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Fine Needle Aspiration Cytology Profile of Head and Neck Lesions in a Tertiary Care Hospital

Afnan Gul*, Vani B.R., Srinivasa Murthy V.*****

*Postgraduate Student, **Associate Professor, ***Director & Professor, Dept of Patholgoy, ESICMC & PGIMSR, Rajajinagara, Bengaluru, Karnataka.

Abstract

Introduction: Head and neck lesions are frequent entities encountered in clinical practice. Fine needle aspiration cytology is a simple, rapid, and cost-effective method to sample superficial masses found in head and neck. Common pathologies encountered in head and neck region are specific and nonspecific lymphadenopathies, salivary gland neoplasms, sialadenitis, and lesions of skin appendages. FNAC enables a useful primary evaluation in these cases. *Objectives*: The objectives were to study various cytological features of neoplastic and non-neoplastic lesions of head and neck region and to evaluate the distribution of various lesions among different age groups. *Materials and Methods*: A cross-sectional study was conducted from May 2014 to December 2014. FNA was performed on 300 patients with head and neck masses. Thyroid lesions were excluded from study. Aspirations were performed using 22-25 G needles with syringe, and smears stained using Leishman and H & E stain. Fine needle aspiration diagnosis was correlated with relevant clinical details and investigations. *Results*: Out of 300 fine needle aspiration procedures, 60% were from lymph nodes, 10% from salivary gland, 14% from benign neoplasms and 14% were cysts. Diagnosis was inconclusive in 2% of the cases. The most common diagnosis was reactive/non-specific lymphadenitis (38%) followed by benign neoplasms and cysts (14%). Metastatic carcinomatous deposits in lymph node were most common type of cancer followed by lymphoma. *Conclusion*: FNA of head and neck masses is a very useful diagnostic tool in separating inflammatory and neoplastic lesions, thus avoiding unnecessary surgeries. FNAC can be recommended as a first line investigation in the diagnosis of head and neck swellings.

Keywords: FNAC; Head and Neck; Reactive Lymphadenitis; Salivary Gland.

Introduction

Head and neck lesions are frequent entities found in clinical practice. The close proximity of various types of tissues at this site and a wide range of primary and metastatic neoplasms make it one of the most interesting and challenging in FNAC diagnosis [1].

Common pathologies encountered in head and neck region are specific and non specific lymphadenopathies, salivary gland neoplasms, sialadenitis, and lesions of skin appendages. Frequency of incidence of various non thyroid head and neck lesions varies from 40-70% [2,5,8].

It can differentiate a benign lesion from a malignant one, thus preventing the patient from being subjected to unnecessary surgery [11].

Hence, FNAC is a cost-effective and rapid technique for the assessment of masses within the head and neck area [13].

The differential diagnosis of head and neck swellings include a broad spectrum of diseases with differing implications for management. FNAC provides for a suitable and useful method of assessment of these lesions [14].

This study was undertaken to study and categorize lesions of the head and neck region on aspiraton cytology.

Corresponding Author: Afnan Gul, Postgraduate Student, Department of Pathology, ESICMC & PGIMSR, Rajajinagara, Bengaluru- 560010.
E-mail: afr.afr.on.the.wall@gmail.com

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Materials and Methods

The present study was conducted in the Department of Pathology at ESIC MC & PGIMSR, Rajajinagar, Bangalore from May 2014 to Dec 2014. FNAC was performed on 300 patients with head and neck mass. Thyroid lesions were excluded from the study. After collecting clinical details, relevant questions pertaining to the etiological cause along with history of the lesions were noted. Patients were explained about the procedure and consent was taken. Under aseptic precautions, a 23 gauge needle with syringe and trocar was inserted into the lesion and sufficient negative pressure given to aspirate adequate material. Smears were prepared from the aspirate on multiple glass slides. As per the staining procedure, the smears were either air dried or fixed using fixative like absolute alcohol and subsequently stained using Leishman or H&E stain, respectively. ZN stain for AFB was done in those cases with clinical suspicion, where purulent or cheesy material was aspirated or diagnosis was granulomatous. The procedure was repeated when material was inadequate for a definitive diagnosis. FNAC diagnosis was correlated with relevant clinical details and investigations.

