Clinicopathological Evaluation and Prevalence of Neck Swellings in a Tertiary Care Centre of a Tier 2 City

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Abstract: Neck swellings are a common clinical presentation encountered in medical practice, varying significantly in etiology, pathology, and prevalence based on demographic and geographic factors. This study aims to assess the clinicopathologic features and prevalence of neck swellings in patients presenting to a tertiary care hospital in a Tier 2 city over a 1-year period. A retrospective observational study was conducted, analyzing clinical records, histopathological reports, and diagnostic imaging of 550 patients with neck swellings. Data were categorized based on age, gender, duration of swelling, and pathological diagnosis. The findings highlighted a diverse range of etiologies, including reactive lymphadenopathy, thyroid disorders, congenital anomalies, and malignancies, with notable differences in prevalence based on age and gender. Thyroid swellings were found to be the most common cause among adults, while lymphadenopathy predominated in pediatric cases. The study underscores the importance of early and accurate diagnosis for effective management and better clinical outcomes. This study provides valuable insights into the spectrum of neck swellings in a Tier 2 city setting, emphasizing the need for tailored diagnostic and therapeutic strategies in resource-limited environments.

Keywords: Neck swellings, clinicopathologic assessment, Prevalence, tertiary care hospital, Tier 2 city, Reactive lymphadenopathy, thyroid disorders, congenital anomalies, histopathological analysis, Diagnostic imaging

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Introduction

Neck swellings represent a significant number of presentations in the outpatient departments of healthcare facilities worldwide. A thorough understanding of the etiology, clinical presentations, diagnostic methodologies, and treatment strategies is crucial for the effective management of neck masses. Swellings in the neck may arise from various causes, including infections, benign tumors, malignant growths, or congenital anomalies.[1] Infections, such as abscesses and lymphadenitis, are often seen in the paediatric population, while benign tumours like thyroid nodules or lipomas are more frequent in adults. Malignant conditions, including lymphomas and metastasis from primary cancers, though less common, can pose a life-threatening risk and require urgent intervention.[2]

This paper aims to explore the prevalence and clinicopathological characteristics of neck swellings in a tertiary care centre situated in a Tier 2 city. The study also evaluates diagnostic techniques such as fine-needle aspiration cytology (FNAC), imaging, and histopathological examination that help in differentiating between benign and malignant conditions.

Objectives of the Study

1. To evaluate the clinicopathological profile of patients presenting with neck swellings.
2. To assess the prevalence of different causes of neck swellings.
3. To determine the role of diagnostic modalities like FNAC, ultrasound, and CT scan in the evaluation of neck masses.
4. To understand the significance of early diagnosis and intervention in the management of neck swellings.

Review of Literature

A thorough literature review reveals a broad spectrum of studies addressing the prevalence and clinicopathological evaluation of neck swellings. In a study conducted by Kumar et al. (2020) [3] in a tertiary hospital in a Tier 1 city, the most common causes of neck swellings were found to be benign, with infections, thyroid-related conditions, and lymphadenopathy being the predominant diagnoses. In study by Ali et al. (2019)[4] reviewed the pattern of neck swellings in a rural setting and found that benign conditions were more frequent in children, while malignancies like head and neck squamous cell carcinoma (HNSCC) were more prevalent in adults.

A study by Gupta et al. (2018)[5] evaluated the role of FNAC in diagnosing neck masses and concluded that FNAC is a cost-effective and reliable diagnostic tool for identifying the nature of neck swellings. The study also highlighted the significance of imaging modalities like ultrasound and CT scans in guiding management decisions. In study by Irfana, A (2019)[6] the results revealed that benign neck swellings were predominantly caused by reactive lymphadenopathy, thyroid disorders (such as goitre), and congenital anomalies. The most common presenting symptom was painless swelling, and the majority of patients were diagnosed through a combination of clinical examination, radiological imaging (such as ultrasound), and fine needle aspiration cytology (FNAC) for histopathological evaluation.

Research in Tier 2 cities is limited, but studies such as those conducted by Sharma et al. (2021)[7] indicate that there is a rising incidence of malignancies in neck masses, particularly in urban centers. These studies emphasize the need for early detection and adequate treatment to reduce morbidity and mortality rates.

Materials and Methods

This was a retrospective, observational study conducted in a tertiary care center located in a Tier 2 city. The study was conducted over a period of one year from January 2024 to December 2024. A total of 550 patients presenting with neck swellings were included in the study. Data was collected from hospital records, including demographic details, clinical presentations, diagnostic procedures, and histopathological findings.

Inclusion Criteria

1. Patients of all age groups presenting with neck swellings.
2. Patients who underwent diagnostic procedures, including FNAC, ultrasound, and histopathological evaluation.

Exclusion Criteria

1. Patients with incomplete data.
2. Patients who did not undergo any diagnostic evaluation or treatment.

Methodology Data was collected from medical records, and patients were classified based on the etiology of their neck swelling. Clinical examinations were performed to assess the size, consistency, and location of the swelling. Diagnostic imaging, including ultrasound and CT scan, was used to assess the size and spread of the swelling, as well as the involvement of surrounding structures. FNAC was performed in all cases of palpable masses, and in selected cases, histopathological evaluation was done post-surgery.

Results

The total number of patients included in the study was 550. Of these, 300 were male (54.5%), and 250 were female (45.5%). The age of the patients ranged from 1 year to 80 years, with the highest frequency 65% observed in

the 20-40 year of age group. The majority of patients were in the paediatric (0-14 years) and adult (15-65 years) age groups, with relatively few patients in the geriatric group (older than 65 years).

