International Journal of Otorhinolaryngology and Head and Neck Surgery
Sangavi AKB et al. Int J Otorhinolaryngol Head Neck Surg. 2018 Jan;4(1):189-192
http://www.ijorl.com
pISSN 2454-5929 | eISSN 2454-5937

DOI: http://dx.doi.org/10.18203/issn.2454-5929.ijohns20175623

Original Research Article

Evaluation of FNAC of head and neck swellings: a retrospective study

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Received: 25 September 2017
Revised: 22 November 2017
Accepted: 24 November 2017

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ABSTRACT

Background: Neck swellings are one of the commonest clinical presentations encountered by the practicing physicians. Hence; we undertook the present study to assess the incidence and nature of various head and neck swellings by FNAC.
Methods: The present study included evaluation of data of all the patients that underwent FNAC for various head and neck swellings. A total of 100 patients were included in this study in which FNAC was performed with lesions in the head and neck regions in the otorhinolaryngology, pediatric, and surgery departments. Cleaning of the area, to be aspirated, was done and a 23‑gauge needle with syringe and trocar was inserted at convenient angles to the lesions and multiple hits was 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.
Results: Majority of the patients with head and neck swellings belong to the age group of 21 to 30 years. Only 6 and 4 patients were having age of 51 to 60 years and 61 years and above respectively. Out of 100 patients, 36 were males and 64 were females. In a total of 54 patients, diagnosis of inflammatory lesion was made while in case of 34 and 12 patients; diagnosis of benign and malignant lesions was made respectively.
Conclusions: Most of the swellings occurring in the head and neck region are inflammatory in nature and affect females more frequently than males.

Keywords: Head and neck, FNAC, Swellings

INTRODUCTION

Neck swellings are one of the commonest clinical presentations encountered by the practicing physicians. Diagnostic procedures can be easily performed on these swellings due to their superficial nature and provides ease both to the doctor and to the patients. There often are no associated symptoms, other than the recognition of a "new lump" noted incidentally on palpation while grooming, or noticed by another individual. Evaluation of the neck mass must be approached in a thorough and disciplined manner.[1] Especially in the adult population, these masses can present as only manifestation of a serious and potentially malignant pathology. There is extensive list of differential diagnosis of the patients presenting with neck masses which show considerable variation according to the age of the patient. A thorough history and physical examination are essential steps in the evaluation. This will narrow the diagnostic possibilities and help determine the appropriate next diagnostic steps, as outlined in an algorithm. Evaluation of a patient with a neck mass should always begin with a thorough history, followed by a complete head and neck examination. The entire mucosal surface of the upper aerodigestive tract requires special attention.[2]

Fine-needle aspiration cytology (FNAC) can be performed in patients in whom the physical examination does not explain the neck masses. FNAC is being used as a first line of investigation in the diagnosis of head and

neck swellings. The negative pressure applied during aspiration leads to bloody smears, especially in highly vascular organs like thyroid. In 1981, fine needle sampling without aspiration, called as fine needle non-aspiration cytology (FNNAC) was introduced. FNNAC, variously termed fine needle capillary sampling, cytopuncture, non-aspiration fine-needle cytology and fine needle sampling without aspiration, is a simple procedure. Cells make up the basic structural unit of the human body.[3] Study of cells is therefore helpful not only in understanding the normal structure but also in analyzing various disease processes. Exfoliative cytology and aspiration cytology both initially were employed by the clinicians as an aid for arriving to rapid diagnosis. The technique of FNAC has undergone various modifications over a period of time. It was thought to cause cell trauma, altering the cell morphology. It also leads to bloody aspirates in highly vascular organs like thyroid. The expansion of FNAC in primary diagnosis of tumors in the last 30 years or so has been impressive and generally successful.[1] FNAC 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.[4] Hence; we undertook the present study to assess the incidence and nature of various head and neck swellings by FNAC.

