

Original Research Article

Diagnostic Utility of Fine Needle Aspiration in A Spectrum of Cytology Cases in a Tertiary Health Care Center of Central India**Dr. Bhanu Pratap Singh¹, Dr. Sujata Singh², Dr. Rashmi Gupta³, Dr. Sadhana Bagde⁴,
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ABSTRACT**Background**

Fine needle aspiration cytology is a simple, inexpensive method for obtaining a tissue diagnosis of disease site. FNAC has become a well-established diagnostic component in the medical field. It has become an accepted technique for the preoperative diagnosis of palpable and radiographically detected lesions at a wide variety of body sites. The technique is relatively painless, produces a speedy result and is inexpensive. In experienced hands its accuracy can approach that of histopathology in arriving at a definite diagnosis.

Method

The present retrospective study included total number of 768 fine needle aspiration cytology cases which came to Cytology section of Department of Pathology, Chhattisgarh Institute of Medical Sciences. The patients were clinically evaluated and underwent routine hematological, biochemical and radiological investigations. After performing the fine needle aspiration, the smears were stained with May-Grünwald-Giemsa (MGG), hematoxylin and eosin (H and E) and papanicolau (Pap) stains. No major complications like penetration into the trachea, laryngeal nerve palsy, or hematoma were recorded. Only slight pain was reported by some patients.

Results

In our study we have included a total number of 768 cases. A broad classification included cases from Soft tissue lesions (217 cases), lymph node (184 cases), Breast (149 cases), Thyroid (137 cases), Salivary gland (56 cases) and Neck lesions(25 cases). The most common soft tissue lesion was lipoma (72 cases). Cystic/ infective lesions were the second most common ones. In lymph nodes maximum cases were of reactive lymphadenitis (53 cases)

followed by tubercular lymphadenitis (57 cases). In 149 breast fine needle aspiration cytology we had 75 benign cases, 16 Atypical ductal hyperplasia and 58 malignant cases. FNA of thyroidal lesions yielded Benign colloid nodule (30 cases), Nodular goitre (24 cases) and Autoimmune thyroiditis (36 cases). In malignant lesions of thyroid, we found Follicular carcinoma (9 cases), Follicular variant of papillary carcinoma (14 cases), Papillary carcinoma (16 cases), Medullary carcinoma (5 cases) and Anaplastic carcinoma (3 cases). In salivary gland lesions benign cases included Chronic sialadenitis (16 cases), Pleomorphic adenoma (9 cases), Mucinous cyst (8 cases), Granulomatous sialadenitis (3 cases), Sialadenosis (5 cases) and Warthin's tumor (3cases). Malignant cases were of Acinic cell carcinoma (4 cases), Mucoepidermoid carcinoma (3 cases), Squamous cell carcinoma (3 cases) and Adenocarcinoma NOS (2 cases). Other lesion in neck included Thyroglossal cyst (14 cases), Branchial cyst (9 cases) and lymphangioma (2 cases).

Conclusion

This study emphasizes the use of fine needle aspiration cytology as a first line diagnostic procedure for the investigation of lumps or masses. It is a relatively painless, inexpensive and easily accessible procedure for the patients. It readily generates the report and gives an insight into the nature of the lesion prior to the surgery. However, it has its limitations. Definitive treatment such as surgery is carried out only after histological confirmation of cytological findings.

Keywords: Fine-needle aspiration, Cytology, Soft tissue, Thyroid, Breast, Salivary gland

INTRODUCTION

The use of needle aspiration for purposes of diagnosis can be traced back to 1847 when Kun described a "new instrument for the diagnosis of tumours". There followed occasional sporadic reports of this technique towards the end of the 19th century. In 1883 Leydon used needle aspiration to obtain cells to isolate pneumonic microorganisms, and three years later Menetrier used the technique to diagnose pulmonary carcinoma. In 1904 Griegg and Gray diagnosed trypanosomiasis in lymph node aspirates from patients with sleeping sickness.¹ Few pathologists were involved in this pioneering work, which was promulgated to a large extent by clinicians who used these techniques as aids to rapid diagnosis. The art and science of cytology and cytopathology has been implemented and recognized as early as the 18th century.²⁻⁶ Nevertheless standardization of the cytology was not completely done until the 20th century. The very first committee in cytopathology was established in 1989 which was referred to as American Board of Examination. Europeans, especially north Scandinavian countries, were able to utilize this technique even before the World War II.^{2,5} The initial North American scientific papers describing tumor diagnosis by cytological examination was published in 1930 from New York Memorial Hospital by Drs. Martin and Ellis followed by a publication by Dr. Stewart in 1933.^{7,8}

