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Research Article

Retrospective study of fine needle aspiration cytology of head and neck lesion in tertiary care hospital

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Abstract

Fine needle aspiration cytology (FNAC) is simple, quick, inexpensive and minimally invasive technique used to diagnose different types of swellings located in the head and neck region most commonly originating from cervical lymph node, thyroid, parotid and salivary glands.

Aims: To assess the frequency of incidences of different sites, age groups, sex and distribution among inflammatory non neoplastic and neoplastic lesion.

Material and Methods: A retrospective study was conducted between Jun 2011 to Jun 2012. Fine needle aspiration diagnosis was correlated with detail of relevant clinical data and investigations. Patients between the ages of 1 to 70 years were included in the study. A total of 450 patients with head and neck mass underwent FNAC.

Results: Out of 450 fine needle aspiration procedures, 69% were of lymph node, 20% were thyroid, 06% from salivary gland, 06% from soft tissue and miscellaneous swellings.

Conclusions: It is concluded that head and neck swellings are very common conditions in clinical practice. Our study found that FNAC is simple, quick, low cost and minimally invasive technique to diagnose different types of head and neck swellings. It could differentiate the infective process from neoplastic one and avoids unnecessary surgical intervention.

Keywords: Fine Needle Aspiration Cytology (FNAC), Head and Neck Swelling

1. Introduction

Fine needle aspiration cytology (FNAC) is one of the most valuable tests available in the initial assessment of the patient who presents with a mass in the head and neck region or where a recurrence is suspected after previous treatment [1]. Fine Needle Aspiration Cytology (FNAC) is a simple, quick and low cost method that is used to sample superficial masses

like those found in the neck and is usually performed on the OPD basis. It causes minimal trauma to the patient and carries virtually no risk of complications. Fine Needle Aspiration Cytology is a procedure where by small amount of tissue or cells is aspirated from a pathological lesion with the help of fine 10ml disposable syringe of 21 , 22 or 24 gauge needle. Virtually any superficial organ or tissue can be sampled through this procedure. Easily targeted organs include thyroid, breast, or lymph nodes. Whereas deep organs like lungs, liver, kidney, mediastinum, and retro peritoneum are aspirated under the guidance of ultrasound or computed tomography. FNAC is an inexpensive, safe and quick procedure, and when performed by experienced worker is quite accurate[2].

It has contributed a great deal to transform cytology from a primarily screening tool to powerful diagnostic technique[3]. Over the past two decades FNAC has moved to the forefront of the diagnostic test for the evaluation of palpable masses in head and neck areas and has been particularly useful in this region since so many desperate entities may be considered in differential diagnosis. The diagnostic spectrum ranges from innocuous inflammation to life threatening malignancies. Nodules in the neck could be due to diseases involving the salivary glands, lymph nodes, thyroid, parathyroid, skin, soft tissue, vessels and nerves. Majority of medical professionals view FNAC as a valuable technique for the investigation of cervical lymphadenopathy, thyroid and salivary gland lesions. The sensitivity for FNAC for the diagnosis of lymphadenopathy averages 90% with a specificity of 95%. The high degree of diagnostic accuracy, low costs and minimally invasive nature of the procedure makes FNAC a highly desirable alternative to open biopsy for investigation of cervical lymphadenopathy. Substitution for open biopsy of lymph nodes can achieve significant reduction in cost. Majority of cervical lymphdenopathies are due to reactive hyperplasia, tuberculosis or metastatic carcinomas, however some enlarged lymph nodes are due to a primary lymphoma. FNAC has shown to be a useful diagnostic tool in identification of neoplastic (metastatic or primary) and inflammatory lesions.

Use of FNAC for Thyroid enjoys unmatched popularity as it is related predominantly to the cosmetic complication and technical difficulties of thyroid surgery and relatively small number of true neoplasms in patients with thyroid nodules. Virtually any disease of thyroid can present as a nodule and it is not usually possible to distinguish between benign and malignant thyroid nodule by any non invasive procedure. Many reports have documented the utility of FNAC of thyroid as triage method for separating patients into operative and non-operative groups. Published results claim a sensitivity and specificity of over 90% leading some authors to recommend FNAC as initial test in evaluation of any thyroid nodule[4,5,6,7].

