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Dr. Paresh B Shiladaria
Professor, Pathology
Department GMERS Medical
College and Hospital
Himmatnagar, Gujarat, India

Dr. Varsha S Khant
Tutor, Pathology Department
GMERS Medical College and
Hospital Himmatnagar,
Gujarat, India

Role of FNAC in evaluation and diagnosis of head and neck lesions: A retrospective study at tertiary care center

Dr. Paresh B Shiladaria and Dr. Varsha S Khant

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Abstract

Background: FNAC is very simple, quick, cost effective and minimally invasive technique used to diagnose different type of swelling occur in lymph node, thyroid gland, soft tissue and salivary gland in head and neck region.

Aim and Objective: To evaluate role and utility of FNAC in diagnosis of palpable head and neck lesions

Methods: Our study has included 260 patients presented with palpable swelling in head and neck region at our hospital from January 2017 to January 2019. FNAC procedure has been and smears are stained with H & E stain and pap stain. Cyto histopathological correlation were done wherever possible.

Results: Out of 260 cases, Lymph node (57.69%) is most common site of aspiration where TB lymphadenitis (53.33%) was most common diagnosed lesion. Thyroid gland lesions constitute 64 cases (24.61%) followed by salivary gland lesions 26 cases (10%), soft tissue lesions 16 cases (6.15%). FNAC was inconclusive in 7 cases (2.69%).

Conclusion: FNAC serves as a guide to appropriate therapeutic management whether to locally excise a benign tumor or plan radical surgery and helps as an adjunct to histopathology.

Keywords: FNAC, Lymph Node, TB lymphadenitis

Introduction

Fine needle aspiration cytology (FNAC) is first line investigation in approach towards diagnosis of lesions of head and neck region. It has contributed a great deal to transform cytology from a primarily screening tool to powerful diagnostic Technique [1]. 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 [2]. FNAC is applicable to easily palpable lesions of thyroid, salivary glands, superficial lymph nodes, superficial growth of skin & soft tissue. With the help of newer radiological techniques FNAC of deeper structures is easily possible [3]. Palpable head and neck swellings include various non-neoplastic and neoplastic lesions of lymph node, salivary gland, thyroid gland and soft tissues. Proximity of tissues of various types and wide range of primary and metastatic neoplasm are responsible for this site being the most common in FNAC diagnosis [3]. It causes minimal trauma to the patient and carries virtually no risk and complications. Fine needle aspiration cytology is helpful for the diagnosis of salivary gland tumors where it can differentiate between a malignant and a benign tumor with over 90% accuracy [4]. FNAC is both diagnostic and therapeutic in cystic swellings [5]. In 1930, Martin introduced this technique for evaluation of head and neck lesion and the procedure has since then being used for all palpable swellings [6, 7]. FNAC assessment needs relevant clinical history of patient as well as radiological findings to make plausible diagnosis.

Material and Methods

Place of study-Department of Pathology, Gmers Medical College and Hospital Himmatnagar. Type of study-This was a retrospective observational study. Sampling methods and collection -Data were retrieved from the stored reports of patients in Department of Pathology and results were tabulated, analyzed and studied. Clinical and radiological details were obtained from patients files.

Correspondence

Dr. Paresh B Shiladaria
Professor, Pathology
Department GMERS Medical
College and Hospital
Himmatnagar, Gujarat India

Inclusion and exclusion criteria-All the cases of head and neck cases were segregated from other lesions which were aspirated over a period of two years one month (January 2017 to January 2019). Relevant clinical and demographic details were noted and tabulated. This study excluded FNA performed under ultrasound guidance. Both air dried and alcohol fixed smears stained with May Grund wald Giemsa (MGG) and Papanicolaou (PAP) stain respectively and smears are also stained with H &E stain, were studied. Results were also correlated with special stains like Ziehl Nelson (ZN) stain wherever applicable. The sites of FNAC were classified as lymph nodes, thyroid, skin, soft tissue, salivary gland. Statistical methods-Data was tabulated, slides were reviewed wherever necessary and the percentages were calculated for estimating frequency of various pathological conditions. The cytological diagnosis was correlated with histopathology wherever available and the concordance rate, sensitivity, specificity value were calculated keeping histopathology diagnosis as gold standard using the statistical program Epi-info.