After these initial breakthroughs the medical fraternity started recognizing its benefits and started aggressively pursuing this sub specialized field of pathology. Although there are still few limitations for making the initial diagnoses merely on the basis of cytological materials, these limitations are shrinking day by day and the role that cytopathology plays as an initial diagnostic tool is currently a standard procedure.^{9,10} Collection of samples is generally quick and relatively non-invasive, and examination of cytology samples typically does not require any special equipment beyond what would normally be found in a practice, with the result that a diagnosis often can be made in-house. Although limitations exist in regard to sensitivity, specificity, and predictive values of positive and negative results, cytologic examination is considered the preferred diagnostic modality for many types of inflammatory, neoplastic, and other lesions. The purpose of collecting and examining a cytology sample is to collect

information on the nature of the sampled tissue that can be used to make appropriate diagnostic and therapeutic decisions about the patient and, ultimately, improve the patient's outcome. When samples are taken an effective communication between the pathologist collecting the sample and the clinician examining the patient is essential, so as to gain as much clinical information as possible and establish an effective clinicopathological correlation which in turn will aid in making the final diagnoses. In 1933 Stewart described the experience of the Memorial Hospital comprising 2500 tumours analysed by the aspiration method.¹¹ In his report he emphasised certain points that must be considered for optimal results: emphasis on the technique of aspiration and preparation of the sample; the importance of correlating clinical information with interpretation of the aspirated material; the pathologist is encouraged to compare the "picture" of the smear with conventional histology; for correct interpretation, the pattern of the smear must be taken into account along with detailed individual cytological features; and the usefulness of this method is documented for tumour diagnosis, but attention is also directed towards its limitations.

AIMS AND OBJECTIVES

To study the spectrum of fine needle aspiration cytology cases in a tertiary health care centre in Central India

MATERIALS AND METHODS

We included a total of 768 fine needle aspiration cytology cases in this retrospective study. A 23-gauge needle attached to a Franzen's handle was used, either without or with aspiration by a 10 ml disposable syringe. Two to three passes were made in each case depending upon the situation. The procedure was done by cytopathologists in all the cases. Prior to aspiration, a physical examination was carried out to note the consistency of the lesion. The patients were made to sit or lie supine depending upon the location and type of the swelling. Local anaesthetic is rarely required for comfort; if used it may alter the palpatory findings and foil the precision of needling. Despite statements to the contrary, a 20 ml plastic disposable syringe is the most satisfactory size coupled with a 21-, 23-, or 25-gauge needle. After the skin has been cleaned with antiseptic, the tumour is held firmly with one hand and the needle is inserted directly into it. The plunger of the syringe is pulled back, thus exerting suction. This is maintained with the thumb, and the needle is moved through the tumour three or four times in different directions. Still with the needle in the tumour, suction is slowly released. The needle is then removed from the tumour and the syringe from the needle. The syringe is then filled with a little air, reconnected to the needle, and the contents of the needle blown on to one or more clean dry slides, which are rapidly air dried or fixed as per the stain required. In the case of cystic nodules, the cysts' contents were aspirated, centrifuged, and slides made from the sediment for cytological analysis. The slides were stained with May-Grünwald-Giemsa (MGG), hematoxylin and eosin (H and E) and papanicolau (Pap) stains. No major complications like penetration into the trachea, laryngeal nerve palsy, or hematoma were recorded. Only slight pain was reported by some patients.

Inclusion criteria

The cases having definite cytopathological diagnoses on fine needle aspiration cytology.

Exclusion criteria

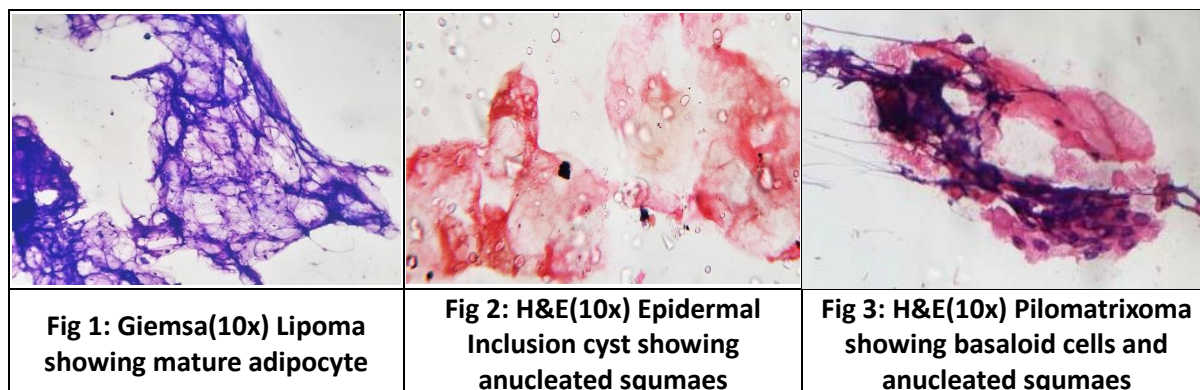
1. Smears having inadequate cellularity on slide.
2. Smears which are hemorrhagic.
3. Smears having drying/ crush artifact
4. Smears having poor stain quality.

