

FINE NEEDLE ASPIRATION CYTOLOGY OF SUPRACLAVICULAR LYMPH NODE- THREE YEAR RETROSPECTIVE STUDY

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ABSTRACT

BACKGROUND

Lymphadenopathy especially in the supraclavicular region is often associated with an underlying pathology. Fine needle aspiration cytology of lymph nodes is a cost effective and simple procedure that can be carried out in the outpatient department itself which helps in deciding the management.

MATERIALS AND METHODS

The study was done in Department of Pathology, Govt. Medical College, Kozhikode. Data of past 3 years (January 2014 - December 2016) was retrieved from records of the pathology department and reviewed. Relevant history, clinical examination findings and investigations were documented. Aspiration was done routinely using 23 gauge needle and smears wet fixed in isopropyl alcohol and Papanicolaou staining was done. Cases in which aspirate was inadequate were excluded from the study. The cases were broadly divided into following groups, viz., reactive lymphoid hyperplasia, acute suppurative lymphadenitis, granulomatous lymphadenitis, metastatic malignancy, lymphoma and miscellaneous cases.

RESULTS

A total number of 724 cases were included in the study, males constituted 66% and females 34%. Metastatic malignancy constituting 65% was the commonest cause of lymph node enlargement, followed by reactive hyperplasia 22%. Granulomatous lymphadenitis was diagnosed in 64 cases (8.8%). Rest of the causes like lymphoma, suppurative and non-specific causes constituted only a minor category. Most common site of lymphadenopathy was left side, constituting 59.4%. Metastatic malignancy was the commonest cause of supraclavicular enlargement in the age group of 40-80 yrs. On analyzing histopathology adenocarcinoma was the most common type in this study constituting 55% followed by squamous cell carcinoma in 27%. Approximately 11% were metastasis from small cell carcinoma and 5% from poorly differentiated carcinoma. In metastatic adenocarcinoma, the most common primary site was lung, constituting 54.2%.

CONCLUSION

Supraclavicular lymphadenopathy is most often associated with an underlying pathology and it has to be evaluated especially in the elderly. FNAC is a cheap and reliable diagnostic tool in the initial evaluation as well as follow up of patients attending outpatient department and provides valuable information that helps in treating patients.

KEYWORDS

Supraclavicular Lymphadenopathy, Aspiration Cytology, Granuloma, Carcinoma.

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BACKGROUND

Lymphadenopathy especially in the supraclavicular region is one of the commonest clinical presentations of patients, attending the outdoor department. It often has some underlying pathology both in young adults and old patients.¹ It may be just a reactive change or due to infectious

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aetiology like Tuberculosis, toxoplasmosis or it may be the first clinical manifestation of an underlying malignancy.

Fine needle aspiration cytology is an excellent cost effective diagnostic procedure that can be carried in outpatients to evaluate lymphadenopathy. It causes minimal trauma and complications are very rarely encountered. Guided FNAC with the help of CT, USG is also being practiced in difficult cases.²

Aims and Objectives-

In this retrospective study, we attempted to analyze and categories the pattern of supraclavicular lymph node enlargement.



MATERIALS AND METHODS

This retrospective study was carried out in Department of Pathology, Govt. Medical College, Kozhikode. Data of past 3 years (January 2014 - December 2016) was retrieved from records of the pathology department and reviewed. Relevant history, clinical examination findings and investigations were documented. Aspiration was done routinely using 23 gauge needle and smears wet fixed in isopropyl alcohol and Papanicolaou staining was done. Special stains like AFB were done in indicated cases. Cases in which aspirate was inadequate were excluded from the study.

The cases were broadly divided into following groups, viz., reactive lymphoid hyperplasia, acute suppurative lymphadenitis, granulomatous lymphadenitis, metastatic malignancy, lymphoma and miscellaneous cases.

RESULTS

A total number of 724 cases were included in the study, males constituted 66% and females 34% (Table 1).

Gender	Frequency	Percentage
Female	243	33.6
Male	481	66.4
Total	724	100.0

Table 1. Gender Distribution of the Subjects

The causes for lymph node enlargement are classified into six categories as shown in the Table 2 below. Metastatic malignancy (constituting 65%) was the commonest cause of lymph node enlargement, followed by reactive hyperplasia (22%). Granulomatous lymphadenitis (Figure 1) was diagnosed in 64 cases (8.8%), which included 35 cases of Tuberculosis. Definitive diagnosis of Tuberculosis was given for cases in which there was granuloma along with caseous necrosis or those cases in which AFB stain was positive. Rest of the causes like lymphoma, supportive and non-specific causes constituted only a minor category.

