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Original Research Article.

A Study to Evaluate Prognosis in Different Clinico-Histological Grades and TNM Staging of Oral Squamous Cell Carcinoma

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ABSTRACT

Introduction: Head and neck cancer, including oral squamous cell carcinoma (OSCC), is the sixth leading cancer worldwide. Cancer staging has provided a framework to determine prognosis and design guideline-based treatment for each stage. Hence, present study was conducted to evaluate prognosis in different clinico-histological grades and TNM staging of oral squamous cell carcinoma.

Materials and Methods: A total of 60 cases was collected from the archives of the Department of Oral and Maxillofacial Pathology and Department of E.N.T with prior consent from the concerned department. The clinical staging of the tumor was done according to modified American Joint Committee on Cancer (AJCC) staging system and recorded. Cases were divided into Group I which were further subdivided into three groups i.e., well-differentiated Oral squamous cell carcinoma (WDSCC), Moderately differentiated Oral squamous cell carcinoma (MDSCC) and Poorly differentiated Oral squamous cell carcinoma (PDSCC). Data was further examined for statistical significance 'p'value and <0.05 was considered as statistically significant ('*'); while p value <0.001 was considered as statistically highly significant ('**').

Results: In the category of no recurrence, 10 cases belong to stage T1, 9 cases belong to stage T2a and 2 cases belong to stage T2b. In the category of recurrence, 3 cases belong to stage T1, 8 cases belong to stage T2a, 4 cases belong to stage T2b and 2 cases belong to stage T3. In the category of death, 1 case belong to stage T1, 17 cases belong to stage T2a, 4 cases belong to stage T2b and 1 case belong to stage T3. In the category of no recurrence, 9 cases belong to stage I, 4 cases belong to stage II, 5 cases belong to stage III and 2 cases belong to stage IV. In the category of recurrence, 1 case belongs to stage I, 3 cases belong to stage II, 7 cases belong to stage III and 6 cases belong to stage IV. In the category of death, 5 cases belong to stage II, 6 cases belong to stage III and 12 cases belong to stage IV.

Conclusion: Various clinicopathological parameters can be employed to assess outcome, recurrence, and overall survival. There is statistically significant correlation between the TNM clinical classification and histologic malignancy grading, and advanced-stage disease and presence of metastatic lymph nodes is associated with poorer survival compared with early-stage OSCC.

Keywords: Head and Neck Cancer; OSCC; Prognosis; Survival.

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INTRODUCTION

Head and neck cancer, including oral squamous cell carcinoma (OSCC), is the sixth leading cancer worldwide, with an estimated 300,400 cases and 145,400 OSCC-related deaths occurring in 2012. OSCC is a major public health problem in the Indian subcontinent, where it ranks among the top three types of cancer in the country.[1] Prognosis is thought to be influenced by factors related to the host, surgeon, and tumor. Establishing the interaction between these factors and patient prognosis is important. The most well-known critical factors associated with survival are disease stage at initial diagnosis, neck metastasis, invasiveness of cancer cells, and tumor thickness.[2] Cancer staging has provided a framework to determine prognosis and design guideline-based treatment for each stage.[3] Survival outcomes of OSCC have improved over the last 20 years, but the prognosis is still relatively unfavorable, with 5-year overall survival (OS) and disease-free survival estimated to be 47% and 74%.[2] The TNM staging system of the head and neck region is, in fact, an anatomic staging system that describes the anatomic extent of the primary tumour as well as the involvement of regional lymph nodes and distant metastases.[4] The aim of the present study was to evaluate prognosis in different clinico-histological grades and TNM staging of oral squamous cell carcinoma

MATERIALS AND METHODS

The study sample was collected from the archives of the Department of Oral and Maxillofacial Pathology and Department of E.N.T with prior consent from the concerned department and after obtaining permission from the ethical committee for the commencement of study. A total of 60 cases formed the study sample. Formalin fixed paraffin embedded blocks of previously diagnosed cases of Oral squamous cell carcinoma were retrieved from the archives of the Department of Oral and Maxillofacial Pathology. A detailed clinical history and follow up was obtained from patient records for all cases of oral squamous cell carcinoma and were recorded in case history proforma. The clinical staging of the tumor was done according to modified American Joint Committee on Cancer (AJCC) staging system and recorded. From the paraffin embedded blocks, 2 slides each of 4 µm thickness were obtained using Semi-automatic microtome (Shandon finesse e/ME). Corresponding tissue sections were subjected to Hematoxylin and Eosin staining.

