ORIGINAL ARTICLE

FINE NEEDLE ASPIRATION CYTOLOGY OF NECK LESION- AN EXPERIENCE AT TERTIARY CARE HOSPITAL IN CENTRAL GUJARAT

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ABSTRACT

Introduction: Fine needle aspiration cytology has become a rapid, cost effective investigative method for obtaining reliable tissue diagnosis especially for the sites like neck where considerable overlapping of various structures makes it difficult to reach to exact diagnosis.

Objective: Present study was taken up to evaluate role of FNA in management and diagnosis of various neck lesions and to compare FNA with conventional biopsy for providing correct tissue diagnosis.

Method: Total 641 cases of neck lesions were subjected to FNA and out of these, 71 were further subjected to conventional surgical biopsy and results were correlated histologically. FNACs were performed in outpatient department of a tertiary care hospital by 23-24 gauge needle and 10 ml syringe.

Results: Out of total 591 satisfactory smears, there were 140 thyroid lesions, 20 salivary gland lesions, 400 lymphnode lesions, 31 cystic lesions of neck. The overall sensitivity, specificity, accuracy, positive predictive value and negative predictive value of FNA for neck lesions were 93.1%, 100%, 98.4%, 90.1% & 100% respectively.

Conclusion: Thus, this study concludes that FNAC is quite sensitive, specific, accurate investigative procedure with very good patient compliance. Use of FNAC should be encouraged as an investigation for initial diagnostic evaluation of neck lesions and as a tool to avoid unnecessary surgical procedures and its complications.

Key words: Aspiration, Lymphnode, Histologically, FNAC

INTRODUCTION

Neck lesions often pose a challenging diagnostic problem to the clinician. A variety of inflammatory and neoplastic diseases involving the diverse neck structures may present as visible neck lesions. Inspite of easy accessibility & because of considerable anatomic overlap of the various neck structures, the accuracy of clinical diagnosis approaches only 50%. The accurate identification of the lesion is very essential for the proper management of patients. Radiology does not always help & may not be cost effective. Although biopsy gives reliable tissue diagnosis, it carries the complications of surgical intervention, may require hospitalization &it leaves behind unsightly scars.

It was Kun (1847) who realized for the first time that tissue samples obtained through syringe and needle could be utilized for the diagnosis of malignancy. FNAC is now established as a rapid, reliable, cost effective and excellent alternative method of obtaining tissue diagnosis with good patient acceptance to decide best line of management both in benign and malignant diseases.

The present study has been taken up to evaluate role of FNAC as a primary investigation in diagnosis and management of the considerable spectrum of palpable lesions that occur in neck region. Objectives of the study were: 1) To find out the suitability & reliability of FNAC in the diagnosis & management of neck lesions. 2) To evaluate the possibility of FNAC replacing conventional biopsy totally by providing correct tissue diagnosis.

MATERIAL & METHOD

Six hundred and forty-one patients with neck lesions were subjected to FNAC. FNA were performed by the cytologists in the cytology OPD of the pathology department, in a tertiary care hospital attached to medical college. Out of 641 cases, 71 were also subjected to conventional surgical biopsy and correlated histologically.

The material was obtained by using a 2.5 cm long, 23-24 gauge needle attached to a 10 ml disposable syringe. From the aspirate multiple smears were prepared. The smears were immediately fixed with ether-ethanol mixture & stained by haematoxylin and eosin and pap stain.

OBSERVATION

The present study consists of 641 (23%) FNA from neck lesions, studied cytologically during a period of one year, out of total of 2756 FNAS from various body sites examined. Out of total 641 neck lesions, 591(92.2%) smears were satisfactory and only 50(7.8%) were unsatisfactory.

Among these 591 satisfactory smears, Thyroid Lesions were 140 (23.6%), Salivary Gland Lesions were 20 (3.4%), Lymphnode Lesions were 400 (67.8%) and Cystic Lesions were 31 (5.2%)(Table 1).