Observations and Results

The study included 300 patients with head and neck swelling. The age ranged from 4 months to 85 years. Males were 52% and 48% were females. Of the 300 cases, non neoplastic lesions accounted for 201 cases (67%) and neoplastic were 99 cases (33%).

The most common lesion of lymph node was reactive lymphadenitis due to inflammatory pathology, frequently seen in the first three decades. Tuberculous lymphadenitis comprised 17% of cases, predominant in the second and third decades. Malignant lesions involving the lymph node were 35 out of the 180 cases (19%). of lymph node pathology. The commonest neoplasm encountered was metastatic carcinomatous deposits, either adenocarcinoma or squamous cell carcinoma.The most frequent site of metastasis was to the cervical group of lymph nodes. Inflammatory lymphadenitis was common among first three decades of life whereas malignant neoplasms were more common after the third decade, as shown in Table 1.

Salivary gland lesions comprised 31 cases (10%) of cases, the most common being pleomorphic adenoma. Soft tissue neoplasms comprised of 41 cases (14%) of which the most frequent diagnosis was lipoma, seen in 21 cases (7%) followed by benign adnexal tumors occurring in 14 cases (5%).

Incidence of cystic lesions in the head and neck region was 14% and constituted a total of 41 cases. Most frequently diagnosed cystic lesion was epidermal cyst (68%).

FNAC was inconclusive in 2% of the patients. This could be attributed to firm small swellings and uncooperative patients.

Discussion

Fine needle aspiration cytology dates back to around mid 19th century [1]. In 1940, two doctors, Martin and Colley, and a technical developer, Ellis, performed aspirations from several organs and carried out cytological studies on them [2]. The main advantage of FNAC is the avoidance of a surgical biopsy and its attendant risks, which include scarring, potential tumor seeding, greater duration of hospital stay and increased costs [15].

A further advantage of performing the aspiration is the ability to immediately assess the adequacy of the sample and to decide whether or not further passes are required [16]. This rapid diagnosis decreasing patient anxiety as well as reducing the time from presentation to diagnosis and, ultimately, to treatment.

In this study, age of patients ranged from 4 months to 85 years, with male:female of 1.08:1. Benign and infective diseases were more common in the younger age group while malignant lesions were seen more frequently in elderly patients, as shown in Table 1. This is similar to studies by Pawde Y [5] and Jindal U et al [8].

Lymphadenopathy due to inflammatory pathology was the most commonly encountered diagnosis, comprising 115 out of 180 cases (64%). Another study carried out by El Hag, et al [3] in Saudi Arabia also concluded reactive/non-specific lymphadenitis to be the commonest cause of neck masses accounting for 33% cases. Tubercular lymphadenitis formed 17% of the lymph node lesions in our study, most commonly seen in first 3 decades of life (Table 2). Frequency of incidence varies from 20% to 60% in different studies [3,5,6,8] as shown in Table 3. These findings were comparable to various other studies carried out by Manjula K. et al [7]. Carcinomas metastasizing to lymph nodes were the most common type of malignancy (15%) followed by lymphoma (5%). Among lymphomas, seven cases of non-Hodgkin lymphoma (04%) and 1 case of anaplastic lymphoma