Cases of oral squamous cell carcinoma were divided into Group I which were further subdivided into three groups i.e., Group Ia comprised of well-differentiated Oral squamous cell carcinoma (WDSCC), Group Ib comprised of Moderately differentiated Oral squamous cell carcinoma (MDSCC) and Group Ic comprised of Poorly differentiated Oral squamous cell carcinoma (PDSCC). Only cases for which detailed clinical history and follow up was available were included in the study. Group II was further subdivided into three groups i.e., Group IIa comprised of well-differentiated Oral squamous cell carcinoma (WDSCC), Group IIb comprised of Moderately differentiated Oral squamous cell carcinoma (MDSCC) and Group IIc comprised of Poorly differentiated Oral squamous cell carcinoma (PDSCC). Inclusion Criteria consisted of cases of Oral Squamous Cell Carcinoma with a minimum of 1 year follow-up were included in the study. In cases with recurrence, only the sample of the primary lesion was included for histopathological examination. Those cases / subjects with recurrence in which sample from primary lesion were unavailable were excluded from the study. All the haematoxylin and eosin-stained slides were assessed for histopathologic grading Data was tabulated and stored in MS Excel and then analyzed. Mean and standard deviations for the various parameters was calculated for all the groups. Data was further examined for statistical significance (p-value) using non-parametric tests (ANOVA one way test, Post-Hoc Tukey, Spearman correlation test). 'p' value <0.05 was considered as statistically significant ('*'); while p value <0.001 was considered as statistically highly significant ('**').

RESULTS

Table 1 & Graph 1: The graph shows the distribution of cases with respect to prognosis in all the three groups. In group IIa (WDSCC), 7 cases each showed no recurrence and recurrence and 6 cases died. In group IIb (MDSCC), 12 cases showed no recurrence, 8 cases showed recurrence and 12 cases died. In group IIc (PDSCC) 1 case showed no recurrence, 2 cases showed recurrence and 5 cases died.

Table 2 & Graph 2: The graph shows the distribution of cases with respect to prognosis and T-Staging of cases. In the category of no recurrence, 10 cases belong to stage T1, 9 cases belong to stage T2a and 2 cases belong to stage T2b. In the category of recurrence, 3 cases belong to stage T1, 8 cases belong to stage T2a, 4 cases belong to stage T2b and 2 cases belong to stage T3. In the category of death, 1 case belong to stage T1, 17 cases belong to stage T2a, 4 cases belong to stage T2b and 1 case belong to stage T3.

Table 3 & Graph 3: The graph shows the distribution of cases with respect to prognosis and N-Staging of cases. In the category of no recurrence, 13 cases belong to stage N0, 5 cases belong to stage N1, 1 case each belong to stage N2b and stage N3. In the category of recurrence, 4 cases belong to stage N0, 3 cases belong to stage N1, 2 cases each belong to stage N2a and N2b, and 1 case belong to stage N3. In the category of death, 5 cases each belong to stage N0 and N2a, 6 cases belong to stage N1, 3 cases belong to stage N2b and 4 case belong to stage N3.

Table 4 & Graph 4: The graph shows the distribution of cases with respect to prognosis and Clinical Stage of cases. In the category of no recurrence, 9 cases belong to stage I, 4 cases belong to stage II, 5 cases belong to stage III and 2 cases belong to stage IV. In the category of recurrence, 1 case belongs to stage I, 3 cases belong to stage II, 7 cases belong to stage III and 6 cases belong to stage IV. In the category of death, 5 cases belong to stage II, 6 cases belong to stage III and 12 cases belong to stage IV.

