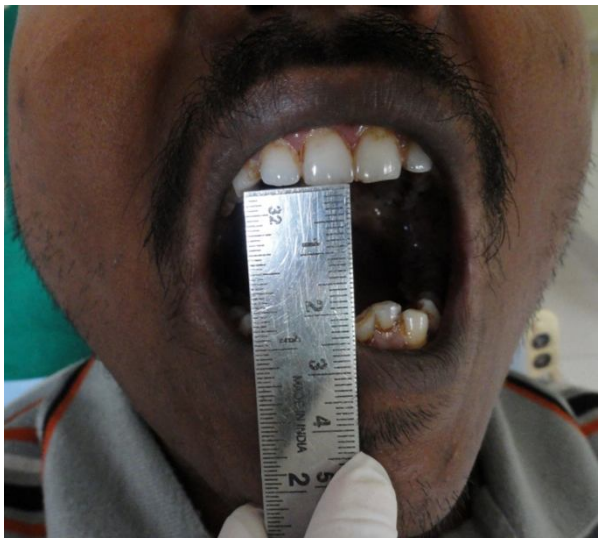

Figure 2: Clinical stage II with restricted mouth opening.

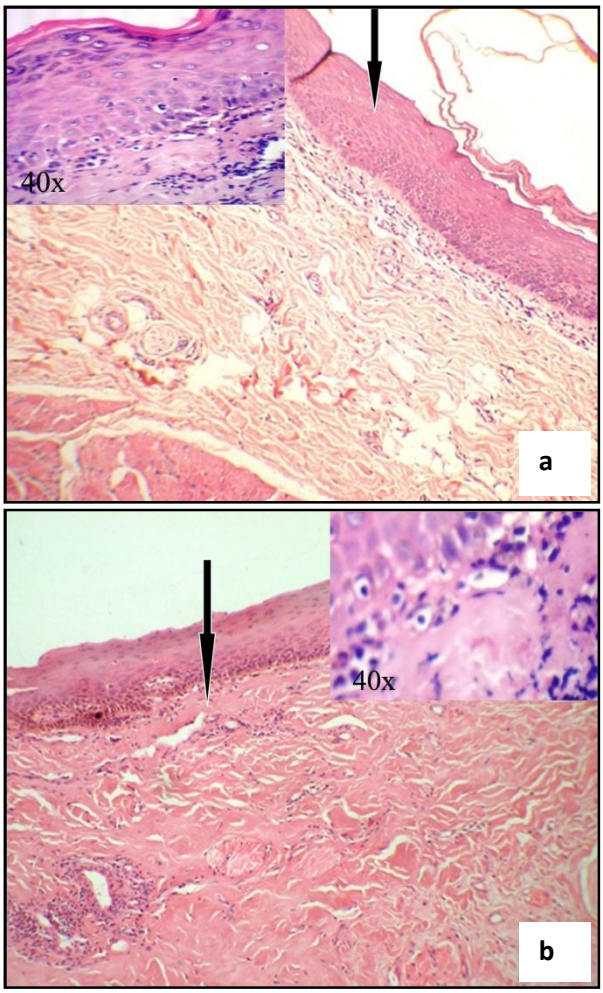

Figure 3a: Epithelial atrophy (arrow) and juxtraepithelial hyalinization were seen in subepithelial area (H&E stain, x100; inset: x400). **3b:** Melanin incontinence, juxtaepithelial hyalinization (arrow) and fibrosis of the connective tissue were striking (H&E stain, x100; inset: x400).

DISCUSSION

Oral submucous fibrosis (OSF) is a chronic and potentially malignant condition of the oral cavity. It is characterized by a juxtraepithelial inflammatory reaction followed by fibroelastic changes in the lamina propria and associated epithelial atrophy. The disease affects most part of the oral cavity as well as the upper third of the esophagus [6]. The pathogenesis of OSF is not well established, but is believed to be multifactorial. The chewing of betel quid (containing areca nut, tobacco and slaked lime) has been recognized as one of the most important risk factors for OSF [7]. OSF is a potentially malignant disease of oral cavity and is most commonly found in Asian countries. Reichart et al suggested that as a result of transmigration of populations, an increasing number of OSF cases are being found in other countries [8].

