

ROLE OF FNAC PROCEDURE IN A STUDY OF HEAD AND NECK LESIONS AT A TERTIARY CARE CENTER DHARPUR-PATAN

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Abstract—FNAC (Fine Needle Aspiration Cytology) is a well accepted technique for head and neck lesions. It is a safe and inexpensive outdoor procedure. Fine needle aspiration cytology (FNAC) is a simple, quick and cost effective method and plays an important role in early diagnosis of superficial masses found in the head and neck region. It is to assess the frequency and incidence of different sites, age, sex and according to the lesions being inflammatory, benign and malignant. A retrospective study among 110 patients was conducted at GMERS Medical College and Hospital, Dharpur-Patan Gujarat from January 2021 to March 2023. Patients between the ages of 5 years to 75 years were taken into the study. Fine needle aspiration cytomorphological diagnosis was correlated with detailed clinical findings and investigations. Out of 110 fine needle aspiration procedures 67.28 % (74 cases) were of lymph node, 14.54% (16 cases) were of thyroid, 7.27% from salivary gland(08 cases) and 10.91% (12 cases) from miscellaneous swellings. Out of total 110 lesions, 60(54.54%) were inflammatory, 35 (31.82%) benign and 15 (13.65%) were malignant. From the present study we concluded that FNAC is excellent, fast, inexpensive and minimally invasive first line investigation for differential diagnosis of head and neck masses. Also combination of fine needle aspiration cytology with acid fast staining is very much helpful for routine diagnosis of tuberculosis.

INTRODUCTION

Fine needle aspiration cytology (FNAC) is a simple, quick and cost effective method to sample superficial masses found in the head and neck region most commonly originate from cervical, lymph node, thyroid, parotid and salivary glands (Svante, 1995). The technique is performed in the outpatient department and causes minimal trauma to the patient (Watkinson *et al.*, 2000). Sometime Fine Needle Aspiration Cytology may give false negative and false-positive results so in every circumstance, we should interpret Fine Needle Aspiration Cytology report with the entire clinical circumstance (Salgarelli *et al.*, 2009). Lymph node enlargement is the common presentation and secondary squamous carcinoma is the common cause of enlargement of lymph nodes in elderly population. Fine Needle Aspiration Cytology of head and neck lesions is also very useful in differentiating inflammatory lesions that does not

require surgical excision from other neoplastic lesions that require surgical management (El Hag *et al.*, 2003). FNAC does not give the same architectural detail as histology but it can provide cells to diagnose from the entire lesion as many passes through the lesion can be made while aspirating (Kirk and Ribbans, 2004). We undertook the present study to assess the incidence and nature of various head and neck swellings by FNAC. The common pathologies encountered in the head and neck region presenting as a lump are lymphadenitis (specific and non-specific, acute and chronic and reactive), metastatic carcinoma, lymphoproliferative lesions, thyroid swellings (goiter, nodules and cysts and carcinoma), salivary gland swellings (sialadenitis, adenomas and carcinomas) and the skin and soft tissue lesions like lipoma, epidermal (keratinous, dermoid) cysts, benign adnexal tumors, etc. (Gamba *et al.*, 1995 and Lee and Siow, 2002). It is noted from the analysis that FNAC is easily accessible, nontraumatic and inexpensive method that avoids

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requirement of open surgical biopsy. An early differentiate of inflammatory, benign and malignant pathology is beneficial as it greatly influences the planned treatment (Watkinson *et al.*, 2000).

MATERIALS AND METHODS

A retrospective study has been conducted at Cytology section of Pathology Department in GMERS Medical College and Hospital, Dharpur-Patan, a tertiary care hospital. Study duration was 2 years and 3 months from January 2021 to March 2023. FNAC was performed in total 110 patients came from surgical department and ENT Department. The cases of head and neck swellings which were inaccessible were excluded from the study. Sample collection is done by asking detailed clinical, past, personal and family history of all the patients related to head and neck swellings. Patients were explained about the procedure in detail and its advantages and their written consent about the same was taken. 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. The swelling was fixed with one hand and a 22- 23 gauge needle with 10 ml syringe was inserted at convenient angles to the lesion and to and fro movement were made within the lesion with sufficient negative pressure to collect representative and adequate sample for the study. The needle was removed after releasing the negative pressure. An adequate pressure with dry cotton was applied to the penetration site of needle to avoid bleeding. The material obtained was immediately smeared on glass slides, from which some were air dried and some were fixed in methanol for routine hematoxylin and eosin stain, Pap, Giemsa and AFB stain as per the requirement. Frequency distribution of various parameters were performed. Data were represented using Tables and pie charts.