Results

The present study included 266 cases of patients having palpable head and neck lesions from various departments as an OPD as well as indoor patient. Age group of patients ranged from 1 year to 75 years. Maximum no. of patients were in the age group of 21-40 years (51.92%) followed by 1-20 years (26.92%) and least no. of patients were seen in age group of above 70 years (5.76%).

Out of 260 patients 110 (42.30%) were females and 150(57.69%) were males. Site wise distribution of head and neck FNAC [Table1] shows lymph nodes lesion (57.69%) as the predominant site of FNAC followed by thyroid lesions (24.61%), salivary glands (10%) and soft tissue (6.15%). FNAC was inconclusive in 7 (2.61%) cases. Out of 150(57.69%) cases of lymph node lesions, tubercular lymphadenitis (53.33%) was the predominant cause of lymphadenopathy followed by reactive lymphadenitis in 39(26.0%) cases. In malignant lesions, all cases are metastatic malignant epithelial lesion 4 (2.66%) [Table-2] Amongst 64 (24.61%) cases of thyroid lesions, inflammatory lesion including Hashimoto's thyroiditis was found in 4.68% of cases. Benign neoplastic lesions constituted 70.31% of cases. In malignant lesions one case (1.56%) of papillary carcinoma was observed. [Table-3] In salivary glands lesions, sialadenitis was observed in 53.58% of cases. Benign neoplasm included 9 (34.61%) cases of pleomorphic adenoma and 3 cases (11.53%) of Warthin's tumor. There was absence of malignant lesion in salivary gland during period of study [Table4] FNAC of soft tissue constituted 16 cases (6.15%) with varied pathological lesions like lipoma 3 cases (18.75%), 13 cases epidermal cyst (81.25%). [Table-5] Histo-cytopathological correlation was possible in 75 cases In 73 cases of cytological diagnosis was consistent with histopathological diagnosis while two cases showed false negative result.

Discussion

In 1930, Martin and Ellis described and first introduced the technique of FNAC for diagnosis of organ lesion [7]. The fundamental requirements on which success of FNAC depends are representative sample and high quality of preparation. These two prerequisites will always remain a

sine qua non, no matter how sophisticated supplementary techniques [3].

Head and neck neoplasm constitute a major form of cancer in India accounting for 23% of all cancer in males and 6% in females and approximately 5% all childhood neoplasms [8]. Increased prevalence of malignancies may be due to use tobacco and smoking in our country. Palpable lesions of head and neck include variety of developmental, inflammatory and neoplastic lesions.

The present study was carried out over a period of 2 years 1 month in a tertiary care hospital to evaluate role and utility of FNAC in diagnosis of palpable head and neck lesion. The present study also compares its findings with various national and international studies published in the literature. [Table-6] The study included patients from all age groups. Majority of patients were females with male to female ratio of 0.71:1. Similar results of female preponderance were also reported by Muddegowda *et al.* [9]. In our study, Predominant site of FNAC was lymph node lesions (57.69%) followed by thyroid gland. Similar result reported by various studies. [Table-6] In lymph node lesions tubercular lymphadenitis was the most common pathological findings followed by reactive lymphadenitis which is in concordance with Bhagat *et al.* [10] and El Haq *et al.* [11], kishor *et al.* [12]. In malignant neoplasms, epithelial metastasis was found in 4 cases (2.66%) and one case of papillary thyroid carcinoma was found.