Table 1: Distribution of samples according to different lesions (n=591)

	Malignant	Benign	Total
Thyroid Lesion	8 (5.7)	132 (94.3)	140
Salivary Gland Lesion	3 (15.0)	17 (85.0)	20
Lymphoid Lesion	33 (8.3)	367 (91.8)	400
Cystic Lesion of Neck	1 (3.2)	30 (96.8)	31
Total	45 (7.6)	546 (92.4)	591

Table 2: Distribution of subjects according to Various Neck Lesions

Name Of Lesions	Cases (%)
Thyroid Lesions(total 140 cases):	
Goitres (diffuse and nodular)	119 (85)
Thyroiditis	7 (5)
Benign follicular lesions	6 (4.8)
Follicular neoplasm highly suspicious of malignancy	1 (0.7)
Papillary carcinoma	5 (3.1)
Medullary carcinoma	2 (1.4)
Salivary Gland Lesions(total 20 cases):	
Chronic Sialadenitis	9 (45),
Pleomorphic Adenoma	6 (30)
Warthin's Tumor	2 (10)
Mucoepidermoid	1 (5)
Suspicious of Malignancy	2 (10)
Lymphnode Lesions (total 400 cases):	
Chronic Nonspecific Lymphadenitis	180 (45)
Tuberculous Lymphadenitis	170 (42)
Suspicious of Tuberculosis	15 (3.7)
Toxoplasmosis	2 (0.5)
Hodgkin's Lymphoma,	2 (0.5)
Non- Hodgkin's Lymphoma	3 (1)
Metastatic Carcinoma	29 (7)
Cystic Lesions (total 31cases):	
Thryoglossal Duct Cyst	21 (81)
Brachial Cleft Cyst	2 (3)
Cystic Hygroma	2 (6.4)
Dermoid Cyst	2 (3)

Among these, 546(92.3%) were Benign lesions and 45(7.8%) were Malignant. Among 140 Thyroid lesions 132(94.3%) were Benign & 8 (5.7%) were Malignant. Among 20 Salivary Gland lesions 17(85%) were Benign and 3 (13%) were Malignant. Among 400 Lymphnode lesions 367(91.8%) were Benign and 33 (8.2%) were Malignant. Among 31 Cystic lesions 30(96.8%) were Benign and 1 (3.2%) was Malignant(table 1). 520 (88.1%) cases were treated conservatively and in 71 cases histopathological correlation was done.

Among the studied neck lesions maximum lesions were of thyroid. Goitres (diffuse and nodular) were the predominant lesions seen. Among malignant thyroid lesions, papillary carcinomas were the predominant. Among salivary gland lesions, maximum were chronic inflammatory lesions. among the benign salivary gland neoplasms, pleomorphic adenomas (6 cases) were common followed by 2 cases of warthin's tumor. A single case of mucoepidermoid carcinoma was detected. Reactive non specific lymphadenitis were the main lymphnode lesions seen followed by tuberculosis. Metastatic carcinoma were the main finding in malignant lymphnode lesions followed by 3 cases of non- hodgkin lymphoma and 2 cases of hodgkin lymphoma.

Table 3: Comparison of Cytological finding and Histopathological findings (n=71)

	Not Concurred with Cytological Diagnosis	Concurred with Cytological Diagnosis
Thyroid Lesion	5	15
Salivary Gland Lesion	1	7
Lymphoid Lesion	0	35
Cystic Lesion of Neck	1	7
Total	7	64

In only 71 (12%) cases histological correlation was available. Among these 64 (90.1%) concurred with cytological diagnosis and rest 7 (9.8%) cases differed. 20 cases of thyroid lesions were correlated, 75% cases concurred and 25% not concurred with cytological diagnosis. Only 8 cases of both salivary gland and cystic lesions were correlated, 7(87.5%) concurred and 1 (12.5%) not concurred. In lymphnode lesions all the 35(100%) lesions correlated histologically.

Table 4: Sensitivity and Specificity of FNAC for various lesions

	Sensitivity (%)	Specificity (%)	Accuracy (%)
FNAC of Neck Lesion	93.1	100	98.4
Thyroid FNAC	90.0	100	86.4
Salivary Gland FNAC	89.8	100	90.0
Lymphnode FNAC	100	100	100
Cystic Lesion FNAC	89.8	100	93.0

In our study 45 cases were malignant. 40 cases were detected cytologically making sensitivity rate of FNA 93.1%. None of the benign lesions was misdiagnosed as malignant making specificity rate 100%. 584 cases (benign as well as malignant) were diagnosed correctly making accuracy rates 98.4 %.(table 4). Positive and negative predictive values were 100% and negative predictive value 90.1%.

