

Original Research Article

Fine needle aspiration cytology role in head and neck lesions

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Abstract

Introduction: Fine Needle Aspiration Cytology (FNAC) is a simple, quick and inexpensive method in the head and neck region. It also affords a practicable and means of rationally planning surgery and causes minimal trauma to the patient and carries no risk of complications.

Aim and objectives: The aim of this study was to see the frequency of various pathological conditions detected on FNAC in patients presenting with head and neck swellings and to evaluate the role of FNAC in diagnosis of head and neck swellings.

Material and methods: A retrospective study was conducted in Department of Pathology, SMIMER Medical College, Surat from July 2014 to June 2015 which included 250 patients with head and neck swellings presenting to Outpatient clinics. Fine Needle Aspiration Diagnosis was correlated with detail of relevant clinical findings and investigation.

Results: Maximum incidence was observed in the age group 31-40 years with higher incidence among males. Out of 250 cases, 160 cases of lymph node lesions were diagnosed of which non-specific lymphadenitis was the commonest diagnosis (47%) followed by Tuberculous lymphadenitis (25%). 57 cases of thyroid lesions were diagnosed, in which incidence rate of benign thyroid lesions was (84%). 12 cases of salivary gland lesions were found, among which pleomorphic adenoma was common (67%).

Conclusion: It was concluded that non-specific lymphadenitis is the commonest condition in patients presenting with neck swellings. FNAC is a simple, safe and inexpensive tool for the assessment of patients with head and neck swellings. It could differentiate the infective process from neoplastic one

and avoids unnecessary surgeries. Thus, FNAC can be recommended as a first line of investigation in the diagnosis of head and neck swellings.

Key words

Head and neck swellings, Fine Needle Aspiration Cytology (FNAC), Tuberculous lymphadenitis, Non-specific lymphadenitis.

Introduction

A lump is the most likely clinical problem to be encountered in the neck [1]. The evaluation of a neck mass is a common clinical dilemma and a condition to which clinicians routinely encounters [2]. The common pathologies encountered in the neck presenting as a lump are lymphadenopathies (specific and non-specific, acute and chronic), metastatic carcinoma, lymphoma, thyroid swellings (goitre, nodules and cysts) and salivary gland swellings (sialadenitis, cysts, adenomas and carcinomas). The less common pathologies presenting as swelling in the neck are carotid body tumour, bronchial cyst, thyroglossal cyst, cystic hygroma, pharyngeal pouch and lumps of skin appendages [1]. Fine needle aspiration cytology is a simple, quick and inexpensive method that is used to sample superficial masses like those found in the neck and is usually performed in the outpatient clinic. It causes minimal trauma to the patient and carries virtually no risk of complications. Masses located within the region of the head and neck, including salivary gland and thyroid gland lesions can be readily diagnosed using this technique [3, 4].

FNAC is both diagnostic and therapeutic in a cystic swelling [5]. Fine needle aspiration cytology is helpful for the diagnosis of salivary gland tumours where it can differentiate between a malignant and a benign tumor with over 90% accuracy [6]. FNAC is particularly helpful in the work-up of cervical masses and nodules because biopsy of cervical adenopathy should be avoided unless all other diagnostic modalities have failed to establish a diagnosis [7]. Fine needle aspiration cytology does not give the same architectural detail as histology but it can provide cells from the entire lesion as many passes

through the lesion can be made while aspirating [8]. The purpose of this study was to see frequency of distribution of various pathological conditions detected on FNAC in patients presenting with head and neck swellings and to evaluate the role of FNAC in their diagnosis.

Material and methods

In this study, FNAC was performed in 250 patients presented with lesions in the head and neck regions, in Department of Pathology, SMIMER Medical College, Surat from July 2014 to June 2015. All patients were asked about history related to head and neck swelling and relevant questions to the etiological cause along with present, past and family history of tuberculosis and history of sexual exposure for syphilis and AIDS. Patients were explained about the procedure and its advantages and their written consent was taken. Fine Needle Aspiration Diagnosis was correlated with detail of relevant clinical findings and investigation. The technique was performed in the outpatient department with minimal trauma to the patient without any risk of complication. The area to be aspirated was cleaned with spirit and a 22-23-gauge needle was inserted at convenient angles to the lesions and multiple hits were made within the lesion with sufficient negative pressure; the needle was removed and the pressure was applied to the area of aspiration to avoid bleeding or hematoma formation. The aspirated material was smeared on minimum two clean glass slides and later, they were either wet dried or air dried as per the staining procedure adopted. Smears were stained by Giemsa and Hematoxylin and Eosin stain. Statistical Analysis was done. Percentages were calculated for estimating frequency of various pathological

conditions detected on FNAC in patients presenting with head and neck swellings.

