Original Article

Role of FNAC in Head and Neck Lesions

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Abstract
Background: *FNAC of palpable masses has important diagnostic role. As it is a safe, simple and rapid procedure, it can be done in the diagnosis of a wide range of diseases even in most remote areas where other diagnostic tools are not available.*
Aims: *The present study was designed to find out the spectrum of head and neck masses, their cytohistological correlation and diagnostic accuracy of FNAC.*
Material and Methods: *The study included 1857 patients with palpable head and neck masses, FNAC was done, histopathological examination was done where available, cytological findings were correlated with histopathology and diagnostic accuracy of FNAC was evaluated.*
Results: *Sites involved were lymph node (74.4%), thyroid gland (11.7%), miscellaneous lesions (11.2%) and salivary gland(1.2%). FNAC yielded overall accuracy of 88%.*
Conclusion: *FNAC is highly diagnostic procedure for assessing swelling of head and neck region.*
Keywords: *head and neck lesions, fine needle aspiration cytology.*

Introduction

Fine needle aspiration cytology diagnosis has important application in clinical practice. It is an excellent first line method for investigating the nature of palpable lesions in the head and neck region[1]. FNAC is also one of the most valuable tests available in the initial assessment of the patient who presents with a mass in the head and neck region or where a recurrence is suspected after previous treatment[2-4].

As fine needle aspiration procedure being safe, rapid, cost - effective, simple OPD procedure,

early diagnosis at the first contact of patient and it can delineate between benign and malignancy and can be repeated for definite confirmation on doubtful diagnosis. It also plays an important role to serves as a complementary diagnostic procedure to histopathological examination. Therapeutic decisions can be made earlier and without the need for further diagnostic surgery.

It is true that the increasing use of ancillary techniques such as, immunohistochemistry, electron microscopy, cytogenetics and molecular biology techniques has significantly enhanced the

potential to make precise type specific diagnosis but they are expensive and not done as a routine, can be applied in problem case.

This study aims to evaluate the role of Fine Needle Aspiration Cytology (FNAC) in diagnosing lesions of the head and neck region and to correlate cytology with histopathology wherever possible.

Aim and Objectives

The present study was done with following aims and objectives:

1. To find out spectrum of various head and neck masses at LLRM Medical College, Meerut, attached to SVBP Hospital, Meerut.
2. Clinico-histopathological correlation of various head and neck masses.
3. To find out diagnostic accuracy of fine needle aspiration cytology in head and neck masses.

Materials and Methods

The present study was a Comparative and Observational study conducted in Department of Pathology, LLRM Medical College, Meerut attached to SVBP Hospital Meerut from May 2018 to July 2019 on patients being referred from outpatient and inpatient Department of Surgery, ENT and Medicine, LLRM Medical College, Meerut.

Inclusion Criteria: All patients attending the Department of Surgery, ENT and General Medicine, presenting with palpable Head and Neck Masses, were evaluated. Patient have given signed and informed consent. Ethical Approval was taken from the Institutional Ethical Committee after explaining the Aim and Objectives of the Study.

Method of Data Collection: A total of 1857 Patients of all ages and both sexes with palpable head and neck masses were included in the study from May 2018 to July 2019 , a detailed patient history and thorough examination was carried out with basic relevant investigations done in all the

patients to arrive at a provisional diagnosis.

Fine needle aspiration was done with 22-23 gauge needle attached to the 10ml plastic disposable syringe. Multiple smears were made and subsequently stained with May-Grunewald Giemsa (MGG) and Papanicolaou stain (95% ethyl alcohol fixed smears). Zeihl-Neelsen (ZN) stain for AFB was done in those cases, where purulent or cheesy material was aspirated. Cellblocks were also made where ever necessary. All the smears were routinely air-dried and stained by Hematoxylin and Eosin stain.

The cases which were subjected for surgery either incisional or excisional biopsy, the biopsy material was sent to the department of pathology for Histo-pathological examination. The cytological features of these cases were reviewed with corresponding histopathology features.

