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A Retrospective Study on Clinicopathological Correlation of Neck Lymph Node Metastasis in Head and Neck Malignancy

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ABSTRACT

Identifying patients with regional neck node metastasis and initiating appropriate treatment is crucial for reducing mortality associated with head and neck malignancies. This study was conducted at a tertiary care center in India to assess the correlation between evidence of neck node metastasis on both clinical and histopathological examination. Additionally, the study aimed to determine the most common tumor and nodal staging at presentation. A proforma was completed for each patient with head and neck malignancy from the medical registry who underwent any type of neck dissection along with resection of the primary tumor. The sensitivity and specificity of clinical examination for neck node metastases were found to be 70.37% and 60.78%, respectively. The positive and negative predictive values were 48.72% and 79.49%, respectively. Although most patients presented with a tumor stage of T2, half of patients did not have any clinically palpable cervical lymph nodes when considering nodal staging alone. The study underscores the importance of addressing the neck electively in cases of head and neck malignancy, alongside resection of the primary tumor. Even in cases where neck nodes were not clinically palpable, histopathological examination revealed evidence of neck node metastasis, highlighting the significance of thorough evaluation and treatment of the neck in these patients.

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Key Words
Head and neck malignancy, metastasis, neck node

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INTRODUCTION

Malignancies of the head and neck region rank as the sixth most common malignant disease globally, comprising approximately 6% of all malignancies diagnosed worldwide. Squamous cell carcinoma is the predominant histological type observed in these cases and represents the malignancy with the highest mortality rate in India[1]. A significant proportion of patients with head and neck malignancies present with concurrent regional neck node metastasis, which significantly impacts prognosis. The extent of involvement of neck nodes serves as an indirect indicator of the systemic tumor burden and is crucial in determining the aggressiveness of the disease. Metastasis to cervical lymph nodes is the primary mode of spread in head and neck cancer cases, underscoring the importance of assessing lymph node involvement. In cases where surgical excision is the chosen modality of treatment, concurrent neck node dissection is typically performed. Additionally, elective neck node removal may be considered in situations where subclinical metastasis is suspected, clinical evaluation of the neck is challenging, or reconstruction procedures are planned. The detection of occult metastatic neck nodes, which cannot be identified clinically or radiologically but are detectable through histological examination or micrometastases measuring <2 mm in diameter, is common in head and neck malignancies. Specialized techniques such as step serial sectioning, immunohistochemistry, or molecular analysis may be required to identify these micrometastases. Elective neck dissection is indicated to address occult metastatic neck disease[2-4].

Given the potential for undetected neck node metastases to lead to distant metastases and serve as a prognostic indicator, elective neck dissection is recommended in cases of suspected neck node metastasis, regardless of clinical evidence of lymphadenopathy. The pathological status of cervical lymph nodes regarding metastasis influences treatment decisions, including the consideration of adjuvant irradiation. Prophylactic neck dissection should be considered in cases of histopathologically confirmed malignancy of the primary tumor in the head and neck[5]. This study was conducted at a tertiary care center in India to assess the correlation between evidence of neck node metastasis on both clinical and histopathological examination. Additionally, the study aimed to determine the most common tumor and nodal staging at presentation.

MATERIALS AND METHODS

A retrospective cohort study was conducted at a tertiary care center in India over a span of 12 months. Data were collected using a standardized proforma from the medical registry of 78 patients who had undergone neck dissection along with resection of the primary tumor for head and neck malignancies. Patients with a history of previous malignancies, cases of recurrent malignancy, or prior chemotherapy or radiotherapy were excluded from the study. Quantifiable variables were reported as frequencies and percentages. Data analysis was performed using Epi Info 6 software.

