

Fine Needle Aspiration Cytology of Neck Masses in a Hospital

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ABSTRACT

Background: Fine needle aspiration cytology is a valuable technique in the work-up of masses arising within neck and represents a screening, inexpensive, and rapid technique to sample masses found in neck.

Methods: This study included 117 cases of neck masses, subjected to fine needle aspiration cytology at the department of Pathology of a hospital in Nepal from January 2013 to December 2013.

Results: The study included 117 patients with neck masses with median age of 37 years. The majority of the patients were in the age group of 20-29 yrs with female predominance. The most frequent cause of neck swelling is lymphadenopathy 65 (55.6%), followed by thyroid swelling 36 (30.7%), soft tissue lesion 12 (10.3%) and salivary gland lesions 4 (3.4%). The most common lesion in these patients was non-neoplastic, followed by malignant neoplasm. Tuberculosis is the most common cause of neck lymphadenopathy and colloid goiter is the commonest cause of thyroid swelling. In soft tissue, abscess is the most frequent one. Pleomorphic adenoma is more common than other salivary gland lesions.

Conclusions: Lymphadenopathy is commonest cause of neck mass, followed by thyroid gland & soft tissue swellings. Tuberculosis is the most common diagnosis of neck masses, followed by colloid goiter. Fine needle aspiration cytology is pretty accurate technique to diagnose neck masses and it is helpful to avoid unnecessary surgeries and in general clinical management and it is recommended as a first line of investigation in the diagnosis of neck masses.

Keywords: fine needle aspiration cytology, lymphadenopathy, neck mass.

INTRODUCTION

FNAC has assumed importance in diagnosing a variety of disease processes. It is a valuable technique in the work-up of masses arising within the neck.

FNAC of the head and neck region is a well-accepted technique with a high specificity.¹ By providing few false-negative diagnoses, the categorization of lesions into inflammatory/benign and malignant is possible with a high degree of certainty.² This feature of FNAC alone can be extremely helpful not only in surgical planning³ but also in general clinical management.

Masses in the neck are common occurrences and the lesions range from inflammation to neoplasia. The majority cervical lymph nodes will disclose either

reactive or granulomatous lymphadenopathy or metastatic carcinoma or lymphoma. Other neck lesions are salivary gland and thyroid lesions, carotid body tumors, soft tissue tumors etc.

This study was aimed to illustrate scenario of the diagnoses of neck masses & to find diagnostic accuracy of FNAC.

METHODS

This study included 117 cases of neck masses, subjected to fine needle aspiration cytology (FNAC) at the department of Pathology, Om hospital & research centre private limited, Chabhil, Kathmandu, Nepal from January 2013 to December 2013.

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Aspirates were procured by using 21 or 23 gauge needle attached to a 10 ml syringe. Generally one to two passes were performed and aspirated material was smeared into glass slides with preparation of both air dry smears for Giemsa stain and 95% alcohol fixed smears for H&E stain. Ziehl-Neelsen stain was performed whenever required.

Cytological evaluation was performed and cytological diagnosis from each case was based on cytomorphology and clinical findings.

All excised or incised surgical specimens were routinely processed and H&E staining was performed.

RESULTS

The study included 117 patients with neck masses, subjected to fine needle aspiration. The median age of the patients with neck masses was 37 years with a range of seven to 82 years. The majority of the patients were in the age group of 20-29 years with female to male ratio being 1.9 (Table 1).

Table 1. Age and Sex distribution of Patients with neck masses.

Age group (years)	Male	Female	n (%)
0-9 year	1	1	2 (1.7)
10-19 years	5	9	14 (12.0)
20-29 year	6	18	24 (20.5)
30-39 year	6	17	23 (19.6)
40-49 year	6	17	23 (19.6)
50-59 year	5	7	12 (10.3)
60-69 year	5	2	7 (6.0)
70 years and above	6	6	12 (10.3)
Total	40	77	117 (100)

The most frequent cause of neck swelling is lymphadenopathy and the incidence of lymph node lesions constituted 65 (55.6%). It was highest than other lesions in neck regions (Table 2). The most common lesion in these patients was non-neoplastic, followed by malignant neoplasm (Table 2).

Table 2. Organ wise distribution of cytopathological diagnoses.

