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A comparative study of Fine Needle Aspiration Cytology and Histopathology reports among the cases of Neck masses attending tertiary care centre, Maharashtra, India

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Abstract

Background: *The most common challenge to otolaryngologist in managing neck masses is to get accurate diagnosis so as to decide clinical management including surgical intervention. Though the various tests like USG neck, FNAC, CT Neck, and excision biopsy are available but the sensitivity and specificity varies from test to test. FNAC with its minimal invasive procedure has been helpful in the diagnosis of various swelling. The purpose of this study is to determine the accuracy of FNAC in diagnosis by comparing with the histopathological reports among the cases with neck masses.*

Methods: *The present prospective hospital based study carried out at ENT department during year Jan 2013-June 14 among the cases of palpable neck masses of all age group. Cases underwent FNAC and subsequently histopathological examination was done. All the collected data was entered, cleaned and analyzed using the Microsoft Excel 2010.*

Results: *A total of 85 cases studied. 29(34.1%) of neck swelling was in >18-40 age group. 62.4% of neck swelling were in females. Pain (24.7%), dysphagia (22.3%) most common symptoms associated with swelling. 34(40%) were thyroid swelling, 24(28.2%) lymph node swelling. Overall FNAC reports have shown Sensitivity (71.45), Specificity (97.1%) & diagnostic Accuracy (91.7%) as correlated with HPE reports. 75% & 94.1% of sensitivity and accuracy observed for FNAC in Thyroid swelling. 71.4% and 100% sensitivity observed among LN swelling & Salivary gland swelling respectively with FNAC report.*

Conclusion: *FNAC is quick, convenient, safe and reliable technique in diagnosis of neck masses with good accuracy specially in thyroid and salivary gland swelling.*

Keywords: *FNAC, Histopathology, Neck mass, Sensitivity, Accuracy.*

INTRODUCTION

The lump or mass in the neck region varies from inflammatory to neoplastic is routinely presented to the otolaryngologist in clinical practice. The

most common neck masses are enlarged lymph nodes and thyroid nodules, parotid and other salivary glands.¹ Clinical examination of neck has false positive result of between 20-30% and false

negative rate 30-40%.² It becomes challenge to decide clinical management including surgical intervention for the neck mass. Though the various tests like USG neck, FNAC, CT Neck, and excisional biopsy are available but the sensitivity and specificity varies from test to test. Fine Needle Aspiration Cytology (FNAC) with its minimal invasive procedure has been helpful in the diagnosis of various swelling.³

FNAC is safe, inexpensive procedure with a quick results and excellent patient compliance.⁴ FNAC is particularly helpful in the workup of cervical masses and nodules as biopsy of cervical adenopathy should not be done until all diagnostic modalities have failed to establish diagnosis.⁵ The studies^{6,7,8} conducted by various authors found FNAC has sensitivity(52.6%-97%), specificity(86.6%-100%) and accuracy(79.1%-91.6%). Hence the purpose of this study is to determine the accuracy of FNAC in diagnosis of neck mass by comparing with the histopathological reports among the cases with neck masses.

MATERIALS AND METHODS

The present prospective hospital based study carried out at ENT department of a tertiary care centre of a Government Medical College, Maharashtra during year Jan 2013-June 14.

The study included cases of palpable neck masses of all age group irrespective of gender and willing to participate. Cases with Acute neck space infection, non palpable neck masses, not willing to participate were excluded. Approval of Institutional ethical committee was taken prior to study.

Clinicodemographic profile of the cases recorded. FNAC procedure as per protocol was performed as per the protocol. Subsequently, all the cases were subjected for surgery either incisional or excisional biopsy. The biopsy material was sent to the department of pathology for HPE. The cytological features of all cases were reviewed with corresponding histopathology features.

All the collected data was entered, cleaned and analyzed using the Microsoft Excel 2010. Percentage analysis and Sensitivity, Specificity, and diagnostic accuracy have been of FNAC was calculated with the HPE findings.

RESULTS

A total of 85 cases included between January 2013 to June 2014 those who have done both the FNAC and HPE.

Table 1 shows the clinic demographic profile of the cases. 29(34.1%) of neck swelling was in >18-40 age group followed by 18(21.1%) & 16(18.8%) in >60 yrs and >40-60 yrs age group. In our study 62.4% of neck swelling was in females. The thyroid swelling and other neck swelling were also common in female than male, while lymph node and salivary gland swelling were common in male than female(64% and 65% respectively in male). The symptoms associated with swelling includes pain (24.7%), dysphagia (22.3%), wt loss(9.4%), fever (7.5%), hoarseness of voice (4.7%). In our study midline neck swellings were 42% followed by submandibular region (21.3%) and upper cervical(14%). Tenderness was seen among the 21.1 % of swelling. 75.2% were firm swelling.

