ROLE OF FINE NEEDLE ASPIRATION CYTOLOGY IN DIAGNOSIS OF METASTATIC LYMPHADENOPATHY

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ABSTRACT

INTRODUCTION

Lymph node is a common site of metastasis for various malignancies. So the strong clinical suspicion and thus the early diagnosis of palpable lymphadenopathy by FNAC is of paramount importance. It is useful to differentiate between inflammatory lesions or malignant lesion whether primary or metastatic.

AIMS

To establish the role of fine needle aspiration cytology (FNAC) as a diagnostic tool in the interpretation of metastatic lymphadenopathy.

MATERIAL AND METHODS

The present study was conducted on 295 consecutive patients presented with lymphadenopathy and were reported as metastasis.

OBSERVATIONS

Total of 295 cases of metastatic lymphadenopathy were taken. Squamous cell carcinoma was the most common primary tumor metastasizing to lymph nodes (n=133) followed by adenocarcinoma (n=57), duct carcinoma breast (n=22) , mucoepidermoid carcinoma (n=19), undifferentiated carcinoma (n=13), small cell carcinoma (n=11) and other malignancies Cervical lymph nodes were the most commonly involved and the commonest primary site was head and neck. In most of the cases primary could be pointed out based on clinical and cytological findings.

CONCLUSION

FNAC is a rapid, safe, easy and non-expensive diagnostic technique which can be used for initial diagnosis of metastatic lymphadenopathy in a resource challenged environment, confirm secondaries where primary tumor is evident, for detection of primary of unknown origin and for response to treatment.

KEYWORDS

FNAC, Lymph node, Metastasis.

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INTRODUCTION: Lymphadenopathy is a sign of inflammation, infections, primary or secondary malignancy. In an adult patient it may be the first presenting clinical sign of non-hematologic malignancy. Lymph nodes are common site of metastasis for various malignancies. Thus clinical recognition and urgent diagnosis of palpable lymphadenopathy is of paramount importance to differentiate between inflammatory lesions or malignant lesions (metastatic or primary neoplastic tumour).

FNAC is a cost-effective, reliable, rapid and inexpensive procedure with high diagnostic accuracy in metastatic lymphadenopathy.

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It is an OPD procedure which is repeatable if required so country like India is eminently suited for this procedure.[1] The use of Fine Needle Aspiration Cytology (FNAC) for the diagnosis of metastatic lymphadenopathy is a well-established method.[2] Metastatic lesions reported on FNAC can also give a clue to the nature and site of primary lesion.[3] This is commonly seen involving the head, neck and inguinal region.[4] Clinical history, physical examination, correct performance of FNA and proper handling of the aspirate are the four essential components in the management of patient with lymphadenopathy.[5]

Cytological criteria for diagnosis of metastatic lesions are foreign cells amongst normal or reactive lymphoid cells and cytological criteria of malignancy. The causes of metastatic lymphadenopathy includes squamous cell carcinoma, adenocarcinoma, anaplastic carcinoma and carcinoma from specific site such as kidney, thyroid, breast, liver, and testis as well as malignant melanoma, soft tissue and bone tumours and germ cell tumours.[6]

It also provides clues for occult primaries and sometimes also surprises the clinician who does not suspect a malignancy.[7] A correct diagnosis guides a clinician to start the specific therapy in time thus reducing mortality and morbidity. Carcinoma metastatic from the head and neck area is the most important of these and must remain prominent in the mind of the clinician.[8]

The purpose of this study is to establish the role of fine needle aspiration cytology (FNAC) as a diagnostic tool in the interpretation of metastatic lymphadenopathy.

MATERIALS AND METHODS: This study included 295patients presented to our institute. Presenting with lymphadenopathy and reported as metastatic lymphadenopathy. The complete clinical history of the patients were noted and correlated with cytological findings to find out primary.

Patients were explained about the procedure & all sterile precautions were taken. FNAC was performed by using 10 ml disposable syringe with 22G or 24G needles. Patency of needle and syringe was checked. Lesion was fixed with one hand and other hand was used to pierce the lesion with needle tip. Negative pressure was applied by pulling plunger and needle was moved back and forward. Once material was inside hub, negative pressure released. Slides were prepared from aspirated material. The smears were fixed by air drying followed by staining with Giemsa stain.

For Giemsa stain, smears were removed from methanol fixative and followed to air dry. Working staining solution was prepared by mixing of Giemsa solution 1ml in to 9ml of working buffer solution. Smears were covered for 10 minute with stain. Stain was then poured off and washed well in running tap water. Smears were air dried and mounted in DPX.

The complete clinical history and radiological details of the patients were noted and correlated with cytological findings to find out primary.

RESULTS: A total of 295 consecutive cases having metastatic lymphadenopathy were included in the present study. Metastatic lesions of lymph node are usually common after age of 40 years, majority of cases in this study were in 41-60 years i.e.160 cases followed by 61-80years i.e.74 cases. (Table 1) Metastatic lesions were seen more commonly in males (79%) than in females (21%) except metastatic lesion form carcinoma of breast. (Table 2)

In present study squamous cell carcinoma was the most common metastatic lesions in the lymph node comprising about 45.08% of total metastatic cases (Table 3). Metastasis from various salivary gland, testicular, ovarian, soft tissue, bone, skin tumours were also observed in few cases.

Cervical lymph nodes are commonest site for metastasis (Table 4) mainly for squamous cell carcinoma while axillary lymph nodes are commonest site for metastasis from breast cancer.