RESULTS

The present study included 110 cases with the age ranging from 5 years to 75 years out of which 72 (65.45%) were females and 38(34.55%) were males (Table 1). There was higher incidence of lesion in the neck region than in the head region. Lymph node involvement was the commonest constituting 74 cases i.e. 67.28% followed by thyroid (14.54%), miscellaneous (10.91%) and salivary gland lesion

(7.27%) (Table 2). Among lymph node lesions, tuberculosis lymphadenitis is the commonest constituting 38 cases(51.35%), followed by 22 cases(29.73%) of reactive lymphadenitis, metastatic lymph node [12 cases (16.22%)], and nonhodgkin's lymphoma [2 cases (2.70%) (Pie chart 1)].

Table 1. Age wise distribution of various head and neck lesions

Age (years)	No. of cases	Percentage of cases
00-10	10	9.09%
11-20	21	19.09%
21-30	23	20.90%
31-40	21	19.09%
41-50	14	12.73%
51-60	14	12.73%
61-70	5	4.55%
71-80	2	1.82%
Total	110	100%

Table 2. Distribution of lesions involved in gender

Lesions	Female	Male	Total	Percentage
Lymph node	46	28	74	67.28%
Thyroid	15	01	16	14.54%
Miscellaneous lesions	08	04	12	10.91%
Salivary gland	03	05	08	7.27%
Total	72	38	110	100%

Thyroid was the second common site to be involved with total 16 cases (14.54%) out of which 15 cases were females and 1 case was males. Goiter is the most common thyroid lesion with 06 cases, followed by 05 cases of Benign follicular lesion, 03 cases of follicular neoplasm, and a single case of cystic thyroid nodule (Table 3). Out of 12 cases of miscellaneous lesions, epidermal cyst was the commonest with 05 cases followed by 4 cases of benign cystic lesion, 2 cases of lipoma and single cases of brachial cyst (Pie chart 2). Out of the 08 salivary gland lesions, 7 cases were of Pleomorphic Adenoma and a single case of SUMP(Salivary gland

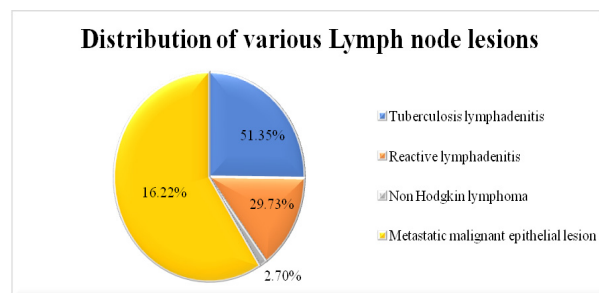


Fig. 1. Distribution of various Lymph node lesions.

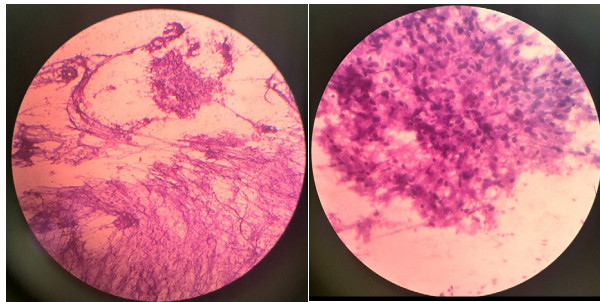


Fig. 2. FNAC of lymph node showing necrotic background and epithelioid cell granuloma (H&E, X10) (H&E, X40)

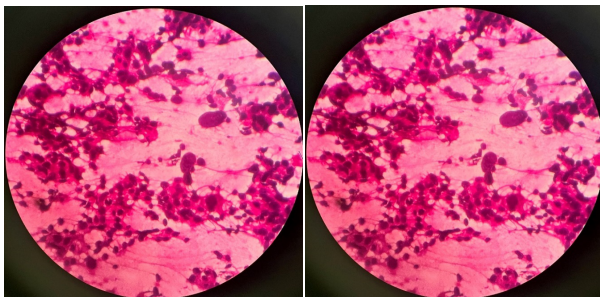


Fig. 3. Metastasis of squamous cell carcinoma (H&E, X40)