METHODS

The present study was conducted from January 2015-january 2016 in the department of pathology of the medical institution and included evaluation of data of all the patients that underwent FNAC for various head and neck swellings. Complete data was obtained of the patients that presented with lesions in the head and neck regions. A total of 100 patients were included in this study in which FNAC was performed with lesions in the head and neck regions. All the patients of study will be from the otorhinolaryngology, pediatric, and surgery departments. Ethical approval was taken from the institutional ethical committee and written consent was obtained after explaining in detail the entire research protocol. Detailed history of all the patients was taken related to 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. Cleaning of the area, to be aspirated, was done with spirit and a 23‑gauge needle with syringe and trocar was inserted at convenient angles to the lesions and multiple hits was 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 technique was performed in the outpatient department with minimal trauma to the patient without any risk of complication. Smearing of the aspirated material was done on two clean glass slides followed by wet-drying or air-drying as per the staining procedure adopted. Smears were stained by Giemsa and pap stain and special stains will be carried out as and when required. All the results were compiled and assessed using SPSS software.

RESULTS

Majority of the patients with head and neck swellings belong to the age group of 21 to 30 years. 16 and 17 patients belonged to the age group of 10 to 20 years and 31 to 40 years respectively. 13 patients belonged to the age group of 41 to 50 years. Only 6 and 4 patients were having age of 51 to 60 years and 61 years and above respectively. Data record of age of two patients was missing. Out of 100 patients, 36 were males and 64 were females. In a total of 54 patients, diagnosis of inflammatory lesion was made while in case of 34 and 12 patients, diagnosis of benign and malignant lesions was made respectively (Table 1). Majority of the pathologies were of lymph node and of thyroid gland (Table 2). Incidence of occurrence of benign and malignant pathologies in our study was 34 percent and 54 percent respectively.

Table 1: Distribution of all the patients according to age, gender and nature of lesion.

Parameter		No. of patients
Age group (in years)	Less than 10	11
	10-20	16
	2-30	31
	31-40	17
	41-50	13
	51-60	6
	61 and above	4
Gender	Male	36
	Female	64
Nature of the swelling	Inflammatory	54
	Benign	34
	Malignant	12

Table 2: Distribution of all the patients according to different pathologies.

Pathology	N	Percentage (%)
Thyroid	37	37
Lymph nodes	41	41
Infectious	7	7
Salivary gland	5	5
Total	100	100

DISCUSSION

One of the simple, quick and cost- effective methods of evaluating superficial masses found in the head and neck is FNAC. The technique is performed in the outpatient department and causes minimal trauma to the patient.[5-7] It is always beneficial while doing an early differentiation of benign from malignant pathology as it greatly influences the planned treatment. It can be both diagnostic and therapeutic in cystic swellings.[8] Hence, we undertook the present study to assess the incidence and nature of various head and neck swellings by FNAC.

In the present study, we observed that inflammatory lesions were the most commonly encountered in the head and neck swellings (Table 1). Our results were in correlation with the results of Gupta et al who observed similar findings in relation to the nature of the head and neck swellings. El Hag et al[8] studied the value of FNAC in the diagnosis of head and neck masses in a secondary care hospital. FNAC from 225 patients with head and neck masses were reviewed. The results were analyzed, according to anatomic location, into 3 groups: inflammatory, congenital and neoplastic. FNAC diagnoses were retrospectively correlated with available histologic findings or with the outcome of treatment. The most common diagnoses were reactive/nonspecific lymphadenitis and tuberculous lymphadenitis. Sensitivity and negative predictive value for TB were 97% and 93%, respectively. The next most common masses were malignant neoplasms, cysts, benign neoplasms and sialadenitis, in 13%, 11%, 9% and 5%, respectively. From the results, they concluded that FNAC is simple, cost effective and suitable for developing countries and small, secondary care hospitals with limited resources. Skilled personnel and routine audits are the keys to success.