Statistical Analysis: Statistical analysis was performed using SPSS (Statistical Package for the Social Sciences) for Windows (version 21.0). For all analyses, a two-tailed p-value of <0.05 was considered statistically significant.

Observations and Result

The present study was a Comparative and Observational study conducted on 1857 patients with palpable head and neck masses.

Table 1: Age wise distribution of study participants (n=1857)

Age group (years)	Frequency	Percent (%)
0-10 year	92	5.0
11-20 year	226	12.2
21-30 year	408	22.0
31-40 year	518	27.9
41-50 year	399	21.5
51-60 year	138	7.4
61-70 year	76	4.1
TOTAL	**1857**	**100.0%**

The maximum age group seen among the study subjects was 31-40 years, having 518 (27.9%) subjects, followed by 21-30 years, having 408 (22.0%) subjects, then 41-50 years, having 399 (21.5%) subjects. The mean age of the study group was 38.2±5.3 years (Mean±SD.) and range was 7-67 years (Table 1).

Table 2: Distribution and FNAC report of Head and neck lesions

FNAC report	Number of patients (n)	Percentage (%)
Lymph node lesions (n = 1382)(74.4%)		
Reactive lymphadenitis	485	26.12
Granulomatous lymphadenitis	390	21.00
Necrotizing lymphadenitis	333	17.93
Suppurative lymphadenitis	91	4.90
Hodgkin's lymphoma	09	0.48
Non-Hodgkin's lymphoma	15	0.80
Squamous cell carcinoma	36	1.94
Adenocarcinoma	05	0.27
Poorly differentiated carcinoma	18	0.97
Thyroid gland lesions (n = 218)(11.7%)		
Hashimoto''s thyroiditis	29	1.56
Colloid cyst	6	0.32
Colloid goiter	175	9.42
Follicular neoplasm	1	0.05
Medullary carcinoma	1	0.05
Anaplastic carcinoma	1	0.05
Thyroglossal cyst	4	0.22
Parathyroid cyst	1	0.05
Miscellaneous lesions (n = 208) (skin and soft tissue)(11.2%)		
Epidermal inclusion cyst	125	6.73
Lipoma	18	0.97
Benign cystic lesion	31	1.67
Abscess	29	1.56
Pilomatrixoma	02	0.11
Chondroid syringoma	03	0.16
Salivary gland lesions (n = 21)(1.2%)		
Sialadenitis	05	0.27
Sialadenosis	01	0.05
Pleomorphic adenoma	08	0.43
Warthin's tumor	06	0.32
Mucoepidermoid carcinoma	01	0.05
Inconclusive FNAC report (n = 28)(1.5%)		
Inconclusive	28	1.51

Table 2 shows the FNAC report of all patients studied. For lymph nodes, reactive lymphadenitis was the most common lesion diagnosed (26.12%), followed by granulomatous lymphadenitis (21.00%). Among thyroid gland lesions, colloid goiter (9.42%) and Hashimoto's thyroiditis (1.56%) were the most common swelling. Among miscellaneous lesions, epidermal inclusion cyst (6.73%) and benign cystic lesion (1.67%) were the most common diagnosis. Among salivary gland lesions, pleomorphic adenoma (0.43%) and Warthin,s tumor (0.32%) were the most common diagnosis. There were 28 (1.51%) cases of inconclusive FNAC diagnosis.

Table 3: Total of Head and Neck lesions

Cytologically confirmed	Number of cases	Tissue available for Histopathology
Lymph node lesions		
Benign	1299	20
Malignant	83	80
Total	1382	100
Thyroid gland lesions		
Benign	216	50
Malignant	2	2
Total	218	52
Miscellaneous lesions		
Benign	208	27
Malignant	0	0
Total	208	27
Salivary gland lesions		
Benign	20	13
Malignant	1	1
Total	21	14

Table 3 shows the distribution of head and neck lesions in form of benign and malignant lesions with number of cases available for histopathology.