Table 2 shows that 34(40%) were thyroid swelling, 24(28.2%) lymph node swelling, 15(17.6%) salivary gland swelling and 12(14.2%) other neck swelling. 23(68.2%) of FNAC reports of thyroid swelling were similar with the HPE report. 18(75%) of the FNAC report was similar with the HPE report from the 24 lymph node swelling. Out of 15 swelling of salivary gland, 13(86.6%) of FNAC report similar with the HPE report. 06(50.0%) of the FNAC report was similar with the HPE report among the 12 neck swelling.

Table 3 shows sensitivity, specificity and accuracy of FNAC report for diagnosing malignancy with HPE reports. Overall FNAC reports have shown Sensitivity (71.45), Specificity (97.1%) & Accuracy (91.7%) to diagnosis of benign and malignant lesions similar with Histopathology

reports. FNAC conducted among the thyroid swelling shown 75%, 96.6% and 94.1% of sensitivity, specificity and accuracy when compared with HPE reports. 71.4%, 100.0% and 91.3% of sensitivity, specificity and accuracy observed respectively with FNAC report among

LN swelling. Salivary gland swelling has shown 100.0%, 92.3% and 93.3% of sensitivity, specificity and accuracy with FNAC report respectively. 91.6% of accuracy was observed with FNAC report among neck swelling.

Table 1: Clinico-demographic profile of the cases with Neck mass. (n=85)

Sr No.	Variables	Numbers(Percentage)	
1	Age(yrs)	<12	09 (10.5)
		>12-18	13 (15.2)
		>18-40	29 (34.1)
		>40-60	16 (18.8)
		>60	18 (21.1)
2	Gender	Male	32 (37.6)
		Female	53(62.4)
3	Clinical symptom	Swelling	85(100)
		Pain	21(24.7)
		Dysphagia	19(22.3)
		Hoarseness	04(4.7)
		Fever	06(7.5)
		Wt loss	08(9.4)
		Palpitations	05(5.8)
4	Anatomical site	Submental	03(3.5)
		Submandibular	18(21.3)
		Upper cervical	14(16.4)
		Mid cervical	02(2.4)
		Lower cervical	03(3.5)
		Posterior triangle	09(10.5)
		Midline neck	36(42.4)
5	Tenderness	Yes	18(21.1)
		No	67(78.9)
6	Consistency	Soft	09(10.5)
		Firm	64(75.2)
		Hard	04(4.7)
		Flatulent	04(4.7)
		Cystic	02(2.3)
		Rubbery	01(1.1)

Table No. 02: FNAC report compared with the HPE for similarity.

Type of Swelling	Correlation with Result of Histopathology			Total(% of swelling)
	Matched	Unmatched	Inconclusive	
Thyroid	23(68.2)	11(31.8%)	0	34(40.0%)
Lymph node	18(75.0)	04(16.6)	2(7.4)	24(28.2%)
Salivary land	13(86.6)	01(6.7)	01(6.7)	15(17.6)
Other Neck	06(50.0)	05(41.6)	01(6.4)	12(14.2)
Total	60(70.5%)	21(24.7%)	04(6.9%)	85

Table No 3: Sensitivity Specificity and diagnostic accuracy of FNAC for the various neck masses

Sir No	Swelling	FNAC results	HPE results		Sensitivity To FNAC (TP/TP+FN X100)	Specificity to FNAC (TN/TN+FPX100)	Accuracy to FNAC (TN+TP/Total NO.X100)
			Malignant	Benign			
1	Thyroid	Malignant Benign	3(TP) 1(FN)	1(FP) 29(TN)	75	96.6	94.1%
2	Lymph Node swelling	Malignant Benign	5(TP) 2(FN)	0(FP) 16(TN)	71.4	100.0	91.3%
3	Salivary Gland swelling	Malignant Benign	2(TP) 0(FN)	1(FP) 12(TN)	100.0	92.3	93.3%
4	Other neck swelling	Malignant Benign	0(TP) 1(FN)	0(FP) 11(TN)	0	0	91.6%
5	Total	Malignant benign	10(TP) 4(FN)	2(FP) 68(TN)	71.43%	97.1%	91.7%

DISCUSSION

The present study was carried out at the department of ENT located at tertiary care hospital of a Government Medical College, Maharashtra. A total of 85 cases clinically evaluated during study period. It is prime important to get diagnosis of neck mass before intervention for clinical management.

