

Diagnostic Role of FNAC in Evaluation of Head and Neck Lesions

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Abstract

Introduction: The neck masses are relatively common problem. These neck masses are evaluated by history, clinical examination and investigation like FNAC, USG neck, CT Neck and excision biopsy. Fine Needle Aspiration Cytology (FNAC) is a very simple, quick, inexpensive and minimally invasive technique used to diagnose different types of swellings in head and neck region. **Objective:** To assess the frequency and incidence of different sites, age, sex and distribution of reactive, benign and malignant lesion. **Methods:** A retrospective study was conducted at GMERS Medical College & Hospital, Gotri, Vadodara, Gujarat from April 2018 to November 2018. Patients between the ages of 1 to 90 years were enrolled into the study. A total of 305 patients with a head and neck swelling underwent FNAC. Fine needle aspiration diagnosis was correlated with detail of relevant clinical findings and investigations. USG Neck was done in all cases prior to FNAC examination. **Results:** Out of 305 fine needle aspiration procedures 66.56% (203 cases) were of lymph node, 21.97 % (67 cases) were of thyroid, 5.90% from salivary gland (18 cases), 5.57% (17 cases) from skin and subcutaneous swellings. Out of total 305 lesions, 239 (78.36%) were inflammatory and benign, 66 (21.64%) were malignant and metastatic carcinoma. **Conclusions:** Our study found that FNAC is simple, quick, inexpensive and minimally invasive technique to diagnose different types of head and neck swellings. It could differentiate the infective and benign process from neoplastic one and avoids unnecessary surgeries and expenses. Thus, FNAC can be recommended as a first line of investigation in the diagnosis of head and neck swellings.

Keywords: Head and neck Lesions, Fine Needle Aspiration Cytology, Benign and Malignant

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 differential diagnosis in a patient presenting with neck mass is often extensive and will vary with age. These neck masses are evaluated by a detail history, clinical examination and investigation like FNAC, USG neck, CT Neck and excisional biopsy.

The common pathologies encountered in the neck presenting as a lump are lymphadenopathies (specific and non-specific, acute and chronic and reactive), metastatic carcinoma, lymphoma, thyroid swellings (goitre, nodules and cysts and carcinoma) and salivary gland swellings (sialadenitis, cysts, adenomas and carcinomas).

The less common pathologies presenting as swelling in the neck are carotid body tumour, Keratinous cyst, 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

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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. It emerges from the analysis that Fine needle aspiration cytology is a safe, simple and rapid method that can be done in diagnosing wide range of neck swellings.

Material and Methods

Place of the study: Blood Bank, Department of Pathology, GMERS Medical College & Hospital, Gotri, Vadodara, Gujarat (India)

Type of the study: Retrospective

Sampling Methods: In this study, FNAC was performed in 305 patients presented with lesions in the head and neck regions, in Department of Pathology, GMERS Medical College & Hospital, Gotri, Vadodara, Gujarat from April 2018 to November 2018. 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 material obtained was immediately fixed in 90% alcohol for routine haema-toxylin and eosin stain and Pap stain and few were air dried for giemsa stain.

Inclusion Criteria: All the age group of patients (0-90 years).

Exclusion Criteria: Lesions of oral cavities.

Statistical Analysis: Percentages were calculated for estimating frequency of various pathological conditions detected on FNAC in patients presenting with head and neck swellings.

Results

The study included 305 cases of the age ranged from 1 to 90 years (Table 1) out of which 147(48.20.%) were males and 158(51.80.%) were females (Table 2).

Table-1: Distribution of various lesions Age wise.

Age (Years)	Cases	Percentage
00-10	21	6.9%
11-20	38	12.50%
21-30	64	21.05%
31-40	58	19.07%
41-50	55	18.09%
51-60	38	12.17%
61-70	26	8.55%
71-80	2	0.65%
81-90	3	0.65%
Total	305	

Table-2: Distribution of lesions as per tissue involved and gender.