Table 4: Final Diagnosis as per HPE reports in sample population

	FNAC	HPE
FNAC report	**N**	**N**
Reactive lymphadenitis	8	7
Granulomatous lymphadenitis	3	3
Necrotizing lymphadenitis	7	5
Suppurative lymphadenitis	2	2
Lymph node abscess	0	2
TB abscess	0	2
Hodgkin's lymphoma	9	7
Non-Hodgkin's lymphoma	15	12
Squamous cell carcinoma	35	34
Adenocarcinoma	5	5
Poorly differentiated carcinoma	16	21
Matching = 91 cases out of 100 (91%)		
THYROID GLAND LESIONS		
Hashimoto's thyroiditis	16	15
Colloid goiter	30	26
Nodular colloid goiter	0	3
Follicular adenoma	1	1
Medullary carcinoma	1	1
Anaplastic carcinoma	1	1
Thyroglossal cyst	2	1
Parathyroid cyst	1	1
Papillary carcinoma	0	2
Solitary nodule	0	1
Matching = 46 cases out of 52 (88.5%)		
MISCELLANEOUS LESIONS (Skin and soft tissue)		
Epidermal Inclusion cyst	10	8
Lipoma	8	8
Benign cystic lesion	2	2
Abscess	2	1
Pilomatrixoma	2	2
Chondroid Syringoma	3	2
Dermoid cyst	0	2
Hemangioma	0	2
Matching = 23 cases out of 27 (85.2%)		
SALIVARY GLAND LESIONS		
Pleomorphic adenoma	7	5
Warthin's tumor	6	4
Mucoepidermoid carcinoma	1	1
Chronic sialadenitis	0	2
Adenoid cystic carcinoma	0	2
Matching = 10 cases out of 14 (71.4%)		
OVERALL ACCURACY = 170 cases out of 193 (88.0%)		

Table 4 shows the correlation of FNAC diagnosis and diagnosis by HPE examination. Overall, 193 patients (10.4%) were subject to HPE examination. Among lymph node lesions, 91 cases matched with FNAC diagnosis out of 100, accuracy 91%, among thyroid lesions, 46 cases matched with FNAC diagnosis out of 52, accuracy 88.5%, among miscellaneous lesions, 23 cases matched with FNAC diagnosis out of 27, accuracy 85.2% and among salivary gland swellings, 10 cases matched with FNAC diagnosis out of 14, accuracy 71.4%. Overall accuracy was 88.0% in all the cases.

Overall, a total of 08 individuals were subject to HPE examination with reactive lymphadenitis on FNAC, out of which, 07 were confirmed with the same diagnosis, and 01 was turned out to be simple lymph node abscess. Also, out of 07 cases of necrotizing lymphadenitis, 05 were confirmed with the same diagnosis, and 02 were confirmed as TB abscess. Out of 09 cases of Hodgkin's lymphoma, 07 were confirmed, and 02 turned out to be poorly differentiated carcinoma. Also, 12 cases out of 15 of Non-Hodgkin's lymphoma were confirmed, rest 01 was lymph node abscess, 02 was poorly differentiated carcinoma on histology.

Squamous cell carcinomas on FNAC turned out with similar diagnosis on histology except one which was actually poorly differentiated carcinoma

In cases of thyroid lesions subjected to HPE examination, 15 out of 16 cases of Hashimoto's thyroiditis were confirmed and rest 01 was nodular colloid goiter. 26 out of 30 colloid goiter cases were confirmed by HPE, and rest 02 were nodular colloid goiter, 01 was solitary nodule and 01case turned out to be papillary carcinoma. Similarly, 01 out of 02 cases of thyroglossal cyst were confirmed and 01 was papillary carcinomas. One case each of follicular adenoma, medullary carcinoma and anaplastic carcinoma yielded same diagnosis on histopathology