However, Zhang et al from China suggested that the prevalence of betel quid chewing is highest in the Hunan and Hainan provinces (64.5% to 82.7%) with signs of OSF in 0.9% to 4.7% of the population and the 30 to 49 years age group being the most commonly affected [9].

Once the disease progress to early stage from very early stage and if the patient continues with the areca nut chewing habits, the fibrotic changes in the connective tissue accelerates in severity. As the disease progresses, the collagen is tightly packed and the thickness of the collagen fibers increases considerably to the very early stage. So, the very early stage could be considered as the appropriate stage for secondary prevention of the disease [10].

The malignant potential of OSF was put forward by Paymaster in 1956 and confirmed by Pindborg in 1976 [11].

Malignant transformation rate of OSF was found to be in the range of 7–13%. According to long term follow-up studies a transformation rate of 7.6% over a period of 17 years was reported, 1.9% and 3.3% in a study done in Taiwan and Nagpur respectively [11].

The discovery of coexisting lesions like dysplastic epithelium is suggestive of a generalized premalignant change in the whole of the epithelium [12].

In our study 3 cases of clinically diagnosed stage I and 1 case of stage II OSF showed epithelial dysplastic features. Among these, 2 cases of clinical stage I OSF showed histopathological grade III and 1 case as grade I; the clinically stage II OSF showed histological grade IV OSF.

Oral submucous fibrosis is diagnosed on clinical criteria including mucosal blanching, burning, hardening, and the presence of characteristic fibrous

bands, and is associated with gradual inability to open the mouth as in our cases (Figure 1a and b). Mouth-opening is an objectively verifiable criterion by which severity of the disease can be assessed (functional stage).

On the basis of clinical symptoms, patients suffered from difficulty in opening of the mouth (Figure 2), a burning sensation of the buccal cavity and excessive salivation were reported. According to their personal habits, patients chewed areca nut; patients consumed gutkha and were habituated to smoking.

Among our cases buccal mucosa was the most common involved site. Palate was the second common site and affected along with the retromolar area. The disease should also be identifiable by histopathology.

The important histopathologic features consist of deposition of dense collagen in lamina propria along with epithelial atrophy. Initially, there is juxtaepithelial inflammation followed by hyalinization [13]. Histopathologic features reported in the literature include epithelial atrophy with loss of rete ridges, epithelial atypia, and pigment incontinence. Similar features were seen in our cases (Figure 3a and b).

However, there are only few studies on the clinicopathological feature of OSF and its correlation with histopathologic grading.

We had aimed to establish a correlation between clinical staging and histopathological grading amongst our cases. We found no correlation between clinical staging and histopathological grading after statistical analysis (p=0.635). This was in accordance with the study conducted by V. K. Hazarey n coworkers [14].

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. Medical treatment is symptomatic and predominantly aimed at improving mouth movements. Treatment strategies include the following: Steroids, placental extracts, hyaluronidase, pentoxifylline, IFN-gamma and Lycopene [15].

The histopathological features of OSF being largely non-specific greater emphasis have to be laid on clinical information as far as the diagnosis of the condition is concerned. However, histopathological features are as important as that of clinical information in predicting the prognosis of the disease condition.

In conclusion, there is no correlation between clinical staging and histopathological grading of oral submucous fibrosis in our series. This may be due to difference in severity and extend of fibrosis in different parts of the oral mucosa. As the diagnosis of oral submucous fibrosis cannot be made based on histopathology alone but rather on a combination of histopathology, chewing habit and clinical information is necessary to confirm the diagnosis.

CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest.

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