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Fine needle aspiration cytology study of spectrum of neck masses in a tertiary care hospital

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Abstract
Neck lesions are frequently encountered in clinical practice and found responsible for significant morbidity and mortality. Palpable lesions in the region of the head and neck include a wide differential diagnosis including inflammatory lesions and neoplasms. The sensitivity and specificity of fine-needle aspiration biopsy in detecting a malignancy range from 77% to 97% and 93% to 100%, respectively. Fine needle-aspiration cytology (FNAC) represents a relatively accurate, inexpensive and rapid technique for elucidation of the etiology of neck masses. It can be performed as an OPD procedure and is well accepted by the patients. Lymphadenitis accounted for the majority of the cases (36.1%) of which Reactive Lymphadenitis was the commonest followed by granulomatous lymphadenitis. Metastatic tumors accounted for 26.6% of the cases followed by thyroid swellings (21.5%). Squamous cell carcinoma (10.2%) was the most common metastatic lesion while colloid goiter (17.4%) predominate in the thyroid swellings. Histopathological correlation was carried out wherever feasible. In our study, Lymphadenitis accounted for the majority of the cases followed by metastatic lesions of the neck.

Keywords: Neck masses, FNAC, lymphadenitis, metastatic neck lesions, thyroid swelling

Introduction
Neck lesions are frequently encountered in clinical practice and found responsible for significant morbidity and mortality.
Palpable lesions in the region of the head and neck include a wide differential diagnosis including inflammatory lesions and neoplasms. Lymph nodes are the most common structures to enlarge in the neck region. Other commonly presenting neck masses are within the thyroid gland and salivary glands. The origin of less commonly seen neck masses is from thyroglossal cyst, branchial cleft cysts, carotid body tumors, cystic hygromas, pharyngeal pouch and skin appendages. Neck lesions account for majority of cancers in India accounting for 23% of all cancers in males and 6% in females. The increased prevalence of malignancies in neck area compared to other areas has been attributed to use of tobacco in various forms, poor oral hygiene, and viral infection [1].
A clinically relevant approach to differentiating neck masses depends on whether the mass is acute, subacute, or chronic to begin with. Acutely developing neck masses are usually symptomatic. The causes of acute neck masses include trauma, infection, inflammation. Subacute masses develop over weeks to months. They often go unnoticed at onset because they are usually asymptomatic. The common causes of subacute neck masses include neoplasms of head and neck, salivary gland neoplasm. Chronic neck masses can be mainly due to congenital neck masses, thyroid swellings, laryngocele there is only one study on spectrum of neck masses in India. It was carried out in Maharaja Agrasen Medical College, Agroha in 2010-11 [2]. Other studies on neck masses have either focused on pediatric population or malignancies. Therefore, the present study was undertaken to study the spectrum of neck lesions in patients in a tertiary care hospital.

Material and methods
Ethical approval was given by Institutional Ethical Committee. This observational study was conducted at a tertiary care hospital that caters to the healthcare needs of large population. All patients who were referred to the Department of Pathology for FNAC of any neck mass

over a period of two years from Jun 2015 to May 2017 were included. Patients of all ages irrespective of their age or gender were included in the study. Data regarding age, gender, clinical presentation, local and systemic examination findings, imaging and family history from the hospital records was collected.

The collected data was numerically coded and entered in Microsoft excel 2007 and then transferred to SPSS version 17. Patients were classified as whether the lesions are inflammatory, benign or malignant. Data was analyzed with appropriate tests and logical conclusions were deduced.

