ISSN- O: 2458 - 868X, ISSN–P: 2458 – 8687
National Library of Medicine - ID: 101731606

International Journal of Medical Science and Innovative Research (IJMSIR)
IJMSIR : A Medical Publication Hub
Available Online at: www.ijmsir.com
Volume – 6, Issue – 1, February – 2021 , Page No. : 15 - 21

Utility of FNAC in Head Neck Masses Excluding Thyroid - A Prospective Study

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Citation this Article: Dr. Akanksha Gautam, Dr. Aditya Sharma, "Utility of FNAC in Head Neck Masses Excluding Thyroid - A Prospective Study", IJMSIR- February - 2021, Vol – 6, Issue - 1, P. No. 15 – 21.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Background: Fine needle aspiration cytology (FNAC) is of particular relevance in head and neck lesions because of easy accessibility, excellent patient compliance, minimally invasive nature of processes and helping to avoid surgery in non-neoplastic lesions, inflammatory conditions and also some tumors.

Methods: This prospective study includes 697 cases of head neck swelling exclude thyroid performed predominantly indoor and outdoor patients from January 2018 to July 2018 at department of pathology government medical college of kota Rajasthan.

Results: In the present study the youngest patient was 6 month old female child while the eldest being 84 yrs male. The cases showed maximum incidence in the age group of 11-20 yrs with 190 cases (27.25%), 110 male (57.89%) and 80 females (42.10%). Most common site of FNAC is lymph node 508 cases (72.88 %) second most common salivary glands , 85 cases (12%), followed scalp 40 cases (5.7%) and soft tissues 32 cases (4.5%), oral cavity 3 cases (0.43%) and miscellaneous 29 cases (4.16)

Conclusion: We recommend that FNAC to be a safe and reliable technique in diagnosis of non-thyroidal head and neck lesions. It is a quick, convenient and accurate method of tissue diagnosis and should be considered as first line investigation in the evaluation of lesions in head and neck region

Keywords: FNAC, Cancer, Head, Neck

Introduction

A number of masses may develop in the head and neck region and these can also be called swellings, growths, tumors or lumps. Various diseases may affect head and neck region, which present clinically as swellings. [1]

FNAC is a simple, quick and cost effective method to sample superficial masses found in the head and neck region. The technique is performed in the outpatient department and causes minimal trauma to the patient and carries virtually no risk of complications.[2]

Lesions of head and neck are comprised of developmental, inflammatory and neoplastic conditions. Most commonly seen swellings are branchial cysts, thyroglossal cysts, dermoid cysts, lymphangioma, haemangioma, lymphadenitis, sialadenitis and neoplastic pathologies.[3]

This study was done to assess the role of FNAC in determining the cytomorphology of different palpable neck masses in respect to their sites of occurrence , age and sex distribution , to evaluate the role of FNAC and its utility in the diagnosis of head neck masses other than thyroid.

Material & Method

This prospective study includes 697 cases of head neck swelling exclude thyroid performed predominantly indoor and outdoor patients from January 2018 to July 2018 at department of pathology government medical college of kota Rajasthan. The details regarding history of patients, age, sex , personal detail of patients and local examinations finding laboratories and other investigations, clinical diagnosis and microscopic finding

Material Used

Disposable needle (22-24 gauge.), standard 10 ml or 20 ml disposable plastic syringes with good negative pressure, good quality clean grease –free glass slides ,spirit as a disinfectant, for staining 1 in 9 diluted giemsa stain was routinely used in our set up, Gram's stain ,Z-N stain, PAS stain .

General Technique

1 Localise the swelling.

2 Skin at the site of Fnac will be cleaned with spirit.

3 Appropriate needle (22-24 gauge) was placed against the skin and insert it into the lesion and once the needle is in the lesion the needle will be moved back and fourth several times and directed into different areas of the lesion.The plunger of the syringe was retracted to create negative pressure in the syringe and the needle lumen .The drew material in the needle.