	Frequency	Percentage
Granulomatous	64	8.8
Lymphoma	13	1.8
Metastatic Malignancy	471	65.1
Non specific	10	1.4
Reactive	152	21.0
Suppurative	14	1.9
Total	724	100.0

Table 2. Causes of Supraclavicular Lymphadenopathy

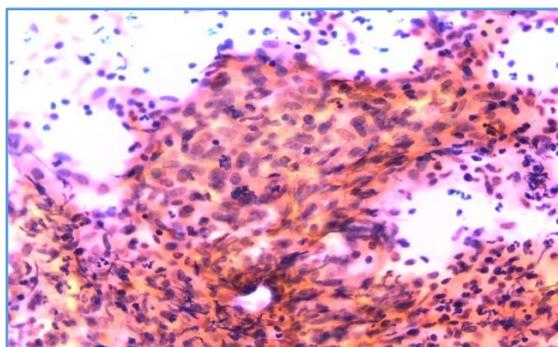


Figure 1. Granulomatous Lymphadenitis, Papanicolaou Stain, 40x

Most common site of lymphadenopathy was left side, constituting 59.4%.

	Frequency	Percentage
Left	430	59.4
Right	294	40.6
Total	724	100.0

Table 3. Side of Enlargement

Metastatic malignancy was the commonest cause of supraclavicular enlargement in the age group of 40- 80 yrs. as shown in the Table 4.

Age Group	Cause of Supraclavicular Lymphadenopathy						Total
	Granulomatous	Lymphoma	Metastatic Malignancy	Non-Specific	Reactive	Suppurative	
<10	1	0	0	0	0	1	3
11-20	2	2	0	3	7	2	16
21-30	7	1	4	1	10	7	25
31-40	17	2	20	3	18	17	62
41-50	13	0	73	1	29	13	118
51-60	15	3	149	2	55	15	226
61-70	4	5	153	0	24	4	187
71-80	3	0	62	0	5	3	71
>80	2	0	10	0	4	2	16
Total	64	13	471	10	152	64	724

Table 4. Pattern of Lymphadenopathy Based on Age Group

On analysing histopathology (Table 5), adenocarcinoma (Figure 2) was the most common type in this study constituting 55% (260/471) followed by squamous cell carcinoma (Figure 3) in 27% (126/471). Approximately 11% (50/471) were metastasis from small cell carcinoma (Figure 4) and 5% (24/471) from poorly differentiated carcinoma. There were a few cases of malignant melanoma, papillary carcinoma thyroid and single case of urothelial, Wilms tumour, neuro endocrine carcinoma and germ cell tumor.