Results

The present study of 250 cases included patients from 1 to 90 years, in which 52% were males and 48% were females. Maximum incidence was observed in the age group 31- 40 years with

higher incidence among males. Among the diagnostic outcome, higher incidence of lesion was in the neck region than in the head region. Out of 250 cases, 138 cases (55%) were inflammatory in nature while remaining 112 (45%) cases were of neoplastic nature. (**Table - 1**)

Table - 1: Distribution of inflammatory and neoplastic lesions.

Organ involved	Inflammatory	Neoplastic	
		Benign	Malignant
Lymph node	114	-	44
Thyroid	6	48	3
Salivary Gland	2	9	1
Soft tissue	-	5	-
Miscellaneous	16	2	-
Total	138	64	48

Incidence of lymph node lesions was highest in 160 cases (64%) followed by thyroid lesions in 57 Cases (22.8%), salivary gland in 12 cases (4.8%), soft tissue lesions in 5 (2%) and miscellaneous in 18 cases (7.2%). Overall, incidence of thyroid lesions was proportionately more in females 20.8% while incidence of lymph node lesions was higher in males (40.8%). Out of 12 cases of salivary gland lesions, incidence of pleomorphic adenoma (67%) was highest (**Table - 2**) (**Figure - 1**). Incidence of benign cystic lesions (74%) was highest followed by lipoma (22%) among soft tissue and miscellaneous lesions in our study (**Table - 3**) (**Figure - 2**). Among 160 cases of lymph node lesions, inflammatory lesions were common which included non-specific 47% and tuberculous 25% (**Table - 4**). Out of 57 cases of thyroid lesions, 48 cases (84%) were having benign neoplastic lesions, 6 cases (10 %) were having inflammatory lesions (**Table - 5**). One case each of medullary carcinoma, anaplastic carcinoma and follicular carcinoma with metastasis were noted in our study out of 3 cases (2%) of malignant thyroid lesions (**Table - 5**) (**Figure - 3**). Among 250cases, 12 cases of salivary gland lesions were found. In this benign pleomorphic

adenoma was common and was found in 8 cases (67%). Out of 250 cases, 230 cases of various soft tissue and miscellaneous lesions were obtained. Among this benign cystic lesions were common and accounted for 74%. One case of ameloblastoma was noted.

Table - 2: Distribution of salivary gland lesions.

Salivary gland lesions	No.	%
Sialadenitis	2	17
Pleomorphic Adenoma	8	67
Warthins tumour	1	8
Mucoepidermoid Carcinoma	1	8
Total	12	100

Table - 3: Various soft tissue and miscellaneous lesions diagnosed.

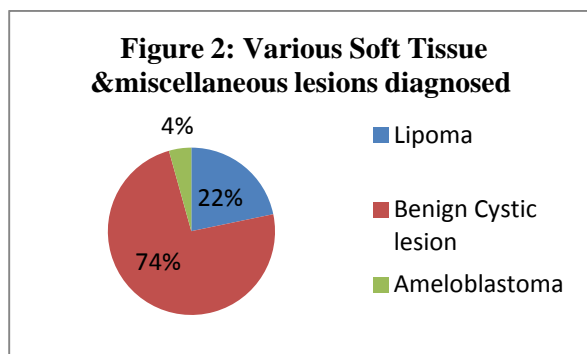
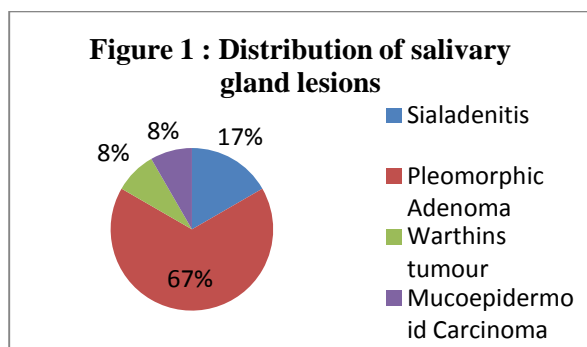
Lesions	No.	%
Lipoma	5	22
Benign cystic lesion	17	74
Ameloblastoma	1	4
Total	23	100

Table - 4: Distribution of various lymph node lesions obtained.

Lesions		No.	%
Inflammatory	Nonspecific	75	47
	tuberculosis	39	25
Metastatic		43	27
Lymphoma		1	1
Total		158	100

Table - 5: Distribution of thyroid lesions obtained.