Most of papillary carcinomas and other types of malignancy other than follicular carcinoma can also be identified[8] by this technique as sufficient cytologic criteria are not available to definitively separate certain benign neoplasms from malignant neoplasms. The established diagnostic categories for FNAC often include several distinctive histologic entities. Hence cytologic category of follicular lesion includes follicular adenoma, follicular carcinoma and highly cellular, hyperplastic nodules. Salivary Gland can give rise to a wide range of benign and malignant neoplasms and tumor like lesions that may be poorly separated by clinical and radiologic findings. Many lesions of salivary gland initially considered as neoplasm may be in fact, intra parotid lymph nodes, localized chronic sialadenitis, benign lymphoepithileal lesion and cysts. Preoperative identification of this lesion as non neoplastic can negate the need for subsequent operative interventions. The accuracy of FNAC for diagnosis of salivary gland nodules is high with studies showing an accuracy of differentiation of benign from malignant lesions to be greater than 90% [9,10.]

2. Material & Methods

This Study was done in S.B.K.S. Medical college & Dhiraj Hospital, under Sumandeep Vidyapeeth, Piparia, Baroda. In this retrospective study data of FNAC of head and neck taken from the patient attending cytology section since Jun 2011 to Jun 2012.

In the procedure of FNAC :- After careful palpation and localization of target nodules the area was cleansed with 95% ethanol. Needle attached to 10 ml disposable syringe was inserted through skin into the nodule. Severe short rapid strokes were made with needle tip within nodule. After completion of aspiration, the needle was withdrawn . The material was expelled on a clean glass slide. The smear were prepared using two glass slide technique, and were fixed in 95% ethanol or with spray fixative. The smears were stained by Papanicolaou (Pap) and with hematoxylin and eosin (H&E).

In this study we took data of FNAC of head and neck lesions which has provided us a spectrum of various lesions presenting at tertiary care hospitals. The data has revealed that the majority of lesions were benign hence management was planned with minimal surgical intervention, thus achieving significant reduction in cost and patient morbidity.

3. Result

The study included 450 cases among those age ranged from 1 to 70 years in which 54% were male and 46% were female. Maximum incidences observed in the age group of 25 to 35 years.

Lymph node involvement (69%) is common than other lesions. Incidences of lymph node lesions is higher in male 189 cases (61%) while thyroid lesion is higher in female 68 cases (77%). Table no-01

Out of 309 cases of lymph node lesions, 115 cases (37%) were having non specific lymphadenitis, 90 cases (29%) were having tuberculous lymphadenitis, 50 cases (16%) were reactive lymph node , 35 cases (11 %) were having metastatic lymph node and 19 cases (6%) were having Lymphomas.

Out of 88 cases of thyroid lesion, 40 cases (45%) were having benign lesion, 18 cases (21%) were having inflammatory pathology, 30 cases (34%) were having malignant lesion.Table no-02 and 04

Out of 27 cases of salivary gland lesions, 12 cases (44%) were benign, 10 cases (37%) were inflammatory and 5 cases (19%) were malignant lesion. Table no-02

Table :- 01 Sex wise distribution of lesion

Organ involved	Male		Female		Total
	No.	Percentage	No.	Percentage (%)	
Lymph node	189	61.00	120	39	
Thyroid	20	23.0	68	77	
Salivary gland	18	67	9	33	
Soft tissues	14	70	6	30	
Miscellaneous	4	67	2	33	
Total	245		205		450

Table :- 02 Distribution of infllamatoy and neoplastic lesion

Organ involved	Inflammatory	Neoplastic		Total	%
		Benign	Malignant		
Lymph node	210	50	49	309	69
Thyroid	18	40	30	88	20
Salivary gland	10	12	5	27	6
Soft tissues and Miscellaneous	10	10	6	26	6
Total	248	112	90	450	100

Table :- 03 Spectrum of lymph node lesion

Cytological diagnosis		No. of cases	Percentage (%)
Reactive node		50	16.18
Inflammatory	Non-specific	115	37.22
	Tuberculosis	90	29.13
Metastatic		35	11.33
Lymphoma		19	6.15
Total		309	100

Table :- 04 Spectrum of Thyroid lesion

Cytological diagnosis	No. of cases	Percentage (%)
Benign nodular goiter	25	28
Follicular lesions	10	11
Cystic lesions	5	6
Lymphocytic thyroiditis	8	9
Hashimoto's thyroiditis	5	6
Acute thyroiditis	5	6
Malignant	30	34
Total	88	100