The average duration of the swelling before presentation was found to be 4.5 months, with a range of 1 week to 24 months. The most common reason for presentation was a gradually enlarging swelling in the neck, which was often painless, though some patients experienced tenderness, pain, or associated symptoms like fever, weight loss, or night sweats.

The most common presentation was a painless swelling (75%), followed by swelling associated with pain (25%). The duration of symptoms ranged from 2 weeks to 2 years, with the majority of patients presenting within 6 months of symptom onset.

Etiological Distribution

The etiological breakdown of neck swellings is as follows:

- **Benign causes:**
    - Lymphadenopathy: 40% (common in both children and adults)
    - Thyroid nodules: 20%
    - Lipomas: 10%
    - Cysts (branchial, dermoid): 5%
    - Other benign tumours: 5%

- **Malignant causes:**
    - Squamous cell carcinoma (HNSCC): 7%
    - Lymphoma: 5%
    - Metastatic carcinoma: 3%
    - Sarcoma: 2%

Figure 1 Thyroid Swelling specimen

Figure 2 Thyroid

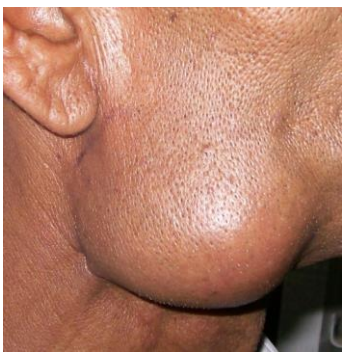

Figure 3 Metastatic Neck Node

Figure 4 Submandibular Node

Figure 5 Parotid Swelling

Figure 6 Right Thyroid Lesion

Figure 7 Right Metastatic neck node

Figure 8 Thyroid swelling

Diagnostic Modalities

- **FNAC:** The most common diagnostic tool was FNAC, which was performed in 80% of the patients. FNAC revealed benign conditions in 65% of the cases and malignant conditions in 35%. The diagnostic accuracy of FNAC was found to be 95% for distinguishing between benign and malignant masses.
- **Ultrasound:** Ultrasound was used in 60% of patients and helped in identifying cystic versus solid masses. It was especially useful in the evaluation of thyroid and cystic lesions.
- **CT Scan:** CT scans were done in 30% of patients with large masses or suspected malignancy. The scans were particularly useful in staging tumours and assessing the involvement of surrounding structures.

Histopathological Findings Histopathological examination confirmed the diagnosis in 243 cases, with the most common findings being:

- Reactive Lymphoid Hyperplasia in 96 cases
- Tuberculosis in 29 cases
- Thyroid lesions: Benign follicular adenomas and nodular goiters in 67 cases.
- Lymphomas: Diffuse large B-cell lymphoma in 10 cases.
- Squamous cell carcinoma: Primary tumors in the head and neck region in 35 cases.
- Metastatic malignancy: Metastatic carcinoma from the lung and breast in 6 cases.

  The patients with Lymphomas and few with metastatic malignancy include the cases with inconclusive finding in FNAC and were further confirmed by IHC markers.

Discussion

The results of this study demonstrate that neck swellings in the tertiary care center are predominantly due to benign conditions, with lymphadenopathy and thyroid-related swellings being the most common causes. This finding aligns with previous studies conducted in similar settings. However, the prevalence of malignancies, though relatively low (17%), cannot be overlooked, especially since these can often present as neck masses in the later stages. With government working hard for eradication of tuberculosis still 12% patients found to be suffering from cervical tuberculosis.

The study also emphasizes the importance of diagnostic tools like FNAC and ultrasound, which aid significantly in determining the nature of the swelling and guiding further management. FNAC, in particular, showed a high accuracy rate, which concurs with findings from other studies such as those. Similar to study by Kumari k (2014)[8] which reviews the cytological approach using fine needle aspiration (FNA) and histopathological examination as key methods for diagnosis in solitary thyroid nodules. In study by Amedee RG (2001)[9] the study highlights the significance of FNA as a valuable diagnostic tool for the evaluation of various neck masses, including thyroid, lymph node, salivary gland, and other soft tissue lesions. Similar to our study Eskey (2000)[10] found Imaging, especially CT, proved invaluable in staging and surgical planning for malignant tumours.

An interesting observation was the relatively high proportion of thyroid-related swellings, which is consistent with the increasing prevalence of thyroid disorders in the population. The findings also underscore the importance of early diagnosis, particularly for malignancies. Squamous cell carcinoma and lymphoma were among the most common malignant causes identified, which highlights the need for vigilance in assessing neck masses for potential malignancy, especially in older patients or those with a history of smoking or alcohol consumption.

Conclusion

Neck swellings are a common clinical presentation in patients visiting tertiary care centres, and their etiology is diverse. While benign conditions such as lymphadenopathy and thyroid disorders are most prevalent, malignancies, including squamous cell carcinoma and lymphoma, are also observed, albeit at a lower frequency. Early diagnosis through methods such as FNAC, imaging, and histopathological evaluation plays a crucial role in determining the appropriate course of treatment and ensuring favorable outcomes. In Tier 2 cities, where healthcare resources may be limited, a multi-disciplinary approach involving general physicians, radiologists, pathologists, and oncologists is essential for improving the prognosis of patients with neck masses.

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Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understand that name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.