4 Constant negative pressure was maintained in the syringe throughout this manipulation by keeping the plunger of the syringe retracted

5 The pressure in the syringe was allowed to return to atmospheric pressure by gently releasing the plunger. The aspirated material remained in the needle.

6 The needle was withdrawn from the lesion and pressure applied on the puncture site with spirit soaked cotton /gauze.

7 Smears were immediately made by applying a gentle pressure with another slide.

8 Four smears were made from the obtained material.

Fixation And Staining

Different methods of fixation are used in FNAC at different centers: air dried ,followed by staining with a hematological stain such as leishman ,Giemsa or May Grunwald Giemsa (MGG) stain and alcohol fixation followed by staining with pap or H&E . In our set up we have routinely used MGG staining.

MGG Stain (May Grunwald Giemsa Stain)

Reagent: May Grunwald stain

1 May Grunwald stain powder -.3 gm

2 Methanol -100 ml

Preparation: Mix .3 gm of powder to methanol and warm the mixture to 50 degree C. Allow the solution to cool to 20 degree C .Keep it standing for 24 hours,filters and keep for use.

Results and Observations

This prospective study includes 697 cases of head neck swelling exclude thyroid performed predominantly indoor patients from January 2018 to July 2018 at department of Pathology Government Medical College of kota Rajasthan. The details regarding history of patients, age, sex , personal detail of patients and local examinations finding laboratories and other investigations, clinical diagnosis and microscopic finding were recorded predesigned questionnaire. Giemsa and special stain used when required. Purulent

or cheesy material as aspirate or with clinical suspicion of tuberculosis were stained by ZN stain. Cytological findings were recorded, and patients were advised medical treatment and follow up or biopsy and surgical intervention depending upon the pathology.

Table 1: Age wise, Sex wise distribution head neck mass

Age Group (Yrs)	Cases(Total numbers)	Cases (%)	Male(total numbers)	Male %	Female (Total numbers)	Female (%)
0-10	105	15.06	65	61.90	40	38.90
11-20	190	27.25	110	57.89	80	42.10
21-30	125	17.9	7.6	60.8	49	39.2
31-40	72	10.32	40	55.55	32	44.44
41-50	63	9.03	38	60.3	25	39.68
51-60	85	12.19	50	58.82	35	41.17
> 60	57	8.17	35	61.40	22	38.59
Total	697	-	414	59.39	283	40.60

Table one shows that in the present study the youngest patient was 6 month old female child while the eldest being 84 yrs male. The cases showed maximum incidence in the age group of 11-20 yrs with 190 cases (27.25%), 110 male (57.89%) and 80 females (42.10%).

Table 2: Showing Site of FNAC

Site	Number of cases	Cases (%)
Lymph Node	508	72.88
Salivary Gland	85	12
Scalp	40	5.7
Soft Tissues	32	4.5
Oral Cavity	3	0.43
Miscellaneous	29	4.16

Table 2 illustrates that the most common site of FNAC is lymph node 508 cases (72.88 %) second most common salivary glands , 85 cases (12%), followed scalp 40 cases (5.7%) and soft tissues 32 cases (4.5%), oral cavity 3 cases (0.43%) and miscellaneous 29 cases (4.16).

Table 3: Spectrum of various lymph Node neck masses (N=508)

Lesion (508)	Cases (Numbers)	Cases (Out of 508 in %)	Cases(Out of 697 in %)
Reactive lymphadenitis	208	40.94	29.84
TB lymphadenitis	81	15.94	11.62
Metastatic carcinoma	74	14.56	10.6

Granulomatous lymphadenitis	80	15.74	11.47
Cold Abscess	26	5.11	3.73
Suppurative lesion	18	3.54	2.58
Burkitt lymphoma +NHL+Small Lymphocytic leukemia	7	1.36	.99
Inflammatory Cell Only	2	0.39	0.28
Only Epitheloid cell	3	0.59	0.43
Only Blond	2	0.39	0.28
Inconclusive	6	1.18	0.86
Only fat	1	0.19	0.14

Table 3 shows total cases 508, out of which reactive lymphadenitis is most common 208 cases (40.94%). Tubercular lymphadenitis 81 cases (15.94%), metastatic carcinoma 74 cases (14.56%), total inflammatory lesion 418 cases (82.28%), neoplastic 81 cases (15.94%), inconclusive 9 cases (1.74%).

