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Recurrence Rate of Oral Squamous Cell Carcinoma in Retro-Molar Trigone at a Tertiary Level Hospital

Sumana Bhowmick[1]*, Sirajum Manira[2], Dilara Jahan[3], Shamiul Alam[4]

[1]*Medical Officer,* Department of Oral & Maxillofacial Surgery, *Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh.*

[2]*Fellow of Oral & Maxillofacial Surgery, Dhaka, Bangladesh.*

[3]*Medical Officer; Department of Pediatric Dentistry, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh.*

[4]*Associate Professor; Department of Oral & Maxillofacial Surgery, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh.*

Corresponding Author: Sumana Bhowmick.
ORCID ID :Sumana Bhoumick https://orcid.org/0009-0003-0061-298X

Abstract

Background: *Oral squamous cell carcinoma (OSCC) is a prevalent oral malignancy with a high propensity for local recurrence, posing a significant clinical challenge. Understanding the factors contributing to recurrence, particularly in the complex anatomical location of the retromolar trigone, is crucial for improving patient outcomes.*

Aim of the study: *To enhance the understanding of local recurrence in retromolar trigone OSCC, providing clinicians with valuable insights to refine treatment strategies and ultimately improve the prognosis for individuals diagnosed with this challenging malignancy.*

Methods: *This prospective observational study, conducted at Dhaka Dental College and Hospital from March 2017 to September 2020, focused on the Recurrence Rate of Oral Squamous Cell Carcinoma in Retro-Molar Trigone. A sample size of 35 participants was determined using inclusion and exclusion criteria. The analysis of data was performed using a comprehensive statically software statistical package for social sciences (SPSS version 24)*

Result: *A 31.4% local recurrence rate was observed among 35 patients with retromolar trigone OSCC (Figure 2). Advanced clinical (Stage III: 70.8%; Table 3) and pathological stages (Stage II: 79.2%; Table 3) significantly correlated with higher recurrence rates compared to less advanced stages (Stage II: 16.7%; Stage I: 4.2%; Table 3). Additionally, lymph node metastasis (54.5%) and close resection margins (63.6%) were associated with significantly increased recurrence risk compared to their absence (18.2% and 4.2%, respectively) (Table 3). Notably, radiotherapy alone as adjuvant therapy demonstrated a significantly lower recurrence rate (12.5%) compared to other options (chemotherapy alone: 45.5%; chemo-radiotherapy: 18.2%) (p=0.015; Table 3). These findings highlight the importance of considering these factors in treatment planning to minimize recurrence risk in OSCC patients with retromolar trigone involvement.*

Conclusions: *This study found a significant association between advanced clinical and pathological stages, lymph node metastasis, and close resection margins with increased retromolar trigone OSCC local recurrence.*

Keywords: *Retromolar trigone OSCC, Local recurrence, Advanced clinical and pathological stages, Lymph node metastasis, Radiotherapy*

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I. Introduction:

Head and Neck Cancer (HNC) is a type of malignant tumor that develops from the epithelial layer of the upper aero-digestive tract.[1] The retro-molar trigone's (RMT) cancers account for 1.4% to 5.6% of total oral cavity cancers.[2] Squamous cell carcinoma (SCC) is a distinct clinical entity in head and neck oncology, accounting for around 95% of all oropharyngeal malignancies.[3] Oral cavity squamous cell carcinoma (OSCC) may develop from the mucosal lining of the lip, anterior tongue, floor of the mouth, buccal mucosa, retromolar trigone, or hard palate. OSCC frequently exhibits unpredictable patterns of growth between the initial clinical assessment and surgical excision due to complex anatomical interaction in the oral cavity.[4]

Oral squamous cell carcinoma is the sixth most common cancer and also accounts for nearly 3% of all cancer cases in the world. The estimated incidence is around 275,000 cases/year, with two-thirds of these cases occurring in developing countries, while the incidence is exceptionally high in South Asia. For more than 50% of cases diagnosed each year, OSCC still has a miserable prognosis and is a fatal condition.[5]

The retromolar trigone is a small triangular subsite of the oral cavity. The portion of mucosa lies behind the third molar tooth, covering the anterior ramus of the mandible. The base of the triangle is posterior to the last inferior molar tooth; the apex is in continuity with the tuberosity of the maxilla behind the last upper molar tooth. It is bounded laterally by the gingival and buccal sulcus and medially by the anterior tonsillar pillar. Cancerous lesions involving the RMT are almost always squamous cell carcinomas. Treatment options for RMT carcinoma include surgery, radiation therapy, and chemotherapy.