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

Categories	0-10 yrs	11-20 yrs	21-30 yrs	41-40 yrs	41-50 yrs	51-60 yrs	>60 yrs	Total (%)
Reactive lympadenitis	18	19	33	18	15	12	03	118 (39%)
Tubular lympadenitis	03	03	10	07	05	02	-	30 (10%)
Metastatic deposits to LN	-	-	-	02	04	06	15	27 (09%)
Malignant lympoma	-	-	02	01	03	01	01	08 (03%)
Salivary gland tumor	-	02	03	01	02	07	03	18 (06%)
Sialadenosis	-	01	-	01	02	-	-	04 (02%)
Sialadenitis	-	03	01	01	-	-	03	08 (03%)
Soft tissue tumors	01	05	07	14	10	02	02	41 (14%)
Cystic lesions	01	05	09	08	13	05	-	41 (14%)

Table 2: Distribution of various lymph node cases

Lymph Node Lesions	Cases	Percentage (%)
Inflammatory		
Reactive/Non-specific	115	64
Tuberculosis	30	17
Malignant		
Lymphoma		
Non-Hodgkins lymphoma	07	04
Anaplastic lymphoma	01	01
Metastatic deposits	27	15
Total	180	100

Table 3: Comparison study of frequencies of lymph node pathology

Study	Reactive lymphadenitis (%)	Tuberculosis (%)	Metastatic deposits (%)	Lymphomas (%)
El Hag et al[2]	33	21	10	03
Bhagat VM et al[5]	21	67	08	2.5
Manjula K et al[6]	29.73	16.84	19.73	2.88
Muddegowda PH et al[8]	10	08	8.5	03
Fatima S et al[9]	20.3	52.7	8.7	5.5
Kumar H et al[10]	44.39	47.67	2.8	4.2
Present study	38	10	09	2.6

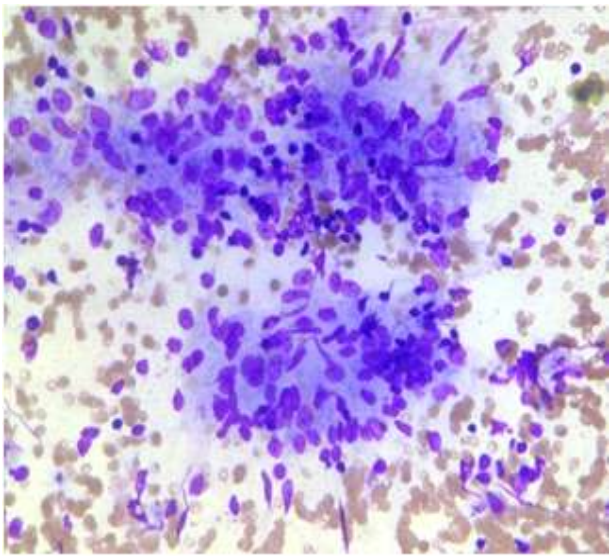

Fig. 1: Granulomatous lymphadenitis: Well formed epithelioid cell granuloma in lymph node (Leishman stain, x40)

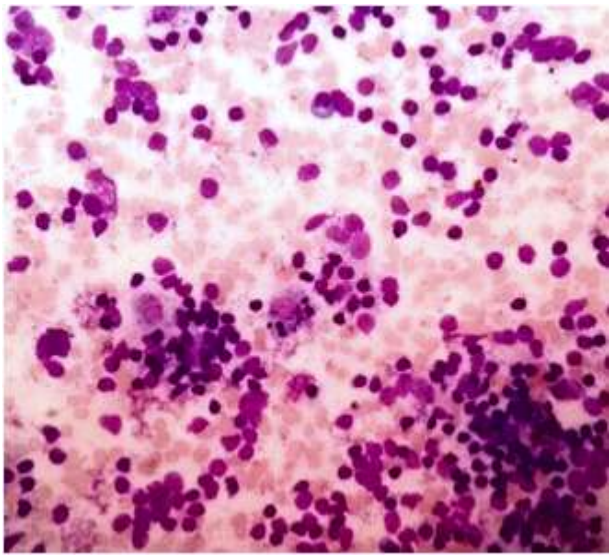

Fig. 2: Sinus histiocytosis with massive lymphadenopathy (Rosai-Dorfman disease): Large histiocytes, with one showing emperipolesis (H&E stain, x40)