RESULTS

In our study we have included a total number of 768 cases. A broad classification included cases from Soft tissue lesions (217 cases), lymph node (184 cases), Breast (149 cases), Thyroid (137 cases), Salivary gland (56 cases) and Neck lesions (25 cases). Fine needle aspiration cytology (FNAC) forms one of the first diagnostic tools in the evaluation of tumors. Its role in diagnosing soft tissue tumors (STT) has been fairly documented, as well as debated. In our study the most commonly encountered entity for fine needle aspiration cytology was soft tissue lesions (217 cases). Benign soft tissue lesions constituted 205 cases and malignant soft tissue lesions constituted 12 cases. Due to lack of the immunohistochemical markers and detailed history we made broad diagnoses of benign soft tissue lesions or malignant soft tissue lesions with the respective possible differential diagnoses. The most common soft tissue lesion was lipoma (72 cases) (Fig.1). It is the benign tumor comprising of mature adipocytes. Cystic/ infective lesions were the second most common ones (47cases). Epidermal inclusion cyst accounted for (45 cases) (Fig.2), benign spindle cell lesion (20 cases), pilomatrixoma (7 cases) (Fig.3), Tenosynovial giant cell tumor (7 cases), Glomus tumor (4 cases) and Hemangioma (3 cases). Epidermoid cysts are common benign intradermal or subcutaneous tumors. Their prevalence is 7% in head and neck patient and 1.6% within the oral cavity. From the surgical point of view, they have a very good prognosis plus it is a nonaggressive lesion. Even though these are the classical sites for occurrence of epidermoid cysts the removal of these cysts is of great concern as it can cause social stigma, aesthetic and functional impairments. Malignant soft tissue lesions were found in 12 cases.

Table 1

Benign lesions	94.5%
Lipoma	35%
Cystic/Infective lesions	23%
Epidermal Inclusion cyst	22%
Benign spindle cell lesions	10%
Pilomatrixoma	3%
Tenosynovial Giant cell tumor	3%
Glomus tumor	2%
Hemangioma	2%
Malignant lesions	5.5%



Second most common site for fine needle aspiration cytology was the lymph nodes (184 cases). In lymph nodes many cases were of reactive lymphadenitis (53 cases). Reactive lymphadenitis

was more common in childhood age group. The cases where Tuberculosis was diagnosed on the basis of demonstration of acid-fast bacilli on Ziehl Neelsen (ZN) stain, were the confirmed cases of Tubercular lymphadenitis (57 cases)(Fig.4), rest were put under the category of chronic granulomatous lesion (44 cases)(Fig.3). Other less commonly found lesions were Rosai-Dorfman disease (3 cases) and Kikuchi disease (3 cases). In malignant cases lymphomas (12 cases) were the primary tumors found in lymph nodes. Out of 12 lymphoma cases, 4 cases were of Hodgkin's lymphoma and rest of them were the non-Hodgkin's lymphoma (8 cases). Metastasis to lymph nodes was also found very commonly (12 cases)(Fig.6).

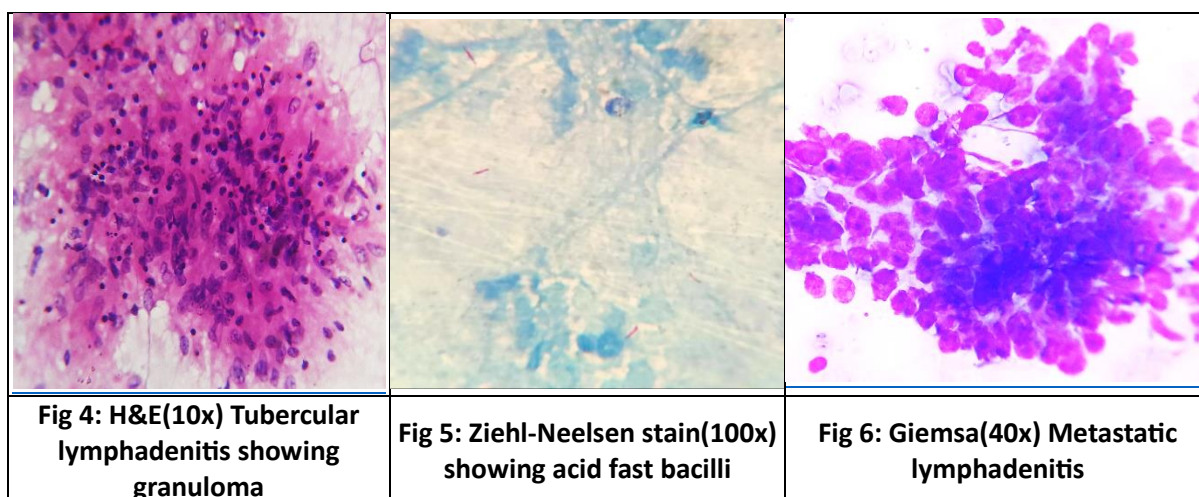
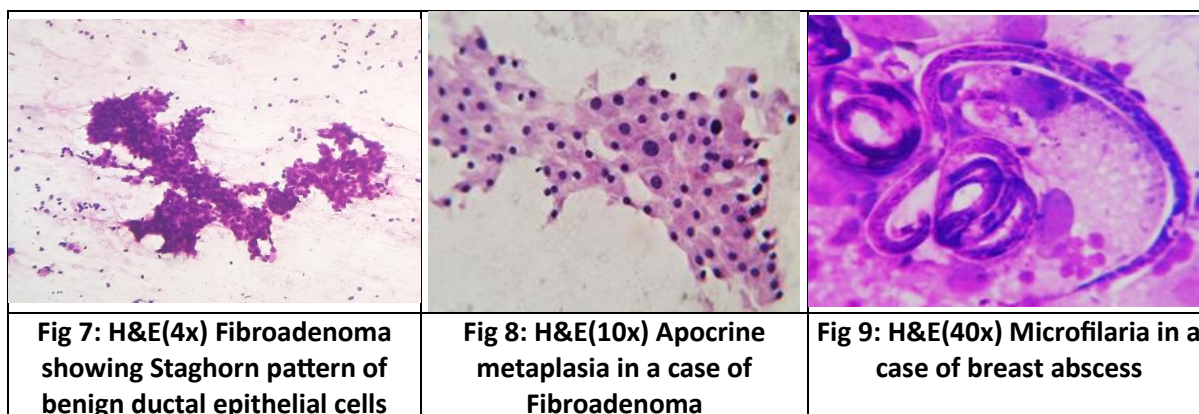


