ORIGINAL ARTICLE

ROLE OF FINE NEEDLE ASPIRATION CYTOLOGY (FNAC) IN NECK MASSES /CERVICAL LYMPHADENOPATHY

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Abstract

Objectives: To evaluate the accuracy and efficacy of fine needle aspiration cytology (FNAC) in neck masses / cervical lymphadenopathy.

Study Design: Cross-sectional study.

Place & Duration: This study was conducted at department of ENT / Head & Neck Surgery Liaquat National Hospital Karachi from April 2002 to July 2004.

Subjects and Methods: Total of 65 patients with neck mass / enlarged cervical lymph nodes were selected from out patients department. All patients were evaluated through detailed history, general physical and otolaryngology examination. Pathologist performed all FNAC procedures and postoperative specimens were also examined at histopathology department for histopathology diagnosis. All the FNAC results were correlated with final histopathology diagnosis. Frequencies and percentages were computed to FNAC & histological findings, and taking histopathology as gold standard criteria performed sensitivity, specificity and accuracy analysis.

Results: Out of 65 patients enrolled in the study, 43 were males and 22 were females, (M: F 2:1). Pathology wise 44 were benign and 21 were malignant. In 44 benign cases, 42 were true negative and 2 were false negative, while out of 21 malignant cases, 20 were true positive and 1 was false positive. Over all sensitivity was 90.0%, specificity 97.6% and accuracy 95.3%.

Conclusion: FNAC is reliable, safe and accurate test as first line for evaluation of neck masses/ cervical lymphadenopathy. It could differentiate the inflammatory and infective process from neoplastic one and avoids unnecessary surgeries.

Key words: FNAC, Neck Masses, Cervical Lymphadenopathy.

INTRODUCTION

Cervical lymphadenopathy is a common problem, seen by the clinicians; it may result from a variety of different underlying disease, and its management is based upon a good clinical diagnosis, and an accurate histopathology diagnosis of an excised lymph node tissue. Several methods are used to obtain tissue from lymph node. Fine needle aspiration cytology (FNAC) is a simple, rapid and inexpensive technique used for the diagnosis of lymphadenopathy. This procedure is reserved for situations in which either a persisting enlargement of lymph nodes cannot be readily explained by clinical data or when a morphologic study of lymph nodes judged essential for diagnostic or therapeutic reason, or it is rarely indicated during the course of an acute illness. The clinical value of FNAC is not limited to neoplastic conditions. It is also valuable in the diagnosis of inflammatory, infection and degenerative conditions.[1]

FNAC is a relatively simple technique requiring no anesthesia and not associated with any serious complications. Although the fear of needle tract implantation is there, but it is largely due to the use of large (18 G needles). The most commonly reported complication is haematoma. The purpose of biopsy is to obtain diagnostic material for cytology study from tissue or that does not shed cells spontaneously2. FNAC has become an important diagnostic technique replacing to some extent and complementing tissue pathology in many clinical situations[3].

Martin & Ellis pioneered FNA biopsy and direct cytological examination, from a number of organs in 1930. In Great Britain in 1927, Dudgeon and Patric proposed the needling of tumor as a means of rapid microscopic diagnosis. Similarly, Martin and Ellies at the

Memorial Hospital in the USA also advocate needle aspiration, although the pathologist working with them initially insisted on sectioning as well as smearing the sample and only made a confident diagnosis if

cellblock preparation were obtained consequently. They used needle of thicker caliber (18 gauge), than those commonly used today[4].

The objectives of this study was to assess the role of FNAC by means of accuracy and efficacy in the diagnosis of cervical lymphadenopathy.

Material and Methods:

The study was carried out in department of Otolaryngology / Head & Neck Surgery Liaquat National Hospital Karachi from April 2002 to July 004.

Inclusions criteria were male and female subjects irrespective of age group, who presented with neck mass / chronic cervical lymphadenopathy for more than three weeks. Subjects with acute febrile illness, acute lymphadenitis or the presence of a localized inflammatory process (abscess) and suspected of vascular swellings were excluded from the study.