Organ	Non-neoplastic lesion	Benign neoplasm	Malignant neoplasm	Inconclusive	n (%)
Lymphnode	53	0	9	3	65 (55.6)
Thyroid gland	25	3	5	3	36 (30.7)
Soft tissue	9	0	1	2	12 (10.3)
Salivary gland	0	2	1	1	4 (3.4)
Total	87	5	16	9	117 (100)

Out of 65 cases of lymphadenopathies (Table 3), the most common diagnosis is tuberculosis (Figure 1), constituting 36 (55.4%), followed by reactive lymphadenitis 11(16.9%), metastatic carcinoma 11 (16.9%), Kikuchi-Fujimoto disease (6.2%) and Non-Hodgkin lymphoma 3 (4.6%). Out of 6 cases of metastatic lymph nodes (Figure 2), five were supra-clavicular and one was level II lymph nodes. In 4 cases, primary site was lung, while it is larynx in one case and breast in another.

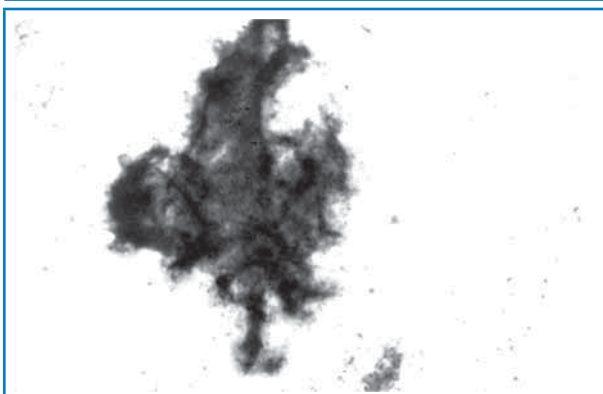


Figure 1. Tuberculous lymphadenitis. FNAC of lymph node showing caseous necrosis. Giemsa stain, X100

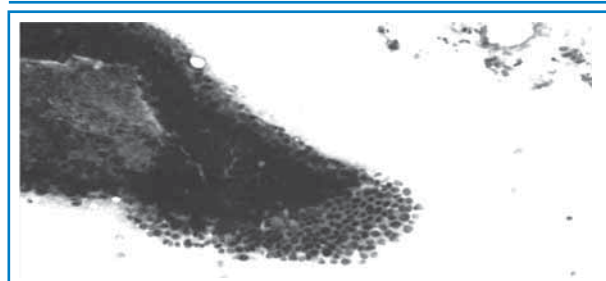


Figure 2. Metastatic adenocarcinoma. FNAC of lymph node showing cohesive clusters of pleomorphic epithelial cells. Giemsa stain, X100

Table 3. Distribution of lymph node lesions.

Lymph node lesions	n (%)
Tuberculosis	36 (55.4)
Reactive Lymphadenitis	11 (16.9)
Kikuchi-Fujimoto disease	4 (6.2)
Non-Hodgkin Lymphoma	3 (4.6)
Acute suppurative lymphadenitis	2 (3.1)
Metastatic adenocarcinoma	2 (3.1)
Met. squamous cell carcinoma	2 (3.1)
Metastatic ductal carcinoma	1 (1.5)
Metastatic small cell carcinoma	1 (1.5)
Inconclusive	3 (4.6)
Total	65 (100)

Table 4. Distribution of thyroid lesions.

Thyroid lesions	n (%)
Colloid Goitre	21 (58.4)
Autoimmune Thyroiditis	6 (16.7)
Follicular Neoplasm	5 (13.9)
Papillary carcinoma	2 (5.5)
Inconclusive	2 (5.5)
Total	36 (100)

