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Clinical and Demographic Patterns of Patients Presenting with Neck Swelling in a Tertiary Otolaryngology Centre

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ABSTRACT

Background: *Neck swellings are a common clinical presentation in otolaryngology, arising from diverse anatomical structures and encompassing benign, inflammatory, and malignant conditions. This study aimed to describe the clinical, demographic, and pathological patterns of patients presenting with neck swellings in a tertiary ENT center.* ***Methods & Materials:*** *A descriptive cross-sectional study was conducted among 100 patients presenting with neck swellings in the Department of Otorhinolaryngology, Faridpur Medical College, Faridpur, Bangladesh, during the period from January 2024 to December 2024. Demographic data, clinical features, FNAC results, and histopathological findings were recorded and analyzed using descriptive statistics.* ***Results:*** *Most patients were young to middle-aged adults, with the largest proportion in the 15–30-year group (37%). Thyroid-origin swellings (42%) and lymph-node lesions (35%) were the predominant anatomical sites. Pain (84%), fever (78%), and lymphadenopathy (60%) were the most frequent symptoms. Cytology identified nodular goitre (22%), Hashimoto's thyroiditis (15%), reactive hyperplasia (14%), and granulomatous lymphadenitis (8%) as major diagnoses. Histopathology confirmed that 73% of masses were benign or inflammatory, while 27% were malignant, predominantly metastatic carcinoma (7%) and lymphomas (8%). FNAC demonstrated 87% overall diagnostic accuracy, correctly identifying 64 benign and 23 malignant cases.* ***Conclusion:*** *Benign and inflammatory conditions form the bulk of neck swellings in tertiary ENT practice, with FNAC providing reliable, efficient diagnostic guidance. A structured diagnostic approach remains essential to ensure timely detection of malignant lesions.*

Keywords: *Neck Swelling, FNAC, Thyroid Lesions, Lymphadenopathy, Histopathology*

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INTRODUCTION

Neck swelling represents one of the most frequent and diagnostically complex clinical presentations encountered in otolaryngology and head–neck surgery. The intricate anatomy of the neck, with its dense arrangement of vital structures including lymph nodes, thyroid gland, salivary glands, congenital remnants, and soft tissues, contributes to the wide etiological spectrum of neck swellings and makes accurate diagnosis both challenging and essential [1]. Globally, these swellings encompass a broad range of conditions, from benign, inflammatory, and infective lesions to primary or metastatic malignancies, often presenting with overlapping clinical features that complicate early recognition and management. In tertiary otolaryngology centers, the clinician's responsibility extends beyond identifying the presence of a mass to discerning its precise origin and pathological nature, as delayed or inaccurate diagnosis can result in missed malignancies or unwarranted surgical interventions. Epidemiologically, neck swellings continue to constitute a significant portion of ENT outpatient and inpatient caseloads worldwide. Several studies have documented that lymph node enlargement, thyroid disorders, congenital cysts, and salivary gland swellings together account for the majority of presentations [2]. Lymphadenopathy, both specific and non-specific, remains the single most common etiology across most hospital series, followed closely by thyroid lesions [3]. The diagnostic challenge is heightened by the fact that malignant lesions, including metastatic squamous cell carcinoma (SCC), thyroid carcinoma, and lymphomas, often masquerade as benign or chronic inflammatory swellings in early stages [1,4]. In tertiary-level settings, these malignancies account for a meaningful subset of cases, underscoring the importance of systematic evaluation and prompt differentiation between benign and malignant causes [5]. Early diagnosis carries critical prognostic implications, as timely initiation of appropriate treatment substantially improves survival outcomes, particularly for lymphomas and metastatic SCC [6]. Regional variations in the epidemiology of neck swellings are striking, reflecting underlying sociodemographic and environmental determinants. In South Asia, especially within low- and middle-income countries (LMICs), the etiological distribution differs markedly from that of high-income nations. Infectious and inflammatory causes such as tuberculous lymphadenitis remain disproportionately prevalent, while late presentation is common due to socioeconomic barriers, healthcare inaccessibility, and limited public awareness [7]. Studies from Bangladesh consistently demonstrate a dual burden of communicable and non-communicable pathologies, where tuberculous lymphadenopathy coexists with thyroid disorders and metastatic malignancies in the same clinical spectrum [8]. Among thyroid lesions, benign multinodular goitre and chronic thyroiditis dominate; however, the rising incidence of papillary and medullary carcinomas reflects a gradual epidemiological transition [7]. Female preponderance in thyroid swellings is well documented, attributed to both hormonal and nutritional influences, including iodine intake variability [9,10]. Concurrently, tobacco, betel-quid, and areca

