Original Article

A study of diagnostic accuracy of FNAC of neck swelling at tertiary health care centre

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Abstract

Background: The most common neck masses are enlarged lymph nodes and thyroid nodules, parotid and other salivary glands. **Aims and Objectives:** To Study diagnostic accuracy of FNAC of neck swelling at tertiary health care centre. **Methodology:** It was a cross-sectional study of 210 cases of palpable neck lesions from March 1998 to October 1999 at Chhatrapati Shivaji Maharaj general hospital and Dr.V.M medical college, Solapur. Any patients with palpable lesion of neck referred is selected and the aspiration is done in central clinical laboratory of pathology department. The procedure was first explained to the patient. **Results:** Accuracy rates % of Reactive lymphadenitis acute was 95.45%, Supp. Lymphadenitis was 100.00%, Tuberculous lymphadenitis was 95.00%, Metastatic tumours 85.71, non-Hodgkins lymphoma was 50.00% and Hodgkins disease was 100.00%. Colloid goiter was 91.34%, Thyroid cyst was 100.00%, Hashimotos thyroiditis was 100.00%, For Papillary carcinoma was 100.00%. Follicular adenoma was 100.00%.Accuracy rates % for Pleomorphic adenoma was 83.33% and for Monomorphic adenoma was 100.00%, Acute sialadenitis was 100.00% and for Chronic sialadenitis was 87.50%, for Lipoma-100.00 % for branchial cyst100.00%. **Conclusion:** The sensitivity and Specificity of Cytology in our study was found to be very high and also it varied as per the disease. It can be concluded from our study that routinely cytology can be used for the diagnostic purpose as accurate as the Histology.
Key Words: FNAC (Fine Needle Aspiration Cytology), Histology, Neck swelling.

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INTRODUCTION

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 falsenegative 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%).

MATERIAL AND METHODS

It was a cross-sectional study of 210 cases of palpable neck lesions from March 1998 to October 1999 at Chhatrapati Shivaji Maharaj general hospital and Dr. V.M medical college, Solapur. Any patients with palpable lesion of neck referred is selected and the aspiration is done in central clinical laboratory of pathology department. The procedure was first explained to the patient. Once the patients confidence was gained, the patient was made to assume a suitable position, depending upon the site of the swelling. The clinical findings were used in selection of the swellings. Labeled glass and the fixative were kept ready. The procedure of

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fine needle aspiration was performed using the technique descried by A. Johnwebb (1982).The material used in performing the FNAC were Sterile disposable needles 22 to 23 gauge and 1.5 inches long, 10 C.C. plastic Disposable syringes were used. Standard, clean dry grease free slides (75mm x 25mm) were used along with standard size coverslips (22Sq.Mm)**.** The fixative was made up of equal amounts of ether and alcohol. The aspirated material was spread on slide with the help of another slide and then clipped in to the fixative immediately to avoid air drying. Minimum three slides were prepared. The smears were allowed to fix for at least 30 minutes and that stained by papanicoloau's staining method (George N. papanicoloau, 1945) or by H and E method (L.G. Koss *et al* 1992).One was kept aside without staining wherever possible in order to perform stains like ziehl-neelson stain or any special stain, if required. After aspiration with needle few specimens are surgically removed whenever necessary. These are fixed in 10% formalin and are processed in histopathology section to obtain H and E stained section for histopathological study.

RESULTS

Table 1: Correlation of histologic and cytologic diagnosis in relation to lymph node swellings

Histological diagnosis	No of cases	Cytological diagnosis							Accuracy rates %
		Reactive lymphadenitis	Acute supprative Lymphadenitis	Tuberculuslympha-denitis	Metastatic tmours	Non-hodgkins lymphoma	Hodkins disease	Suspicious of malignancy	
Reactive lymphadenitis acute	22	21	0	0	0	1	0	0	95.45
Supp. Lymphadenitis	5	0	5	0	0	0	0	0	100.00
Tuberculo us lymphadenitis	20	1	0	19	0	0	0	0	95.00
Metastatic tumours non-	7	0	0	0	6	0	0	1	85.71
Hodgkins lymphoma	2	1	0	0	0	1	0	0	50.00
Hodgkins disease	1	0	0	0	0	0	1	0	100.00
Total	**57**	**23**	**5**	**19**	**6**	**2**	**1**	**1**	**93.00**

Accuracy rates %of Reactive lymphadenitis acute was 95.45%, Supp. Lymphadenitis was 100.00%, Tuberculous lymphadenitis was 95.00%, Metastatic tumours85.71, non-Hodgkins lymphoma was 50.00% and Hodgkins disease was 100.00%.