Table 1: Distribution of Cases Based on Prognosis in Different Histological Grades of Oral Squamous Cell Carcinoma

Group	No. of Cases	Prognosis		
		No Recurrence	Recurrence	Death
IIa- WDSCC	20	7	7	6
IIb-MDSCC	32	12	8	12
IIc- PDSCC	8	1	2	5
TOTAL	60	20	17	23

Table 2: Distribution of Cases Based on Prognosis with Respect to Cases and Their TNM Staging (T-Stage) of Oral Squamous Cell Carcinoma

T-Stage	No. of Cases	Prognosis		
		No Recurrence	Recurrence	Death
T1	13	9	3	1
T2a	34	9	8	17
T2b	10	2	4	4
T3	3	0	2	1
TOTAL	60	20	17	23

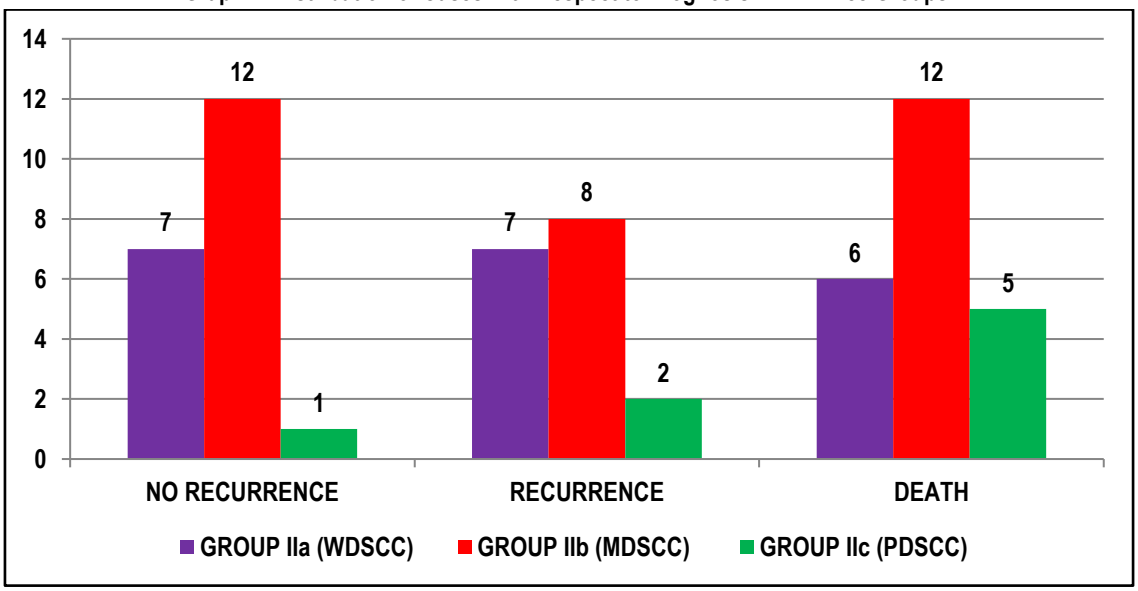
Table 3: Distribution of Cases Based on Prognosis with Respect to Cases and Their TNM Staging (N-Stage) of Oral Squamous Cell Carcinoma

N-Stage	No. of Cases	Prognosis		
		No Recurrence	Recurrence	Death
N0	22	13	4	5
N1	19	5	8	6
N2a	7	0	2	5
N2b	6	1	2	3
N3	6	1	1	4
TOTAL	60	20	17	23