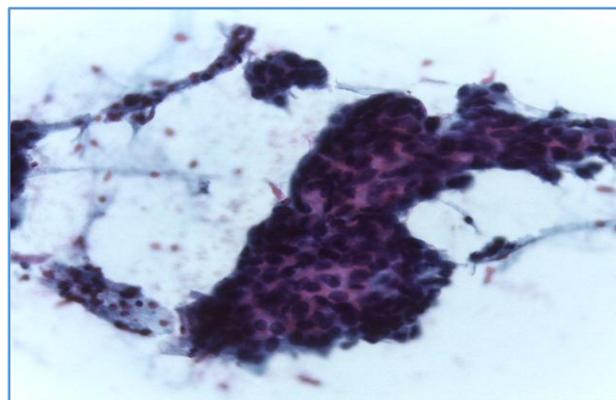


Figure 2. Metastasis from Adenocarcinoma, Papanicolaou Stain, 40x

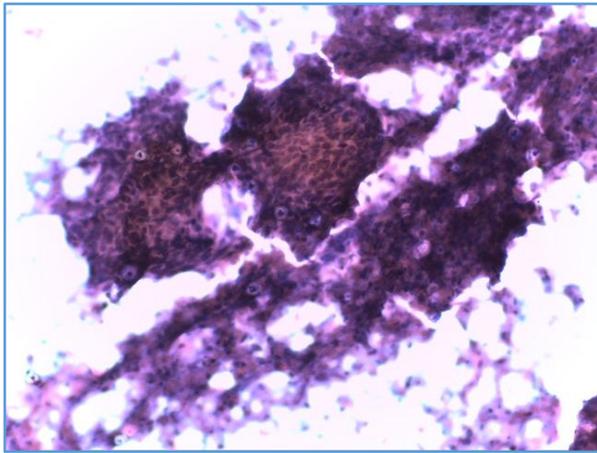


Figure 3. Metastasis from Squamous Cell Carcinoma, Papanicolaou Stain, 40x

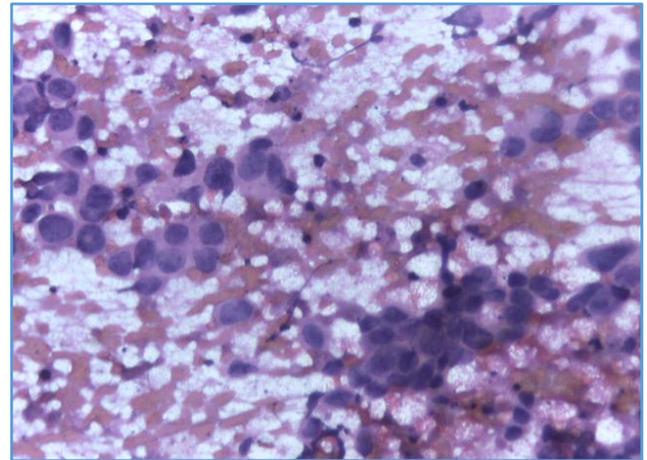


Figure 5. Metastasis from Invasive Carcinoma Breast, Papanicolaou Stain, 40x

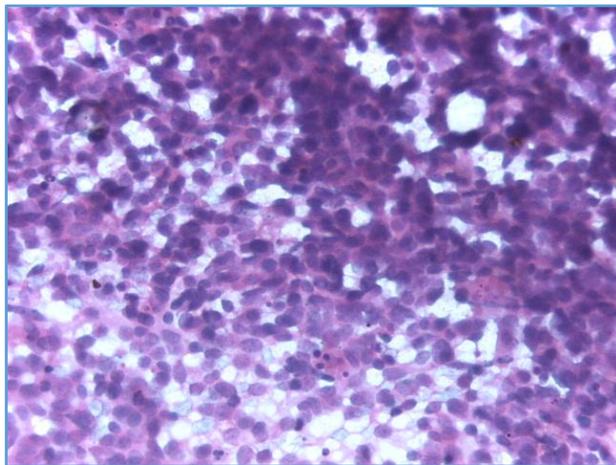


Figure 4. Metastasis from Small Cell Carcinoma, Papanicolaou Stain, 40x

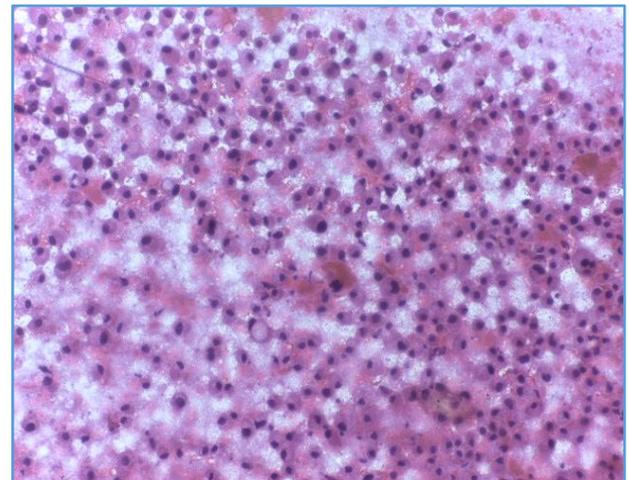


Figure 6. Metastasis from Adenocarcinoma Stomach, Signet Ring Cell Type, Papanicolaou Stain, 40x

	Frequency	Percentage
Adenocarcinoma	260	55.2
Follicular ca (thyroid)	1	2
Germ cell tumor	1	2
Malignant melanoma	3	6
Neuro endocrine ca	1	2
Papillary ca (thyroid)	3	6
Poorly differentiated	24	5.1
Small cell carcinoma	50	10.6
Squamous cell ca	126	26.8
Urothelial carcinoma	1	2
Wilms	1	2
Total	471	100.0