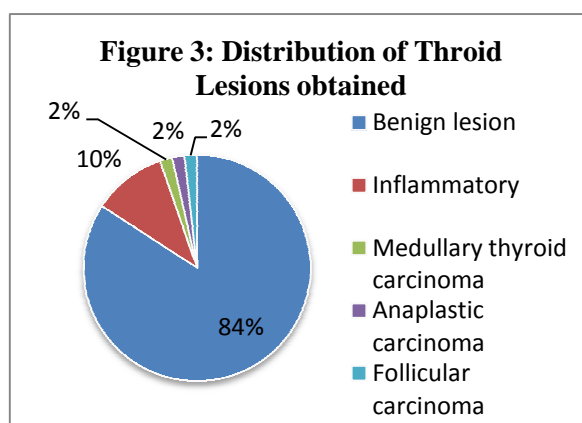
Thyroid lesion	No.	%
Benign lesion	48	84
Inflammatory	6	10
Medullary thyroid carcinoma	1	2
Anaplastic carcinoma	1	2
Follicular carcinoma	1	2
Total	57	100



Discussion

In this study, FNAC was performed in swellings of the head and neck regions of the 250 patients to find out the relative frequencies of various pathologies presenting as lump in the neck. The

results achieved in the present study were compared with different National and International studies. In the present study, slightly higher number of lesions was found in males (52%) than in females (48%). These findings were similar to the study by Setal Chauhan, et al. [2] who found that there were 55% male and 45% females while studies by Fernandes Het, al. [9] and Vijay Tilak, et al. [10] found higher lesions in females.



Lymph node involvement was common than other lesion accounting for 64% which was similar to the findings by Setal Chauhan, et al. [2] while study by Fernandes Het, et al. [9] and Vijay, et al. [10] found that thyroid lesions were more common 56.45% and 43.63% respectively. Non-specific Lymphadenitis was the commonest diagnosis (47%) followed by tuberculous lymphadenitis (25%) and malignancy was found in 27% of cases. El Hag, et al. [11] carried out a similar study in Saudi Arabia over a period of 5 years which included 225 patients which showed reactive/ nonspecific lymphadenitis to be the commonest cause of neck masses accounting for 33% of cases. Tuberculous lymphadenitis was found to be the next most common pathology constituting 21% of cases followed by malignant swellings found in 13% of cases while other studies by Rathod GB, et al. [12] and Tariq, et al. [1] found that tuberculous lymphadenitis was found to be the most common pathology of lymph node lesions accounting for 42.12% and 36% of cases respectively followed by reactive/non-specific lymphadenitis constituting 18% and 19.3 % of cases and metastatic

carcinoma found in 14% and 21.5 % of cases. In our study malignancy was found in only 27 % cases while Cheng [13] in his study found malignancy to be the cause in 50% of cases. This shows an epidemiological variation between the developed and developing countries. Infections like Tuberculosis are more commonly found in developing countries while malignancies as cause of neck swellings are more common in developed countries. Stevenson [14] in his study of 120 patients, carried out at Christchurch, New Zealand; found that 28% of the swellings are malignant which is similar to the pattern of disease in developed countries. Similarly, studies done in developing countries have consistently shown Tuberculous and Reactive/ Non-specific lymphadenitis to be the more common cause. Out of 250 cases, 57 cases (23%) cases were of thyroid lesions with female preponderance 52 cases (91%), male to female ratio 1:10 and Maximum incidence of thyroid lesions was found in the age group of 31-40 years.

Benign lesion were more common in third decade while malignant lesion more common in fifth decade while Charry, et al. [15] in their study found that maximum incidence was between 20 and 40 years and male to female ratio was 4:1. Other Studies by Y.M. Sirpal [16] and Nazma Afroz [17] also found maximum incidence of thyroid lesions in females. Among 12 cases of salivary gland lesions, Pleomorphic adenoma was found to be common in 8 cases (67%). Studies done by Rathod GB, et al. [12] and Setal Chauhan, et al. [2] also found that Pleomorphic adenoma was the commonest of salivary gland. Mucoepidermoid carcinoma was found in 8 % of cases while studies by Solanki Piyush K, et al. [18] found Mucoepidermoid carcinoma in 10% cases and Cohen M.B [19] reported 35% mucoepidermoid carcinoma among salivary glands. Thus the greatest application of thyroid FNAC is the nonsurgical alternative provided in the investigation of goitre, thus eliminating the need for a purely diagnostic thyroidectomy. Additionally, the method may serve a therapeutic function since the evacuation of fluid in cystic lesions may be followed by

involution of the lesion. Sometimes False positive diagnoses by FNAC can be caused by regenerative epithelial hyperplasia and squamous metaplasia in sialadenitis while false negative diagnoses can be due to faulty technique, Central cystic, Hemorrhage or necrotic area devoid of diagnostic cells, Small malignant lesion adjacent to dominate mass. But overall, the procedure was simple and rapid obviating the need of surgical intervention.