The retro-molar trigone in the posterior aspect of the oral cavity represents a complex and intricate anatomical region that presents unique challenges in diagnosis and management.[5] Tumors originating in this area are often diagnosed at an advanced stage, leading to limited treatment options and a heightened risk of recurrence.[6,7]

This study aimed to investigate the local recurrence rate of oral squamous cell carcinoma in the retromolar trigone and analyze the associated clinicopathological factors to improve patient outcomes and minimize recurrence risk.

II. Methods:

The study was designed as a prospective observational investigation conducted within the Department of Oral and Maxillofacial Surgery at Dhaka Dental College and Hospital, Dhaka, over three years, adhering to specific inclusion and exclusion criteria. The calculation resulted in an approximate sample size of 35 participants. The analysis of data was performed using a comprehensive statically software statistical package for social sciences (SPSS version 24)

III. Results:

This study analyzed the recurrence rate of oral squamous cell carcinoma (OSCC) in the retromolar trigone. Among 35 patients, 31.4% experienced local recurrence (Figure 2). Older patients (41-50 years) constituted the majority (Table 1). All patients used tobacco products, with betel quid being the most common (Table 2). Hypertension, diabetes, and long-term steroid therapy were the prevalent co-morbidities (Figure 3). Advanced clinical (Stage III: 70.8% recurrence) and pathological stages (Stage II: 79.2% recurrence) were significantly associated with higher recurrence rates compared to their counterparts (Stage II: 16.7%; Stage I: 4.2%) (Table 3). Similarly, lymph node metastasis (54.5% recurrence) and close resection margins (63.6% recurrence) exhibited significantly increased recurrence risk compared to their absence (18.2% and 4.2%, respectively) (Table 3). Interestingly, radiotherapy alone as adjuvant therapy demonstrated a significantly lower recurrence rate (12.5%) compared to chemotherapy alone (45.5%) or chemo-radiotherapy (18.2%) (p=0.015) (Table 3). These findings emphasize the crucial role of considering these factors, including clinical stage, pathological stage, lymph node status, resection margin status, and type of adjuvant therapy, in treatment decisions to improve outcomes and minimize recurrence risk for OSCC patients in the retromolar trigone.

Table-1: Age distribution of the study population (n=35)

Age (in years)	Number of patients	Percent (%)
30-40	6	17.1
41-50	13	37.1
51-60	10	28.6
>60	6	17.1
Mean±SD Range	50.37±9.49 (35-65) years	

Table 1 shows the age distribution of the study patients. The age range of the patient was 35 to 65 years. The mean age of the patients was 50.37±9.49 years. Most of the patients (37.1%) belong to the age group of 41-50 years.

Figure 1: Gender distribution of the study subjects (n=35)

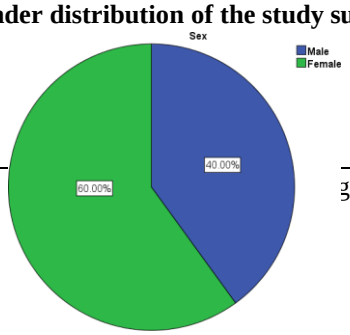

Figure 1 demonstrates the distribution of sex among the patients. Out of 35 subjects, 14(40.0%) were male and rest of 21(60.0%) were female patients. Male: female ratio was 1:1.5.

Figure 2: Overall recurrence rate of RMT squamous cell carcinoma (n=35)

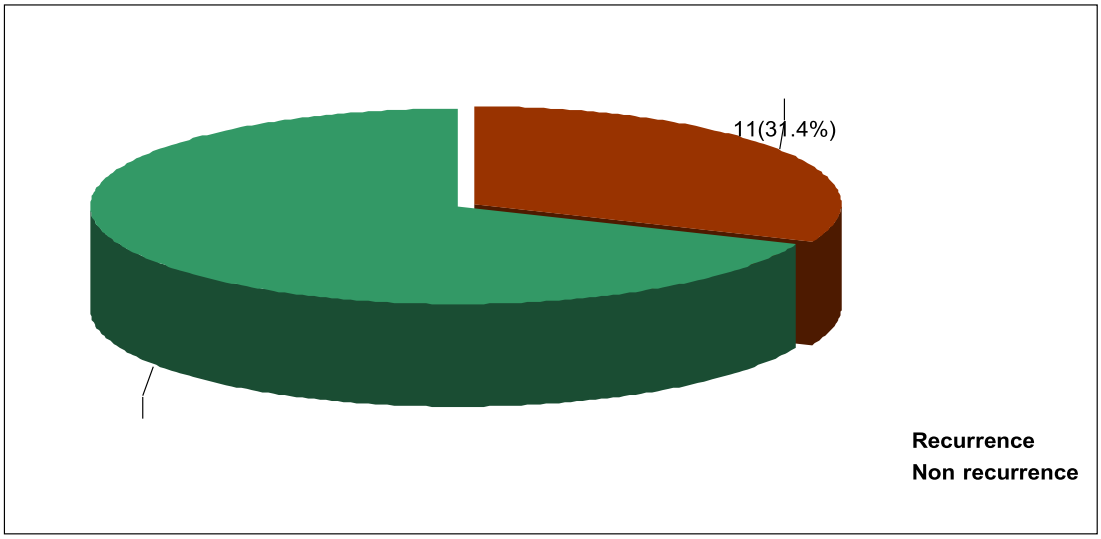

Figure 2 shows the recurrence rate of the OSCC patients at retromolar trigone. Out of 35 cases, 11 (31.4%) patients had recurrence.