In our study, Maximum number of patients (34.1%) were between the age group >18 -40 years i.e. young adults followed by >60 yrs of age with 21.1%. Females reported maximum swellings in neck i.e.62.4%. (42 Tariq ahmed;68% female)thyroid swelling more common among females while lymph node N salivary gland swelling more common in male. These findings similar with other studies.^{9, 10} Maximum swellings were in midline neck (43%). Swelling associated with symptoms majority has pain (24.7%), dysphagia (22.3%), and wt loss (9.4%), and fever (7.5%), hoarseness of voice (4.7%). Tenderness was seen among 21.1% & firm (75%).

We found thyroid swelling (40%) more commonly followed by lymph node swelling (28.2%). Chatham Steal, Rather Dharmendra¹¹ observed maximum 51% of lymph node swelling. This difference may be because of geographical variation. On comparison of FNAC reports with the HPE reports, Salivary gland swelling report for FNAC has shown maximum (86.6%) correlation with HPE reports followed by thyroid

swelling having 75% correlates with HPE report. Kagheswar Rout et al¹⁰ found 31 out of 32 FNAC reports correlating with HPE reports. In our study lower correlation (50%) was found for other neck swelling.

The overall sensitivity, specificity and diagnostic accuracy rate of FNAC in the diagnosis of neck masses was 71.43%, 97.1% and 91.7% respectively. Rajbhandari M et al¹² found 86%, 99% and 87.4% sensitivity, specificity and diagnostic accuracy rate in his study. Chuahan et al al¹³ found 93.1%, 100% and 98.4% sensitivity, specificity and diagnostic accuracy rate in his study. Tandon et al¹⁴ found al found 89.6%,96.5% and 93% sensitivity, specificity and diagnostic accuracy rate in his study. This finding more or less similar with our study except for sensitivity reported in our study is quite low. When evaluating test for its ability to identify patients with malignancy, the sensitivity is more important than the specificity since false negative report may encourage delay in further investigation or treatment. Needle aspiration has lower sensitivity than accuracy both in our study and in other reports. It cannot be over emphasized that fine needle aspiration is always a part of work up and not final diagnosis.

In present study, FNAC results for thyroid swellings shows sensitivity (75%), specificity (96.6%) and diagnostic accuracy (94.1%) suggest the utilization of FNAC as a diagnostic tool for

such a swelling. Rajbhandari M et al found highest degree of sensitivity (96%) in thyroid swelling among all neck mass. However, overall sensitivity for thyroid ranges from 55 to 97%.^{13, 14, 15, 16} the appropriate techniques for conducting FNAC improves the accuracy rate.

71.4%, 100% and 91.3% were the sensitivity, specificity and diagnostic accuracy for FNAC with Lymph node swelling. 2 samples were false negative among the lymph node swelling. Misinterpretation in the diagnosis of lymphadenitis and classification of lymphomas may be due to mixed population of lymphoid tissues and tangible body microphages. Germinal centres may be very large in some cases of reactive hyperplasia. If aspirates are obtained from such a large germinal centres, the increased number of large cells and increased mitosis may suggest it of malignancy.¹² Salivary gland swelling shows 100%, 92.3% and 93.3% of sensitivity, specificity and diagnostic accuracy for FNAC. Rajbhandari M et al¹² found 80% sensitivity and 100 % specificity with accuracy 75%. This may be because of cystic lesion of the salivary gland. Other neck masses have very low sensitivity and specificity for diagnosing with FANC as compared to HPE.

Difference in the specificity between our study and others may be due to differences in the method of aspiration of the neck lump. FNAC performed by with ultrasound guidance may improve the diagnostic value. The technique is difficult when small lesion, which tend to slip away from needle are encountered and when there is an excessive amount of fibrosis/ necrosis In addition, in large lesions there may well be a sampling error within the mass itself with different regions of the mass having different grades of pathology.

The study concludes that FNAC is quick, convenient, safe and reliable technique in diagnosis of neck masses with good accuracy especially in thyroid and salivary gland swelling. Though high sensitivity ,there are certain factors

which misinterprets results specially in lymph node swelling, use of clinical history correlation and further diagnostic tools USG,CT scan ,Biopsy are most useful information to surgeon to intervene the clinical management.

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