



Original Article

Histopathological Spectrum of Benign and Malignant Non-thyroid Neck Masses in Adults

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Abstract

Background: Neck masses in adults not related to the thyroid can have various benign and malignant origins, frequently posing diagnostic difficulties. Although FNAC is valuable for preliminary assessment, histopathology is considered the gold standard for conclusive diagnosis, aided by imaging and additional tests. The lack of sufficient local data in Bangladesh requires additional research to more accurately characterize their histopathological spectrum and enhance clinical management.

Methods: This cross-sectional research involved 100 patients with neck masses not related to the thyroid at Dhaka Medical College Hospital over a six-month period (2019–2020). Clinical data were gathered and validated through histopathology, categorizing lesions as benign/inflammatory or malignant. Age, sex, and lesion origin associations were evaluated using Chi-square and Fisher's exact tests ($p < 0.05$), with ethical approval and informed consent secured.

Results: A total of 100 patients (average age 42.67 ± 8.42 years) were examined, with males representing 53%. Benign

and inflammatory lesions were more common (73%, $n=73$) than malignant lesions (27%, $n=27$), resulting in a benign-to-malignant ratio of approximately 2.7:1. Reactive lymphadenopathy (36.9%) and tuberculous lymphadenitis (32.8%) accounted for the most frequent benign lesions, whereas metastatic carcinoma (33.3%) and non-Hodgkin lymphoma (25.9%) were the predominant malignancies. Malignancy showed a significant correlation with age ($p=0.002$), gender ($p=0.031$), and the source of lymph nodes ($p=0.018$).

Conclusion: The majority of neck masses not related to the thyroid were benign or inflammatory, primarily consisting of reactive lymphadenopathy and tuberculous lymphadenitis. Malignancy was linked to advanced age, male gender, and lymph node origin, emphasizing the significance of histopathological diagnosis.

Keywords: Histopathology, Benign, Malignant, Non-thyroid Neck Masses, Adults.

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Introduction

Non-thyroid neck masses in adults represent a diagnostically complex category of lesions with various origins, ranging from benign inflammatory disorders to malignant neoplasms. Due to the intricate anatomy of the neck, achieving an accurate diagnosis is frequently challenging [1,2].

Cancers of the head and neck pose a significant worldwide health issue, characterized by elevated incidence and death rates. Cervical lymph node metastasis frequently serves as the initial indication of these cancers, rendering neck masses a crucial clinical marker for early detection [3]. The majority of cancerous neck masses in adults are metastatic, primarily resulting from squamous cell carcinoma originating in the oral cavity, pharynx, larynx, or nasopharynx. HPV, particularly HPV-16, is closely associated with oropharyngeal carcinoma and correlates with improved prognosis and treatment outcomes, resulting in alterations to disease classification and management [4,5].

Lymphomas manifest as non-painful swelling of cervical lymph nodes and necessitate a combination of histological, immunohistochemical, and genetic evaluation. Tumors of the salivary glands, primarily in the parotid, consist of benign (pleomorphic adenoma, Warthin tumor) and malignant forms (mucoepidermoid, adenoid cystic carcinoma), with diagnosis reliant on histopathology because of diverse behavior [6,7].

FNAC is a primary, economical test for neck masses; however, it might overlook lymphoma and certain salivary tumors, necessitating a biopsy for validation. Ultrasound enhances the detection rate and accuracy of FNAC by revealing characteristics of lymph nodes that are suspicious. Immunohistochemistry and EBV testing assist in identifying the source of metastatic cervical lymph nodes, particularly in nasopharyngeal carcinoma [8,9].

A study conducted in Bangladesh demonstrated that FNAC has a strong correlation with histopathology when assessing neck swellings, establishing it as an effective preliminary diagnostic method. Nonetheless, histopathology continues to be the benchmark for conclusive diagnosis, especially in cases that are malignant or unclear [10].

In Bangladesh, there is scarce extensive information on the histopathological variety of non-thyroid neck masses in adults, as most research is small-scale and centered on particular lesions. Therefore, this research seeks to assess the occurrence of benign and malignant non-thyroid neck masses along with their histopathological characteristics in a tertiary care facility.

