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Utility of Fine Needle Aspiration Cytology in the Evaluation of Palpable Cervical Swelling: A Study of 100 Cases at a Tertiary Care Hospital

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ABSTRACT

Background and objectives: Lesions of the head and neck region are routinely encountered by clinicians, in patients across all age groups. Diagnoses range from reactive inflammatory conditions to malignancies. Cancer is among the leading causes of death in India. Head and neck cancers account for 23% of all cancer incidents in males and 6% of all incidents in females in India,. Fine needle aspiration cytology (FNAC) of cervical masses is an easy, effective, and relatively inexpensive technique. The aim of this study was to determine occurrence of various head and neck swellings and classify them under various categories.

Methods: The present study included 100 cases of palpable cervical swellings who had been referred to the AMC MET Medical College, Ahmedabad (India) from June 2018 to October 2020.

Results: The majority of cases were lymph node swellings (57%), followed by thyroid swellings (23%), salivary gland swellings (12%), and soft tissue swellings (8%). Among all cervical region swellings, tuberculous lymphadenitis and thyroid lesions were the most prevalent.

Conclusion: The findings suggest that lymph node swellings are most commonly observed in the cervical area, and that the majority of them are inflammatory, requiring medical treatment rather than surgery. Moreover, FNAC is a straightforward, quick, and cost-effective way to distinguish between non-neoplastic and metastatic malignant lesions, which could help timely surgical interventions.

Keywords: Biopsy, Fine-Needle, Tuberculosis, Lymph Nodes, Goitre.

INTRODUCTION

Fine-needle aspiration cytology (FNAC) is a simple, cost-effective, and minimally invasive method of assessing cervical swellings to help clinicians avoid surgery in case of some non-neoplastic, inflammatory tumors (1).

A majority of head and neck cancers are preventable. Cancers of the oral cavity primarily metastasize to the head and neck area (2,3). The highest incidence of head and neck neoplasms has been reported from India (4,5). The FNAC technique has been regarded as a highly efficient tool for primary diagnosis of tumors (6), particularly in debilitated patients. This readily repeatable and useful technique can effectively triage patients for further investigations, surgery or palliative therapy (e.g., thyroid and breast lesions) (7).

The aims of this study were the followings:

To estimate occurrence of various lesions of head and neck swellings and to study their distributions according to age, sex, and etiological factors.

To classify the lesions under various categories such as inflammatory, benign, malignant, and allergic condition.

We believe that our results could assist clinicians in management of surgery and palliative therapy for the evaluation of cervical swellings.

MATERIALS AND METHODS

The present descriptive-observational, cross-sectional study included 100 cases of palpable cervical swellings (both outpatients and inpatients) referred to AMC MET Medical College (Ahmedabad, India) from June 2018 to October 2020. The study was conducted in accordance with the Declaration of Helsinki and approved by the Institutional Review Board of AMCMET Medical College & LG hospital, Ahmedebad, Gujarat, India. Inclusion criteria included patients presenting with palpable swelling over cervical region who had been referred from the surgery and ENT departments, and in pre-operative assessments. Exclusion criteria included failure to cooperate, unconsciousness, inadequate sampling, and hemorrhagic aspirate. The FNAC procedure was done under standard operating conditions, with disposal 20-24 gauge needle and 10 ml syringe (7).

After detailed history taking and explaining the procedures to the patients, written informed consent was taken from the subjects.

Next, the patients were instructed to sit on a chair with a headrest, and the lesion was palpated and fixed with a finger. The needle was inserted centrally in case of small swellings and peripherally in case of larger swellings, perpendicular to the surface of the skin.

Once the needle was within the mass, continuous negative pressure was applied by withdrawing the plunger to obtain an adequate specimen. The needle was moved within the circumscribed area with to and fro movements, short stabs, and in a corkscrew manner. Admixture with blood tends to be less if the needle is moved along the same track rather than in multiple directions. The needle was then gradually withdrawn from the mass. After withdrawal, the needle was detached from the syringe, and the aspirated specimen was ejected onto microscope slides (1). The smears were immediately fixed in methanol solution, and haematoxylin and eosin staining was done. In this type of staining, nuclei and cytoplasm are shown as blue and varying shades of pink, respectively.

Interpretation of the aspirate was done by assessing cellularity, background of the smear, and cytomorphological features of cells. The smears were also assessed for neoplasms. Finally, FNAC was repeated for cases with low cellularity and inconclusive diagnosis.

RESULTS

The study included 51 males and 49 females. Figure 1 shows the distribution of cervical swellings based on age.