Table 2

Benign lesions	87%
Reactive lymphadenitis	33%
Tubercular lymphadenitis	36%
Chronic granulomatous lymphadenitis	27%
Rosai-Dorfman disease	2%
Kikuchi disease	2%
Malignant lesions	13%
Hodgkin's lymphoma	17%
Non-Hodgkin's lymphoma	33%
Metastatic lymphadenitis	50%

Breast cancer is rapidly emerging as the leading cause of cancer in Indian women. Cytopathology and histopathology services are required to tackle this growing burden. The IAC Yokohama system is an excellent system for accurately diagnosing breast fine needle aspirate. The International Academy of Cytology (IAC) Yokohama Reporting System of breast cytology classifies them into five categories- insufficient, benign, atypical, suspicious and malignant. In our study we had a total of 149 breast fine needle aspiration cytology cases comprising of 75 benign cases, 16 Atypical ductal hyperplasia and 58 malignant cases. Out of all benign breast lesions, Fibroadenoma (42 cases)(Fig.7,8))was the most commonly found entity, followed by granulomatous mastitis (12cases), Fibrocystic breast disease (10 cases), breast abscess (5 cases), phyllodes (3 cases) and fat necrosis (3 cases) in descending order. One of the FNA in breast surprisingly yielded Microfilaria on smear(Fig.9).



In malignant cases, infiltrating ductal carcinoma was the most commonly found entity (38 cases), followed by lobular carcinoma (12 cases)(Fig.12) and Medullary carcinoma (5 cases) and Mucinous carcinoma(3cases) (Fig.10,11). 16 cases were of Atypical ductal hyperplasia.

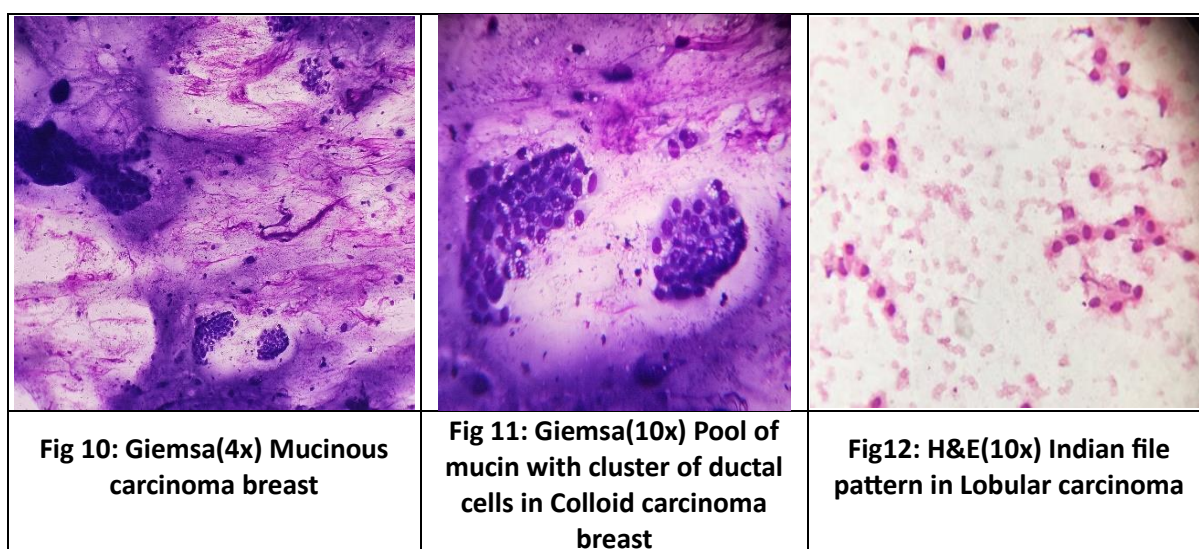


Table 3

Benign lesions	50%
Fibroadenoma	56%
Granulomatous mastitis	16%
Fibrocystic breast disease	13%
Breast abscess	7%
Phyllodes	4%
Fat necrosis	4%
Malignant lesions	39%
Infiltrating ductal carcinoma	65%
Lobular carcinoma	21%
Medullary carcinoma	9%
Mucinous carcinoma	5%
Atypical ductal hyperplasia	11%