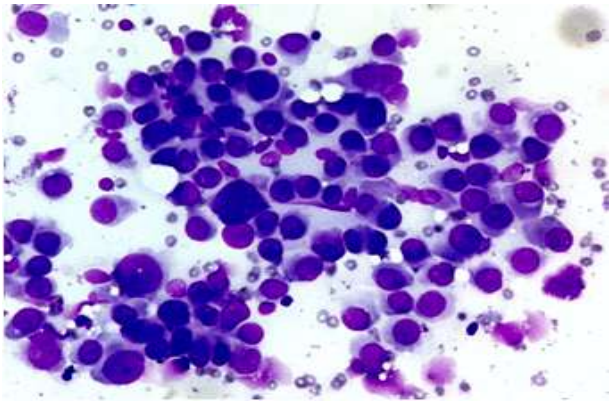

Fig. 3: Malignant deposits of adenocarcinoma in lymph node. (Leishman stain, x40)

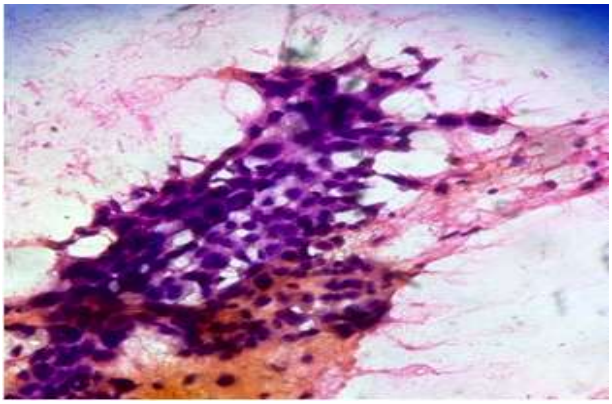

Fig. 4: Malignant squamous cells in cervical lymph node. (H&E stain, x40)

was encountered. These were characterized by monotonous population of lymphoid cells having hyperchromatic nuclei, prominent nucleoli, chromatin clumping, and often nuclear indentation.

The most common benign soft tissue swelling was lipoma. One case of nodular fasciitis of neck and three cases of neurofibroma were encountered in the study which was confirmed on histopathology. Nodular fasciitis on cytology exhibited high cellularity with clusters of proliferating spindle shaped fibroblasts admixed with ganglion cells in a myxoid background.

Salivary gland lesions comprised 10% of the cases of which pleomorphic adenoma was the most common benign swelling (42%) of salivary gland (Table 4). This was in concordance to studies conducted by Jindal U et al [8] and Muddegowda PH [9]. The diagnosis of salivary gland neoplasms has specific potential pitfalls on fine needle aspiration. These are the result of heterogeneous tumor cytology, which may result in benign tumors appearing malignant and vice versa [17].

Table 4: Distribution of various salivary gland lesions.

Diagnosis	No. of Cases	Percentage (%)
Benign		
Pleomorphic adenoma	13	42
Warthin's tumor	02	07
Oncocytoma	01	03
Sialadenitis	08	26
Sialadenosis	05	16
Malignant		
Adenoid cystic carcinoma	01	03
Mucoepidermoid carcinoma	01	03
Total	31	100

Benign cystic lesions constituted 14% of cases, comparatively more than other similar studies [7,8]. The commonest cyst seen in head and neck region was epidermal cyst (8.3%) as shown in Table 5. Benign adnexal tumors constituted fourteen cases (4.6%). These presented as cystic lesions which on cytology showed basaloid cells and myxoid basement membrane material. Cytology in cases of pilomatrixoma revealed ghost cells, basaloid cells and calcificationin a background of debris. One case of squamous cell carcinoma of the scalp presented as a cystic swelling and was confirmed to be malignant on cytology.