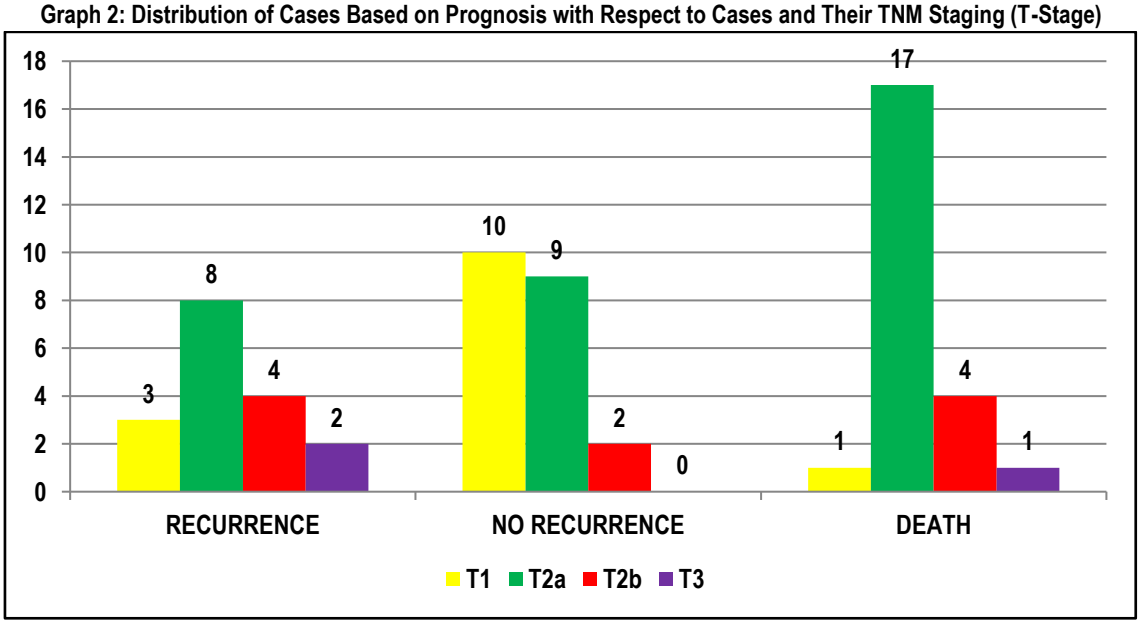
Table 4: Distribution of Cases Based on Prognosis with Respect to Cases and Their Clinical Stage of Oral Squamous Cell Carcinoma

Clinical Stage	No. of Cases	Prognosis		
		No Recurrence	Recurrence	Death
I	22	9	1	0
II	19	4	3	5
III	7	5	7	6
IV	6	2	6	12
TOTAL	60	20	17	23

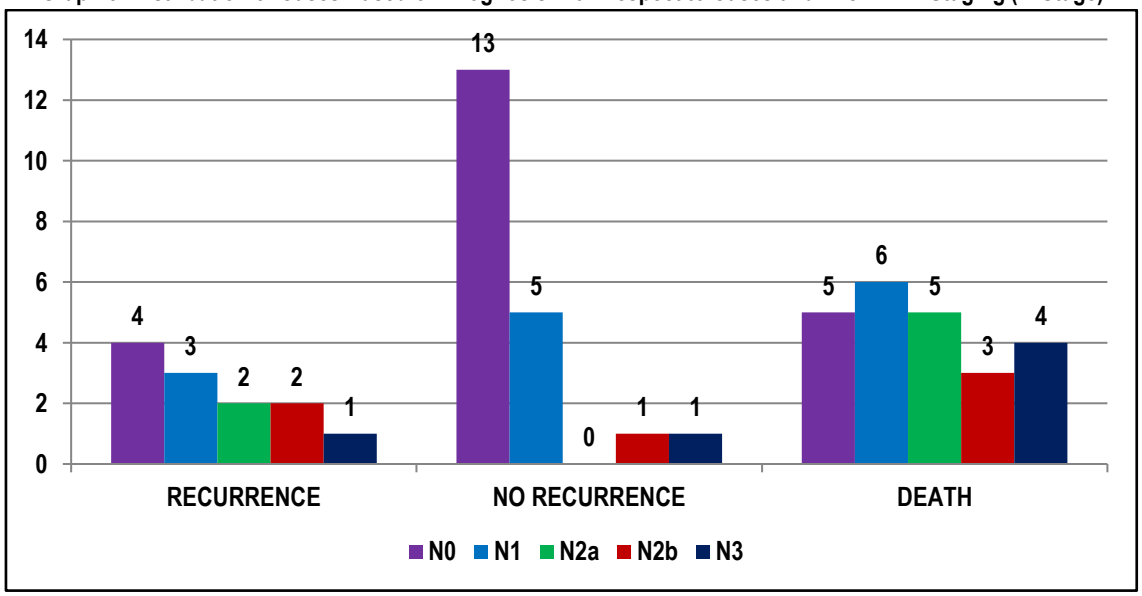
Graph 1: Distribution of Cases with Respect to Prognosis in All Three Groups.