The salivary gland swellings suspected to HPE examination 07 were pleomorphic adenoma in which 05 were same diagnosis and 01 was actually chronic sialadenitis and 01 was adenoid cystic carcinoma. 06 cases of Warthim's tumor, 04 was same diagnosed but 01 was actually chronic sialadenitis and 01 was adenoid cystic carcinoma.01 case of mucoepidermoid carcinoma was same diagnosed

Among miscellaneous (skin and soft tissue) lesions, of 10 cases of epidermoid cysts, 08 were same diagnosed but 01 was actually dermoid cyst and rest 01 was hemangioma. 08 cases of lipoma were with same diagnosis. Among 02 cases of abscess, 01 was diagnosed with same diagnosis and 01 was actually hemangioma. 02 cases of pilomatrixoma were same diagnosed while 03 cases among of chondroid syringoma, 02 were same diagnosed and 01 was actually dermoid cyst. Overall, a total of 170 (88.0 %) subjects had conditions correctly evaluated by FNAC and confirmed by HPE evaluation. The major proportion of correctly identified swelling were lymph node (91.0%).It was followed by thyroid gland (88.5%) miscellaneous (skin and soft tissue) lesions (85.2%) and salivary gland lesions (71.4%).

Table 5: Correlation between Cytological diagnosis and Histopathological diagnosis

Cytological Diagnosis	Histopathological diagnosis			
	Concordance (n)	Concordance (%)	Discordance (n)	Discordance (%)
Lymph node lesions				
Benign (n = 20)	17	85	3	15
Malignant (n = 80)	74	92.5	6	7.5
Total (n= 100)	**91**	**91**	**9**	**9**
Thyroid gland lesions				
Benign (n = 50)	44	88	6	12
Malignant (n = 2)	2	100	0	0.0
Total (n = 52)	**46**	**88.5**	**6**	**11.5**
Miscellaneous lesions (skin and soft tissue)				
Benign (n = 27)	23	85.2	4	15
Malignant (n = 0)	0	0.0	0	0.0
Total (n = 27)	**23**	**85.2**	**4**	**15**
Salivary gland lesions				
Benign (n = 13)	9	69.2	4	30.7
Malignant (n = 14)	1	100	0	0.0
Total (n = 14)	**10**	**71.4**	**4**	**28.6**

Table 5 shows the correlation between cytological diagnosis and histopathological confirmation .Lymph node lesions show concordance in 91 cases while 9 cases showed discordance, while thyroid, miscellaneous and salivary gland lesions show concordance in 46, 23 and 10 cases respectively.

Discussion

Evaluation of the neck masses must be approached in a thorough and disciplined manner[5]. Especially in adult population, these masses can present as only manifestation of a serious and potentially malignant pathologies.

The present study was a comparative and observational study conducted in Department of Pathology LLRM Medical College Meerut (U.P) attached to S.V.B.P. Hospital Meerut. The technique is performed in outpatient department and causes minimal trauma to the patient. It is a simple, reliable and inexpensive diagnostic tool in evaluation of head and neck swellings[6,7]. FNAC does not give the same architectural detail as histology but it can provide cells from entire lesions as many pass through the lesion can be made while aspirating[6,7].

A total of 1857 cases were included in a study period duration of 15 months. The maximum number of patients were between 21-50 years with major group was between 31-40 years. This was similar to studies done by Patel et al(2015)[8] while Rathod et al (2012), Poorey et al(2014), Kapoor et al (2014), Khetrapal et al(2014) ,Valiya et al (2016) and Sanghvi et al(2018) found 21-30 years as the major group.[9,10,11,12,13,14] So our study was similar to studies by Patel et al.

Out of 1857 cases, 1382 (74.4%) were from lymph node, 218 (11.7%) from thyroid, 208 (11.2%) form miscellaneous sites (skin and soft tissue) and 21 (1.2%) form salivary glands while 28 (1.5%) cases were inconclusive. Our study is similar to studies done by Ishar etal (2012)[15], Poorey et al (2014)[10], Gupta G et al (2014)[16] Khetrapal et al (2015)[12], Patel et al (2015)[8], Valiya et al (2016)[13], Sangavi et al (2018)[14] and Banstola et al (2018)[18].