Fine needle aspiration cytology (FNAC) of the thyroid is a non-invasive, cost-effective screening procedure that is valuable for distinguishing neoplastic lesions from non-neoplastic

nodules. The sensitivity and specificity of thyroid FNAC for detecting neoplasia were 92.6% and 91.6%, respectively. For thyroid fine needle aspiration cytology, we followed the 2017 Bethesda system. The Bethesda System for Reporting Thyroid Cytopathology (TBSRTC) established a standardized, category-based reporting system for thyroid fine-needle aspiration (FNA) specimens. The 2017 revision reaffirms that every thyroid FNA report should begin with one of six diagnostic categories, the names of which remain unchanged since they were first introduced: (i) nondiagnostic or unsatisfactory; (ii) benign; (iii) atypia of undetermined significance (AUS) or follicular lesion of undetermined significance (FLUS); (iv) follicular neoplasm or suspicious for a follicular neoplasm; (v) suspicious for malignancy; and (vi) malignant.¹² In our study the fine needle aspiration cytology on thyroidal lesions yielded Benign colloid nodule (30 cases), Nodular goitre (24 cases) and Autoimmune thyroiditis (36 cases). In malignant lesions of thyroid, we found Follicular carcinoma (9 cases)(Fig.14), Follicular variant of papillary carcinoma (14 cases), Papillary carcinoma (16 cases)(Fig.15), Medullary carcinoma (5 cases) and Anaplastic carcinoma (3 cases)(Fig.13).

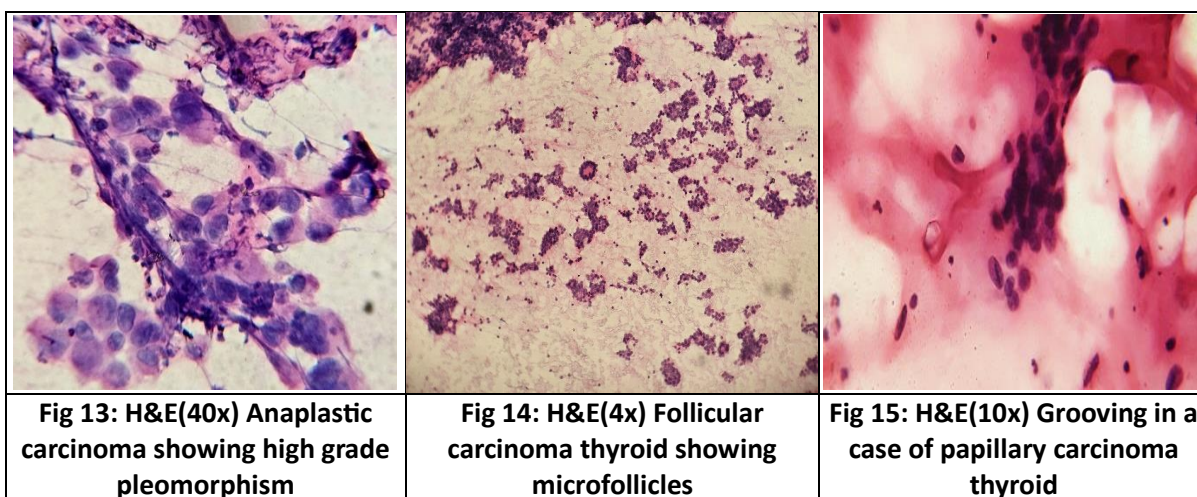


Table 4

Benign lesions	66%
Benign colloid nodule	33%
Nodular goitre	27%
Autoimmune thyroiditis	40%
Malignant lesions	34%
Follicular carcinoma	19%
Follicular variant of papillary carcinoma	30%
Papillary carcinoma	34%
Medullary carcinoma	11%
Anaplastic carcinoma	6%

Fine-needle aspiration (FNA) is widely accepted as an efficient first-line diagnostic test for the management of salivary gland lesions. It can differentiate between neoplastic and non-neoplastic salivary gland lesions, and in cases of a neoplasm, FNA can diagnose a majority of common benign tumors. In most cases, FNA can also differentiate between low- and high-grade carcinomas. The reported overall sensitivity and specificity of salivary gland FNA in most series ranges from 86 to 100% and 90 to 100%, respectively. The Milan System for

Reporting Salivary Gland Cytopathology (MSRSGC) has been shown to improve the overall effectiveness of salivary gland FNA leading to improved patient care. The novel approach of the MSRSGC is that it emphasizes risk stratification rather than specific diagnoses and provides an associated risk of malignancy (ROM) for each ascending risk category rather than a binary benign or malignant assessment for each individual case.¹³

It consists of 6 diagnostic categories: Nondiagnostic (Category1), Nonneoplastic (Category2), Atypia of undetermined significance -AUS (Category3), Neoplasm- benign (category IVA) and salivary gland neoplasm of uncertain malignant potential -SUMP (category IVB)) (Category4), Suspicious for malignancy (SM) (Category 5) and Malignant (Category 6). In our study we encountered a total number of 56 cases of salivary gland lesions out of which 44 cases were benign and 12 cases were malignant. The benign cases included Chronic sialadenitis (16 cases), Pleomorphic adenoma (9 cases), Mucinous cyst (8 cases), Granulomatous sialadenitis (3 cases), Sialadenosis (5 cases) and Warthin's tumor (3cases). Malignant cases were of Acinic cell carcinoma (4 cases), Mucoepidermoid carcinoma (3 cases), Squamous cell carcinoma (3 cases) and Adenocarcinoma NOS (2 cases). Other lesions in neck included Thyroglossal cyst (14 cases), Branchial cyst (9 cases) and lymphangioma (2 cases).