Table 3. Distribution of various Thyroid gland lesions in gender

Lesions	Female	Male	Total
Goiter	07	00	07(43.75%)
Benign follicular lesion	05	00	05 (31.25%)
Cystic thyroid nodule	00	01	01 (6.25%)
Follicular neoplasm	03	00	03 (18.75%)
Total	15	01	16

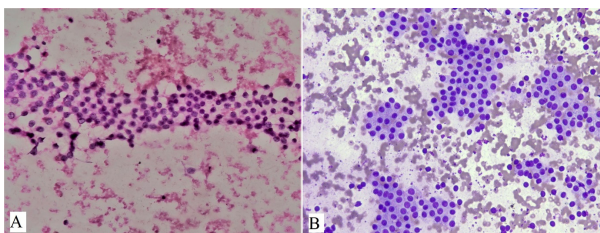


Fig. 4. (A) shows benign follicular cells having round nuclei and scant to moderate amount of cytoplasm (H&E, X400), Figure 4 (B) shows benign follicular nodule having monolayered sheets of evenly spaced follicular cells arranged in honeycomb- like pattern (MGG, X400)

neoplasm of uncertain malignant potential) (Pie chart 3).

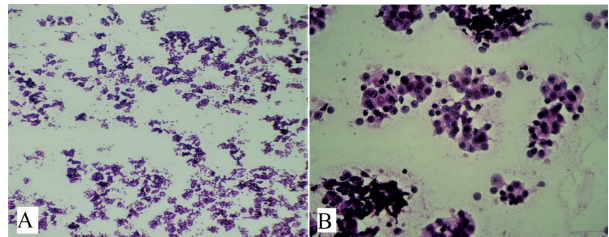


Fig. 5. (A) shows moderate cellularity comprised of uniform follicular cells arranged in crowded clusters of microfollicles (H&E, X100), Figure 6 (B) shows follicular cells in crowded, micro follicular or rosette arrangements with mild size variation, vesicular chromatin and prominent nucleoli (H&E, X400)

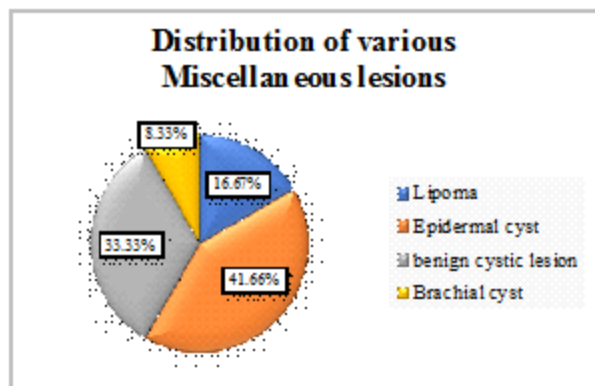


Fig. 6. Distribution of various miscellaneous lesions in gender

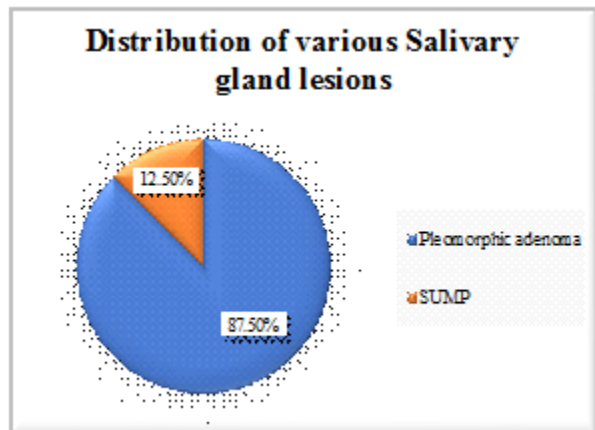


Fig. 7. Distribution of salivary gland lesions

DISCUSSION

FNAC, one of the simple, quick and cost- effective methods of evaluating superficial masses found in the head and neck region. An early differentiate of inflammatory, benign and malignant pathology is beneficial as it greatly influences the planned