Results

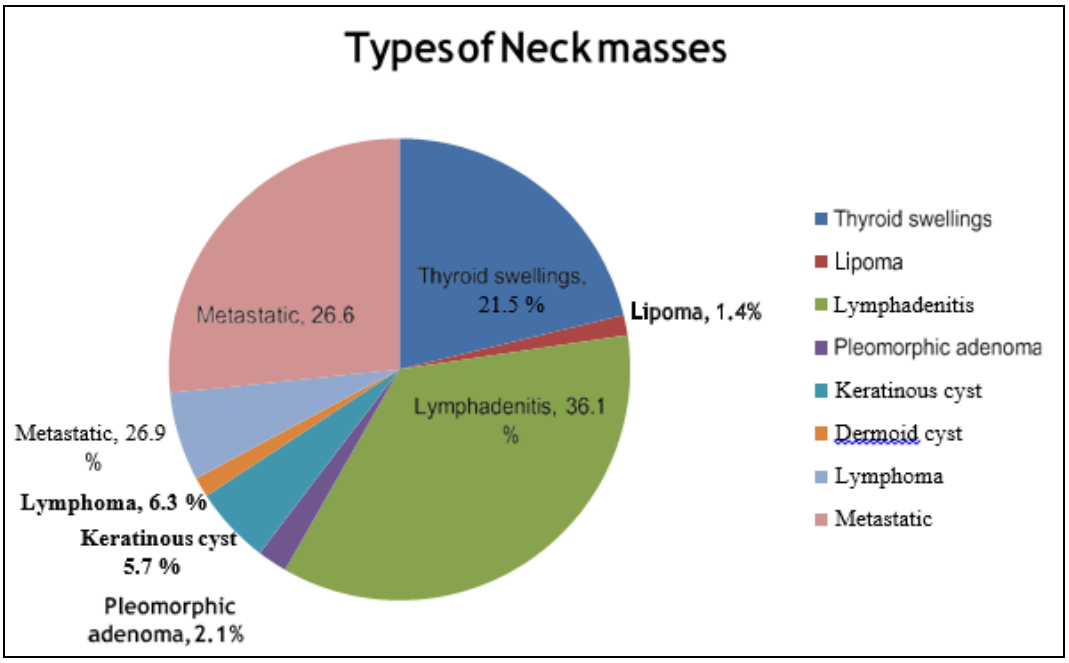

Fig 1: Types of Neck masses/swellings

Table 1: Distribution of neck masses

Histological Diagnosis	Frequency	Percentage
Thyroid- Benign	123	17.4
a) Colloid goiter	96	13.6
b) Lymphocytic thyroiditis	24	3.4
a) Follicularadenoma	3	0.4
Thyroid- Malignant	27	3.8
b) Papillary carcinoma thyroid	21	3
c) Follicular carcinomathyroid	6	0.8
Lipoma	10	1.4
Lymphadenitis	252	35.6
a) Granulomatous lymphadenitis	100	14.1
b) Reactive lymphadenitis	120	17
c) Suppurative lymphadenitis	32	4.5
Pleomorphic adenoma	15	2.1
Keratinous cyst	38	5.4
Dermoid cyst	10	1.4
Lymphoma	44	6.2
a) Non Hodgkin lymphoma	39	5.5
b) Hodgkin lymphoma	05	0.7

Metastatic	188	26.6
a) Squamous cell carcinoma	72	10.2
b) Adenocarcinoma	48	6.8
c) Poorly differentiated	68	9.6
Total	707	100

Table 1 describes distribution of neck masses. Out of 252 cases of lymphadenitis, reactive lymphadenitis was the most common (17.5%) followed by granulomatous lymphadenitis (14%). Next in the sequence was metastatic tumors (26.6%) with squamous cell carcinoma with most number of case (10.2%) followed by undifferentiated tumors (9.6%). Number of thyroid cases was 17.4% out of which colloid goiter showing the maximum number of cases (13.6%) followed by lymphocytic thyroiditis (3.4%). There were only 10 cases of dermoid cyst.

Table 2: Distribution of thyroid swellings

Histological Diagnosis	Frequency	Percentage
Thyroid- Benign	123	82
a) Colloid goiter	96	64
b) Lymphocytic thyroiditis	24	16
c) Follicular adenoma	3	2
Thyroid- Malignant	27	18
d) Papillary carcinoma thyroid	21	14
e) Follicular carcinoma thyroid	6	4

Tables 2 describes the distribution of thyroid swellings. Out of 123 cases 96 cases were of colloid goiter and 24 were of lymphocytic thyroiditis.