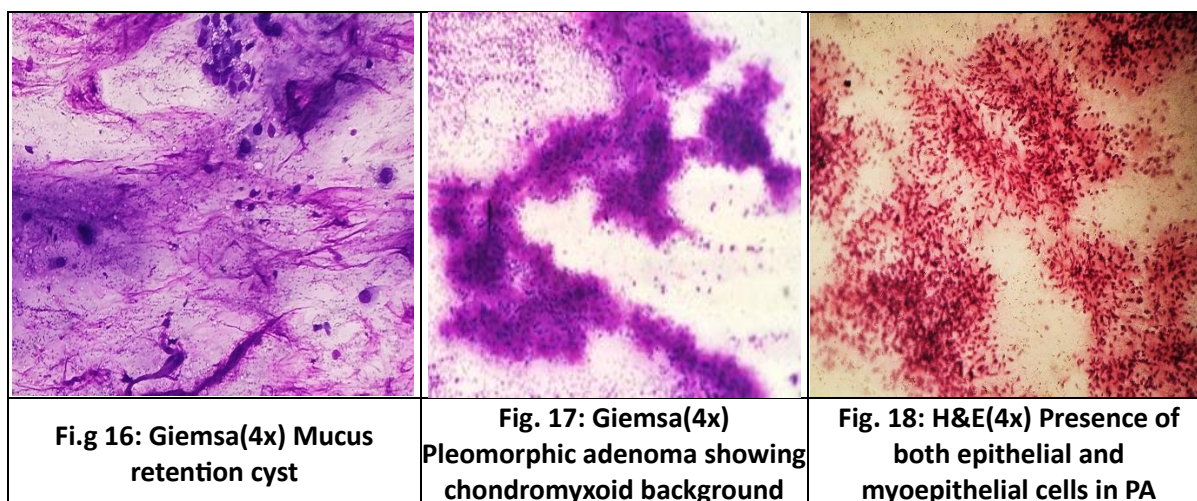


Table 5

Benign lesions	79%
Chronic sialadenitis	36%
Pleomorphic adenoma	21%
Mucinous cyst	18%
Granulomatous sialadenitis	7%
Sialadenosis	11%
Warthin's tumor	7%
Malignant lesions	21%
Acinic cell carcinoma	33%
Mucoepidermoid carcinoma	25%
Squamous cell carcinoma	25%
Adenocarcinoma NOS	17%

DISCUSSION

Fine needle aspiration cytology is a simple, inexpensive method for obtaining a tissue diagnosis of subcutaneous and other tumours. The method is used most commonly for the preoperative assessment of breast lumps, but it is also applicable to lymph nodes, thyroid and other lesions

in the neck, and, with the aid of a special needle, the prostate. Modern imaging techniques enable the method to be extended to virtually any part of the body.^{14,15} Difficulties were experienced in the correct diagnoses in cases of soft tissue lesions. Difficulties were experienced in the correct assessment of aspirates from low-grade malignancies. Clinical and radiographic data provide important information in the evaluation of soft tissue lesions/neoplasms. A study by Wakely et al¹⁶ documented that soft tissue neoplasms are a diagnostically difficult sector of tissue pathology. Their numbers are a small component of adult and pediatric tumors, and thus, they are encountered relatively infrequently by many pathologists. However, in our study FNAC of soft tissue lesions constituted the major chunk of our data. A malignant cytopathologic diagnosis was assigned to 42 of 82 (51%) aspirates and a benign diagnosis to 32 of 82 (39%) aspirates. About half of the benign aspirates actually represented soft tissue neoplasms, lipoma being the most common one. In our study also Lipoma was the most commonly encountered benign soft tissue lesion. The remainder were examples of benign inclusion cysts, inflammation or degenerative changes such as fat necrosis and hematoma formation. Discounting the examples diagnosed as benign adipose tissue consistent with lipoma, specific subtyping of benign soft tissue neoplasms occurred in 8 of 10 cases (2 fibromatosis, 3 giant cell tumors of the tendon sheath, 3 myxomas). The leiomyoma and schwannoma were not subtyped specifically upon FNA, but were diagnosed only as benign spindle cell tumors. In our study remaining entities were cystic/Infective lesions (47 cases, 23%), pilomatrixoma, Epidermal inclusion cyst (45 cases, 22%), Tenosynovial giant cell tumor (7 cases, 3%), Glomus tumor (4 cases, 2%) and Hemangioma (3 cases, 2%).