Pathologist at histopathology department made aspiration and slides for cytological diagnosis. All the postoperative specimens were sent to histopathology department for histopathology diagnosis. The results of FNAC were compared with histopathological diagnosis obtained from the surgical specimen. Sixty five patients with neck mass including enlarged cervical nodes were selected from out patients department of Otolaryngology/ Head & Neck Surgery. All patients were evaluated through detailed history, general physical examination, otolaryngology examination & systemic examination, and findings were noted on predesigned performa. Investigations included

complete blood count and FNAC (Fine needle aspiration cytology) done in all patients. Chest x-rays, ESR, ECG, Blood sugar, ultra sound CT scan and MRI scan were done in selected cases. Pan-Endoscopy and biopsy were done in patients who presented with occult primary cases and biopsy taken from primary tumor site, in those subjects where primary tumor found on clinical examination.

Statistical analyses: The following criteria were used:

True positives: those cases in which both FNAC and histopathology showed malignancy.

True negatives: those in which FNAC was negative for malignancy and histopathology also confirmed benign disease.

*False positive*s: those cases in which FNAC showed malignancy but histopathology showed no evidence of malignancy.

*False negative*s: those in which FNAC failed to confirm malignancy while histopathology showed malignancy.

Sensitivity was defined on the basis of detection of malignant disease on FNAC or on histopathology.

Specificity was defined as detection of benign diseases either on FNAC or on histopathology.

Diagnostic accuracy represents combination of sensitivity and specificity.[5]

Criteria used for detection of sensitivity and specificity are given below :-

Sensitivity = True positive / True positive + False negative x 100

Specificity = True negative / True negative + False positive x 100

Accuracy = (True positive + True negative) / (True positive + False positive +True negative + False negative) x 100.

RESULTS:

Sixty five patients met the criteria and were included in the study; 43 were males and 22 were females. (Male to female ratio 2:1). Their ages ranged from 8 to 70 years (mean 41.6 years).

Out of 65 cases, 44 were benign and 21 malignant. (Table I). In 44 benign cases, 42 were true negative and 2 were false negatives i.e FNAC showed benign reactive nodes but on histopathology they turned out to be metastatic squamous cell carcinoma. In 21 malignant cases, 20 were true positives and 1 was false positive, i.e on histopathology it was benign. Therefore the over all sensitivity was 90.0%, specificity 97.6% and accuracy was 95.3% (Table II).

In benign lesions the commonest pathology seen was tuberculosis, (33 cases) followed by 2 cases of cystic hygroma, 4 cases of benign reactive nodes, 2 cases of actinomycosis, 2 cases of lipoma and 1 case of Shawanoma.

In 21 malignant lesions, the predominant lesion was metastatic Squamous cell carcinoma (16 cases), followed by 4 cases of lymphoma and 1 case of castle man's disease. In 16 squamus cell carcinoma the most common primary site of malignancy was larynx (6 cases); 4 supra glottic and 2 involving both supragllotic & glottic regions. 4 cases were

involving pyriform fossa and supragllotic region, 4 cases were of buccal mucosa, and 2 were of occult primary.

DISSCUSION:

Cervical lymphadenopathy is not an uncommon problem in clinical practice. One of the most common pathology is cervical tuberculous lymphadenopathy in most countries of Asia and Africa. In Pakistan, studies show that tuberculosis is the most common cause of peripheral lymphadenopathy with diagnostic accuracy 83 and 93% [1, 6].

In a study of 1396 cases of FNAC of cervical lymphadenopathy, Rameshkumar found it a very useful diagnostic test; most common benign lesion was tuberculosis (54%) [7]. Bezabih et al found FNAC reliable in helping to avert more invasive surgical procedures undertaken in the diagnosis of tuberculous adenitis [8]. They suggested adding ZiehlNeelsen stain for identification of acid-fast bacilli as an adjunct to increase the diagnostic accuracy of tuberculous lymphadenitis.

In our study, out of 44 benign cases, tuberculosis cervical lymphadenopathy was also the commonest pathology (33 cases).

