



Role of Cytology in Evaluation of Neck Swellings

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Abstract

Background: Neck swellings include various non-neoplastic and neoplastic lesions of lymph node, salivary gland, thyroid and soft tissue. Neoplasms of neck region account for majority of cancers in India, accounting for 23% of all cancers in males and 6% in females.

Aim: 1. To evaluate the role of FNAC and its utility in diagnosis of palpable neck masses.
2. To study the spectrum of swellings in neck region.

Material and Methods: A total of 315 cases of neck swellings over a period of 1 year between December 2016 to December 2017, presenting to the Department of Pathology, FMHS, SGT University, Gurugram were taken.

Result: Out of 315 patients of neck swellings studied, lymph node (56.82%) was the predominant site aspirated with tubercular lymphadenitis being the commonest. Thyroid lesions constituted 26.98% followed by salivary gland (6.98%), cystic (5.39%) and soft tissue lesions (2.23%). FNAC was inconclusive in 1.58% cases.

Conclusion: FNAC is a simple, quick, inexpensive and minimally invasive technique to diagnose neck swellings. It can obviate the need for surgery in some of non-neoplastic lesions. Thus, FNAC can be recommended as a first line investigation in diagnosis of neck swellings.

Keywords: FNAC, Cytology, Neck swellings.

Introduction

FNAC is an important tool for the diagnosis of various palpable swellings of head and neck. It is an inexpensive, reliable and patient acceptable technique⁽¹⁾. It is an outpatient department procedure which causes minimal inconvenience to the patients with minimum risks and complications.^(2,3) Palpable neck swellings include various non-neoplastic and neoplastic lesions of lymph node, salivary gland, thyroid gland and soft

tissue. With the help of newer radiological techniques, FNAC of deeper structures can also be done.⁽⁴⁾ Neoplasms of neck region account for 23% of all cancers in males and 6% in females in India.⁽⁵⁾ FNAC of neck swellings is a generally well accepted technique with high specificity.⁽⁶⁾

Material and Methods

The present study was conducted in Department of Pathology, FMHS, SGT University for a period

of one year from December 2016 to December 2017 and included 315 cases with palpable neck swellings. Detail clinical history of the patient and significant findings of the swelling were noted. After explanation of the procedure and taking informed consent of patient, FNAC was done using 10cc disposable syringe and 22/23/24 gauge needle taking all aseptic precautions. Both aspiration and non aspiration techniques were used wherever it was required. Smears were prepared according to the amount of material aspirated and wet fixed in 95% alcohol and air dried followed by staining with Giemsa stain and PAP stain as required. Zeihl-Neelsen staining for acid fast bacilli was done in suspected cases of tubercular lesions. Aspirations were taken from various sites that included lymph node, thyroid, salivary gland and soft tissue.

Result

The present study included 315 cases of palpable neck swellings of the age ranging from 1 to 80 years. Maximum number of patients were in the age group of 21-30 years (31.11%) followed by <20 years (27.94%) and the least number of patients were seen in the age group of 51-60 years [Table-1], out of which 68.25% were females and 31.64% were males. Site wise distribution of neck swellings [Table-2] show lymph nodal lesion as the predominant site of FNAC (57.46%) followed by thyroid swellings (26.66%), salivary glands (6.98%), cystic (6.66%) and soft tissues (2.22%).

Lymph node

Out of 179 cases of lymph node, tubercular lymphadenitis (36.87%) was the predominant cause of lymphadenopathy followed by reactive lymphadenitis (34.08%). In malignant lesions, metastatic epithelial malignancy was the predominant finding (9.50%) and two cases of lymphoma (1.12%) were reported.[Table-3]

Thyroid

Out of 82 cases of thyroid swellings, 46 cases (56.09%) were of colloid goiter, 22 cases (26.82%) were of Hashimoto's thyroiditis, 3 cases (3.65%) were of primary hyperplasia of thyroid, 3 cases (3.65%) were of thyroglossal cyst and 2 cases (2.43%) were of lymphocytic thyroiditis. Follicular neoplasms constitute 8 cases (9.75%) and 1 case was of Hurthle cell neoplasm.[Table-4]