In the above table comparison of sensitivity, specificity and accuracy of FNA in diagnosis of individual neck lesion is also shown. For thyroid lesions sensitivity is 90%, specificity 100% and accuracy 86.4%. For salivary gland lesions sensitivity, specificity and accuracy were 89.8%, 100% and 90% respectively. For lymphnode lesions all these 3 parameter were 100%. For cystic lesions of neck sensitivity, specificity and accuracy were 89.8%, 100% and 93% respectively.

DISCUSSION

FNAC has become an invaluable diagnostic tool to the clinician who depends on tissue diagnosis to decide on the best line of patient management especially in malignant diseases. The present study was taken up to evaluate the role of FNAC in the management of the considerable spectrum of lesions that occur in the neck region. Total 641 patients with neck lesion were subjected to FNAC.

Out of 641 patients only in 50(7.8%) cases smears were unsatisfactory and remaining 92.2% smears were satisfactory. This is comparable to Nail Tariq et al 2005[1] where the rate of satisfactory smears was 96%. Satisfactory smears were the primary requisite to achieve high degree of accuracy in cytological diagnosis. The smears were unsatisfactory when there is inadequate material or distortion of cytomorphology might be due to faulty fixation or due to smearing artefact.

Table 5: Comparison Of Sensitivity, Specificity And Accuracy of Present Study With Other Similar Studies.

	Cases	Sensitivity	Specificity	Accuracy
S. Tandon et al, 2008[2]	3459	89.6%	96.5%	93.1%
El. Hug et al,2003[3]	225	98%	100%	95%
Mobley et al[4]	89	96.6%	97.7%	94.4%
Present study	641	93.1%	100%	98.4%

The efficacy of FNA can be judged by its ability to detect the malignant lesions correctly. Various parameters like sensitivity, specificity and accuracy rates are used to gauge this. The sensitivity, specificity & accuracy rates found in present study can be compared as following.

Total 140 cases with thyroid pathology were examined cytologically. Out of 140, 132 were benign and 8 were malignant. Among these 140 cases, 120 treated conservatively based on cytological diagnosis, and 20 cases were treated surgically and correlated histologically. Out of these 20 cases, 15 cases (6 goitres, 2 thyroiditis, 3 benign adenoma, 3 papillary carcinoma, 1 medullary carcinoma) were confirmed histologically. Among remaining 5 cases, 2 follicular adenomas and 2 papillary carcinomas were missed within multinodular goitres and latter on detected within histological specimen. A single case of medullary carcinoma was missed diagnosed as a benign adenoma. Thus, out of total 20 cases 3 malignancies were missed cytologically, making sensitivity of FNAC for thyroid lesions 85%. Out of Total 140 cases, 135 cases (benign and malignant) diagnosed accurately, making accuracy rate of FNAC 96.2%. No false positive case, thus specificity is 100%. In different literature, overall sensitivity for thyroid lesion ranges from 55% to 97%, and the range of specificity is 76% to 100%.[5,6,7.]

Out of total 20 cases, 12(60%) cases were treated conservatively, and in 8 cases surgical biopsy was followed. Among these 8 cases, 2 cases of chronic sialadenitis, 1 pleomorphic adenoma, 1 Warthin's tumor, 1 mucoepidermoid carcinoma were confirmed histologically. Out of 2 cases of suspicious of malignancy on cytology, one was mucoepidermoid carcinoma and another was pleomorphic adenoma with squamous malignancy on histological examination. A single case of mucoepidermoid carcinoma was misdiagnosed as plemorphic adenoma. Thus, out of 8 cases correlated histoloigically, only one malignant case was missed cytologically making sensitivity of FNA 87.5%. Among 20 cases 19 cases (benign and malignant) diagnosed accurately by cytological examination, thus accuracy is 95%. So, sensitivity, specificity and accuracy of FNAC for salivary gland lesions were 87.5%, 100% and 90.1%. These can be compared with, Costas et al[8].