FNAC of thyroid lesions was the next common site in our study. Colloid goiter (70.31%) was the predominant finding in benign lesion followed by inflammatory lesions consisting of Hashimoto's thyroiditis One case of papillary carcinoma was detected which was confirmed on histopathology. Muddegowda *et al.* [9] and Rathod *et al.* [13] also found thyroid lesions as the predominant site of FNAC in their study with colloid goiter as the predominant finding. Female preponderance was observed in FNAC of thyroid lesion in our study with similar findings reported by Rathod *et al.* [13] and Muddegowda *et al.* [9]. In salivary gland lesions acute and chronic sialadenitis together comprised 53.84% followed by pleomorphic adenoma in 9 cases (34.61%) and warthin tumor in three cases (11.56%) which was comparable with study of Kishor *et al.* [12]. In our study, we could not find malignant lesion of salivary gland during period of study.

In soft tissue and miscellaneous lesions benign lesions were commonest finding including 13 cases (81.25%) of epidermal cyst, 3 cases (18.75%) of lipoma. In 2.69% of cases cytology was inconclusive. The causes of unsatisfactory aspirates were lack of cooperation of patient, smaller lesions, poor handling of material, inadequate aspirate, nonrepresentative sampling and morphological diversity of lesion. Incidence of inadequate reports ranged from 0 to 10% in various studies in the literature.

Cytohisto pathological correlation was possible in only 75 cases (28.84%). Cytomorphological diagnosis was in concordance with histopathological diagnosis in 73 cases (97.33%) while 2 cases showed false negative results. One case of tubercular lymphadenitis which showed scattered epithelioid cells with a reactive background on cytology and was reported as reactive lymphadenitis in FNAC report. So multiple pass in various directions were required to avoid false negative result. Other case reported as a follicular neoplasm of thyroid gland turned out to be follicular

carcinoma on histopathological examination. This is one of the known limitations of FNAC in thyroid lesions. To avoid or minimize false positive results various factors including regenerative changes, metaplasia and others should be taken into considerations while reporting. False negative results may be due to cystic change, necrotic and hemorrhagic areas revealing no diagnostic cellular yield. Repeat FNAC of solid areas after aspiration of fluid in solid cystic lesion may minimize false negative results in such cases.

Table 1: Distribution of Head & Neck Lesions [Cases=260]

| Site | No. of Cases | % |
|-----------------------------|--------------|-------|
| Lymph node | 150 | 57.69 |
| Salivary Gland | 26 | 10 |
| Thyroid Gland | 64 | 24.61 |
| Soft tissue & miscellaneous | 16 | 6.15 |
| Inconclusive cases | 7 | 2.69 |

Table 2: Distribution of various lymph node lesions [N=150]

| Lesions | | No. of cases | % |
|------------------------|---------------------------------|--------------|-------|
| Reactive Lymphadenitis | | 39 | 26 |
| Inflammatory | Acute suppurative lymphadenitis | 27 | 18 |
| | TB Lymphadenitis | 80 | 53.33 |
| Malignant | Metastatic carcinoma | 4 | 2.66 |
| Total | | 150 | 100 |

Table 6: Comparison of Results of Various National and International Studies

| | Our study (2019) | Kishor H. <i>et al.</i> (2015) ^[12] | Muddagowda <i>et al.</i> (2014) ^[9] | Bhagat VM <i>et al.</i> (2013) ^[10] | Mohmad MH <i>et al.</i> (2013) ^[15] | Rathod G. (2012) ^[13] | Ahmed T. (2008) ^[14] |
|------------------------|------------------|--|--|--|--|----------------------------------|---------------------------------|
| Duration of study | 2 years 1 month | 3 years | 8 months | 8 months | 1 year | 1 year 1 month | 1 year 4 months |
| No. of patients | 260 | 280 | 100 | 100 | 701 | 37 | 200 |
| Predominant site | Lymph node | Lymph node | Thyroid | Thyroid | Lymph node | Lymph node | Thyroid |
| Reactive LN (%) | 15 | 18.75 | 17 | 13 | 11.98 | 8 | 9.5 |
| TB LN (%) | 30.76 | 18.75 | 04 | 12 | 35.66 | 4 | 12 |
| Malignant neoplasm (%) | 1.92 | 4.16 | 07 | 16 | 20.68 | 5 | 15 |
| Goiter (%) | 17.30 | 20.83 | 60 | 46 | - | 9 | 35 |
| Benign neoplasm | 24.23 | 12.84 | 8 | 9 | 6.56 | 6 | 12.5 |
| Inconclusive | 2.69 | 3.12 | 2 | 3 | 10 | 0 | 4.5 |