RESULTS AND DISCUSSIONS

The majority of patients presenting with head and neck malignancies fell within the age group of 41 to 50 years (47%), while the smallest proportion belonged to the age group of 21 to 30 years (2.3%). The lowest age group was 21 to 30 years, and the highest was 71 to 80 years, with a mean age of 52.3 years. The study comprised predominantly male patients (85%), with females accounting for 15%. (Table 1) illustrates that a majority of subjects had a primary tumor located over the lateral border of the tongue. Other sites included the buccal mucosa, retromolar trigone, gingivobuccal sulcus, parotid, maxilla and larynx. As presented in (Table 2), out of the total study population of 78, 9 (11.53%) had no clinically palpable cervical lymph nodes, but subsequent elective neck dissection revealed neck node metastasis on histopathological examination. Among these cases, N1 stage was observed in 55.56%, N2b in 22.22% and N3b in 22.22%. (Table 3) displays the sensitivity of clinical examination at 70.37% and specificity at 60.78%, with a positive predictive value of 48.72% and a negative predictive value of 79.49%. (Table 4) indicates that the majority of the study population had N0 nodal staging.

This study aimed to investigate the correlation between palpable neck node metastases in various head and neck malignancies and their histopathological confirmation after neck dissection. Additionally, it sought to determine the most common clinical stage at which patients present. The study was conducted retrospectively, involving 78 patients who underwent neck dissection for head and neck malignancies. The majority of patients included in the study were male, with females constituting only 15%. The mean age of the study population was 52.3 years, with the highest representation from the age group of 41 to 50 years. A significant proportion of patients had primary tumors located over the lateral border of the tongue. The sensitivity and specificity of clinical examination for detecting neck node metastases were 70.37% and 60.78%, with positive and negative predictive values of 48.72% and 79.49%, respectively. While most patients presented with a tumor stage of T2, half of them did not have clinically palpable cervical lymph nodes upon nodal staging alone. Similar findings were reported by previous studies[6-12].

The findings underscore the importance of clinical examination in detecting palpable neck nodes in cases of head and neck malignancy. This information can

Table 1: Distribution of primary tumor site in study participants

Primary tumour site	n	percentage
Lateral border of tongue	44	56.41
Buccal mucosa	14	17.95
RMT	8	10.26
GBS	5	6.41
Parotid	3	3.85
Larynx	2	2.56
Maxilla	2	2.56

Table 2: Metastasis to Cervical Lymph nodes: Clinically negative, pathologically positive

Clinical N stage	Pathological N stage	n	percentage
N0	N1	5	55.56
N0	N2b	2	22.22
N0	N3b	2	22.22
Total		9	100.00

Table 3: Correlation between clinically palpable lymph nodes and pathological metastasis

Clinically palpable Cervical lymph node	Post-operative HPE showing neck node metastasis		Total
	Yes	No	
Yes	19	20	39
No	8	31	39
Total	27	51	78
Parameter	**%**		**95% confidence interval**
Sensitivity	70.37		46.51-86.35
Specificity	60.78		43.97-75.77
Positive predictive value	48.72		30.27-66.21
Negative predictive value	79.49		61.24-90.68

Table 4: Clinical T and N stage in cervical lymph nodes

Clinical T stage	Clinical N Stage				Total	percentage
	N0	N1	N2a	N3b		
T1	20	2	5	2	29	37.18
T2	15	16	5	5	41	52.56
T3	2	0	2	0	4	5.13
T4	2	0	0	2	4	5.13
Total	39	18	12	9	-	-
%	50.00	23.08	15.38	11.54	-	-

guide decisions regarding the necessity for neck dissection alongside primary tumor resection. Despite ongoing debates among surgeons regarding the need for elective neck dissection in the absence of palpable cervical lymphadenopathy, this study highlights instances where patients without clinical evidence of cervical lymphadenopathy later exhibited neck node metastasis upon histopathological examination following selective neck dissection[13-15]. Therefore, performing elective neck dissection based on the primary tumor site is strongly recommended to reduce recurrence and prevent future distant metastases.

CONCLUSION

The study underscores the importance of addressing the neck electively in cases of head and neck malignancy, alongside resection of the primary tumor. Even in cases where neck nodes were not clinically palpable, histopathological examination revealed evidence of neck node metastasis, highlighting the significance of thorough evaluation and treatment of the neck in these patients.

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