Out of total of 400 lymphnode lesions, 365(91%) cases were treated conservatively based on cytological diagnosis & 35 (8.7%) cases biopsied subsequently. Out of these 35 cases, 5 cases with cytological diagnosis of highly suspicious of tuberculosis were histologically diagnosed as tuberculous lymphadenitis. In rest of the cases, 6 cases of tuberculous lymphadenitis, 19 cases of chronic nonspecific lymphadenitis, one case of non-Hodgkin's lymphoma low grade and 4 cases of metastatic carcinoma the histological diagnosis concurred with the cytological diagnosis. Thus, sensitivity, specificity and accuracy of FNAC for lymophnode lesions were 100%. These were much higher than those obtained by Akinde et al[9], 2011.

Out of total 31 cases, 24 (77%) cases treated conservatively & 8 (23%) cases correlated histologically. Among these 8 cases, one case with a cytological diagnosis of thyroglossal cyst, was histopathologically diagnosed as papillary carcinoma of thyroid in a thyroglossal duct cyst. Similar finding was studied by Schneider R et al[10] . Thus, sensitivity of FNAC is 87.5%, accuracy is 96.8%, specificity is 100 %.

In present study, out of total cases, 71(12%) cases correlated histologically. Rest of 520(88%) cases treated conservatively based on cytological diagnosis (figure 2) and surgery could be avoided. Thus, FNAC is proved to be an effective diagnostic tool for preventing clinically misguided surgery.

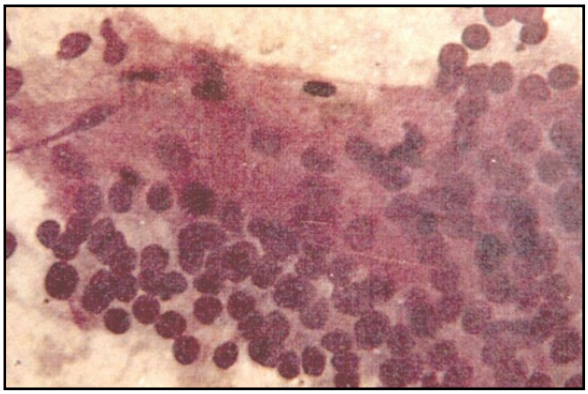

Fig 1: Thyroid FNA: Colloid Goitre showing cells in the background of brownish colour colloid & bare nuclei (H&E 100X)

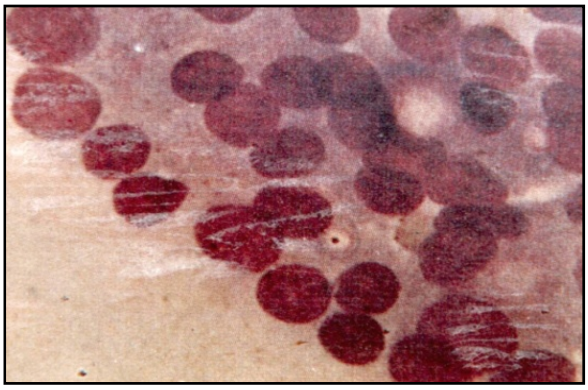

Fig 2: Thyroid FNA: Benign Thyroid follicular cells of uniform size and shape arranged in follicles (H &E, 400X)

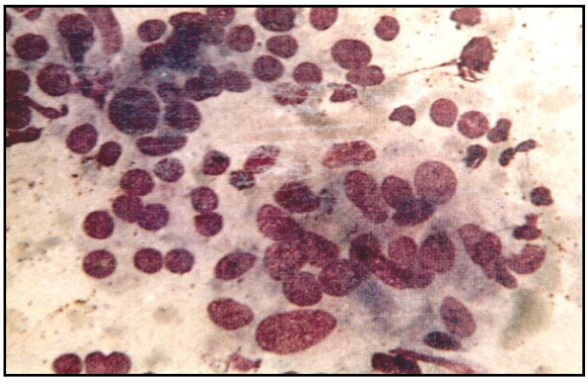

Fig 3: FNA Hashimoto's Thyroditis shows granuloma Composed of epitheliod cells and lymphocytes with benign thyroid cells in background (H &E, 400X)