In case of malignant neck masses in thyroid, papillary carcinoma was the maximum with 21 cases out of 27 followed by follicular carcinoma with 6 cases out of 27 cases.

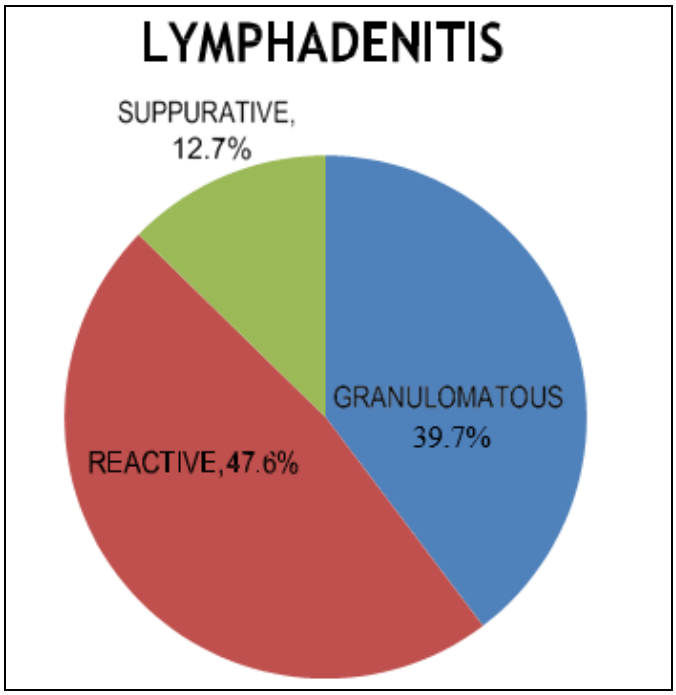

Fig 2: Distribution of Benign Lymphnode swellings

Figure 2 gives the knowledge about the distribution of lymph node swellings. Out of 252 patients, reactive lymphadenitis (120 cases) was the most common followed by granulomatous lymphadenitis (100 cases) rest of them were suppurative lymphadenitis.

Table 3: Distribution of Lymphomas

Lymphoma	frequency	Percentage
c) Non Hodgkin lymphoma	39	88.6
d) Hodgkin lymphoma	05	11.4
Total	44	100%

Table 3 shows the distribution of lymphomas. Majority of the them were non Hodgkin lymphoma (88.6%).

Table 4: Distribution of Metastatic swellings

S. No.	Metastatic	Frequency	Percentage
1	Squamous cell carcinoma	72	38.3
2	Adenocarcinoma	48	25.5
3	Poorly differentiated	68	36.2
	Total	188	100%

Table 4 describes distribution of metastatic swellings. Out of 188 patients, Squamous cell carcinoma was most common (72 cases) followed by poorly differentiated cases of metastatic carcinoma (68 cases).

Discussion

In India neck lesions have become an important cause of mortality and morbidity. The most common site of involvement is lymph node followed by thyroid gland, salivary gland and then the thyroglossal/brachial cyst. Approach towards the patient of neck masses involves a proper history taking and physical examination. We did an observational study for 2 years to find the spectrum of neck lesions.

This is a hospital based study and does not include cases which either go unreported or are medically managed by local physicians. It also does not include cases of neck swellings which were clinically obvious and managed medically at our own institute and therefore not referred to the department of pathology for FNAC. Therefore, this study does not give the true spectrum of neck masses in the community which can only be ascertained by a community based study. This study only gives the spectrum of neck masses which are apparently of serious nature and are therefore referred to the department of pathology for evaluation.

More than two-third of the neck swellings referred for FNAC arose from the lymph nodes (68%) in our study (Table 2). 52% of these were benign swellings of the lymph nodes due to inflammation (lymphadenitis). 39% of these lymph node swellings were due to metastasis and 9% were due to lymphoma.

About one-fourth of the neck swellings were due to metastasis. Squamous cell carcinoma was the most common metastatic lesion.