Table 2: Distribution of the patients according to personal habit (n=35)

Habitual factor	No of patients	Percentage (%)
Betel quid	18	51.4
Tobacco (chewing, smoking)	2	5.7
Betel quid with smoking	15	42.9
Total	35	100.0

Table 2 shows that the patients of OSCC have the habit of taking betel quid 18(51.4%), betel quid with smoking 15(42.9%), and tobacco 5.7%. No patient without any habit was found during the study period.

Figure 3: Distribution of the patients according to co-morbid disease (n=35)

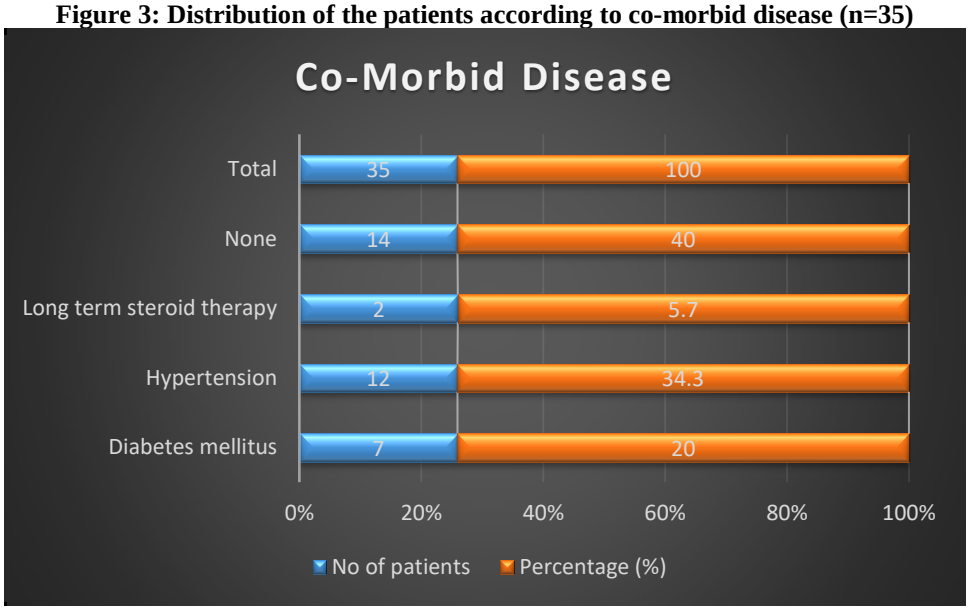

Figure 3 shows that the co-morbid disease of OSCC patients, 34.3% respondents had hypertension, 20.0% patients had diabetes mellitus and 5.7% patients had long term steroid therapy.

Table 3: Association of clinico-pathological risk factors for local recurrence of oral cell carcinoma in retro-molar trigone between recurrence and non-recurrence study subjects (n=35)

Clinico-pathological risk factors	Recurrence		p-value
	No (n=24) No. (%)	Yes (n=11) No. (%)	
Clinical stage			
Stage II Stage III	4(16.7%) 17(70.8%)	1(9.1%) 4(36.4%)	0.030[s]
Stage IV	3(12.5%)	6(54.5%)	
Pathological stage			
Stage I	1(4.2%)	2(18.2%)	
Stage II	19(79.2%)	2(18.2%)	0.006[s]
Stage III	4(16.7%)	6(54.5%)	
Stage IV	0(0.0%)	1(9.1%)	
Pathological status of neck lymphnode			
Not metastasis	15(62.5%)	2(18.2%)	
Reactive hyperplasia	7(29.2%)	3(27.3%)	0.006[s]
Metastasis	2(8.3%)	6(54.5%)	
Resection margin status			
Clear margin Close margin	23(95.8%) 1(4.2%)	7(63.6%) 4(36.4%)	0.012[s]
Pattern of invasion			
Type 1	10(41.7%)	2(18.2%)	
Type 2	12(50.0%)	6(54.5%)	0.208[ns]
Type 3	2(8.3%)	3(27.3%)	
Postoperative adjuvant therapy			
None	1(4.2%)	5(45.5%)	
Radiotherapy alone Chemotherapy alone	14(58.3%) 3(12.5%)	2(18.2%) 2(18.2%)	0.015[s]
Chemo-radiotherapy	6(25.0%)	2(18.2%)	