Table 2: Correlation of histologic and cytologic diagnosis in relation to thyroid swellings

Histologic diagnosis	No of cases	Cytologic diagnosis					
		Colloid goitre	Thyroid cyst	Benign thyroid lesion	Hashimotos thyroiditis	Papillary carcinoma	Accuracy rate %
Colloid goiter	23	21	0	2	0	0	91.34
Thyroid cyst	3	0	3	0	0	0	100.00
Follicular adenoma	1	0	0	1	0	0	100.00
Hashimotos thyroiditis	1	0	0	0	1	0	100.00
Papillary carcinoma	1	0	0	0	0	1	100.00
Total	**29**	**21**	**3**	**3**	**1**	**1**	**89.65**

Colloid goiter was 91.34%, Thyroid cyst was 100.00%, Hashimotos thyroiditis was 100.00%, For Papillary carcinoma was 100.00%. Follicular adenoma was 100.00%.

Table 3: Correlation of histologic and cytologic diagnosis in relation to salivary gland swellings

Cytological diagnosis				No of cases	Histological diagnosis	Accuracy rates %
Pleomorphic adenoma	Monomorphic adenoma	Acute sialadenitis	Chronic sialadenitis			
5	1	0	0	6	Pleomorphic adenoma	83.33
0	0	1	0	1	Monomorphic adenoma	100.00
0	0	0	1	1	Acute sialadenitis	100.00
5	1		1	8	Chronic sialadenitis	87.50

Accuracy rates % for Pleomorphic adenoma was 83.33% and for Monomorphic adenoma was 100.00%, Acutesialadenitis was 100.00% and for Chronic sialadenitis was 87.50%.

Table 4: Correlation of histologic and cytologic diagnosis of other swellings in neck

Cytological diagnosis		No of cases	Histological diagnosis	Accuracy Rates %
Lipoma	Branchial cyst			
1		1	Lipoma	100.00
		1	branchial cyst	100.00
1	1	2		100.00

In this group only two cases are studied histologically, of which both the cases were diagnosed correctly on cytology giving the accuracy rate of 100% False negative rate: Of 96 cases studied in group a only two cases were found to have been reported as false negative giving false negative rate of 2.08%. No false positive cases were reported in our study.