Tissue	Male	Female	Total
Thyroid	4	63	67
Salivary glands	10	8	18
Skin and subcutaneous tissue	8	9	17
Lymph node	125	78	203
Total	147	158	305

Table-3: Distribution of various Lymph node lesions

Lesions	Male	Female	Total
Tuberculosis	37	46	83
Reactive lymphadenitis	14	16	30
Acute suppurative Inflammation	18	05	23
Chronic non specific inflammation	06	03	09
Lymphoma	00	00	00
Metastasis	50	08	58
Total	125	78	203

Among the diagnostic outcome, higher incidences of lesion are in the neck region than in the head region. Lymph node involvement 203 (66.56%) was common than any other lesion. Among 203 cases of lymph node lesions, 83 cases (40.89%) were having tuberculous inflammation, 30 (14.78%) were having reactive lymphadenitis, 23 (11.33%) cases were acute suppurative inflammation and 9(4.43%) cases were having chronic non specific lymphadenitis and 58 (28.57 %) were having metastatic carcinoma (Metastatic Squamous cell carcinoma) (Table 3).

Table-4: Distribution of various Thyroid lesions

Lesions	Male	Female	Total
Thyroiditis	1	18	19
Colloid Goitre	1	41	42
Follicular Carcinoma	0	2	2
Medullary Carcinoma	1	2	3
Papillary Carcinoma	1	0	1
Total	4	63	67

Out of 67 cases of thyroid lesion, 63 cases (94.03%) were females and 4 cases (5.97 %) were males. 42 cases (62.69%) were of colloid goiter with cystic changes. 19 cases (28.36%) were of Hashimoto's Thyroiditis and lymphocytic thyroiditis and 6 cases (8.96%) malignant thyroid carcinoma (Table 4).

Table-5: Distribution of various salivary lesions

Lesions	Male	Female	Total
Sialadenitis	03	05	08
Pleomorphic adenoma	04	01	05
Warthin's tumor	02	00	02
Oncocytoma	00	01	01
Mucoepidermoid Carcinoma	01	01	02
Total	10	08	18

Out of the 18 salivary gland lesions, 5cases (27.78%) were of Pleomorphic Adenoma, 2 cases (11.11%) was Warthin's tumor, 8 cases (44.44%) was of chronic sialadenitis and 2 cases (11.11%) were malignant lesions (Table 5).

Table-6: Distribution of various skin and subcutaneous lesions

Lesions	Male	Female	Total
Lipoma	04	02	06
Keratinous cyst	03	05	08
Infected cyst	01	00	01
Brachial Cyst	00	01	01
Benign Adnexal tumor	00	01	01
Total	08	09	17

Out of 17 cases of skin and subcutaneous lesions 6 cases (35.29%) were Lipoma, 8 cases (47.06%) were Keratinous and epidermal cysts, 1 case (5.88%) was brachial cyst, 1 case (5.88%) was Benign adnexal tumor and 1 case (5.88%) was infected cyst (Table 6).

Discussion

Fine needle aspiration cytology is one of the most accessible technique for head and neck lesions. The most common diagnosis obtained in our study was of tuberculosis lymphadenitis in 40.89% (83 cases) of cases. It was seen in all the age groups. It was common in females compared to males.

Metastatic deposits in lymph node was diagnosed in 28.57% (58 cases). It was common in males compared to females. The most common malignancy encountered was that of squamous cell carcinoma deposits. The smear from these cases were highly cellular and showed pleomorphic squamous epithelial cells arranged in loose cohesive clusters and singles. These cells were highly pleomorphic with very high N: C ratio and prominent nucleoli. Background showed keratinous material with necrosis. However few of the malignant squamous cell carcinoma deposits showed cystic change where we aspirated a fluid material in FNAC. Few of the cases were adenocarcinoma where cells were arranged predominantly in glandular pattern with vacuolated cytoplasm. 5.90% (18 cases) were salivary gland lesions in which 18 were benign and 2 were low grade mucoepidermoid carcinoma. Smears from the mucoepidermoid carcinoma cases showed mucus, intermediate and squamous cells. The nucleus were relatively bland with prominent nucleoli in few cells, Background showed debritic dirty material.