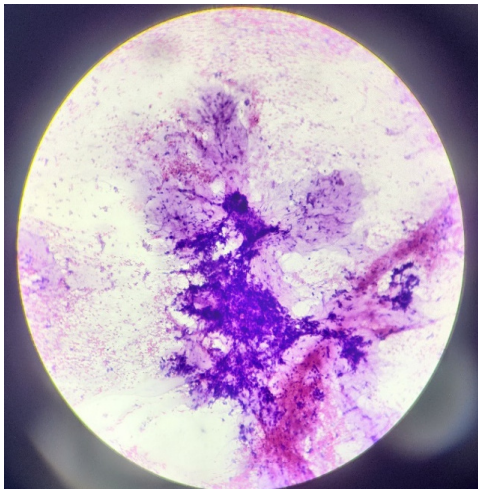


Fig. 8. Benign pleomorphic adenoma (H&E, X40)

treatment. It reduces the cost of hospitalization to the patients. There were no complications of FNAC procedure in head and neck lesions. The role of microbiologist for AFB stained slide interpretation to detect acid fast bacilli in tuberculosis was helpful. It is the screening technique which has high degree of accuracy. However doubtful lesions should always be correlated in biopsy specimen study. Further immunohistochemistry and other molecular diagnostic methods helps in arriving at the definite diagnosis. The most common diagnosis obtained in our study was of tuberculous lymphadenitis in 51.35% (38 cases) of cases. It was seen in all the age groups. It was common in females compared to males.

In our study, out of the 110 FNACs of the head and neck lesions performed, lymph nodes were the most commonly aspirated organ comprising of total 74 cases (67.28%) followed by thyroid with 16 cases (14.54%). These findings were consistent with the study done by Jasani *et al.* (2013) and Jindal *et al.* (2012).

In the present study, of the 110 FNACs performed, 74 cases were from lymph node lesions.

The most common diagnosis found was Tuberculous lymphadenitis comprising of 38 cases (51.35%). This observation is in accordance with the observation of other studies done by Mui *et al.* (1997), Mobley *et al.* (1991) had lymph node masses as the commonest cause for neck lesions. In the present study 12 cases (16.21%) were of metastatic lymph node which is similar to the result from Farzana Shahid *et al.* (2010) (4.5%).

Thyroid lesions constitute second most common site in head and neck lesion accounting for 14.54 % (16 cases). Female to male ratio in thyroid gland lesion was 15:1 in study by Patel *et al.* (2015) which is similar to our study. In present study most of the lesion in thyroid was Goiter (43.75%) followed by benign follicular lesions (31.75%) cases, followed by follicular neoplasm (18.75%). Goiter is the commonest thyroid gland lesion in study done by Sanghvi *et al.* (2018) comparable to our study. In present study, most of the thyroid lesions were benign which were comparable with other studies such as Suryawansh *et al.* (2015) Kate *et al.* (2015) and Goswami *et al.* (2016) studies. Female preponderance in various thyroid lesions is comparatively well observed in present study.

In the present study, out of the 110 FNAC performed, 08 cases were from salivary gland lesions. The most common benign tumor was pleomorphic adenoma 87.5% and SUMP formed 12.5% of all salivary gland lesions. These findings were consistent with study done by Rathod *et al.* (2012).

Miscellaneous Lesions: Miscellaneous lesions constitute 10.91% of all palpable head and neck lesions. Epidermal cyst was the common finding accounting for 5 cases (41.66) % which was comparable with Valiya *et al.*²⁷, and Suryawansh *et al.* (2015) studies.

CONCLUSION

From our study results, we have found FNAs are

Table 4. Showing comparison of distribution of head and neck lesions between our study and other studies

Studies	Lymph node (%)	Thyroid (%)	Salivary gland (%)	Other (%)
Our study	67.28	14.54	7.27	10.91
Shekhar H <i>et al.</i> ⁸	42	18	15.5	17.5
Sreedevi <i>et al.</i> ⁹	50.32	44.07	3.28	2.3
Pathak <i>et al.</i> ¹⁰	61.2	19.2	6.7	12.9
Khetrupal S <i>et al.</i> ¹¹	64.1	16.9	4.1	13.8
Sanghvi AKB <i>et al.</i> ¹²	41	37	5	7
Kapoor S <i>et al.</i> ¹³	43	34	15	8

excellent first line and minimum invasive method 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. In our study, tuberculous lymphadenitis was the most common cause of cervical lymphadenopathy and more common in females. Metastatic carcinoma was the most commonly encountered malignancy and colloid goiter was the most common benign pathology. However, advanced studies are required for establishing a more accurate trend of occurrence of head and neck swellings.

Conflict of Interest: None

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