nut use contribute to increasing rates of metastatic cervical lymphadenopathy from head and neck primaries, an emerging public health concern in Bangladesh and neighbouring countries [1,2]. In resource-constrained healthcare environments, the diagnostic evaluation of neck swellings often relies on a combination of thorough clinical examination and low-cost, readily available investigations. While cross-sectional imaging such as CT or MRI provides superior anatomic delineation, these modalities are not always accessible or affordable in many tertiary institutions of South Asia. Fine-needle aspiration cytology (FNAC), therefore, remains the cornerstone of diagnostic workup, offering a rapid, minimally invasive, and cost-effective method for initial assessment [1,11]. Numerous studies conducted in South Asia have validated the reliability of FNAC, reporting diagnostic accuracies ranging from 85% to over 90%, with sensitivity and specificity values comparable to histopathology in most benign and malignant categories [3,8,12]. It has proven particularly valuable in distinguishing between inflammatory and neoplastic causes and between benign and malignant thyroid and lymph-node swellings [4]. Despite its advantages, however, FNAC is not infallible: limitations include inadequate sampling, interpretive errors, and difficulty distinguishing certain lymphoid neoplasms or cystic metastases, all of which can lead to misdiagnosis or delay in definitive treatment [6,13]. These constraints underscore the importance of correlating cytological findings with clinical and radiological assessment, particularly in tertiary referral centers managing diverse and complex neck pathologies [14]. Bangladesh's tertiary ENT units face these diagnostic challenges daily, functioning within systems constrained by patient load, limited investigative resources, and variable referral patterns. Despite these constraints, clinicians have achieved commendable diagnostic precision through judicious application of FNAC, ultrasound, and clinical acumen, as demonstrated in recent studies from Chittagong and other regions [8]. Yet, the relative frequencies, demographic characteristics, and clinicopathological patterns of neck swellings in these populations remain underreported, particularly when considering the interplay of socioeconomic determinants and evolving disease trends. A comprehensive understanding of the clinical and demographic profile of patients presenting with neck swellings at tertiary otolaryngology centers is essential to guide evidence-based diagnostic strategies, optimize use of limited resources, and refine protocols for early identification of malignant lesions. Accordingly, the present study aims to describe the clinical and demographic patterns of patients presenting with neck swelling in a tertiary otolaryngology center in Bangladesh, providing contemporary data that bridge epidemiological insight with practical diagnostic application.

METHODS & MATERIALS

The study used a descriptive cross-sectional design and was conducted in the Department of Otolaryngology, Faridpur Medical College, Faridpur, Bangladesh, during the period from January 2024 to December 2024. A total of 100 consecutive patients presenting with neck swelling who met the inclusion criteria and provided informed consent were enrolled using purposive sampling. Demographic information, clinical history, and examination findings were documented in a structured case record form. Each patient underwent targeted investigations as indicated, and fine-needle aspiration cytology was performed under aseptic conditions using a 23-gauge needle and 10-ml syringe. Aspirated material was processed for cytological evaluation, and where surgical excision was performed, histopathology reports were collected for comparison. Data were checked for completeness, coded, and entered into SPSS for analysis. Descriptive statistics summarized demographic patterns and clinical characteristics, while cytological and histopathological findings were compared to determine diagnostic agreement. Ethical approval was obtained from the institutional review committee, and all procedures followed informed-consent protocols.

RESULTS

The study population consisted of 100 patients, most of whom were young to middle-aged adults, with the highest proportion belonging to the 15–30-year age group (37%), followed by those aged 31–45 years (28%). Children under 15 years accounted for 9%, while only 7% were older than 60 years. Males and females were almost equally represented, with a slight male predominance (53% vs 47%). Most patients resided in urban areas (66%), and socio-economically, the largest share came from the poor-income group (44%), followed by the middle-income (38%) and upper-income groups (18%). Educational status varied, though a considerable portion had limited formal education: 26% were illiterate, and 6% could only sign their names, while 30% had secondary education and 24% had completed higher secondary schooling. Occupationally, workers formed the largest subgroup (30%), with business owners (22%), service holders (16%), farmers (14%), housewives (12%), and retirees (6%) making up the rest (*Table I*).