FNAC is a simple inexpensive method to diagnose the most significant lesions encountered in clinical practice. Though open biopsy is gold standard in lymph node lesions, FNAC is a simple out-patient procedure where diagnosis is obtained fast and reduces the cost of hospitalization to the patients. It is the 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 the definite diagnosis. There no complications of Fnac procedure in head and neck lesions. There are no reported cases of spread of tumor through sinus tract in cases of malignancy.

Study done by Rajyalakshmi et al in Kakinada found that out of 360 cases of head and neck tumors, 39% were from soft tissue, 38% were from lymph node and 19% were of salivary gland origin. 4% of adnexal lesions were also noticed [10]. Study done by Sreedevi et al [11] also coincided with our study where out of 304 cases studied. 50% of head neck lesions were from lymph node and in that common lesion seen was reactive lymphadenitis next was thyroid lesions. In thyroid lesions the commonest diagnosis they arrived was of goiter and hashimotos thyroiditis. The salivary gland lesions they encountered was pleomorphic adenoma and one case of basal cell adenoma. They did not document any malignant salivary gland tumor. Whereas in our study we got 3 cases of salivary gland malignancies. The soft tissue lesions they documented was of epidermal cysts and lipoma.

The number of cases studied coincided with our study of 50 cases in a study done by Yoshida et al [13] where they found that TB lymphadenitis was seen in 36%, reactive lymphadenitis in 18% of cases. Followed by malignant neoplasms and non neoplastic lesions. Anne R Wilkinson et al in the year 2012 did study on FNAC diagnosis of lymph node malignancies and concluded that diagnostic accuracy of metastatic lesions were 97%, for lymphomas it was 82% with a sensitivity of 97% and specificity of 100% [14].

Rathore and team in Panacea conducted the study on head and neck masses on 756 cases. Lymph node swellings were more common followed by thyroid, skin and soft tissue lesions. Salivary gland lesions were least noticed in their study [12].

Table-7: Showing comparison of distribution of head and neck lesions between our study and other national and international studies.

	Lymph node %	Salivary gland %	Soft tissue %
Our study	66.56	5.90	5.57
Shobha [9]	86	12	02
Rajyalakshmi[10]	38	19	39
Sreedevi[11]	50	10	10
Rathore[12]	75	15	10

This table explains the comparison of our study and other studies in distribution of lesions. It is observed that lymph nodes are the commonly encountered lesions. Followed by Salivary gland and than soft tissue lesions. However in study done by Rajyalakshmi [10] the soft tissue lesions are more competed to salivary gland lesions.

Table-8: Comparison of results of various studies

	Our study	Shreedevi et al [11] (2016)	Patel DN et al [16] (2015)	Muddegowda et al [15] (2014)	Bhagat et al [17] (2013)
Location	India	India	India	India	India
Duration	8 months	1 year	1 year	8 monts	1 year
No. of patients	305	304	250		
M:F ratio	0.48:1	1:2.1	---	0.53:1	--
Predominant sites	Lymphnode	Lymphnode	Lymphnode	Thyroid	Lymphnode

Table-9: Sex wise distribution of cases

Study	Number of cases	Male	Female
Present Study	305	147	158
Shekhar et al [18]	200	114	86

Conclusion

It was concluded from the present study, that Tuberculosis lymphadenitis is the commonest problem in patients presenting with neckswellings in our set-up, followed by malignant neoplasmespecially metastatic carcinoma and Colloid Goitre and Reactive Lymphadenitis. 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 neo-plastic one and avoids unnecessary surgeries. Thus, FNAC can be recommended as a first line of investigation in the diagnosis of head and neckswellings.

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.

Contribution from the Author

- Dr. Mayuree H. Modi: Data collection, analysis and preparation of manuscript.
- Dr. Mayur J. Kokani: Analysis and preparation of manuscript & critical revision.

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