Table 5: Distribution of various head and neck cystic lesions

Diagnosis	No. of Cases	Percentage (%)
Epidermal cyst	25	61
Dermoid cyst	09	22
Pilomatricoma	02	05
Trichilemmal cyst	02	05
Branchial cyst	03	07
Total	41	100

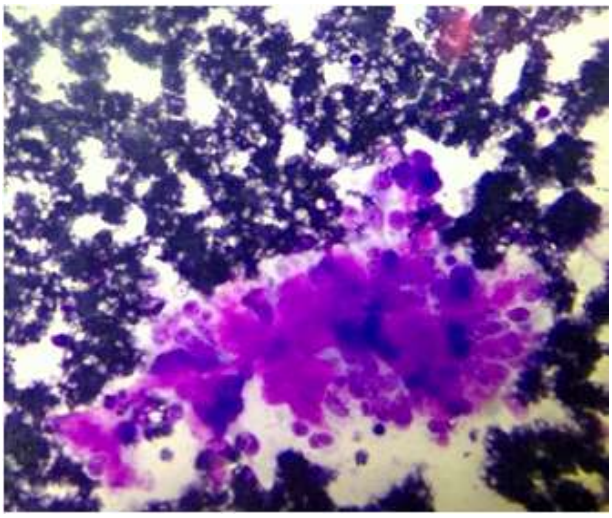

Fig. 5: Adenoid cystic carcinoma of salivary gland showing pleomorphic epithelial cells adhering to hyaline stromal globule (Leishman stain, x40)

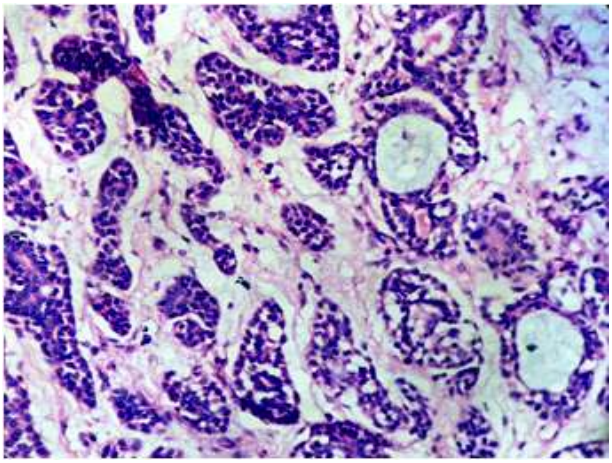

Fig. 6: Histopathology of pleomorhic adenoma of salivary gland (H&E, x10)

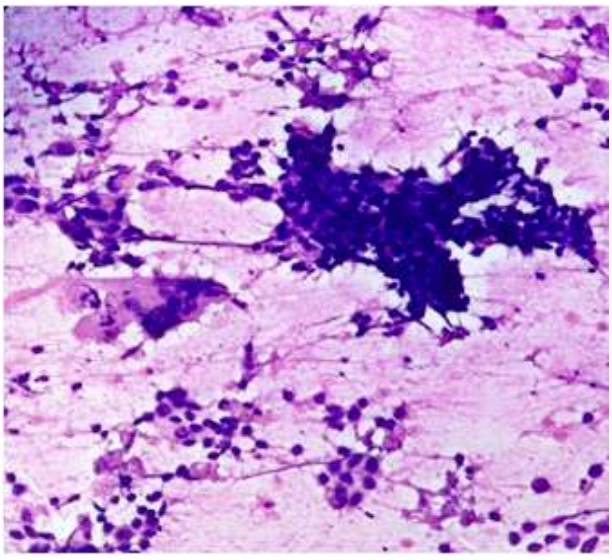

Fig. 7: Pilomatricoma of scalp: Clusters of basaloid cells, ghost cells and focal calcification (Leishman stain, x40)