Ahmad et al observed the frequency of various pathological conditions detected on FNAC in patients presenting with neck swellings coming to Surgical Outpatient department.[9] The study included 50 patients with neck swellings. There were 16 male and 34 female patients with an age range of 15-55 years. Tuberculous lymphadenitis was the commonest diagnosis (36%) followed by reactive/non-specific lymphadenitis (18%). Other pathologies were malignant neoplasms (14%), cysts (10%), benign neoplasms (8%) and sialadenitis (6%). FNAC was inconclusive in 8% of cases. Carcinomas metastatic to lymph nodes were the most common type of malignancy followed by lymphoma and thyroid gland carcinoma (papillary carcinoma). From the results, they concluded that tuberculous lymphadenitis is still the commonest condition in patients presenting with neck swellings followed by non-specific lymphadenitis and malignant neoplasms especially metastatic carcinoma. Rathod et al made clinicopathological correlation of head and neck lesions and assessed the frequency of incidences of different sites, age groups, sex, and distribution among inflammation and neoplastic lesion.[10] Fine-needle aspiration diagnosis was correlated with details of relevant clinical findings and investigations. Out of 200 fine-needle aspiration procedures, 52% were of thyroid, 28.50% were of lymph node, 11% from salivary gland, and 4% from soft tissue and miscellaneous swellings. There were 4.5% cases in which diagnosis was not possible. In inflammatory swelling (33%), tuberculous lymph node (42.12%) involvement is common than all other sites with male preponderance (55%). FNAC is a simple, quick, inexpensive, and minimally invasive technique to diagnose different types of head and neck swellings. From the results, they concluded that FNAC can be recommended as a first line of investigation in the diagnosis of head and neck swellings. Tandon et al conducted a systematic review of the published literature and meta-analysis of data extracted from the included studies were compared with a 10-year review of head and neck FNAC.[11] Systematic review identified 30 studies; 3459 FNAC aspirates from all head and neck sites were included. Overall results were as follows: sensitivity, specificity, accuracy, positive predictive value (PPV), and negative predictive value (NPV) were 89.6%, 96.5%, 93.1%, 96.2%, and 90.3%, respectively. Two thousand seven hundred two head and neck aspirates were included in our institutional review. Sensitivity, specificity, PPV, NPV, and accuracy were 89.5%, 98.5%, 97.3%, 94.0%, and 95.1%, respectively. Meta-analysis and comparative systematic review confirm that FNAC is highly effective in the diagnosis of head and neck masses, with some limitations.

Haynes et al reviewed the diagnostic prospective of various neck masses.[12] Neck masses are often seen in clinical practice, and the family physician should be able to determine the etiology of a mass using organized, efficient diagnostic methods. The first goal is to determine if the mass is malignant or benign; malignancies are more common in adult smokers older than 40 years. Etiologies can be grouped according to whether the onset/duration is acute (e.g., infectious), subacute (e.g. squamous cell carcinoma), or chronic (e.g. thyroid), and further narrowed by patient demographics. If the history and physical examination do not find an obvious cause, imaging and surgical tools are helpful. Contrast-enhanced computed tomography is the initial diagnostic test of choice in adults. Computed tomography angiography is recommended over magnetic resonance angiography for the evaluation of pulsatile neck masses. If imaging rules out involvement of underlying vital structures, a fine-needle aspiration biopsy can be performed, providing diagnostic information via cytology, Gram stain, and bacterial and acid-fast bacilli cultures. The sensitivity and specificity of fine-needle aspiration biopsy in detecting a malignancy range from 77% to 97% and 93% to 100%, respectively.

Goyal et al diagnosed the different types of cysts out of total head neck swellings because these cysts are commonly present in head neck region.[13] In their study, 100 patients of different cystic neck swelling were studied over a period of five years from 2008-2013 to compare the findings with clinical diagnosis, FNAC and histopathological report for its diagnostic reliability. Their study found that simple clinical examination followed by FNAC and histopathology is simple, quick, inexpensive and minimally invasive technique to diagnose different types of head and neck swellings. In this study out of different head and neck cystic swellings thyroglossal cyst was most common followed by dermoid cyst.[14-16]

CONCLUSION

From the above results, the authors concluded that most of the swelling s occurring in the head and neck region are inflammatory in nature and affect females more frequently than males. Metastatic carcinoma was the most commonly encountered malignancy encountered whereas colloid goitre was the most common benign pathology observed in our study. However, future studies are required for establishing a more accurate trend of occurrence of head and neck swellings.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Sangavi AKB, Itagi IR, Choudhari SY, Venkatesh U. Evaluation of FNAC of head and neck swellings: a retrospective study. Int J Otorhinolaryngol Head Neck Surg 2018;4:189-92.