Thyroid swellings accounted for about 21% of the neck swelling in our study, majority of them were of benign nature. Thyroid malignancy accounted for only 3.8% of all the neck swellings which underwent evaluation in our study.

Overall lymphomas accounted for 6.3% of the swellings in our study. Non Hodgkin lymphoma was seen eight times more frequently that Hodgkin lymphoma.

Other causes of neck swellings were keratinous cyst (5.7%), pleomorphic adenoma (2.1%) and lipoma (1.4%).

Though Lipoma is the most common cause of soft tissue swelling in the body, it is not commonly encountered in the neck region and accounted for only 1.4% of the cases.

Similar results were shown by Adhikari *et al*. [3] in which 47% cases were of tuberculosis lymphadenitis followed by 35% of reactive lymphadenitis. Papillary carcinoma of the thyroid was the most common malignant thyroid tumor accounting for most of the cases in a study by Suryavanshi *et al*. [4]. As far as salivary glands are concerned Sialadenitis was reported the maximum (66%) followed by pleomorphic adenoma (24%) [4]. In our study there was no case of sialadenitis and 15 cases were of pleomorphic adenomas.

Other types of neck swellings like thyroglossal cyst were not reported to our department for evaluation as they are relatively rare.

A study of 1208 cases of neck masses at a teaching hospital in Iran [5] revealed that the most common tissue involved was thyroid gland (35.7%) followed by lymph nodes (34.6%) and salivary glands (10.8%) and others. 21% of the lesions were inflammatory and 52.7% were neoplastic (benign or malignant). The anterior triangle (54.1%) was the most common anatomical site for the neck masses, followed by the midline and anterior neck (45.4%), and the posterior triangle (0.5%). Accordingly, the study concluded that any mass in the neck, especially in older patients, located in the anterior triangle must be considered neoplastic until proven otherwise. A significant proportion of cases in this study of Iran had goiter [5]. In our study 13.6% of the cases were of goiter. With the universalization of iodization of salt in our country, goiter has become very uncommon. The majority of the thyroid carcinomas in the same study were papillary thyroid carcinoma as seen in our study. This study also had 13 cases of adenoid cystic carcinoma of the salivary glands but our study there were no cases of malignant mass of the salivary glands [5].

Though majority of studies showed granulomatous to be most common neck mass lesion in lymph nodes, our study showed different results in this context. Jindal *et al.* at Agarsen medical college also showed tuberculosis (granulomatous) to be the most common cause [2].

In a retrospective study of 200 cases of neck masses who underwent FNAC at Mahatma Gandhi medical college, Pondicherry during 2011-12, 52% swellings were thyroid swellings, 28.5% were of lymph nodes and 11% arose from the salivary glands [6]. In a study of 701 patients by Bhagat *et al.* lymph node lesions were most common with granulomatous/ tuberculous lesions being the commonest variety. Pleomorphic adenoma was the commonest among the salivary gland lesions. Other common lesions were squamous cell carcinomas and lipomas as common malignant and benign tumours respectively [7].

In a small study on 50 patients done at Postgraduate Institute, Peshawar tuberculous lymphadenitis (36%) was the commonest cause of neck swellings followed by reactive/non- specific lymphadenitis (18%). Other pathologies included malignant neoplasms (14%), cysts (10%), benign neoplasms (8%) and sialadenitis (6%). FNAC was inconclusive in 8% of cases. Metastasis to lymph nodes were the most common type of malignancy followed by lymphoma and papillary carcinoma of the thyroid gland [8].

Study done in Safdarjung Hospital found lymphadenitis to be the most common cause (36%) followed by thyroid and then salivary glands [9]. Study done at Jamnagar, Gujarat showed thyroid swellings as most common neck lesion seen in middle age group, mostly in males [10].

Conclusion

The differential diagnosis of the neck mass includes a wide array of congenital, inflammatory, benign and malignant lesions. The initial evaluation is the history and physical evaluation. Knowledge of the prevalence of the different pathologies in this region is important for the management of patients with neck masses. In our study the most common masses were due to lymph node swellings.

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