Malignant tumors either primary or metastatic from head and neck are one of the most important causes of cervical lymphadenopathy. Any chronic lymphadenopathy requires

careful investigation that should be easy, repaid and accurate. Diagnostic accuracy was high 91% in patients with metastasis lymphadenopathy.[1]

In 3-5% cases of Squamous cell carcinoma presenting as cervical lymphadenopathy, no primary is found despite an exhaustive work up. Squamous cell carcinoma of neck with unknown primary continues to be a diagnostic and management challenge even as technologic improvement and diagnosis have made it rarer. Nicholas et al in his study, used ultra sound guided FNAC of lymph nodes. He reported sensitivity, specificity and accuracy of 98%, 100% and 98.7% respectively[9]. In our study we found squamus cell carcinoma being predominant malignant tumor in which 2 cases were of occult primary.

Van-de-Berkel did his study to see outcome of N0 neck (clinically negative neck nodes). He used ultra sound guided FNAC for detection of nodal recurrence in metastasis of cervical lymphadenopathy. and concluded that ultra sound guided FNAC is reliable in follow up of N0 neck nodes. It is also very helpful in early detection of recurrence in the neck.[10] In malignancy sensitivity and specificity of fnac was found to be 82.76% and 97.92% respectively and it is suggested that before resorting to surgical intervention, FNAC should be used for both neoplastic and non neoplastic lymph nodes.[11]

In present study out of 65 total 21 were malignant cervical nodes, out of them 2 cases were of recurrence neck node that was detected by FNAC. In our study, ultra sound guided FNAC was not used in any case. Study by Van de-shoots et all included 73 patients with peripheral lymphadenopathy and showed sensitivity of 86% and specificity of 96%. FNAC was helpful in avoiding additional surgical diagnostic procedure in 25 cases[12]. In our study we found sensitivity 90%, specificity 97.6% and accuracy 95.3%.

FNAC is also very helpful and valuable investigative modality in HIV infected cervical lymphadenopathy.[13] In a study conducted by T-Sang Wy and Chan JK, they used FNAC for diagnosis of lymphadenopathy on 27 patients. They conclude that surgical biopsy is unnecessary if a confirmed diagnosis can render by FNAC[14].

Study conducted by Khirwadker-N and colleagues showed 86.8% sensitivity and 67.8% specificity [15] and with higher specificity 100% and sensitivity of 85.29%[16]

Mustafa-MG and colleagues did retrospective study to evaluate the accuracy of FNAC in peripheral lymphadenopathy in 541 patients and their results showed sensitivity and specificity of 99% & 94% respectively[17]. Bajaj et all showed sensitivity 84.6% and specificity 96.4%.[18] Abuja found sensitivity 95% and specificity 83% in metstatic and non-metstatic neck nodes.[19] In comparison with above results our study showed slightly less sensitivity 90.0% but specificity was higher 97.6%.

Lieo–tf conducted FNAC on 154 patients with enlarged superficial lymph nodes showed definite diagnosis achieved in 77% cases, with sensitivity 87.5%, specificity 94.7% and accuracy 91.6%. [20]

CONCLUSION:

In review of above results it can be concluded FNAC is reliable, safe and accurate test as a first line of evaluation in cervical lymphadenopathy / neck masses. It also plays important role in the management of enlarged cervical nodes / masses and can avoid unnecessary surgeries.

ACKNOWLEDGEMENT

I thank Prof. Syed Hassan Ali, Head of the ENT Department, Sir Syed Medical College & Hospital Karachi for his kind guidance and supervision. I am also thankful to Dr. Saeed Akhtar and Dr Mukhtar Singapuri, consultants ENT department, for cooperation in collecting data; Dr. Navin Faridi consultant pathologist for performing cytology and histopathology and to Mr. Mohtashim and Mr. M. Naveed Shamim of Academic Council for helping in computer work.

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Table I

Distribution of cervical node on FNAC & Histopathology

Lesion	FNAC	Histology	Total
Benign	44	42	44
Malignant	20	21	21
			65

Table II

Test (FNAC)	Disease Positive	Disease Negative

Positive	**20 TP**	**1 FP**
Negative	**2 FN**	**42 TN**

Sensitivity = 20/22 x 100 = 90.0%

Specificity = 42/44 x 100 = 97.6%

Accuracy = (62/65 x 100 = 95.3%)

Sensitivity = TP/ TP + FN X 100 =

Specificity = TN/ TN+FP X 100 =

Accuracy = TP + TN / Total No x100 =

TP= True Positive

FP= False Positive

TN= True Negative

FN= False Negative