Table 5. Histopathological Analysis of the Subjects

	Frequency	Percentage
Breast	37	14.2
Cervix	2	0.8
Colon	5	1.9
Endometrium	4	1.5
Kidney	1	0.4
Lung	141	54.2
Ovary	5	1.9
Pancreas	2	8
Prostate	2	8
Stomach	35	13.5
Unknown	26	10.0
Total	260	100.0

Table 6. Frequency and Site of Adenocarcinoma Metastases

In metastatic adenocarcinoma, the most common primary site was lung, constituting 54.2% (141/260 cases), followed by breast (37/260) (Figure 5), stomach (35/260) (Figure 6) and few cases from cervix, pancreas, prostate, kidney, ovary, as shown in Table 6. In 26 cases, primary site was not known.

On analysing squamous cell carcinoma (Figure 3), the most common primary was lung constituting 68% (86/126) followed by oesophagus and head and neck area. In approximately 10% cases primary site was unknown.

	Frequency	Percentage
Cervix	4	3.2
Oesophagus	15	11.9
Head neck	9	7.1
Lung	86	68.3
Unknown	12	9.5
Total	126	100.0

Table 7. Frequency and Site of Squamous Carcinoma Metastases

DISCUSSION

FNAC is a simple, rapid and cost effective diagnostic procedure and it is routinely used as first line of investigation for assessing lymph node enlargement. The overall sensitivity, specificity, positive predictive value and negative predictive value while evaluating lymph nodes with FNAC is 92.7%, 98.5%, 97.3% and 94.8% respectively, making it an important diagnostic tool.³

In this study, supraclavicular lymph nodes were commonly involved by metastatic tumours (471/724, 65%) which is comparable to studies done in India and other countries.^{4,5} As age increases the risk of malignancy also increases and the most common age group with metastatic malignancy was 40-80 years consistent with previous studies.⁶ This emphasizes the need for evaluation of supraclavicular node especially in elderly by the simple procedure.

Adenocarcinoma was the most common type of metastatic tumor which is comparable to previous studies.¹ The most common primary was lung followed by breast. The features in favour of adenocarcinoma are honeycomb-like sheets, three-dimensional clusters, acini, papillae eccentrically placed, round or irregular nuclei, finely textured chromatin, large nucleoli and signet ring cells. Background may show pink homogenous mucoid material if the mucin content of the tumor is high and there is extracellular mucin deposition.

Metastatic squamous cell carcinoma was the second common entity in our study. Tumor cells are seen mostly in sheets and singly scattered. The features favouring squamous cell carcinoma are dense orangophilic cytoplasm, intercellular keratin bridges, pyknotic nuclei, fibre like and tadpole cells in a dirty necrotic background. The tumor cells often show necrotic material in the background. So in case of scanty cellularity with abundant necrotic material, a careful search for the tumor cells is required. Most of the earlier studies have reported squamous cell carcinoma as the most common metastatic malignancy.^{6,7,8,9}

Metastatic small cell carcinoma was seen in 50 cases with primary as lung. Crush artifact and karyorrhectic debris seen in the background is an important diagnostic clue to the diagnosis. The cells have scant cytoplasm with nuclei two to three times larger than small lymphocytes. Nuclei usually demonstrate the classical "salt and pepper" chromatin with indistinct nucleoli and moulding can be frequently appreciated.^{8,10}

Melanomas can be seen anywhere in the body including orbit, head, neck, great toe to name a few, and it is notorious to metastasize to any distant site. Our study

showed 3 cases of metastatic melanoma. The features in favour of melanoma are dyscohesive pleomorphic cells with characteristic prominent macronucleoli. Intra and extracellular melanin pigment can be seen.¹¹

Reactive hyperplasia was seen in 21% of cases. Smears show a polymorphic population of cells composed of small lymphocytes, centrocytes, centroblasts, immunoblasts, tinged body macrophages.