DISCUSSION

FNAC has emerged as a sensitive, specific, and cost-effective tool to diagnose cervical lymphadenitis.[9] Evaluation of a patient with neck mass should always begin with a thorough history, followed by a complete head and neck examination. If the physical examination does not explain the neck mass, a fine needle aspiration (FNA) of the mass may be performed. The role of FNAC in the investigation of lymphadenopathy has previously been established by a number of studies.[10-14] In lymph node group of 52 case reported cytologically 47 cases found to be correctly reported on comparison with histology giving an overall accuracy rate of 93.00%[1]. Reactive Lymphadenitis: Twenty two cases of reactive lymphadenitis were found on biopsy, of these 21 cases were proved to be correctly labeled on cytology, with accuracy rate of 95.45% one case diagnosed as reactive lymphadenitis on cytology was proved to be a case of non hodkins lymphoma on biopsy. The smears contained mixed population of lymphocytes and predominant cells were lymphocytes. The smear pattern was mimicking that of reactive lymphadenitis. This led to the mistaken diagnosis of reactive lymphnode.2.acute suppurative lymphadenitis: Five cases diagnosis as acute suppurative lymphadenitis on cytology were followed up by biopsy which proved the aspiration diagnosis to be correct in all five cases giving an accuracy rate of 100%3. tuberculous lymphadenitis: 20 cases of tubercular lymphadenitis were diagnosed on biopsy. Of these 20 cases 19 cases were found to be correctly reported on FNAC with an accuracy rate of 95% one cases of tuberculus lymphadenitis was labeled as reactive lymphadenitis on cytology. The smear contained mixed population of lymphocytes with predominance of small lymphocytes, pale histiocytes and endothelial cell. The smear pattern was mimicking that of reactive of lymphadenitis. This led to the mistaken diagnosis of reactive lymphnode.4.metastatic tumour: 7 cases of metastatic tumous were diagnosed on biopsy. Of these 6 cases were found to be correctly labeled on cytology with an accuracy rate of 85.71%. Further subtyping of the metastatic tumous were not done cytologically and reported as only positive for malignancy.5.hodgkin's disease. One case of hodgkins disease was diagnosed on histological examination as hodgkins disease mixed cellularity type, which was found to be correctly labeled on cytology. 100% correlation was seen in this case From Table 2: lesions of thyroid gland, of cases reported cytologically 26 cases found to be correctly diagnosis on comparison with histology giving an accuracy rate of 89.65% 1. Colloid Goiter:23 cases of colloid goiter were found on biopsy, of these 21 cases were proved to be correctly labeled on cytology with accuracy rate of 91.34%. 2 cases were diagnosed diagnosis as only benign thyroid lesion showed variable amount of colloid and follicular cell clusters. On cytological smears exact typing was not possible and so tabelled as only benign thyroid lesion. 2. Hashimotos thyroiditis: Only one case of hashimotosthyroidits was on histologic examination which was correctly labeled on cytology. 100% correlation was seen in this case. 3.Thyroid cyst:3 cases of thyroid cyst were diagnosed on histology. All the 3 cases were proved to be correctly diagnosis on cytology giving accuracy rate of 100%. Follicular adenoma: One case of follicular adenoma was diagnosed on histology. On cytology this case was diagnosed as benign thyroid lesion. Thus exact subtyping was not possible. The smear showed scanty amount of colloid and many scattered follicular cell clusters and askanazy cell change at places. Thus considering the benignity of lesion the cytohistological accuracy was 100%. Papillary carcinoma: Only one case of papillary carcinoma was diagnosed on histologic examination which found to be correctly labeled on cytology. 100% correlation was seen in this case Thus all the benign lesions on cytology were found benign on histological examination. The one carcinoma diagnosed on cytology was also diagnosed as carcinoma on histological examination. So the cytohistological accuracy was 100% for benign and malignant lesions. In Table 3: the group of lesions of salivary gland, of 8 cases reported cytologically 7 cases were found to be correctly diagnosed on comparison with histology giving an accuracy rate of 87.50%1. Pleomorphic adenoma: 6 cases of pleomorphic adenoma were found on biopsy, of these 5 cases were proved to be correctly diagnosed on cytology with accuracy rate of 83.33%. One case diagnosed as monomorphic adenoma on cytology was turned out to be

pleomorphic adenoma on histology. The smear contained numerous epithelial cell clusters with few dissociated cells. The nuclei were round to oval and regular, small amount of homogenous stromal tissue was seen. The smear pattern mimicked that of monomorphic adenoma and this led to a mistaken diagnosis.2. acute sialadenitis: One case of acute sialadenitis was diagnosed on histologic examination and was found to be correctly labeled on cytology. 100% correlation was seen in this case.3. chronic sialadenitis: only one case was diagnosed as chronic sialadenitis on histology with 100% correlation on cytology. From Table 4: In this group only two cases are studied histologically, of which both the cases were diagnosed correctly on cytology giving the accuracy rate of 100% False negative rate: Of 96 cases studied in group a only two cases were found to have been reported as false negative giving false negative rate of 2.08%. No false positive cases were reported in our study. These findings are similar to Amit Patil[15] they found 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%) and 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 and Salivary gland swelling respectively with FNAC report.

CONCLUSION

The sensitivity and Specificity of Cytology in our study was found to be very high and also it varied as per the disease. It can be concluded from our study that routinely cytology can be used for the diagnostic purpose as accurate as the Histology.

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