While Rathod et al (2012)[9] found thyroid as the most common site.

In our study out of 1857 cases, 1382 (74.4%) of lymph node in which benign cases are 1299 (94%) and malignant are 83 (6.0%) In benign cases most common cytological finding comprising of reactive lymphadenitis 485 cases (35.1%) followed by granulomatous lymphadenitis 390 cases (28.2%), necrotizing lymphadenitis 333 cases (24.1%) and suppurative lymphadenitis 91 cases (6.6%).

Cytological picture of tubercular lymphadenitis is divided in to three representations-

a. Smears with epithelioid granuloma/without giant cells in milieu of parent lymphoid cells.
b. Smears with degenerating epithelioid granuloma in the background of cheesy material.
c. Smears with degenerating and viable neutrophils in a necrotic background presenting with an occasional degenerating epithelioid cell granuloma.

A definite cytologic diagnosis of TB lymphadenitis can be offered in the smears with first two patterns while the third pattern, in the absence of Ziehl-Neelsen staining would be dismissed as acute supprative lymphadenitis.

Among malignant cases, metastatic lesions were more common (cases 59, 4.3%) with squamous cell carcinoma 36 (2.6%) the most common finding while poorly differentiated carcinoma 18 (1.3%) was second common finding. Adenocarcinoma constituted 05 cases (0.4%). 24(1.7%) cases were of primary malignancy that is lymphoma with 15 cases (1.0%) of Non Hodgkin's lymphoma and 09 cases (0.6%) of Hodgkin's lymphoma.

It is always beneficial while doing an early differentiation of benign from malignant pathology at it greatly influences the planned treatment.[19,7,16]

Our study was similar to studies done by Patel et al (2015)[8] and Padia et al (2018)[20] while studies done by Gupta G et al (2014)[16], Poorey et al (2014)[10] and Valiya et al (2016)[13] who found granulomatous/tubercular lymphadenitis as the most common benign lesion of lymph node.

In our study among 218 cases of thyroid lesions, colloid goiter 175 cases (80.3%) was the most common finding followed by Hashimoto's thyroiditis 29 cases (13.2%). 02 cases (1%) of malignant thyroid lesions were found.

So our studies was similar to studies done by Gupta G et al, Poorey et al, Patel et al, Valiya et al and Padia et al[16,10,8,13,20]

There have been many cases of false negative diagnosis, which could rather be dangerous if left

unidentified. The causes for false negative results were.

a. Acellular/ Poorly cellular sample as encountered in large cystic papillary carcinoma, in marked desmoplasia and in cases of thick fibrous or calcified capsule.

b. Thyroid carcinoma may have a macro follicular area and yields moderate amount of colloid on fine needle aspiration.

The cytological appearance in colloid goiter forms a continuum, which merges with those of follicular adenoma, and is this grey area, cytological criteria alone cannot reliably distinguish between two. The differentiation of thyroid adenoma from early follicular carcinoma based on cytologic criteria done is difficult and challenging as the cytologic appearance of both conditions is very similar. Histologic examination of such cases is advised for final diagnosis

In our study miscellaneous lesions (skin and soft tissue) cases comprised 208 in number of which epidermal inclusion cyst was most common entity 125 (60.1%) followed by benign cystic lesions and abscess with 31 (14.09%) and 29 (13.9%) cases respectively.

So our study was comparable to studies done by Poorey, Valiya, Patel and Padia et al[10,13,8,20]

In our study among salivary gland cases of 21, pleomorphic adenoma was the commonest finding 08 (38.1%) while Warthin's tumor 06 (28.6%) and sialadenitis was next most common 05 (23.7%).