Table I: Socio-demographic Characteristics of Patients Presenting with Neck Swelling (*n* = 100)

Characteristic	Category	n	%
Age group, years	< 15	9	9.0
	15–30	37	37.0
	31–45	28	28.0
	46–60	19	19.0
	> 60	7	7.0
Sex	Male	53	53.0
	Female	47	47.0
Place of residence	Urban	66	66.0
	Rural	34	34.0
Socio-economic status	Poor	44	44.0
	Middle	38	38.0
	Upper	18	18.0
Education level	Illiterate	26	26.0
	Can sign only	6	6.0
	Primary	14	14.0
	Secondary	30	30.0

	Higher secondary	24	24.0
Occupation	Worker	30	30.0
	Business	22	22.0
	Service holder	16	16.0
	Housewife	12	12.0
	Farmer	14	14.0
	Retired	6	6.0

All patients presented with a visible neck swelling, while a large majority reported associated symptoms, reflecting the symptomatic burden at presentation. Pain and tenderness were common (84%), followed by fever (78%) and anorexia or nausea (76%), indicating that many cases had underlying inflammatory or infective processes. Lymphadenopathy was clinically evident in 60% of patients, and more than half experienced difficulty swallowing (54%). Headache was reported by 44%, whereas respiratory discomfort was comparatively uncommon, affecting only 12% of the study population (*Table II*).

Table II: Clinical Presentation of Patients with Neck Swelling (*n* = 100)

Symptom / clinical feature	n	%
Swelling in the neck	100	100.0
Pain and tenderness	84	84.0
Elevated temperature (fever)	78	78.0
Anorexia and/or nausea	76	76.0
Lymphadenopathy	60	60.0
Difficulty swallowing	54	54.0
Headache	44	44.0
Respiratory discomfort	12	12.0

Neck swellings most frequently originated from the thyroid region, which accounted for 42% of all cases, making it the leading anatomical site in this cohort. Lymph node-related swellings were the second most common at 35%, reflecting a substantial burden of nodal disease. Salivary gland swellings constituted 13% of cases, while soft-tissue lesions represented 10%. No cases were classified under the "other" category (*Table III*).

Table III: Anatomical Distribution of Neck Swellings Among ENT Patients (*n* = 100)

Location	n	%
Thyroid region	42	42.0
Lymph node	35	35.0
Salivary gland	13	13.0
Soft tissue	10	10.0
Others	0	0.0

Cytological evaluation showed that thyroid lesions were the most common category, led by nodular goitre (22%) and Hashimoto's thyroiditis (15%), with smaller proportions of papillary (4%) and medullary carcinoma (1%). Among lymph node swellings, reactive lymphoid hyperplasia (14%) was the most frequent diagnosis, followed by granulomatous lymphadenitis (8%), metastatic involvement (7%), and lymphoma (6%), indicating a mix of inflammatory, infectious, and malignant nodal disease. Salivary gland lesions were predominantly pleomorphic adenoma (9%), with mucoepidermoid carcinoma accounting for 4% of cases. Soft tissue swellings included lipoma (6%), benign cystic lesions (2%), and abscesses (2%)*Table IV*.

Table IV: Cytological Diagnosis of Neck Swellings by Organ or Region (*n* = 100)

Organ / region	Cytological diagnosis	n	%
Thyroid lesions	Nodular goitre	22	22.0
	Hashimoto's thyroiditis	15	15.0
	Papillary carcinoma	4	4.0
	Medullary carcinoma	1	1.0
Lymph node lesions	Reactive lymphoid hyperplasia	14	14.0
	Granulomatous lymphadenitis	8	8.0
	Metastatic lymphadenitis	7	7.0
	Lymphoma	6	6.0
Salivary gland lesions	Pleomorphic adenoma	9	9.0
	Mucoepidermoid carcinoma	4	4.0
Soft tissue lesions	Lipoma	6	6.0
	Benign cystic lesion	2	2.0
	Abscess	2	2.0

Histopathological evaluation confirmed that the majority of neck masses were benign or inflammatory in nature, accounting for 73% of all cases. Among these, Hashimoto's thyroiditis (17%) and colloid goitre (15%) were the most

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common thyroid pathologies, while reactive and granulomatous lymphadenitis contributed 10% and 9%, respectively. Benign neoplastic and congenital lesions, including pleomorphic adenoma (8%), lipoma (5%), thyroglossal cysts (3%), branchial cleft cysts (2%), dermoid cysts (1%), and fungal lymphadenitis (3%), were also identified. Malignancies comprised 27% of cases, with metastatic carcinoma (7%) observed most frequently, followed by non-Hodgkin lymphoma and mucoepidermoid carcinoma (5% each). Papillary carcinoma accounted for 4% of all masses, while Hodgkin lymphoma (3%) and medullary carcinoma (2%) were less common (*Table V*).