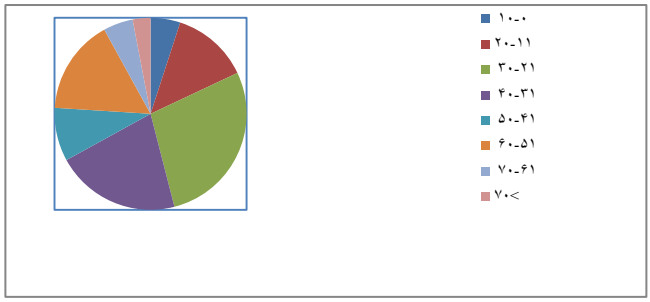

Figure 1- The distribution of cervical swellings based on age

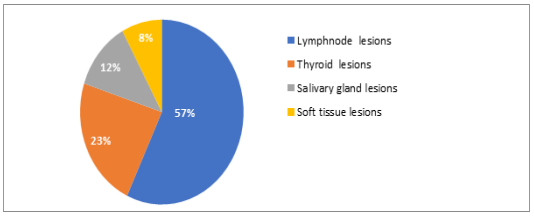

Figure 2- Organ wise distribution of cervical swellings

Table 1-FNAC diagnosis of lymph node lesions

FNAC diagnosis	Number of cases	Percent
Reactive Lymphadenitis	16	28.07 %
Tuberculous lymphadenitis	26	45.61 %
Koch's abscess	09	15.78 %
Abscess formation	02	3.50 %
Hodgkin's lymphoma	04	7.01 %

Table 2- Incidence of various thyroid lesions

FNAC diagnosis	Number of cases	Percent
Colloid goitre	8	34.78 %
Nodular goiter	5	21.73 %
Autoimmune thyroiditis	1	4.34 %
Hashimoto's thyroiditis	3	13.04 %
Benign cystic lesion	3	13.04 %
Follicular neoplasm/Suspicious follicular neoplasm	2	8.69 %
Papillary carcinoma of thyroid/ Suspicious papillary carcinoma of thyroid	1	4.34 %

The majority of cases were lymph node swellings (57%), followed by thyroid swellings (23%), salivary gland swellings (12%), and soft tissue swellings (8%) (Figure 2). Among thyroid lesions, the most common lesions were goiter (56.5%), followed by Hashimoto thyroiditis (13.04%). Among the malignant lesions, one case (4.34%) of papillary thyroid carcinoma and two cases (8.69%) of follicular neoplasm/suspicious of follicular neoplasm were detected (Table 2).

Out of 23 cases of thyroid lesions, 20 (86.95%) Bethesda grade II were detected. Among the benign salivary gland neoplasm, sialadenitis (41.66 %) and pleomorphic adenoma (33.33%) were the most common. Among miscellaneous lesions, the most common were benign cystic (62.5 %), followed by epidermal cyst (25%) and lipoma (12.5%) (Figure 3). Cystic lesions included sebaceous, branchial, thyroglossal, and epidermal cysts.

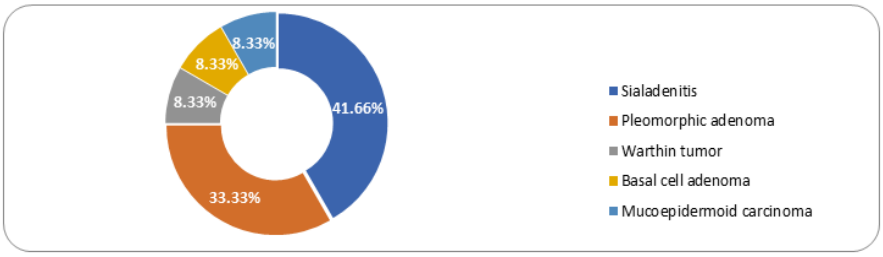

Figure 3- Salivary lesions in cervical swellings

DISCUSSION

In the present study, the frequency of cervical swellings was highest among subjects aged 21-30 years, which is in line with findings of some previous studies (8, 9). However, Shekhar et al. reported that cervical swellings were most prevalent among individuals aged 31-40 years (10).

In the present study, a male:female ratio of 1.04:1 was obtained, which is similar to the results observed in other studies (11-13). Fernandes reported a female preponderance when assessing thyroid swellings (14).

In the FNAC investigation of the cervical region, benign lesions were found to be the most common (86%), which is consistent with findings of previous studies (12, 15). In the present study, tuberculous lymphadenitis was found to be the commonest pathology, accounting for 43.85% of cases, which is similar to the findings of previous studies (16, 18, 19).

In the present study, the six-tier Bethesda method was used to categorize the cases. Out of 23 cases, 20 (86.95%) were benign, one (4.34%) was follicular neoplasm or suspicious for a follicular neoplasm, one (4.34%) was suspicious for malignancy, and another (4.34%) was malignant, which are comparable with other studies (20-22).

Among benign salivary gland neoplasms, inflammatory lesions (chronic sialadenitis) were the most prevalent, followed by pleomorphic adenoma, and Warthin tumor, which is consistent with results of other studies (23-25).

Similar to findings of previous studies (16, 26), sensitivity and specificity of FNAC in cervical swellings was 89% and 95%, respectively.

CONCLUSION

Based on the results, the majority of cervical lesions are of cervical lymph node origin, followed by thyroid. The most common cause of cervical lymph node lesions are tuberculous lymphadenitis, followed by inflammatory causes. The most common causes of thyroid lesions are goiter and thyroiditis. The most common causes of salivary gland swellings are sialadenitis and pleomorphic adenoma.

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DECLARATIONS

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Ethics approvals and consent to participate

The study was conducted in accordance with the Declaration of Helsinki and approved by the Institutional Review Board of AMCMET Medical College & LG hospital, Ahmedebad, Gujarat, India. Written informed consent was taken from all participants after explaining the research objectives.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding publication of this article.

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