So our study is comparable to studies done by Gupta G, Poorey, Valiya and Padia et al[16,10,13,20]

In our study 28 cases (1.5%) were inconclusive. According to Rathod et al (2012)[40] lesions with high blood content, presence of necrosis and fibres with scattered atypical cells also proved difficult to analyze cytologically, resulting in the 09 inconclusive cases of FNAC. Unsatisfactory aspirates have been reported in various studies in the range of 9.3-15% which was much higher than that observed in our study (1.5%) according to Rathod et al[9].

Discordance

01Case of lymph node abscess was misdiagnosed as reactive lymphadenitis so good yield smears should be reported. 01 Cases of tuberculous lymphadenitis were misdiagnosed as necrotizing on cytological examination. Probably, the representative sample was not obtained in these cases or due to inadequate aspiration or observer misinterpretation. This was also observed by other workers.

There are problems in arriving at a definitive diagnosis in certain cases of Tuberculous lymphadenitis, when the aspirate shows a polymorphous picture with occasional epithelioid cells, with an absence of Langhan's giant cells or caseous necrosis, making it necessary to resort to excisional biopsy for a definite diagnosis according to Fernandes et al (2009)[21]. 02 cases of cytologically diagnosed Hodgkin's lymphoma turned out to be poorly differentiated carcinoma. Also out of 15 cases of Non Hodgkin's lymphoma, 03 cases were false positive 01 case of squamous cell carcinoma was found as poorly differentiated carcinoma. One of the study showed that the inability to evaluate the lymph node architectural changes in FANC and low sensitivity are key factors for missing the diagnosis. The accuracy of cytological diagnosis and classification of lymphoma on FNA sample varies between 10-90 % according to Amatya BB[22].

Although FNAC does not replace histological examination in the diagnosis of lymphoma, it is still of value in diagnosis, grading/ classification, in the management of lymphoma, and therefore FNAC has been used extensively in cases of NHL and HL. One of the main limitations to FNAC as an independent diagnostic tool for lymphoma has been the inability to sub classify cases for directing appropriate therapy.

One cytologically diagnosed case of colloid goiter turned out to be papillary carcinoma on histopathology, also 01 case of thyroglossal cyst on FNAC turned out to be papillary carcinoma on histopathology.

False negative results was due to-
a. Acellular or poorly cellular sample as encountered in large cystic papillary carcinoma, in marked desmoplasia and in cases of thick fibrous or calcified capsule.
b. Sampling error- in cases of small carcinoma where the needle may not hit the lesion.
c. Occasionally thyroid carcinoma may have macro-follicular areas and yield moderate amounts of colloid on FNA.

Tilak et al[23] described this features in several follicular variants of papillary carcinoma and in papillary carcinoma with degenerative change. They also stressed the importance of doing multiple aspirations in a thyroid swelling in order to obtain representative material from different areas since the thyroid can be affected by more than one diseases process.

Pleomorphic adenoma was the commonest benign neoplasm (07 cases), as observed in other studies also. In present study 05cases were correctly identified on cytology. One case proved to be chronic sialadenitis and other was adenoid cystic carcinoma on subsequent histopathology. Thus the cytohistological correlation for pleomorphic adenoma was 71.4%. Also of 02 cases of out of 06 Warthin's tumor were false positive on FNAC which turned out to be 01 case as chronic sialadenitis and other adenoid cystic carcinoma

On cytology pleomorphic adenoma shows a biphasic pattern composed of epithelial / myoepithelial cells and fibromyxochondroid stroma. The components may be arranged in a wide spectrum of microscopic appearances with a potential for errors in cytological interpretation. It can be a source of confusion with tumors such as basal cell adenoma, adenoid cystic carcinoma and mucoepidermoid carcinoma- low grade on cytology.

A major diagnostic problem is differentiation of adenoid cystic carcinoma from pleomorphic adenoma. The hyaline globules of basement membrane or a predominant epithelial pattern can be seen in pleomorphic adenoma as well. Cellular atypical (20.6%), cystic transformation (7%), and the presence of Cylindromatous pattern (5%) as common variations in pleomorphic adenoma those are responsible for majority of misdiagnosis. The cytological distinction between these two tumors can be made if the smears are adequately cellular so that the distinctive relationship between the epithelial and extracellular matrix can be recognized. The tumor cells in pleomorphic adenoma have a plasmacytoid appearance with abundant cytoplasm as compared to the cells adenoid cystic carcinoma according to Gupta M et al (24).