Table V: Histopathological Diagnosis of Neck Masses (*n* = 100)

Category	Histopathological diagnosis	n	% of total
Benign and inflammatory (n = 73)	Hashimoto's thyroiditis	17	17.0
	Colloid goitre	15	15.0
	Reactive lymphadenitis	10	10.0
	Granulomatous lymphadenitis	9	9.0
	Pleomorphic adenoma	8	8.0
	Lipoma	5	5.0
	Thyroglossal cyst	3	3.0
	Fungal lymphadenitis	3	3.0
	Branchial cleft cyst	2	2.0
	Dermoid cyst	1	1.0
Malignant lesions (n = 27)	Metastatic carcinoma	7	7.0
	Non-Hodgkin lymphoma	5	5.0
	Mucoepidermoid carcinoma	5	5.0
	Papillary carcinoma	4	4.0
	Hodgkin lymphoma	3	3.0
	Medullary carcinoma	2	2.0
	Follicular adenomas*	1	1.0

Cytological and histopathological findings showed substantial concordance. Among 73 histologically benign cases, 64 were correctly identified as benign on cytology, while 9 were misclassified as malignant. Of the 27 malignant cases, cytology accurately detected malignancy in 23 patients, with 4 false-negative results. Overall, FNAC demonstrated strong diagnostic agreement with histopathology, correctly classifying 87% of all neck masses and misidentifying only a small proportion of benign and malignant lesions (*Table VI*).

Table VI: Agreement Between Cytological and Histopathological Diagnosis of Neck Masses (*n* = 100)

	Histopathology benign, n	Histopathology malignant, n	Total, n
Cytology benign	64	4	68
Cytology malignant	9	23	32
Total	73	27	100

DISCUSSION

The present study analyzed the clinical and pathological characteristics of one hundred patients presenting with neck swellings in a tertiary otolaryngology center, revealing patterns largely consistent with previously published South-Asian and international data. The age distribution demonstrated that the majority of patients were young to middle-aged adults, with 37% in the 15–30-year group and 28% in the 31–45-year group. This age pattern aligns with the reports of Yenkure et al. and Patel and Chawla, who observed the highest frequencies in similar age ranges, reflecting the greater susceptibility of this demographic to inflammatory, thyroid, and lymphoid conditions [3,15]. The near-equal sex ratio in this study (male 53%, female 47%) is also comparable to findings from Bhasker et al., who reported modest sex variation depending on the dominant lesion type, indicating that both sexes are almost equally affected by neck swellings in tertiary settings [2]. The socio-demographic context of the study highlights that 66% of patients resided in urban areas and 44% belonged to lower-income households, suggesting that urban tertiary centers continue to attract patients from disadvantaged backgrounds, often due to delayed referral from primary facilities. Comparable socio-economic distributions have been described by Bhasker et al., who emphasized that lower income and education levels contribute to late presentation and increased disease complexity [2]. Clinically, all patients presented with visible neck swellings (100%), and most reported pain or tenderness (84%) and fever (78%), indicating an inflammatory predominance. Similar symptomatic patterns were documented by Patel and Chawla, where fever and pain were leading complaints among benign and infective lesions [15]. Lymphadenopathy was clinically evident in 60% of patients, while dysphagia was noted in 54%, reflecting mechanical or compressive effects of larger masses. These frequencies are consistent with findings in other South-Asian cohorts, underscoring inflammation and infection as dominant early presentations in head-neck practice. Anatomically, thyroid swellings were the most frequent (42%), followed by lymph node masses (35%), salivary gland (13%), and soft-tissue lesions (10%). This distribution closely mirrors observations by Yenkure et al. and Bhasker et al., who reported thyroid and nodal swellings as the principal categories in similar tertiary populations [2,3]. Cytologically, thyroid lesions were dominated by nodular goitre (22%) and Hashimoto's thyroiditis (15%), whereas papillary and medullary carcinoma accounted for 4% and 1%, respectively. The lymph-node group comprised mostly reactive lymphoid hyperplasia (14%) and granulomatous lymphadenitis (8%), followed by metastatic (7%) and lymphomatous (6%) lesions. These proportions are nearly identical to those reported by Patel and Chawla and Bhasker et al., confirming that inflammatory and