Salivary glands

In salivary gland lesions, chronic sialadenitis was observed in 14 (63.63%) cases. Benign neoplasms included 5 (22.73%) cases of pleomorphic adenoma, 1 case (4.55%) of benign lymphoepithelial lesion and 1 case (4.55%) of Warthin's tumour. In malignant lesions, 1 case of Adenoid-cystic carcinoma was reported.[Table-5]

Miscellaneous

FNAC of cystic lesions included 20 cases (74.07%) and soft tissues included 7 cases (25.92%) of lipoma.[Table-6]

Table 1: Age-wise distribution of cases

Age Group	No. Of cases	%
< 20 years	98	31.11
21-30	88	27.94
31-40	60	19.05
41-50	30	9.52
51-60	19	6.03
>60 years	20	6.35
Total	315	100.00

Table 2: Site-wise distribution of neck swelling

Site	Lesion			Total No. Of cases	%
	Benign	Malignant	Inconclusive (Acellular/Unsatisfactory)		
Lymph Nodes	160	19	2	181	57.46
Thyroid	84	1	2	87	27.62
Salivary Glands	21	1	NIL	22	6.98
Cystic Lesions	17	NIL	1	18	5.71
Soft Tissue Lesions	7	NIL	NIL	7	2.22

Table 3: Lesions in Lymph Nodes

Lesions		No. Of Cases	%
Reactive Changes		61	34.08
Inflammatory	Non-specific	33	18.44
	Tubercular	66	36.87
Malignant	Lymphoma	2	1.12
	Metastasis	17	9.50
Total		179	100.00

Table 4: Lesions in Thyroid

Lesions	No. Of Cases	%
Colloid Goitre	46	54.12
Primary hyperplasia of thyroid	3	3.53
Hashimoto's Thyroiditis	22	25.88
Lymphocytic Thyroiditis	2	2.35
Thyroglossal cyst	3	3.53
Follicular neoplasm	8	9.41
Hurthle cell neoplasm	1	1.18
Total	85	100.00

Table 5: Salivary Gland Lesions

Lesion	No. Of Cases	%
Sialadenitis	7	31.82
Sialadenosis	1	4.55
Acute Abscess	6	27.27
Pleomorphic Adenoma	5	22.73
Benign lympho-epithelial lesion	1	4.55
Warthin's Tumor	1	4.55
Adenoid-cystic Carcinoma	1	4.55
Total	22	100.00

Table 6: Distribution of cystic and soft tissue lesions

Lesion	No. Of Cases	%
Cysts	17	70.83
Lipoma	7	29.17
Total	24	100.00

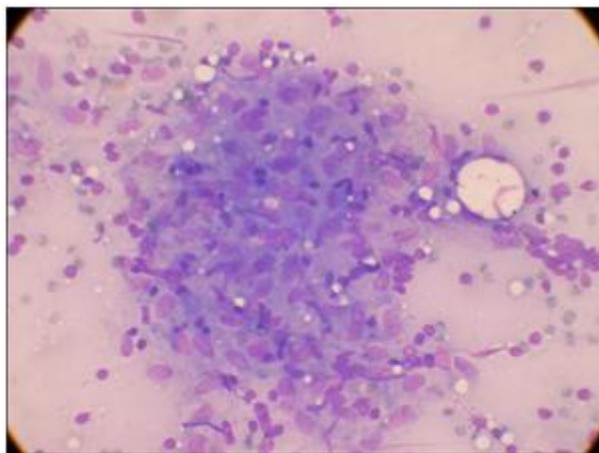


Figure 1- FNA lymph node showing epithelioid cell granuloma in case of tuberculous lymphadenitis (400X, Giemsa stain)

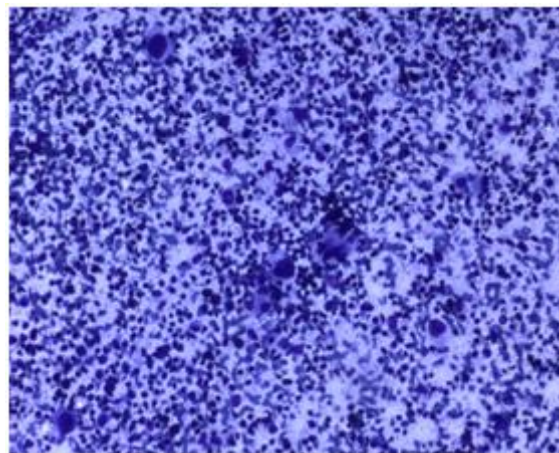


Figure 4- FNA lymph node showing atypical mononuclear cells in case of Hodgkin lymphoma (100X, Giemsa)