Hirachand S. et al¹⁷ conducted a study to evaluate the results of fine needle aspiration cytology (FNAC) on lymph nodes in comparison to results of histopathology. FNAC diagnoses were found to be as follows -reactive hyperplasia 54 (41.55%), tubercular lymphadenitis 36 (28%), metastatic carcinoma 16 (12.3%), granulomatous lymphadenitis 12 (9.2%), lymphoma 8 (6%) and suppurative lymphadenitis 4(3%). However, in our study tubercular lymphadenitis (57 cases, 36%) was the most prevalent finding, followed by reactive lymphadenitis (53 cases, 33%). The rest of the cases were chronic granulomatous lymphadenitis (44 cases, 27%), where the acid-fast bacilli couldn't be demonstrated on Ziehl Neelsen stain. Less commonly encountered diagnoses were Rosai-dorfman disease and Kikuchi disease, (3 cases, 2%) each. In malignant cases, metastatic lymphadenitis was seen in 50% of the positive cases, while lymphoma was the primary malignancy in rest of the 50% of the positive cases. In lymphomas, non-Hodgkin's lymphoma (33%) was more commonly seen than the Hodgkin's lymphoma (17%).

Breast cancer is the most frequently diagnosed cancer and the leading cause of death from cancer in women. Breast cancer survival rates tend to be poorer in developing countries, most likely because of a combination of late diagnoses and limited access to timely and appropriate treatment.¹⁸ A study by Josip Mišković et al¹⁹ indicated FNAC to be an accurate and highly reliable tool in the assessment of breast tumors. With high sensitivity 97.7% and specificity 89.1%, most breast tumors can be reliably diagnosed by FNA. It is a simple, safe, cost-effective and accurate method for the initial diagnosis and for guiding treatment. A study was conducted by Panjvani SI et al²⁰ to assess the utility of Fine Needle Aspiration Cytology in the Evaluation of Breast Lesions. In his study benign breast lesions were found in 144 cases (64.87%); among which fibroadenoma (30.18%) was the commonest lesion which was observed. Malignancy was observed in 69 cases (31.08%); among them, ductal carcinoma was the predominant lesion (29.28%). In our study the occurrence of benign breast lesions was 50% and malignant lesions was 39%, rest of the cases were put under Atypical ductal hyperplasia (11%). Similar to the above-mentioned study in benign breast lesions, fibroadenoma was the commonest lesion (42 cases, 56%), followed by Granulomatous mastitis (12 cases, 16%), Fibrocystic breast disease (10 cases, 13%), phyllodes and fat necrosis (3 cases, 4%). In similar

manner to the study by Panjvani et al²⁰, infiltrating ductal carcinoma was the most commonly found malignant lesion in our study too (38 cases, 65%), followed by lobular carcinoma (12 cases, 21%) and medullary carcinoma (5 cases, 9%). Pure mucinous carcinoma of the breast has a favourable prognosis. Tumor size does not appear to impact survival, perhaps because the volume of mucin overestimates tumor burden.²¹ In our study we found (3 cases, 5%) of mucinous carcinoma. Atypical ductal hyperplasia (ADH) is a lesion with significant malignant potential. A study was done by Lee Su Kim et al²² to correlate Breast Cancer with Atypical Ductal Hyperplasia on Fine-needle Aspiration Cytology Specimens. It was found that surgically excised lesions diagnosed as ADH in their fine needle aspiration cytology specimens showed breast cancer in 15 cases (38.5%), ADH in 11 cases (28.2%) and benign disease in 13 cases (33.3%). In their patient population, 15 cases (38.5%) of 39 patients with ADH at FNAC had a breast cancer. Therefore, the fine needle aspiration cytology finding of ADH warrants a recommendation for an excisional biopsy. In our study we found atypical ductal hyperplasia in 16 cases (11%).

Solitary thyroid nodules are common, being present in up to 50% of the elderly population. Thyroid nodules are a common clinical problem. In contrast, thyroid cancer is rare. Often, however, thyroid cancer manifests as a palpable neck mass or a thyroid nodule. A study by Tariq M et al²³ showed that FNAC is highly effective in detecting thyroid malignancy in solitary thyroid nodule with a sensitivity of 75% and specificity of 97.6%. Another study by Moslavac S. et al²⁴ stated thyroid fine needle aspiration cytology (FNAC) is the most accurate and cost-effective method in the evaluation of the thyroid nodule and has been commonly used in adults. Out of the 236 cytologic diagnoses they had results as: unsatisfactory (9), cyst fluid (7), benign (204), cellular follicular lesion/follicular neoplasm (9) and papillary thyroid carcinoma (7). The prevalence of malignancy among cytologic diagnoses was 3.4%. 21 patients had surgical follow up. 5 patients (23.8%) had thyroid malignancies (all papillary carcinomas). The remainder had benign thyroid lesions; follicular adenomas (8), multinodular goitres (5), diffuse goitres (2) and Hashimoto thyroiditis (1). In our study the fine needle aspiration cytology on thyroidal lesions yielded benign colloid nodule (30 cases, 33%), Nodular goitre (24 cases, 27%) and Autoimmune thyroiditis (36 cases, 40%). In malignant lesions of thyroid, we found Follicular carcinoma (9 cases, 19%), Follicular variant of papillary carcinoma (14 cases, 30%), Papillary carcinoma (16 cases, 34%), Medullary carcinoma (5 cases, 11%) and Anaplastic carcinoma (3 cases, 6%). In the present study incidence of thyroid malignancies among the thyroid nodules was more than the above-mentioned study and then we found a wider range of thyroid malignancies, papillary carcinoma being the most commonly found malignancy.