granulomatous lymphadenitis remain prevalent in South-Asian contexts, where tuberculosis and chronic infections persist [2,15]. Among salivary-gland lesions, pleomorphic adenoma (9%) was the most common benign tumor, and mucoepidermoid carcinoma (4%) was the predominant malignant type. This finding is strongly supported by Yıldız and Şenel, Shah et al., and the Sharma et al., all of which identified pleomorphic adenoma as the dominant benign tumor and mucoepidermoid carcinoma as the leading malignancy [16–18]. Soft-tissue lesions were relatively uncommon but diverse, with lipoma (6%), benign cysts (2%), and abscesses (2%). Histopathology confirmed that 73% of all neck masses were benign or inflammatory, while 27% were malignant. Hashimoto's thyroiditis (17%), colloid goitre (15%), and reactive or granulomatous lymphadenitis (10% and 9%) comprised the largest benign entities. The proportion of malignant lesions, dominated by metastatic carcinoma (7%), non-Hodgkin lymphoma (5%), mucoepidermoid carcinoma (5%), and papillary carcinoma (4%), is comparable to the 20–30% malignancy rates reported in tertiary-center studies by the Sharma et al., and Patel and Chawla [15,18]. Diagnostic accuracy of fine-needle aspiration cytology (FNAC) was high, with overall concordance of 87%, correctly classifying 64 of 73 benign and 23 of 27 malignant cases. This level of agreement falls squarely within the 80–92% accuracy range reported across FNAC studies [15,19]. False negatives occurred in 4% of malignant cases, while false positives were seen in 9 benign cases, comparable to misclassification rates noted by Shah et al [17]. The findings reaffirm FNAC's reliability as a first-line, low-cost diagnostic approach in resource-limited settings while emphasizing the continued necessity of histopathological confirmation, especially for deep or cystic lesions. Overall, the present study's results align closely with existing literature in terms of demographic trends, lesion spectrum, and diagnostic reliability. The predominance of benign and inflammatory diseases, the high prevalence of thyroid and lymph-node swellings, and the consistent diagnostic value of FNAC collectively underscore the ongoing clinical relevance of comprehensive cytological assessment in the management of neck swellings in low- and middle-income contexts.

LIMITATIONS

The study was conducted in a single tertiary otolaryngology center, which may limit the generalizability of its findings to broader community settings. Additionally, FNAC could not be performed or repeated for all doubtful cases, and some diagnostic discrepancies may be attributable to sampling limitations rather than true cytological error.

CONCLUSION

This study demonstrates that neck swellings in a tertiary otolaryngology setting are predominantly benign and inflammatory in nature, with thyroid and lymph-node lesions forming the majority of cases. Most patients were young to middle-aged adults and commonly presented with pain, fever, and clinically evident lymphadenopathy. Cytology revealed nodular goitre, Hashimoto's thyroiditis, reactive hyperplasia, and granulomatous lymphadenitis as the leading diagnoses, while histopathology confirmed a substantial but expected proportion of malignancies, particularly metastatic carcinoma and lymphomas. FNAC showed strong diagnostic concordance with histopathology, reaffirming its value as a first-line, cost-effective tool for evaluating neck masses in resource-limited settings. The findings underscore the importance of early assessment and structured diagnostic pathways to identify malignant lesions promptly and reduce delays in treatment.

RECOMMENDATION

- FNAC should remain the primary diagnostic modality for initial evaluation of neck swellings, complemented by imaging and histopathology when indicated.
- Strengthening early referral pathways from primary care can help reduce delays in diagnosing malignant neck masses.
- Future studies should include multi-center datasets with larger sample sizes to improve generalizability and allow disease-specific sub-analysis.
- Routine follow-up of cytologically benign but clinically suspicious cases should be emphasized to minimize false-negative outcomes.

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CONFLICT OF INTEREST

None declared

ETHICAL APPROVAL

The study was approved by the Institutional Ethics Committee

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