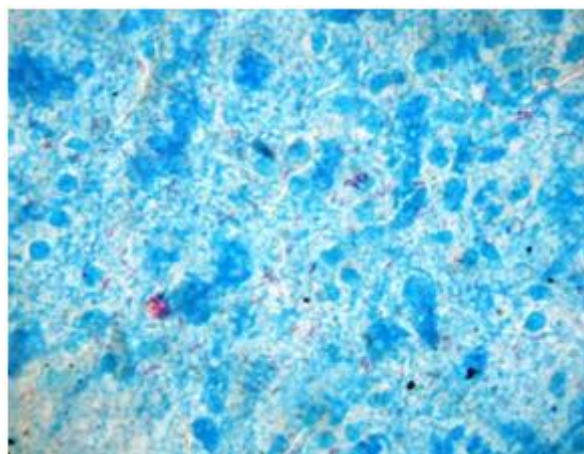


Figure 2- Zeihl Neelsen stain showing acid fast bacilli in tuberculous lymphadenitis (100X, oil immersion)

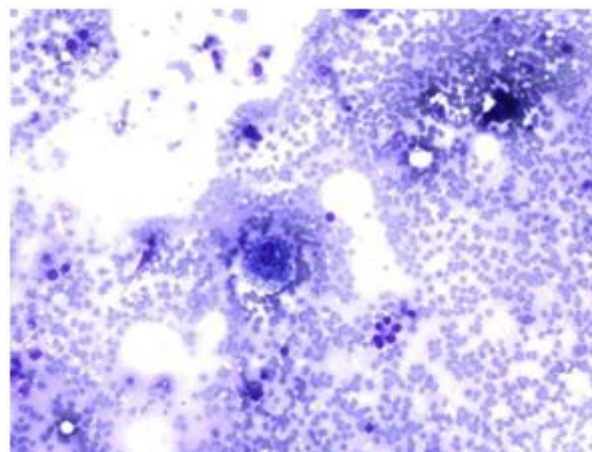


Figure 5- FNA thyroid showing colloid goitre with cystic change (400X, Giemsa stain)

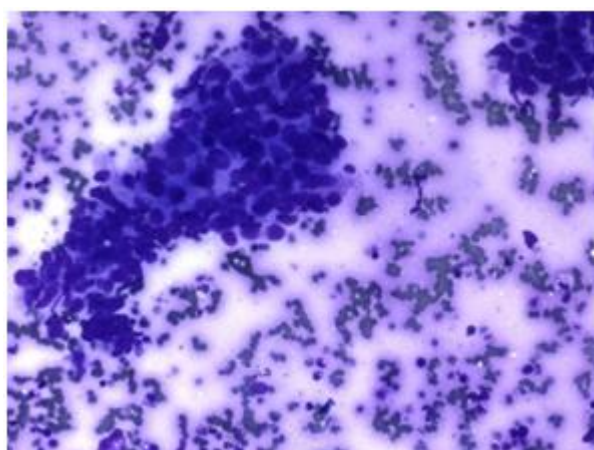


Figure 3- FNA lymph node showing secondaries of squamous cell carcinoma (400X, Giemsa stain)

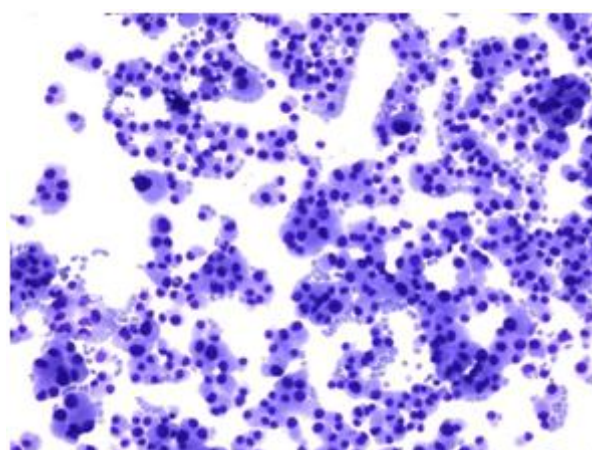


Figure 6- FNA thyroid showing Hurthle cell neoplasm (100X, Giemsa stain)

