

Oral Submucous Fibrosis: Clinical Stage, Functional Stage and Histopathological Grade Correlation

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ABSTRACT:

Background- Oral submucosal fibrosis (OSMF) is a common precancerous condition predominantly affecting the oral cavity. There are several contributing factors to its pathogenesis, areca nut chewing being the primary culprit. OSMF reversal is difficult once the disease sets in. Hence, after its diagnosis, staging becomes imperative as it affects the treatment plan. Several classification methods have been developed by various authors to categorize the disease based on its clinical, functional, and Histopathological characteristics. The main aim to conduct this study was to correlate clinical and histopathological staging.

Materials & Methods- This study involved 30 patients who had been diagnosed with OSMF both Clinically and Histopathologically. All 30 patients were classified and were categorized according to their clinical and functional stages after inspection. Following this, histopathological grading was done.

Results- The statistical analysis showed that there was a wide similarity between the clinical and functional staging. However, no significant similarity or correlation was found between the clinical and functional staging with its corresponding histopathological grades.

Conclusions- Our study concluded that there is strong correlation between clinical and functional grading.

KEYWORDS: clinical staging; functional staging; histopathological grading; oral submucous fibrosis

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INTRODUCTION:

Oral submucous fibrosis (OSMF) is a precancerous condition that affects the oral cavity^[1] and was first mentioned by Schwartz in 1952 under the term “atrophica idiopathica mucosae oris”.^[2] It is a slow-developing, chronic disease characterized by inflammation and fibrosis in the submucosal tissues.^[3] Joshi later coined the term “OSMF” in 1953.^[4] Studies have confirmed that areca nut is the main cause of OSMF,^[5-8] although other factors such as deficiencies in

iron, zinc, essential vitamins, and capsaicin in chilies, may also play a role.^[9-12] Various classification systems have been put forth by different authors, which categorize patients based on their clinical signs and symptoms, functional abilities and histopathological findings.^[13] The main purpose of the classification system is to identify this premalignant disorder in its early stage and to formulate a treatment plan accordingly for patient's speedy recovery.^{[14],[15]} This

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study aims to evaluate the agreement and correlation between the clinical staging, functional staging and histopathological grading of OSMF patients.

MATERIALS & METHODS:

The present study was carried out in the Department of Oral Pathology and Microbiology at Bhabha College of Dental Science in Bhopal, India. The research ethics committee of the institute approved the study and informed consent was obtained from each patient. The study population was composed of patients visiting the Outpatient Department of Oral Pathology and Microbiology. The study group consisted of 30 individuals diagnosed with OSMF both clinically and histopathologically. Participants were seated comfortably in a dental chair for examination and data was recorded using a standardized form. The clinical examination followed the method outlined by Kerr, Ash, and Millard. Interincisal mouth opening was measured using a divider and scale and recorded in millimeters. Local anesthesia was administered, an incisional biopsy was taken from the area with palpable fibrous bands, and the specimens were preserved in 10% formalin for further laboratory procedures. Post-surgical instructions were given and sutures were placed, with cotton kept at the biopsy site.

The functional and histopathological staging of OSMF was done according to Khanna J N and Andrade N N. [16] Clinically subjects were grouped into four categories, according to functional staging and Histological staging was divided into four groups, Group I, Group II, Group III and Group IV.

Statistical Analysis-

Following online calculators were used for statistical analysis of the data.

Kappa (k)	www.graphpad.com
Spearman's r	www.gigacalculator.com
Pearson Chi-square test	www.atozmath.com
P - value	www.socscistatistics.com

RESULTS:

The present study was undertaken to assess the correlation between clinical staging, functional staging, and histopathological grading of patients with OSMF. A total of 30 patients were included in the study with an age range between 11-60 years, with a mean of 36 years.

The youngest patient was 17 years old, and the only female patient was 20 years. Most of the subjects 23 (76.6%) were in the age range of 21-50 years [Table 1].

Table 1: Distribution of cases with respect to Age and Gender.

Age group	Male	Female	Number of patients
11 -20	1	1	2
21 -30	7	0	7
31 -40	6	2	8
41 -50	6	2	8
51 -60	4	0	4
Total	25	5	30

A total of 30 patients were graded according to functional and clinical criteria. Out of these at least in 25 patients, the functional grading was similar to the clinical staging [Table 2]. Hence, the percentage of agreement was 83.3%. No agreement or poor agreement was seen in 5 cases. Overall, there was a good agreement between clinical and functional grading.

Out of 30 patients, only six patients presented clinical staging similar to histopathological grading [Table 3]. Twenty-four patients presented with no agreement or poor agreement. Hence, the percentage of agreement was 20%. There was a poor agreement between clinical and histopathological grading.

There was no significant correlation between clinical and histopathological grading.

Out of 30 patients, functional grading was similar to histopathological staging in only 7 patients [Table 4]. No agreement or poor agreement was seen in 23 patients. The percentage of agreement was only 23.3%. There was a poor agreement between functional and histopathological grading.

There was no significant correlation between functional and histopathological grading.