Among miscellaneous skin and soft tissue lesions, 01 case of dermoid cyst and 01 case of hemangioma misdiagnosed as epidermoid cyst, 01 case of hemangioma as abscess and 01 case of dermoid cyst as chondroid syringoma. FNAC from multiple sites can decrease the rate of false positive/false negative finding.

Overall, a total of 170 (88.0%) out of 193 subjects were correctly diagnosed by FNAC and confirmed by HPE.

Most accurately diagnosed were lymph node lesions (91.0%), followed by thyroid lesions (88.5%), miscellaneous lesions (85.2%) and salivary gland lesions (71.4%).

Table 6: Sensitivity / Accuracy of various studies

Studies	FNAC	HPE	Sensitivity/Accuracy (%)
Schwartz et al (1990) (25)	182	77	92.0%
Fulciriti et al (1997) (26)	218	218	86.4%
Abrari et al (2002) (27)	150	120	93.0%
Wiliams et al (2009) (28)	625	238	92.0%
Ishar et al (2012) (15)	160	46	93.47%
Poorey et al (2014) (10)	179	152	81.81% 92.10%
Khetrapal et al (2015) (12)	290	74	91.8%
Kapoor et al (2015) (11)	100	100	90.47%
Present study (2019)	1857	193	88.0%

Ishar et al (2012)[15] in his study of 160 cases of non thyroidal head and neck swelling found 93.47% sensitivity.

Poorey et al (2014)[10] found sensitivity, specificity, positive predictive value and negative predictive value of 81.8%, 95.0%, 81.8% and 95.0% with accuracy of 92.10%.

Khetrapal et al (2015)[12] found sensitivity of 91.8% in his study of 290 cases

Kapoor et al (2015)[11] in his study of 100 cases found sensitivity 90.47%, specificity 98.73%, positive predictive value 95.0% and negative predictive value 97.5%

So our study is comparable to studies done previously by Schwarz, Fulciriti, Abrari, Wiliams, Ishar, Poorey, Khetrapal and Kapoor et al.[25,26,27,28,15,10,12,11]

According to Tandon et al (2008)[29] FNAC is not without its own problems and limitations. Non diagnostic aspirates, sub classification of lymphomas (which required an open biopsy) inaccurate diagnosis of low grade lymphomas, and the inability to distinguish thyroid follicular adenoma from follicular carcinoma are among the common problems faced.

When evaluating test for its ability to identify patients with malignancy, the sensitivity is more important than the specificity since false negative report may encourage delay in further investigation or treatment. Needle aspiration has lower sensitivity and accuracy both in our study and in other reports.

Therefore caution is mandatory, clinical suspicion must always take precedence and so negative cytology must be disregarded if there is a strong clinical suspicion. It must be borne in mind that negative result in fine needle aspiration does not rule out cancer. A negative aspiration indicates only that a repeat aspiration may be necessary and/or that some other procedure such as biopsy, endoscopy or CT-Scan may be helpful. It cannot be over emphasized that fine needle aspiration is always a part of work up and is not a final diagnosis.

Computed tomography angiography is recommended over magnetic resonance angiography for the evaluation of pulsatile neck masses. If imaging rules out involvement of underlying vital structures, a fine needle aspiration biopsy can be performed providing diagnostic information via cytology, Gram's stain, and bacterial and acid fast bacilli cultures.

Conclusion

FNAC is simple, quick, inexpensive and minimally invasive first line investigation for differential diagnoses of head and neck masses.

FNAC could differentiate the inflammatory process from neoplastic one, it was also concluded form the present study that majority of head and neck lesions can be managed without undue surgical intervention in our set up. Owing to its simplicity, rapidity, accuracy and cost effectiveness.

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