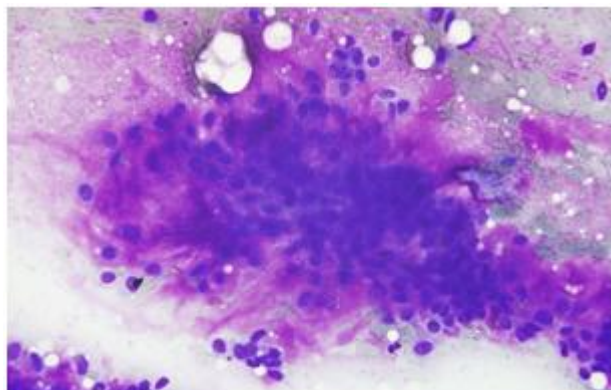


Figure 7- FNA salivary gland showing pleomorphic adenoma (400X, Giemsa stain)

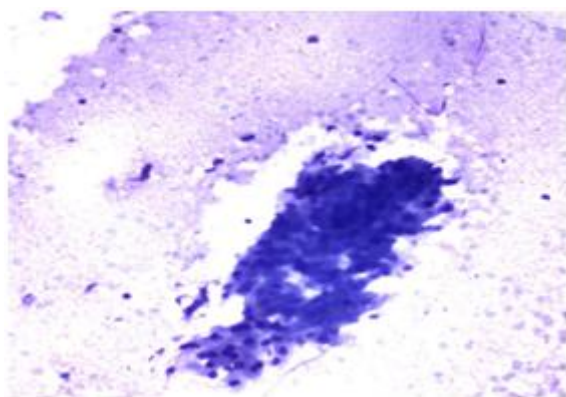


Figure 8- FNA salivary gland showing Warthin's tumour (400X, Giemsa stain)

Discussion

In 1930, Martin and Ellis described and first introduced the technique of FNAC for diagnosis of organ lesions.⁽⁷⁾

The four fundamental requirements on which success of FNA depends are representativeness, adequacy of the sample and high quality of preparation with relevant and correct clinical/radiological information⁽⁸⁾. As palpable swellings of neck are easily accessible, therefore FNAC is the primary investigation of choice. It helps in classifying the lesions as inflammatory, infective, benign and malignant and thereby helping in the further management of patients. The age distribution, sex distribution, site of lesion and the cytological diagnosis were evaluated and compared with other studies.

The present study was carried out over a period of 1 year to find out the frequency of a variety of pathological conditions and to find out the accuracy of FNAC as a rapid diagnostic tool. This

study included patients from all age groups. Majority of patients were females with male to female ratio of 1:2.15. Similar results of female preponderance were also reported by Kishor.H.et.al and Muddegowda et al^(9,10). Predominant site of FNAC was lymph node lesions (57.46%) followed by thyroid gland. Similar results have also been reported by Bhagat VM et al and Mohamed MH et al^(11,12). In lymph node lesions tubercular lymphadenitis was the most common pathological finding followed by reactive lymphadenitis which is in concordance with Bhagat et al and El Hag et al^(11,6). In malignant neoplasms, epithelial metastasis was found in 17 cases (9.50%) and 2 cases (1.12%) of lymphoma were found. All cases showed metastatic squamous cell carcinoma. This is due to consumption of tobacco in various forms leading to high incidence of malignancy in aero digestive tract.