Fine needle aspiration (FNA) is a routine sampling method in the diagnostic work up of salivary gland lesions. The cytopathology of salivary glands presents major challenges due to the heterogeneity of benign and malignant neoplasms, which is reflected in the large range of World Health Organisation 2017 Classifications²⁵. Fine needle aspiration (FNA) of salivary gland tumours is still the favoured approach as it results in good sensitivity (83–92%) and specificity (93–100%)²⁶. FNA is predominantly used to determine before surgery whether the lesion is neoplastic or not, whether the neoplasm is benign or malignant, and to differentiate between an epithelial neoplasm and a lymphoma or between a primary neoplasm and a metastasis. The Milan System for Reporting Salivary Gland Cytopathology (MSRSGC) was published in 2018 and was drawn up by the American Society of Cytology and the International Academy of Cytology²⁷. It standardises terminology and stratified salivary gland lesions into seven categories: non-diagnostic (ND), non-neoplastic (NN), atypia of undetermined significance (AUS), benign neoplasm (BN), salivary gland neoplasm of uncertain malignant potential (SUMP), suspicious for malignancy (SM) and malignant (M). Charlotte Dubucs et al²⁸ conducted a 4-Year Retrospective Analysis of Salivary Gland Cytopathology Using the

Milan System for Reporting Salivary Gland Cytology and Ancillary Studies. In their study the most frequent diagnosis was BN (44.2%) with a majority of pleomorphic adenoma (PA) diagnoses (27, 1%). Moreover, 55 (16,8%) Warthin's tumours and 1 (0,3%) schwannoma were also included in the BN category. Malignant lesions (primary as well as secondary) represented 11.3% of cases, among these 2.7% were LG-M, 62.2% were HG-M and 35.1% were solid tumour metastases. Almost 5% of cases were reported to be SM. They were predominantly cases of suspected lymphomas (10 cases; 62.5%). SUMP represented almost 5% of the cases. Finally, only 1.2% of the cases were reported in AUS category. In our study we encountered a total number of 56 cases of salivary gland lesion. Out of which 44 cases (79%) were benign and 12 cases (21%) were malignant. The benign cases included Chronic sialadenitis (16 cases, 36%), Pleomorphic adenoma (9 cases, 21%), Mucinous cyst (8 cases, 18%), Granulomatous sialadenitis (3 cases, 7%), Sialadenosis (5 cases, 11%) and Warthin's tumor (3cases, 7%). In our study pleomorphic adenoma was the second most commonly encountered entity wherein inflammatory Sialadenitis was the most commonly found benign salivary gland lesion. Malignant cases were of Acinic cell carcinoma (4 cases, 33%), Mucoepidermoid carcinoma (3 cases, 25%), Squamous cell carcinoma (3 cases, 25%) and Adenocarcinoma NOS (2 cases, 17%).

Thyroglossal duct cyst (TDC) is the most common developmental abnormality encountered in the neck. Though it is more frequently encountered in children, prevalence in adult population is 7%. It is the most common nonodontogenic cyst.²⁹ Clinically these lesions can be confused with brachial cleft cyst, colloid cyst, or lymphoepithelial cyst.³⁰ Branchial cleft cysts are the most common type of second branchial cleft anomalies. Preoperative FNAC is a useful and accurate method for preoperative evaluation of branchial cleft cysts.³¹ The present study included 14 cases of Thyroglossal cyst and 9 cases of Branchial cyst. Lymphangioma is defined as a benign, cavernous/ cystic vascular lesion, composed of dilated lymphatic channels.³² They may exist in three forms: capillary, cavernous and cystic.³³ Traditionally called hygromas, cystic lymphangiomas are common paediatric lesions, most often presenting at birth or during the first years of life. Up to 90% of cases present by the second year of age.³⁴ Our study included 2 incidences of lymphangioma in neck region. Cytology proved to be a useful investigative modality and FNAC to be one of the diagnostic techniques often requested in such cases. It can be diagnostic when the lesion is put among the differential diagnoses. Diagnostic efficacy can further be improved when combined with imaging techniques like ultrasound and computerized tomography scans.

CONCLUSION

Fine needle aspiration cytology is a simple, inexpensive method for obtaining a tissue diagnosis of subcutaneous and few other tumours. The method is used most commonly for the preoperative assessment of lumps. Modern imaging techniques enable the method to be extended to virtually any part of the body. Most countries have now adopted a triple assessment approach, i.e. clinical, imaging and pathology, with FNAC as the first-line pathological investigation in both screening and symptomatic populations. Pathologists specialized in cytopathology are best qualified to collect and interpret FNAC samples.

CONFLICT OF INTERESTS

The authors declare no conflict of interest.

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