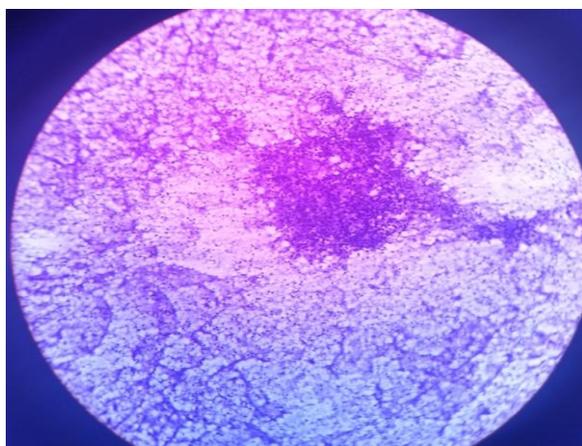


Fig 1: Tubercular lymphadenitis

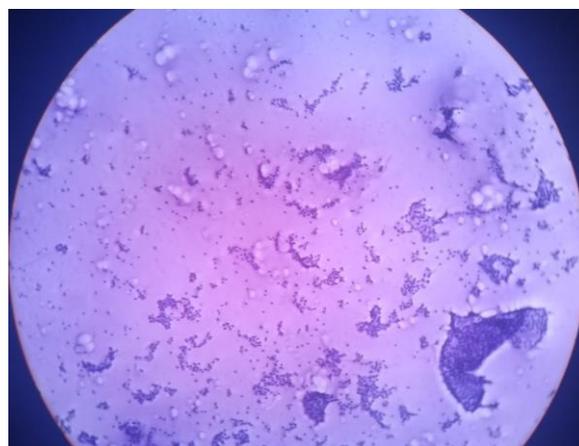


Fig 2: Follicular Neoplasm

Table 3: Distribution of various Thyroid lesions [n= 64]

| Thyroid lesions | No. of cases | % |
|-----------------------------------|--------------|-------|
| Inflammatory | | |
| Hashimoto's thyroiditis | 3 | 4.68 |
| Benign Lesions | | |
| Colloid Goitre | 45 | 70.31 |
| Suspicious of Follicular neoplasm | 6 | 9.37 |
| Follicular neoplasm | 10 | 15.62 |
| Malignant Lesions | | |
| Papillary thyroid carcinoma | 1 | 1.56 |
| Total | 64 | 100 |

Table 4: Distribution of various Salivary gland lesions [n= 26]

| Salivary Gland lesions | No. of cases | % |
|-------------------------------|--------------|-------|
| Inflammatory | | |
| Acute on chronic sialadenitis | 9 | 34.61 |
| Chronic sialadenitis | 5 | 19.23 |
| Benign Lesions | | |
| Pleomorphic Adenoma | 9 | 34.61 |
| Warthin's tumor | 3 | 11.53 |
| Malignant Lesions | 0 | 100 |

Table 5: Distribution of soft tissue & miscellaneous [n=16]

| Soft tissue and Miscellaneous Lesions | No of cases | % |
|---------------------------------------|-------------|-------|
| Epidermal cyst | 13 | 81.25 |
| Lipoma | 3 | 18.75 |
| Total | 16 | 100 |

Conclusion

It was concluded from the present study, that tubercular lymphadenitis is the commonest problem in patients presenting with head and neck swellings in our hospital, most common benign lesion in thyroid gland was colloid goiter and most common malignant lesion was metastatic carcinoma. FNAC had got significant diagnostic value in diagnosing secondaries in lymphnode from primary growth. FNAC is a rapid, cost effective, highly accurate and feasible first line diagnostic tool in management of palpable head and neck swellings.

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