Methodology

This study was an observational cross-sectional analysis carried out in the Department of ENT & Head-Neck Surgery at Dhaka Medical College Hospital over a duration of six months from July 22, 2019, to January 21, 2020. A group of 100 patients with non-thyroid neck masses was recruited through a purposive sampling method. Individuals of both genders within the specified age range who satisfied the inclusion criteria were included, whereas those with incomplete records or a prior diagnosis of thyroid-related neck swellings were excluded.

Comprehensive demographic and clinical information,

such as age, gender, and lesion location, was obtained through a standardized questionnaire. All patients received suitable clinical assessment, and tissue samples were collected and analyzed through histopathological examination for a conclusive diagnosis. Lesions were classified as benign/inflammatory or malignant and then further divided based on histological type.

Information was gathered and examined to identify the prevalence and distribution of various lesion types and to evaluate relationships between histopathological diagnosis and factors like age, gender, and origin of neck mass. Statistical evaluation was conducted utilizing the Chi-square test and Fisher's exact test where applicable, with a p-value of <0.05 deemed statistically significant.

Prior to data collection, ethical approval for the study was secured from the institutional review committee of Dhaka Medical College Hospital. Written consent was obtained from all participants after detailing the study's purpose and procedures. The privacy and secrecy of patient data were rigorously preserved during the study, and involvement was optional, with the ability to withdraw at any point without affecting treatment.

Results:

A total of 100 patients with non-thyroid neck masses were included in the study. The age of the patients ranged from 20 to 60 years with a mean age of 42.67 ± 8.42 years.

Baseline Clinicopathological Characteristics

Table 1 shows the baseline demographic and histopathological characteristics of the study population. The majority of the patients belonged to the 31–40 years age group (37.0%), followed by the 41–50 years age group (31.0%). Male patients constituted slightly more than half of the study population (53.0%), with a male-to-female ratio of 1.12:1. Histopathological examination demonstrated that benign and inflammatory lesions comprised the majority of cases (73.0%), whereas malignant lesions accounted for 27.0% of cases.

Table 1: Baseline demographic and histopathological profile of the patients (n=100)

Variables	Frequency	Percent age (%)
Age group (years)		
20–30	9	9.0
31–40	37	37.0
41–50	31	31.0
51–60	23	23.0
Sex		
Male	53	53.0
Female	47	47.0
Histopathological diagnosis		
Benign and inflammatory lesions	73	73.0
Malignant lesions	27	27.0

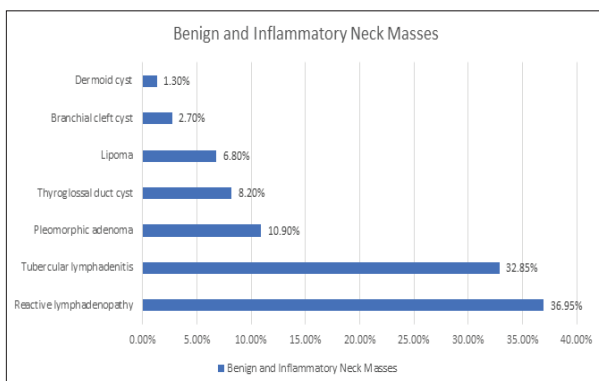


Figure 1: Histopathological findings of benign and inflammatory neck masses (n=73)

Histopathological Findings of Malignant Lesions

Histopathological Spectrum of Benign and Inflammatory Lesions

Figure 1 demonstrates the histopathological findings of benign and inflammatory neck masses. Reactive lymphadenopathy was the most frequent benign and inflammatory lesion, accounting for 36.9% of cases, followed by tubercular lymphadenitis (32.8%). Pleomorphic adenoma was the most common benign salivary gland tumor, representing 10.9% of benign lesions.