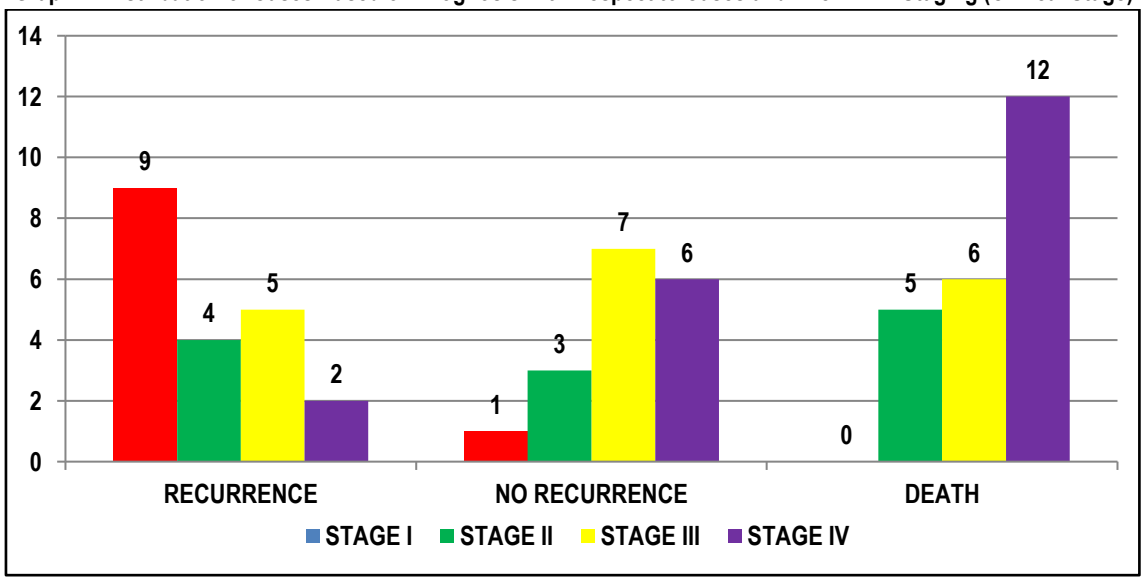
Graph 2: Distribution of Cases Based on Prognosis with Respect to Cases and Their TNM Staging (T-Stage)



Graph 3: Distribution of Cases Based on Prognosis with Respect to Cases and Their TNM Staging (N-Stage)



Graph 4: Distribution of Cases Based on Prognosis with Respect to Cases and Their TNM Staging (Clinical Stage)