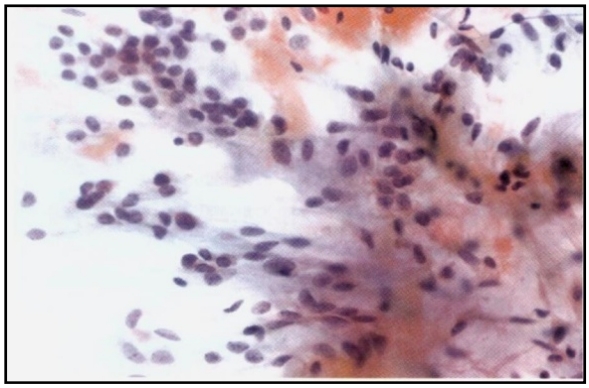

Fig 4: FNA Pleomorphic adenoma showing benign myoepithelial cells in clusters and sheets in back ground of chondromyxoid stromal material (Pap,100X)

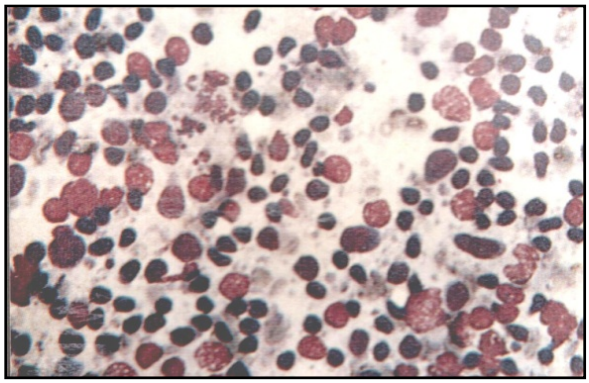

Fig 5: FNA Reactive Lymphadenitis: showing Reactive lymphocytes-centrocytes, centroblasts, plasma cells (H & E, 400X)

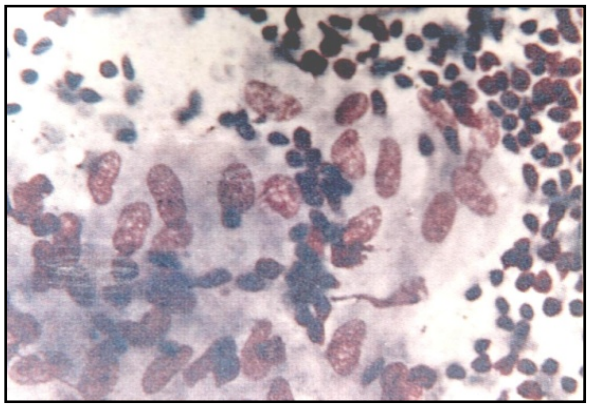

Fig 6: FNA Granulomatous Lymphadenitis showing epitheliod granuloma consisting of epitheliod cells, plasma cells, lymphocytes (H & E, 400X)

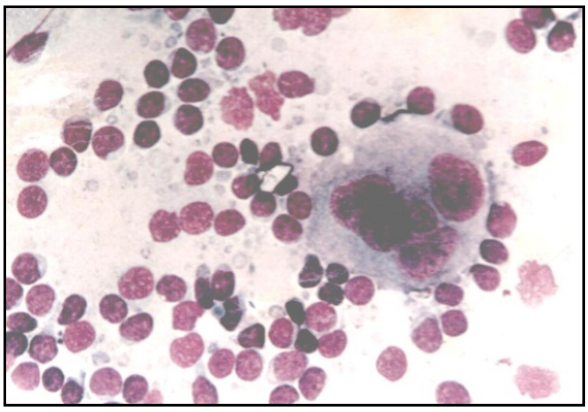

Fig 7: FNA Hodgkin's Lymphoma showing Reed-sternberg cell & Lymphocytes (H & E, 400X).

CONCLUSION

In the evaluation of head and neck lesions FNAC is established as a minimally invasive, cost effective and rapid diagnostic tool. It has a very high degree of patient acceptance because it does not cause any unsightly scars, inconvenient incision lines. It is an invaluable sensitive tool for the detection of malignant neck lesions and equally effective in the diagnosis of non-malignant lesions.

In the present study of 641 cases of neck lesions, 591 cases with satisfactory smears were examined. The overall sensitivity, specificity and accuracy rates of FNAC in the diagnosis of neck lesions as benign or malignant were 90.4%, 100% and 92.4% respectively, which it quite acceptable. In 88% cases surgery could be avoided based on cytological diagnosis.

But FNAC, being a blind and point investigative procedure may miss small focal lesions or may fail to sample representative area of the lesions, leading to diagnostic error. This may be overcome by using X-ray or USG guidance so that samples can be obtained from representative was of the lesions.

Conflict of interest- nil

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