Chi-square test, s= significant, ns= not significant

Table 3 shows the Clinical stage: Stage III (70.8% recurrence) was significantly higher than Stage II (16.7%) (p=0.030). Pathological stage: Stage II (79.2% recurrence) had the highest rate, while Stage I had the lowest (4.2%) (p=0.006). Lymph node metastasis: Patients with metastasis (54.5% recurrence) had a significantly higher rate than those without (18.2%) (p=0.006). Resection margin status: Close margins (63.6% recurrence) were associated with a significantly higher rate compared to clear margins (4.2%) (p=0.012). Pattern of invasion: No significant association was observed (p=0.208). Adjuvant therapy type: Radiotherapy alone (12.5% recurrence) had a significantly lower rate compared to chemotherapy alone (45.5%) or chemo-radiotherapy (18.2%) (p=0.015).

IV. Discussion:

This study investigated the local recurrence rate and associated clinicopathological factors in patients with oral squamous cell carcinoma (OSCC) of the retromolar trigone. Our findings revealed a 31.4% local recurrence rate, highlighting the aggressive nature of OSCC in this complex anatomical region (Figure 2).

Consistent with previous studies, our results demonstrated a significant association between advanced clinical and pathological stages and a higher local recurrence risk.[8,9] Stage III and Stage II OSCC exhibited significantly higher recurrence rates (70.8% and 79.2%, respectively) compared to their less advanced counterparts (Stage II: 16.7%; Stage I: 4.2%) (Table 3). This emphasizes the importance of early diagnosis and timely intervention for improving patient outcomes.[10,11]

Furthermore, our study identified lymph node metastasis and close resection margins as significant risk factors for local recurrence (5, 6). Patients with lymph node metastasis displayed a considerably higher recurrence rate (54.5%) compared to those without (18.2%) (Table 3). Similarly, close resection margins were

associated with a significantly increased risk of recurrence (63.6%) compared to clear margins (4.2%) (Table 3). These findings underscore the importance of meticulous surgical planning and meticulous tumor excision to minimize the risk of residual disease and subsequent recurrence.[12,13]

Interestingly, our study revealed a significantly lower local recurrence rate with radiotherapy alone (12.5%) compared to chemotherapy alone (45.5%) or chemo-radiotherapy (18.2%) (p=0.015) (Table 3). This finding suggests that radiotherapy alone might be a more effective adjuvant therapy for OSCC in the retromolar trigone, although further research is necessary to confirm this observation.[1]

Our study also highlighted the prevalence of tobacco use and various co-morbidities among OSCC patients. All patients reported using tobacco products, primarily betel quid, reinforcing the strong association between tobacco use and OSCC development.[10] Additionally, hypertension, diabetes, and long-term steroid therapy were identified as the most common co-morbidities, suggesting the potential influence of these conditions on disease progression and treatment response.[3,4]

Several limitations of our study should be acknowledged. The relatively small sample size limits the generalizability of our findings.[5] Additionally, the retrospective nature of the study design introduces potential biases.[6] Further prospective studies involving larger patient populations are warranted to validate our findings and elucidate the complex interplay of various clinicopathological factors influencing local recurrence in retromolar trigone OSCC.[7,13]

In conclusion, our study provides valuable insights into the factors associated with local recurrence in retromolar trigone OSCC. Advanced clinical and pathological stages, lymph node metastasis, close resection margins, and specific adjuvant therapy regimes were identified as significant determinants of local recurrence.[14] These findings emphasize the importance of considering these factors in treatment planning and decision-making to optimize outcomes and minimize the risk of recurrence for patients with OSCC of the retromolar trigone. Further research is warranted to explore the role of various co-morbidities and develop personalized treatment strategies for improved management of this aggressive malignancy.

V. Limitations:

1. The study was conducted at a single tertiary level hospital, which may limit the generalizability of the findings to broader populations and healthcare settings.
2. The study's sample size is not representative of the entire population of patients with retro-molar trigone squamous cell carcinoma, and larger studies are needed for more comprehensive insights.
3. While the study identified significant risk factors for local recurrence, the complex nature of cancer progression involves additional factors not included in the analysis.

VI. Conclusion:

In conclusion, our study at Dhaka Dental College and Hospital underscores the formidable challenge posed by the high local recurrence rate (31.4%) in retromolar trigone OSCC. Multicenter investigations are imperative to validate these observations and unravel additional factors influencing the intricate landscape of local recurrence in retromolar trigone OSCC.

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Conflict of Interest:

The authors have stated that there are no conflicts of interest to disclose.

Ethical Approval:

I have secured ethical clearance from the appropriate authorities and obtained informed consent from all participating patients.

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