4. Discussion

Diagnostic cytology when performed by well trained experienced individual offers high degree of accurancy ,reliability and feasibility, therefore FNAC has gained universal acceptance as in most instances it is inexpensive, safe, quick and accurate. In our study the spectrum of lesion observed from the various regions in head and neck region confirms its utility as an effective tool in the diagnostic workup of this area. Factors including the experience of aspirator, sampling method, the adequacy of sample the target organ and the expertise of examiner (Cytotechnologist and cytopathologist). The false positive diagnosis is rarely made by experienced and well trained individuals.The false negative and false positive are pointers towards limitations and pitfalls in cytological interpretation in the present study Male are more affected then Female and inflammatory lymphnode 210 was found to be most common pathology in our study, which is similar to study of setal chauhan et al[11].

The spectrum of lymph node lesions in this study showed maximum cases of non specific lymphadenitis 115 cases (37.22%). Tuberculosis , which were 90 cases (29.13 %). Reactive hyperplasia which were 50 cases (16.18%) This was very similar to the result of study on western population by Lawrence et al 2003 [12] and the study by Gupta et al 2003[13]. Results by Lawrence et al[12] 2003 showed 47% of granulomatous lesion followed by 59% of reactive hyperplasia. Results from gupta et al[13] study showed 59% of granulomatous lesions amongst lymph nodes which is close to our investigation may be due to close genetic similarities. In our screening, we found 50 cases of reactive hyperplasia which shows frequent chronic inflammation in the head and neck region resulting in reactive changes in lymphnodes in the draining path. Result from Farzana Shahid et al[14] showed reactive hyperplasia (15.2%) and result from Setal chauhan et al[11] showed reactive hyperplasia (8%) which is similar to our study. In our study 35 cases (11.3%) were metastatic lymphnode which is closely similar to result from Farzana Shahid et al[14] (4.5%) and with setal chauhan et al[11] (25%). In our study 19 cases (6.15%) were Lymphoma which is similar to result of Farzana Shahid et al[14] (2..8%) and with setal chauhan et al[11] (2%).

Regarding Thyroid lesions our study displayed 25cases(28%) benign nodular goiter, 10 cases (11%) of follicular lesion, 5 cases (6%) of cystic lesions Our results were similar to the study on western population conducted by Antonello et al 2005[15] and Klemi etal 1991[16] which showed 57% of multinodular goiter and 29% of follicular neoplasm. It is in accordance to a recent study in Pakistan conducted by Tariq N et al 2007[17] which showed 56.9% of nodular goiter and 23.08% of follicular neoplasm. In our study inflammatory thyroid lesion 18 case which is similar to result of Farzana Shahid et al[14] 8 cases and with Setal Chauhan et al[11] 4 cases.FNAC is considered as the most effective and reliable procedure for the diagnosis of the thyroid nodules (Gharib 1994). The usefulness of FNAC has been questioned through many studies in cases of small, non palpable masses (less then 1.5 cm Khurana et al 1998[18], MacDonald et al 1996[19], McHenry et al 1993[20], Schmidt et al 1997[21]). These lesions, can be preferably aspirated under ultrasound, guided technique. However, our experience revealed that for small sized nodule the percentage of unsatisfactory results does not appear to be related to the size of the Lesion.

The Salivary Gland lesions were the least within a total of 27 cases (6%) showing 10 cases (37%) inflammatory, 12 cases benign (44%) and 5 cases (19%) were malignant. Which is similar to result of Farzana Shahid et al[14] 15 cases (39.5%) inflammatory, 22 cases benign (57%) and 1 cases (2.6%) were malignant. And also similar to study of Chauhan et al[11] 04

cases inflammatory, 09 cases benign and 2 cases .

In our study more than 98% of the smears showed adequacy of material, eliminating the chances of false positive or negative results. Similarly the number of benign lesions (360 cases) out of 450 cases, highlighted the utility of FNAC and its role in early management of cases without undue surgical intervention. It is concluded from the present study that FNAC can be strongly recommended as a safe, inexpensive and rapid technique and can be enlisted as a primary diagnostic tool in head and neck lesion.

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