Conclusion

It was concluded from the present study, that non-specific lymphadenitis is the commonest problem in patients presenting with neck swellings in our set-up, followed by tuberculous lymphadenitis and malignant neoplasm especially metastatic carcinoma. Our study found that FNAC is a simple, quick, inexpensive, 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 surgeries. Thus, FNAC can be recommended as a first line of investigation in the diagnosis of head and neck swellings. Moreover, nowadays, with increasing cost of medical facilities, any technique which speeds up the process of diagnosis, limits the physical and psychological trauma to the patient, and saves the expenditure of hospitalization, will be of tremendous value. It may also help the surgeon to select, guide, and modify surgical planning in patients requiring surgery.

References

1. Tariq Ahmad, Mohammad Naeem, Siddique Ahmad, Ambreen Samad, Amir Nasir. Fine Needle Aspiration Cytology (FNAC) and Neck Swellings in The Surgical Outpatient. J Ayub Med Coll Abbottabad, 2008; 20(3): 30-32.
2. Chauhan Setal, Dharmendra Rathod, D. S. Joshi. FNAC of Swellings of Head and Neck Region. Indian Journal of Applied Basic Medical Sciences, 2011; 13: 1-6.

3. Gamba PG, Messineo A, Antonello LM, Boccato P, Blandamura S, Cecchetto G, et al. A simple exam to screen superficial masses, FNAC. *Med Pediatr Oncol.*, 1995; 24: 97–9.
4. Lee JC, Siow JK. Thyroid surgery - The Tan Tock Seng Hospital otolaryngology experience. *Ann Acad Med Singapore*, 2002; 3: 158–64.
5. Afridi S, Malik K, Waheed I. Role of fine needle aspiration biopsy and cytology in breast lumps. *J Coll Physicians Surg Pak*, 1995; 5: 75–7.
6. Burnand KG, Young AE, Lucas J, Rrolands BJ, Scholefield J. *The new Aird's companion in surgical studies*. 3rd edition, China: Elsevier; 2005.
7. Layfield LJ. Fine-needle aspiration of the head and neck. *Pathology (Phila)*, 1996; 4: 409–38.
8. Kirk RM, Ribbans WJ. *Clinical Surgery in General*. 4th edition, Edinburgh: Elsevier; 2004.
9. Fernades H, et al. Role of fine needle aspiration cytology in palpable Head & neck masses. *Journal of clinical and diagnostic research*, 2009; 1719-1725.
10. Vijay Tilak, A.V Dhaded, Ragini Jain. Fine Needle Aspiration Cytology of head and neck masses. *Indian journal of Pathol. Microbiol.*, 2002; 45(1): 23-30.
11. El Hag IA, Chiedozi LC, al Reyees FA, Kollur SM. Fine needle aspiration cytology of head and Neck masses. Seven years' experience in a secondary care hospital. *Acta Cytol.*, 2003; 47: 387-92.
12. Rathod GB, Parmar P. Fine Needle Aspiration Cytology of Swellings of Head and Neck Region. *Indian Journal of Medical Sciences*, 2012; 66(3): 49-54.
13. Cheng AT, Dorman B. Fine needle aspiration cytology: The Auckland experience. *Aust N Z J Surg.*, 1992; 62: 368–72.
14. Stevenson DS, Allison RS, Robertson MS, Hamer JW. Aspiration cytology in the diagnosis of head and neck masses: The early Christchurch experience. *N Z Med J*, 1989; 102: 639–41.
15. Charry AK. Role of FNAB in thyroid swelling. *Indian J Surg.*, 1980; 346-8.
16. Y.M. Sirpal. Efficacy of Fine needle Aspiration Cytology in the management of thyroid Diseases. *Indian Journal of Pathol. Microbiol.*, 1996; 173-178.
17. Nazma Afroz. Role of fine needle Aspiration Cytology in the diagnosis of palpable thyroid lesions. *Indian Journal of Pathol. Microbiol.*, 2002; 241-246.
18. Solanki Piyush K, et al. Fine needle aspiration cytology as a Diagnostic procedure in head and neck Swellings. *National journal of community medicine*, 2012; 3(3): 433-436.
19. Cohen MB, Fisher PE, Holly EA, Ljung BM, Lowhagen T, Bottles K. Fine needle aspiration biopsy diagnosis of mucoepidermoid carcinoma: Statistical analysis. *ActaCytologica*, 1990; 34: 43-49.