Granulomatous lymphadenopathy constituted around 9% of which 35 were definitive for Tuberculosis. Other previous studies showed frequency of granulomatous lymphadenitis varying from 7.8% to 52%. The highest incidence was between third and sixth decade of life and incidence decreases as age increases.^{12,13}

Suppurative lymphadenitis and other non-specific causes constituted only a minor percentage. Lymphomas also constitute only a small percentage, and all were Non-Hodgkin type. They were advised biopsy for immunophenotyping.

In our study there are few cases of metastases from ovary and prostate. Similar case reports have been published in literature though it is very rare.^{14,15,16}

CONCLUSION

FNAC is a cheap and reliable diagnostic tool in the initial evaluation as well as follow up of patients attending outpatient department and provides valuable information that helps in treating patients. In this study the main cause of lymph node enlargement was metastases and the most common primary site was lung. Also, the material aspirated can be used for immunohistochemistry and flow cytometry.

REFERENCES

- [1] Laishram RS, Devan RM, Laishram S, et al. Pattern of disease in palpable supraclavicular lymph node: a cytopathological perspective. *J Med Soc* 2012;26(3):163-166.
- [2] Mohanty R, Wilkinson A. Utility of fine needle aspiration cytology of lymph nodes. *IOSR Journal of Dental and Medical Sciences* 2013;8(5):13-18.
- [3] Gupta RK, Naran S, Lallu S, et al. The diagnostic value of fine needle aspiration cytology (FNAC) in the assessment of palpable supraclavicular lymph nodes: a study of 218 cases. *Cytopathology* 2003;14(4):201-207.
- [4] Mitra S, Ray S, Mitra PK. Fine needle aspiration cytology of supraclavicular lymph nodes: our experience over a three-year period. *Journal of Cytology/ Indian Academy of Cytologists* 2011;28(3):108-110.
- [5] Gupta N, Rajwansi A, Srinivasan R, et al. Pathology of supraclavicular lymphadenopathy in Chandigarh, north India: an audit of 200 cases diagnosed by needle aspiration. *Cytopathology* 2006;17(2):94-96.
- [6] Anila KR, Nayak N, George PS, et al. Utility of fine needle aspiration cytology in evaluation of lymphadenopathy -an audit from a cancer centre in south India. *Gulf J Oncol* 2015;1(19):50-56.

- [7] Bagwan I, Kane S, Chinoy R. Cytologic evaluation of the enlarged neck node: FNAC utility in metastatic neck disease. *The Internet Journal of Pathology* 2007;6(2).
- [8] Singh HK, Silverman JF. Lung, chest wall and pleura. In: Orell SR, Sterrett GF, Whitaker D, eds. *Fine needle aspiration cytology*. 4th edn. New Delhi: Churchill Livingstone 2005:245-249.
- [9] Chute DJ, Stelow EB. Cytology of head and neck squamous cell carcinoma variants. *Diagn Cytopathol* 2010;38(1):65-80.
- [10] Bedrossian CMW, Davila RM. Cytologic examination and fine needle aspiration. In Saldana MJ, ed. *Pathology of pulmonary disease*. Philadelphia: Lippincott-Raven 1994: p. 35.
- [11] Ghartimagar D, Ghosh A, Ranabhat S, et al. Utility of fine needle aspiration cytology in metastatic lymph nodes. *Journal of Pathology of Nepal* 2011;1:92-95.
- [12] Kochhar A, Duggal G, Singh K, et al. Spectrum of cytological findings in patients with lymphadenopathy in rural population of southern Haryana, India - experience in a tertiary care hospital. *The Internet Journal of Pathology* 2012;13(2).
- [13] Ahmad T, Naeem M, Ahmad S, et al. Fine needle aspiration cytology (FNAC) and neck swellings in the surgical outpatient. *J Ayub Med Coll Abbottabad* 2008;20(3):30-32.
- [14] Henriksen E. The lymphatic spread of carcinoma of the cervix and of the body of the uterus: a study of 420 necropsies. *Am J Obstet Gynecol* 1949;58(5):924-942.
- [15] Hematpour K, Bennett CJ, Rogers D, et al. Supraclavicular lymph node: incidence of unsuspected metastatic prostate cancer. *Eur Arch Otorhinolaryngol* 2006;263(9):872-874.
- [16] López F, Rodrigo JP, Silver CE, et al. Cervical lymph node metastases from remote primary tumour sites. *Head Neck* 2016;38 Suppl 1: E2374-E2385.