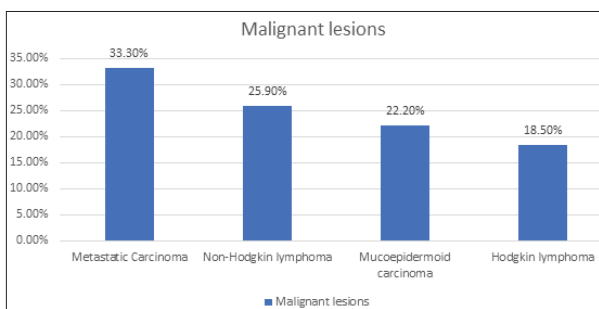


Figure 2: Histopathological findings of malignant neck masses (n=27)

Association of Demographic Characteristics and Origin of Neck Mass with Histopathological Diagnosis

Figure 2 shows, metastatic carcinoma was the most common malignant lesion (33.3%), followed by non-Hodgkin lymphoma (25.9%). Mucoepidermoid carcinoma and Hodgkin lymphoma constituted 22.2% and 18.5% of malignant lesions, respectively.

Table 2 shows the association of demographic characteristics and origin of neck mass with histopathological diagnosis. A statistically significant association was observed between age group and histopathological diagnosis ($p=0.002$), indicating that

malignant lesions were more common among older patients. Sex was also significantly associated with histopathological diagnosis ($p=0.031$), with malignant lesions occurring more frequently among male patients. Furthermore, a significant association was found between the origin of neck mass and histopathological diagnosis ($p=0.018$), where malignant lesions were predominantly associated with lymph node origin.

Table 2: Association of demographic characteristics and origin of neck mass with histopathological diagnosis (n=100)

Variables	Benign/Inflammatory n (%)	Malignant n (%)	p-value
Age group (years)			0.002*
20–30	17 (23.3)	1 (3.7)	
31–40	32 (43.8)	5 (18.5)	
41–50	17 (23.3)	14 (51.9)	
51–60	7 (9.6)	7 (25.9)	
Sex			0.031*
Male	34 (46.6)	19 (70.4)	
Female	39 (53.4)	8 (29.6)	
Origin of neck mass			0.018†
Lymph node	52 (71.2)	24 (88.9)	
Salivary gland	9 (12.3)	4 (14.8)	
Soft tissue	12 (16.5)	0 (0.0)	

*Chi-square test was done.

†Fisher's exact test was done.

Discussion

In this study, the non-thyroid neck masses were primarily benign and inflammatory, whereas malignant lesions constituted 27%, with reactive lymphadenopathy and tubercular lymphadenitis as the predominant benign causes, and non-Hodgkin lymphoma and metastatic carcinoma as the most common malignancies; malignancy was significantly associated with older age, male gender, and lymph node origin. Comparable results have been observed in earlier research regarding non-thyroidal neck swellings, showing a majority of benign lesions and a similar malignant profile

characterized mainly by lymphomas and metastatic deposits, along with akin risk associations [11].

Reactive lymphadenopathy was the most frequently observed benign neck mass, succeeded by tubercular lymphadenitis, whereas pleomorphic adenoma ranked as the most prevalent benign salivary gland tumor, highlighting the prevalence of inflammatory lymph node conditions in benign neck swellings, a pattern that aligns with findings from reference studies and additional surgical series [12].

In the current research, metastatic carcinoma was the leading malignant lesion, succeeded by non-Hodgkin lymphoma, mucoepidermoid carcinoma, and Hodgkin lymphoma, showing a predominance of lymphoid cancers within malignant neck masses. Comparable results in extensive case series have indicated that lymphomas and metastatic carcinomas are the most common malignant cervical lesions, corroborating the current findings [13].

This study revealed a notable correlation between age, sex, and the source of neck mass with histopathological diagnosis. Malignancy occurred more frequently in older age brackets, in males, and in lesions derived from lymph nodes. Comparable trends have been observed in cytological examinations of head and neck lesions, indicating greater malignancy rates with advancing age, a male predominance, and lymph node origin [14].

In summary, neck masses not related to the thyroid are mostly benign and inflammatory, whereas cancers are primarily lymphomas and metastatic carcinoma. Malignancy correlates with advanced age, male gender, and lymph node origin, emphasizing the necessity for histopathological assessment for precise diagnosis.

Conclusion

Neck masses not related to the thyroid were mainly benign and inflammatory, with reactive lymphadenopathy and tuberculous lymphadenitis being the most frequent. Malignant lesions represented a lesser share, primarily non-Hodgkin lymphoma and metastatic carcinoma. Age, gender, and lymph node source revealed a notable correlation with cancer. Histopathological analysis continues to be crucial for precise diagnosis and treatment.

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