In our study, FNAC of thyroid lesions was the next common site. The predominant finding in benign lesion was colloid goiter (56.09%) followed by inflammatory lesions consisting of Hashimoto's thyroiditis. Muddegowda et al⁽¹⁰⁾ also found thyroid lesions as the predominant site of FNAC in their study with colloid goiter as the predominant finding along with female preponderance in FNAC of thyroid lesions. In salivary gland lesions, chronic sialadenitis comprised 63.63% cases followed by pleomorphic adenoma in 5 cases (22.73%) and 1 case (4.55%) each of benign lymphoepithelial lesion and Warthin's tumour. Rathod et al⁽¹³⁾ also found inflammatory lesions as the commonest findings followed by benign neoplasms including pleomorphic adenoma.

In soft tissue and miscellaneous lesions, benign lesions were commonest finding including 20 cases (74.07%) of cystic lesions and 7 cases (25.92) of lipoma. Bhagat et al⁽¹¹⁾ reported neoplastic lesions in 63% cases with lipoma as the predominant benign tumour. In 1.58% of cases, cytology was inconclusive. The causes of unsatisfactory aspirates were smaller lesions,

inadequate aspirate. Incidence of inadequate reports ranged from 0 to 10% in various studies in literature.

Conclusion

FNAC is a simple, quick, inexpensive and minimally invasive technique to diagnose neck swellings. It helps in analysing various pathological spectrum of palpable swellings in neck region. It can obviate the need for surgery in some of non-neoplastic lesions. FNAC being a blind procedure, may miss small foci of representative area which can be avoided by multiple aspirations from different sites with adequate cellularity or in conjunction with USG guidance. FNAC has high accuracy rate to differentiate between benign and malignant nature of the lesions. Thus, FNAC can be recommended as a first line investigation in diagnosis of neck swellings.

References

1. Frable, WJ. 1989. Needle aspiration biopsy. Past, present and future. Hum Pathol. 20:504-517
2. Ahluwalia H, Gupta SC, Singh M, Gupta SC, Mishra V, Singh PA, Walia DK. Spectrum of head and neck cancers at Allahabad. J Otolaryngology Head Neck Surg. 2001;53:16-20.
3. Mehrotra R, Singh M, Gupta RK, Singh M, Kapoor AK. Trends of prevalence and pathological spectrum of head and neck cancers in North India. Indian J Cancer. 2005;42:89-93.
4. Orell SR, Sterrett GF, Walters MN-I, Whitaker D: Manual and Atlas of Fine Needle Aspiration Cytology. 2nd edn. New York: Churchill Livingstone; 1992.p. 2-36.
5. Rao YN, Gupta S, Agarwal SP. National Cancer Control Programme: Current Status & Strategies. In Agarwal SP, ed. Fifty Years of Cancer Control In India. Dir Gen of Health Services, MOHFW, Government of India, 2002;41-7.
6. El Hag IA, Chiedozi LC, al Reyees FA, Kollur SM. Fine needle aspiration cytology of head and neck masses. Seven years' experience in a secondary care hospital. Acta Cytol 2003;47:387-92.
7. Martin HE, Ellis EB. Biopsy of needle puncture and aspiration. Ann Surg 1930; 92:169-81.
8. Orell SR: Fine needle aspiration cytology, 2005.
9. Suryawanshi Kishor H., Damle Rajshri P. Dravid Nandkumar V. Tayde Yogesh. spectrum of fnac in palpable head and neck lesions in a tertiary care hospital in india- a 3 years study. Indian Journal of Pathology and Oncology, January – March 2015;2(1);713.
10. Muddegowda PH, Srinivasan S, Lingegowda JB, Ramkumar KR, Murthy KS. Spectrum of Cytology of Neck Lesions: Comparative Study from Two Centers. Journal of Clinical and Diagnostic Research 2014 ;Vol-8(3): 44-45 .
11. Bhagat VM, Tailor HJ, Saini PK, Dudhat RB, Makawana GR, Unjiya RM. Fine Needle Aspiration Cytology In Nonthyroidal Head And Neck Masses-A Descriptive Study In Tertiary Care Hospital. National Journal Of Medical Research 2013; volume 3(3):273-76
12. Mohamed MH, Hitam S, Brito-Mutunayagam S, Yunus MRM. Role of FNAC in evaluation of neck masses. J Curr Surg 2013;3(1):19-23.
13. Rathod GB, Parmar P. Fine needle aspiration cytology of swellings of head and neck region. Indian Journal of Medical Science 2012;66(3):49-54.