DISCUSSION:

The purpose of this study was to investigate the relationship between the clinical staging, functional grading, and histopathological grading of patients with OSMF. 30 patients participated in the study, 25 of whom were male and 5 were female, a demographic that aligns with previous findings of a higher male predilection for OSMF in the literature. Most of the patients were of age ranging between 20 to

Table 2: Clinical and functional staging assigned to the patients.

Functional grading	Number of patients with clinical stage 1	Number of patients with clinical stage 2	Number of patients with clinical stage 3	Number of patients with clinical stage 4	Number of patients (%)
Stage 1	5	1	0	0	6 (20)
Stage 2	2	13	1	0	16 (53.3)
Stage 3	1	0	6	0	7 (23.3)
Stage 4	0	0	0	1	1 (3.3)
Total, <i>n</i> (%)	8 (26.7)	14 (46.6)	7 (23.3)	1 (3.3)	30

Test for agreement	Agreement
Measure of Agreement	
Weighted kappa (<i>k</i>)	<i>k</i> = 0.755 (Substantial agreement)
Correlation coefficient	
Spearman's coefficient	<i>r</i> = 0.8 (<i>p</i> < 0.001; significant)

Table 3: Clinical and Histopathological staging assigned to the patient.

Histopathological Grading	Number of patients with clinical stage 1	Number of patients with clinical stage 2	Number of patients with clinical stage 3	Number of patients with clinical stage 4	Number of patients (%)
Grade 1	1	2	0	0	3 (10)
Grade 2	3	2	4	0	9 (30)
Grade 3	2	5	3	1	11 (36.6)
Grade 4	2	5	0	0	7 (23.3)
Total, <i>n</i> (%)	8 (26.7)	14 (46.6)	7 (23.3)	1 (3.3)	30

TEST FOR AGREEMENT	AGREEMENT
Measure of agreement	
Weighted kappa (<i>k</i>)	<i>k</i> = -0.050 (No agreement)
Correlation coefficient	
Spearman's coefficient	<i>r</i> = 0.15 (<i>p</i> = 0.4662; No Correlation)

50 years, a finding that is consistent with previous studies.

All patients in the study reported a positive history of chewing raw areca nut, which is known to be a major cause of OSMF. The most commonly used form of areca nut was found to be Gutkha, with 66.6 % of patients consuming it. The use of areca nut was more prevalent in females, while the use of Gutkha was more prevalent in males.

Commercial freeze-dried betel quid substitutes (such as Pan Masala, Gutkha, and Mawa), conveniently packaged in portable sachets, have become increasingly popular because they have a long shelf life and do not require preparation before use. These products contain a higher concentration of areca nut and appear to cause oral submucous fibrosis more rapidly than conventionally prepared betel quid^[17].

Table 4: Functional and Histopathological Staging assigned to the patients.

Histopathological	Number of patients with Functional stage 1	Number of patients with Functional stage 2	Number of patients with Functional stage 3	Number of patients with Functional stage 4	Number of patients (%)
Stage 1	1	1	1	0	3 (10)
Stage 2	3	3	3	0	9 (30)
Stage 3	3	4	3	1	11 (36.6)
Stage 4	3	3	1	0	7 (23.3)
Total, <i>n</i> (%)	10 (33.3)	11 (36.6)	8 (26.6)	1 (3.3)	30

Test for agreement	Agreement
Measure of Agreement	
Weighted kappa (<i>k</i>)	<i>k</i> = -0.036 (No agreement)
Correlation coefficient	
Spearman's coefficient	<i>r</i> = 0 (<i>p</i> = 0.9733; No Correlation)

All 30 patients underwent clinical staging, and 8 were classified as Stage 1, 14 as Stage 2, 7 as Stage 3, and 1 as Stage 4. The functional staging was also done for all patients, with 6 as Stage 1, 16 as Stage 2, 7 as Stage 3 and 1 as Stage 4. The histopathological examination revealed that 3 patients were included in Grade 1, 9 in Grade 2, 11 in Grade 3 and 7 in Grade 4.

Studies by Biradar et al.^[18], Pandya et al.^[19], Radhika et al.^[20], Shivakumar and Sahana^[21], Goel et al.^[22] and Bhatt et al.^[23] have concluded that there is a significant correlation between the functional and histopathological stages of OSMF, but no significant correlation between the clinical and histopathological stages. Our findings align with these previous studies and suggest that clinical signs and symptoms can affect normal functional abilities, such as mouth opening, tongue protrusion, and cheek puffing. These discrepancies should be evaluated to demonstrate the functional loss to the patient and motivate them to seek treatment.

CONCLUSION:

The objective of this study was to examine the relationship between clinical staging, functional staging, and histopathological grading of OSMF. We concluded that there may be a strong correlation between clinical and functional grading. However, the

correlation between clinical and histopathological grading or between functional and histopathological grading was non-significant. The strong correlation between clinical and functional grading provides hope that in the future, it may be possible to make predictions about the prognosis of the disorder based on these classifications.

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Conflicts of interest

There are no conflicts of interest.

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