Table 4: Spectrum of various salivary gland lesion (N=85)

Lesion (85 Cases)	Cases (Numbers)	Cases (Out of 85 in %)	Cases (Out of 697 in %)
Acute pyogenic abscess	5	6.85	0.81
Chronic Sialadenitis	40	50.82	6.17
Pleomorphic salivary gland adenoma	4	5.88	0.71
Warthin Tumours	3	4.70	0.57
Squamous Cell Carcinoma	1	3.52	0.43
Mucinous adenocarcinoma Nos	1	1.176	0.14
Salivary carcinoma Ex pleomorphic adenoma	1	1.17	0.14
Mucoepidermoid carcinoma	4	4.69	0.57
Adenoid cystic carcinoma	1	1.17	0.14
Granulomatous sialadenitis	1	1.17	0.14
Tubercular sialadenitis	7	8.23	1
Benign Cystic Lesion	7	8.23	1
Sialadenosis	2	2.34	0.28
Inconclusive	5	5.88	0.71

Table 4 shows that in the present study out of total 408 cases 85 cases were salivary gland lesion. Most common lesion was chronic sialadenitis 50 cases (58.82%). Majority tumours showing involvement of parotid gland. Most common tumour is pleomorphic adenoma. Squamous cell carcinoma, (three cases) mucoepidermoid carcinoma, Warthin tumour, adenoid cystic carcinoma (1 case) also seen. Granulomatous sialadenitis 1 case (1.17%), Benign cystic lesion 7 cases (8.23%), sialadenosis 1 case (1.17%).

Table 5: Spectrum of various scalp lesion.

Scalp Lesion(40 Cases)	Cases (Numbers)	Cases (Out of 40 in %)	Cases (Out of 697 in %)
Chronic inflammatory cell	2	5	0.28
Only giant cell	1	2.5	0.14
Mesenchymal neoplasm	1	2.5	0.14
Benign spindle cell lesion	2	5.1	0.28
Keratinous cyst	8	20	1.14
Benign cystic lesion	7	17.5	1.1
Vascular lesion	1	2.5	0.14
Lipoma	5	12.5	0.71
Metastatic squamous cell carcinoma	3	7.5	0.43
Metastatic adenocarcinoma	2	5	0.28
Neuroblastoma	1	2.5	0.14
Infected Epidermal Cyst	5	12.5	0.711
Epidermal Cyst	2	5	0.28

Above table shows that in the present study most common lesion keratinous cyst 8 cases (20%) , other presentations included metastatic carcinoma 5 cases (12.5%), lipoma 5 cases (12.5%), benign cystic lesion 7 cases (17.5%), chronic inflammatory lesion 2 cases (5%), only giant cell one case (2.5%), epidermal cyst 7 cases (17.5%).

Table 6: Spectrum of Soft tissues lesion

Soft Tissues Lesion (32 Cases)	Cases (Numbers)	Cases (Out of 32 in %)	Cases (Out of 697 in %)
Lipoma	22	68.75	3.15
Lipomatous Lesion	5	15.62	0.717
GCT of soft tissues	1	3.12	0.14
Benign Fibrohistiocystic tumour	1	3.12	0.14
Inconclusive	3	9.375	0.43

Table 6 shows that in the present study there were 32 cases (4.5%) of soft tissues lesion out of 697 cases. It includes 22 case lipoma (68.75%), lipomatous lesion 5 cases (15.62%), GCT of soft tissues 1 case (3.12%), inconclusive 3 cases.