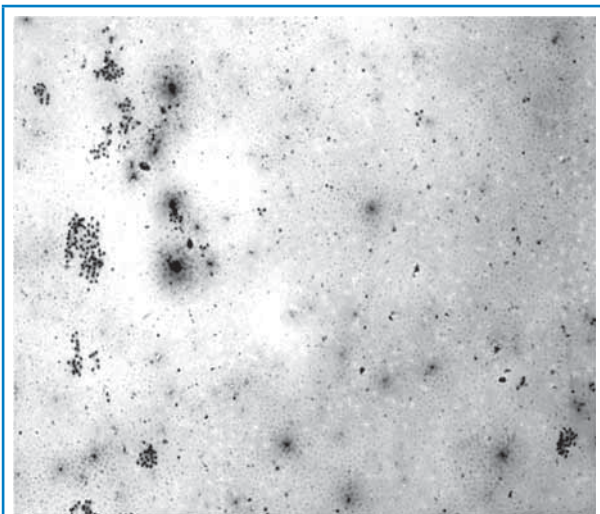


Figure 3. Colloid goiter. FNAC of thyroid gland showing aggregates of follicular epithelial cells with colloid in the background. Giemsa stain, X40

In thyroid gland, the most common diagnosis is colloid goiter (Figure 3), followed by autoimmune thyroiditis and follicular neoplasm (Table 4). In soft tissue, abscess is the commonest diagnosis, comprising of 3 (25%) of soft tissue lesions (Table 5). Total cases of salivary gland lesions were only four, out of them, two were pleomorphic adenoma (Figure 4) and one Warthin's tumor and one was inconclusive. Histopathological study of the excised lesion was performed only in 12 cases (Table 6). FNAC diagnosis was concordant with histopathological diagnosis in 8 cases and one inconclusive case in FNAC turned out to be fibrolipoma histopathologically. A case diagnosed as colloid goiter cytologically was diagnosed as follicular adenoma in surgical specimen; while a case of abscess turned out to be benign lymphoepithelial cyst histologically. The one histopathologically diagnosed case of fungal lymphadenitis was diagnosed as reactive lymphadenitis cytologically. The overall sensitivity of FNAC in diagnosing the neck masses is 66.7% with positive predictive value of 100%.

Table 5. Distribution of soft tissue lesions.

Soft tissue lesions	n (%)
Abscess	3 (25.0)
Lipoma	2 (16.7)
Benign cystic lesion	2 (16.7)
Epidermal cyst	1 (8.3)
Tuberculosis	1 (8.3)
Met. squamous cell carcinoma	1 (8.3)
Inconclusive	2 (16.7)
Total	12 (100)

Table 6. Comparison of cytopathological diagnoses with histopathological diagnoses.

Cytopathological diagnoses	Histopathological diagnoses											Total
	TB	TC	FA	PA	BLC	KFD	NHL	BCC	FL	FC	FLA	
RLN	0	0	0	0	0	0	0	0	0	0	1	1
TB	1	0	0	0	0	0	0	0	0	0	0	1
KFD	0	0	0	0	0	1	0	0	0	0	0	1
NHL	0	0	0	0	0	0	1	0	0	0	0	1
CG	0	0	1	0	0	0	0	0	0	0	0	1
FN	0	0	1	0	0	0	0	0	0	1	0	2
PA	0	0	0	1	0	0	0	0	0	0	0	1
BCL	0	0	0	0	0	0	0	1	0	0	0	1
TC	0	1	0	0	0	0	0	0	0	0	0	1
AB	0	0	0	0	1	0	0	0	0	0	0	1
IC	0	0	0	0	0	0	0	0	1	0	0	1
Total	1	1	2	1	1	1	1	1	1	1	1	12

TB: tuberculosis, TC: thyroglossal cyst, FA: follicular adenoma, PA: pleomorphic adenoma, BLC: benign lymphoepithelial cyst, KFD: Kikuchi-Fujimoto disease, NHL: non-Hodgkin lymphoma, BCC: branchial cleft cyst, FL: fibrolipoma, FC: follicular carcinoma, FLA: fungal lymphadenitis, RLN: reactive lymphadenitis, CG: colloid goiter, FN: follicular neoplasm, BCL: benign cystic lesion, AB: abscess, IC: inconclusive.