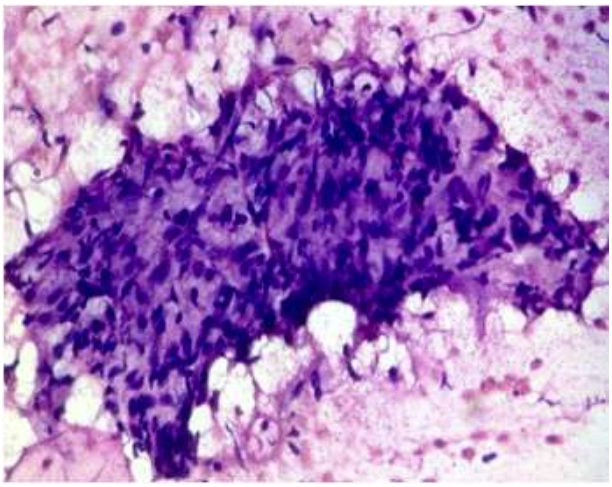

Fig. 8: Nodular fasciitis of neck: Proliferating spindle shaped fibroblasts in a myxoid background. (Leishman stain, x40)

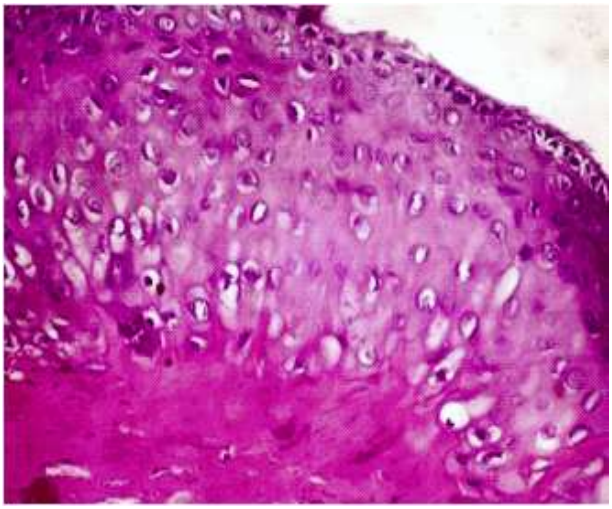

Fig. 9: Pilomatrixoma on histology showing abrupt keratinization and ghost cells (H&E, x10).

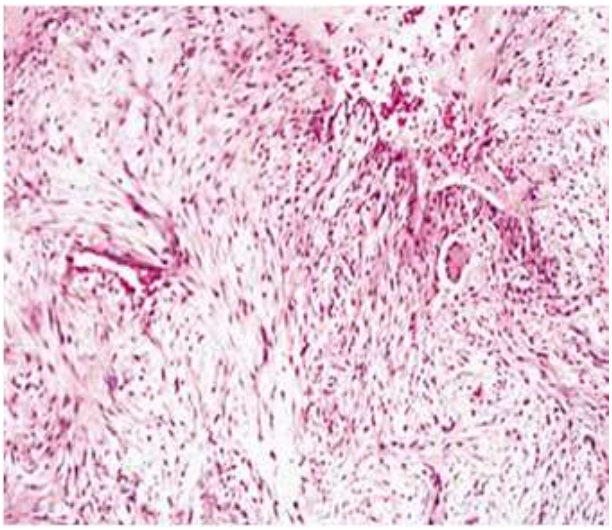

Fig. 10: Nodular fasciitis on histopathology composed of uniform, plump, immature, spindled to stellate fibroblasts (H&E, x10).

In 2% of cases no diagnosis could be made which was attributed to firm, small swellings and uncooperative patients. Unsatisfactory aspirates have been reported in various studies in the range of 9.3-15% [2,4,7,12] which is much higher than that observed in this study.

Conclusion

Fine needle aspiration cytology is a valuable aid in the preliminary diagnosis of various head and neck swellings. It helps to differente infective from neoplastic lesions, thus avoiding unnecessary surgeries. Fine needle aspiration cytology enabled the surgeon to select, guide and modify surgical planning in patients requiring surgery.

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