Table 7: Spectrum of oral cavity lesion.

Oral Cavity lesion (3 Cases)	Cases (Numbers)	Cases (Out of 3 in %)	Cases (Out of 697 in %)
Squamous Cell Carcinoma	3	100	0.43

It includes 3 cases of squamous cell carcinoma.

Table 8: Miscellaneous lesion.

Miscellaneous lesion (29 Cases)	Cases (Numbers)	Cases (Out of 29 in %)	Cases (Out of 697 in %)
Benign Cystic Lesion	2	6.89	0.28
Branchial Cyst	2	6.89	0.28
Thyroglossal cyst	4	13.79	0.57
Keratinous cyst	11	37.93	1.57
Abscess	7	24.13	1.004
Dermoid cyst	1	3.44	0.14
Ganglion Cyst	1	3.44	0.14
? ? Benign cartilaginous tumour ? ? Chondromyxoid Fibroma	1	3.44	0.14

Table 8 shows that in the present study there were 29 cases most common finding was abscess 7 cases (24.13%), Benign cystic lesion 2 cases (6.89%), Branchial cyst 2 cases, thyroglossal cyst, 4 cases of keratinous cyst, 1 case of dermoid cyst, 1 case of ganglion cyst.

Table 9: spectrum of lymph node lesion (N= 508)

Lymph Node lesion	Cases (Numbers)	Cases (%)
Inflammatory Lesion	418	82.28
a. Reactive lymphadenitis	208	40.94
b. Granulomatous lymphadenitis	201	41.33
Metastatic squamous cell carcinoma	74	14.56
Meta SCC + Burkitt Lymphoma+ NHL +SLL	81	15.94
Inconclusive	9	1.17

Table 9 shows that 508 cases of lymph node lesion have been studied. Lymphadenopathy is the most common presentation. Reactive lymphadenitis was given in 208 aspirates (40.94%), granulomatous lymphadenitis second most common 210 cases (41.33%) and it includes caseating or non-caseating aspirate, suspicious for tuberculosis, only giant cell aspirate. Neoplastic lesion 81 cases (15.94%) maximum metastatic squamous cell carcinoma 74 cases (14.56%).

Discussion

FNAC is a valuable diagnostic test in the initial assessment of the patients presenting with a mass in the head and neck region or when a recurrence is suspected after previous treatment.

In the present study the youngest patient was 6 month old female child while the eldest being 84 yrs male. The cases showed maximum incidence in the age group of 11-20 yrs with 190 cases (27.25%), 110 male

(57.89%) and 80 females (42.10%). Most common site of FNAC is lymph node 508 cases (72.88 %) second most common salivary glands , 85 cases (12%), followed scalp 40 cases (5.7%) and soft tissues 32 cases (4.5%), oral cavity 3 cases (0.43%) and miscellaneous 29 cases (4.16) which is similar to the findings of Setal et al. Significantly, granulomatous /tubercular lymphadenitis was the most common cytological diagnosis in both the present study & the one by Setal et al.[4] Malignancy was reported in 25% of cases by Setal et al and in only 7.6% cases in this study. Similarly, El Hag et al in a study of 225 cases in Saudi Arabia reported reactive lymphadenitis & tubercular lymphadenitis to together account for 54% of the cases and malignant neoplasms to constitute only 13% of cases.8 At variance is the study by Maniyar et al in which the average age of the subjects was older, the maximum number being in the 51-60 age group with the authors reporting malignancy in 71.69% cases.[5]

Conclusion

We recommend that FNAC to be a safe and reliable technique in diagnosis of non-thyroidal head and neck lesions. It is a quick, convenient and accurate method of tissue diagnosis and should be considered as first line investigation in the evaluation of lesions in head and neck region

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