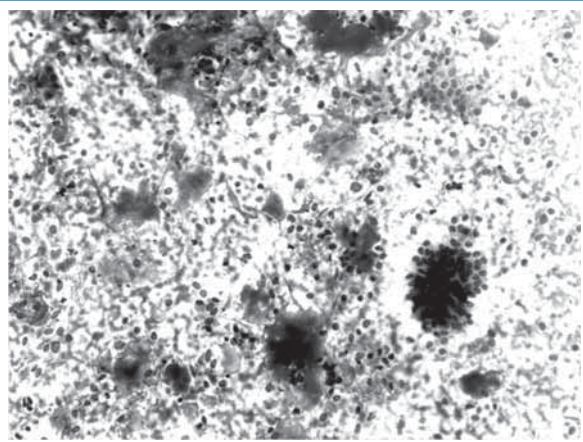


Figure 4. Pleomorphic adenoma. FNAC of salivary gland showing abundant myxoid stromal material and aggregates of benign epithelial cells. Giemsa stain, X200

DISCUSSION

In this study, FNAC was performed to find out relative frequencies of various pathologies in patients presenting with neck masses. All procedures are performed by pathologists without anesthesia. There were no contraindications in patients with co-morbidities and the procedure was performed without complications, as described in the literature.⁴ However, the possible complications include bleeding, infections, nerve injury, swelling, and bruising.^{5,6} There was no evidence that the tumor spreads through the skin tract created by the fine hypodermic needle used in this technique.⁷

In addition, FNAC in neck lesions can be done even in children and its utility has been illustrated in numerous studies.⁸⁻¹¹ This study also included 10 cases of children with neck lymphadenopathy and 3 of them were diagnosed as tuberculosis and remaining cases as reactive lymphadenitis.

Fine needle aspiration from lesions with high blood content, necrosis and desmoplastic stroma yields little material resulting in inconclusive opinion.¹² There were nine inconclusive cases in this study as well and the reason may be the same.

The median age of the patients with neck masses was 37 years with a range of 7 to 82 years in this study and this finding is comparable to other studies.^{12,13} In this study, the majority of the patients were in the age group of 20-29 yrs as in the study of Rathod GB et al.¹² The female predominance is seen in this and other studies.^{13,14}

The most frequent cause of neck swelling is lymphadenopathy in this study (55.6%) and in study of

Jain M et al (81%).¹⁵ However, thyroid swelling is most common in other studies.¹²

The tuberculosis is the most common cause of neck lymphadenopathy in this and other studies.^{12,13} However, reactive lymphadenitis is commonest cause of neck lymphadenopathy in pediatric population.¹⁵ Hag et al. carried out a similar study in Saudi Arabia over a period of 5 years which included 225 patients which showed reactive/non-specific lymphadenitis to be the commonest cause of neck masses accounting for 33% of cases.¹ As in the study of el Hag, et al. metastatic carcinoma is the next common following tuberculous and reactive lymphadenitis in this study. Its frequency is 9.2%, which is comparable to 13% of the study of el Hag et al. However, Cheng et al in similar study in Auckland found malignancy to be the cause in 50% cases.¹⁶ The primary sites were lung, larynx and breast in this study.

Kikuchi-Fujimoto disease as a cause of neck lymphadenopathy was not mentioned in many studies of Indian subcontinent and Arabian region. In this study, this disease comprises 6.2% of cases and it is more common than Non-Hodgkin lymphoma. This may be due relatively high prevalence of this disease in Nepal in comparison with other countries of Indian subcontinent.

In thyroid gland, the most common diagnosis is colloid goiter in this study and this finding is comparable to other studies.¹⁵ In soft tissue, Jain M et al¹⁵ found that vascular hamartoma is the commonest diagnosis, while abscess is the commonest one in ours. Salivary gland lesions were very few in this study and the diagnoses were pleomorphic adenoma and Warthin's tumor.

FNAC diagnoses were compared with histopathological diagnoses in 12 cases and it matched in 8 out of 12 cases with a sensitivity of 75%.

CONCLUSION

FNAC is a simple, quick, inexpensive and minimally invasive technique to diagnose different types of neck swellings. Lymphadenopathy is commonest cause of neck mass, followed by thyroid gland & soft tissue swellings. Tuberculosis is the most common diagnosis of neck masses, followed by colloid goiter. This technique differentiates inflammatory lesions and benign neoplasm from malignancy and it is pretty accurate. In addition, FNAC alone is helpful to avoid unnecessary surgeries and in general clinical management such as antibiotic treatment or neoadjuvant chemo-therapy. Thus, FNAC is recommended as a first line of investigation in the diagnosis of neck masses.

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