DISCUSSION

Oral squamous cell carcinoma (OSCC), the most common form of head and neck cancer, remains difficult to treat, and its prognosis is often uncertain. The main treatment for this disease is still surgery: postoperative radiation-therapy (PORT), alone or in association with chemotherapy (postoperative chemo-radiation therapy; PORTC), is used as adjuvant treatment to enhance surgical outcomes or simply a palliative treatment.[5] The modern system took its initial form in the early 1900's by describing cancer as local, regional, *or* distant disease. Between 1943 and 1952, Pierre Denoix of France built on this idea by classifying cancers by their anatomic location and extensiveness, pioneering the modern TNM (tumor, node, metastasis) system. This system was swiftly adopted by the Union for International Cancer Control (UICC) of Europe in 1953. Shortly after in 1959, the American Joint Committee on Cancer (AJCC) was founded, adopting the system in a modified form for its use in the United States (US). As both systems gathered wide acceptance, TNM committees of the AJCC and UICC formulated a single system in 1982. [3]

According to distribution of cases with respect to prognosis and N-Staging of cases; in the category of no recurrence, 13 cases belong to stage N0, 5 cases belong to stage N1, 1 case each belong to stage N2b and stage N3. In the category of recurrence, 4 cases belong to stage N0, 3 cases belong to stage N1, 2 cases each belong to stage N2a and N2b, and 1 case belong to stage N3. In the category of death, 5 cases each belong to stage N0 and N2a, 6 cases belong to stage N1, 3 cases belong to stage N2b and 4 case belong to stage N3. Costa AD et al[6] investigated the existence of correlation between the TNM clinical classification, histologic malignancy grading and anatomical location of oral squamous cell carcinoma and a statistically significant correlation ($r = 0.2993$, $p = 0.01$) between TNM clinical classification and histologic malignancy grading was revealed.

In a study by Sim YC et al,[2] predictive factors for survival of patients with oral squamous cell carcinoma (OSCC) were investigated and the overall and disease-specific survival (DSS) outcomes were studied, it was found that the overall survival of all

patients were 64.2% and it was found that OSCC has been associated with poor prognosis; advanced-stage disease and presence of metastatic lymph nodes were associated with poorer survival compared with early-stage OSCC and absence of neck node metastasis. Stage I and II OSCC were associated with excellent survival results which is similar to the results of the present study. As in our study, the distribution of cases with respect to prognosis and Clinical Stage of cases reported that, in the category of no recurrence, 9 cases belong to stage I, 4 cases belong to stage II, 5 cases belong to stage III and 2 cases belong to stage IV. In the category of recurrence, 1 case belongs to stage I, 3 cases belong to stage II, 7 cases belong to stage III and 6 cases belong to stage IV. In the category of death, 5 cases belong to stage II, 6 cases belong to stage III and 12 cases belong to stage IV. Tong XJ et al[7] reported that diagnostic delay longer than 2 months, T3 or T4 tumor, neck metastasis, and stage III or IV disease were independent adverse factors for subsequent survival rate and locoregional recurrence in patients with oral squamous cell carcinoma. In a study by Jerjes W et al8 clinicopathological parameters of OSCC were studied and compared to recurrence and death from tumour-related causes. The fields included a range of clinical, operative and histopathological variables related to the status of the surgical margins. Pathological analysis revealed that half of the patients had moderately differentiated OSCC. Follow-up resulted in a 3-year survival of 74.8% and a 5-year survival of 72.2%. Comparing this to pathological nodal disease (pTNM) showed that 10/10 patients and 10/11 patients who died from locoregional and distant metastasis, respectively, had nodal disease. All patients who died from locoregional and distant metastasis were shown to have recurrence after the primary tumour resection. Furthermore, Wunschel M et al9 revealed depth of invasion as strongest histologic predictor of metastatic tumor growth, overall survival, and relapse-free survival in OSCC, confirming the current adaption of the T-classification. Thus, squamous cell carcinoma of the oral cavity has a poor overall prognosis with a high tendency to recur at the primary site and extend to involve the cervical lymph nodes.

CONCLUSION

Various clinicopathological parameters can be employed to assess outcome, recurrence and overall survival. There is statistically significant correlation between the TNM clinical classification and histologic malignancy grading, and advanced-stage disease and presence of metastatic lymph nodes is associated with poorer survival compared with early-stage OSCC.

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