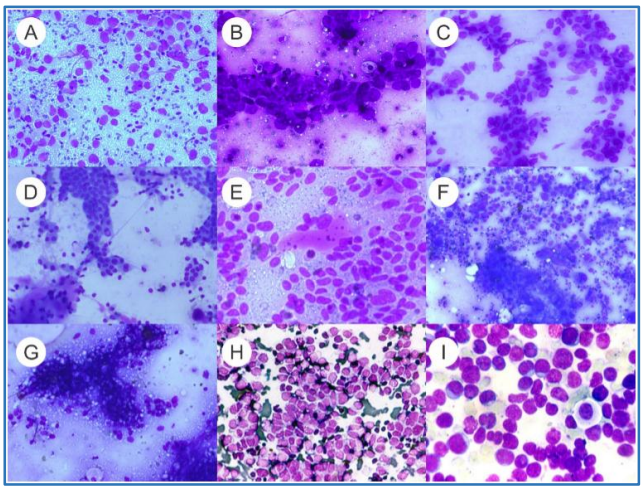

Fig. 1: Giemsa stained cytosmears from lymph nodes **A.** Metastatic seminoma showing tigroid background, seminoma cells and lymphocytes (20x). **B.** Metastatic embryonal cell carcinoma (20x). **C.** Metastatic serous cystadenocarcinoma of ovary (20x). **D.** Metastatic papillary carcinoma thyroid showing sheets of cells, intranuclear inclusions and chewing gum colloid (10x). **E.** Metastatic medullary carcinoma thyroid showing spindle cells, amyloid and sudden pleomorphism (20x). **F.** Metastatic large cell anaplastic carcinoma (10x). **G.** Metastatic Meibomian gland carcinoma showing cytoplasmic vacuolations (10x). **H.** Metastatic Ewing's sarcoma showing 2 cell population and cytoplasmic vacuoles (20x). **I.** Metastatic rhabdomyosarcoma showing type 3 rhabdomyoblast (20x)

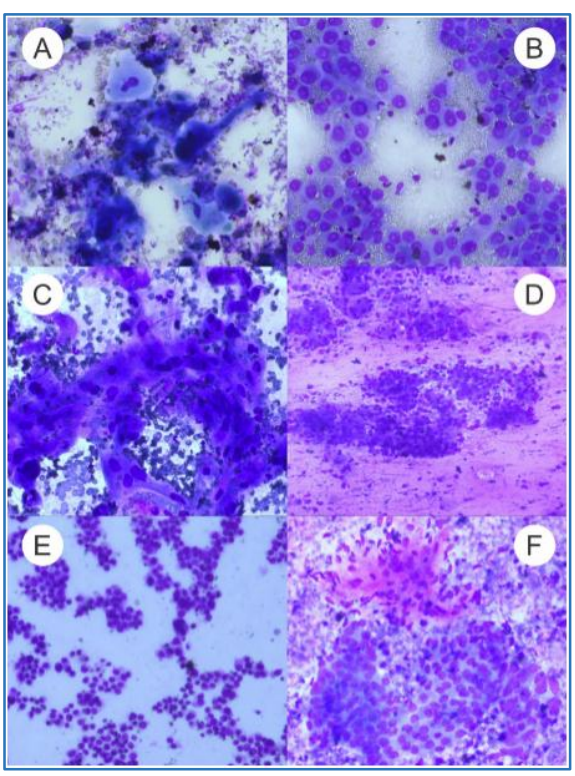

Fig. 2: Giemsa stained cytosmears from lymph nodes **A.** Metastatic well differentiated squamous cell carcinoma showing a tadpole cell (20x). **B.** Metastatic adenocarcinoma showing cells arranged in acini with prominent inclusion like nucleoli (20x). **C.** Metastatic mucoepidermoid carcinoma

showing intermediate cells and squamous cells (20x). **D.** Metastatic colloid carcinoma showing extracellular mucin pools with clusters of cells (10x). **E.** Metastatic duct carcinoma Breast. **F.** Metastatic germ cell tumour showing malignant germ cells showing yolk sac tumour component (20x).

Age Group	Frequency	Percentage
0-20	08	2.7
21-40	47	15.9
41-60	160	54.2
61-80	74	25.1
80-100	6	2.0
Total	**295**	**100**

Table 1: Age distribution of metastatic lesion

Sex	Frequency	Percentage
Male	233	79
Female	62	21
Total	**295**	**100**

Table 2: Gender distribution of metastatic lesion

Type of Metastasis	Freque	Percent
Metastatic SCC	133	45.08
Metastatic Adenocarcinoma	57	19.32
Metastatic Duct Carcinoma Breast	22	7.46
Metastatic Mucoepidermoid	19	6.44
Metastatic Undifferentiated	13	4.41
Metastatic Small Cell Carcinoma	11	3.73
Metastatic Poorly Differentiated	9	3.05
Metastatic Large Cell Anaplastic	8	2.71
Metastatic Papillary Carcinoma	4	1.36
Metastatic Clear Cell Carcinoma	3	1.02
Metastatic Embryonal Carcinoma	2	0.68
Metastatic Nasopharyngeal	1	0.34
Metastatic Serous Papillary	1	0.34
Metastatic Acinic Cell Carcinoma	1	0.34
Metastatic Adenoid Cystic	1	0.34
Metastatic Malignant Melanoma	1	0.34
Metastatic Medullary Carcinoma	1	0.34
Metastatic Malignant Mixed Germ	1	0.34
Metastatic Ewing's Sarcoma	1	0.34
Metastatic Clear Cell Sarcoma	1	0.34
Metastatic Synovial Sarcoma	1	0.34
Metastatic Rhabdomyosarcoma	1	0.34
Metastatic Malignant Spindle Cell	1	0.34
Metastatic Anaplastic	1	0.34
Metastatic Seminoma	1	0.34
Total	**295**	**100**

Table 3: Distribution of different pathological subtypes of metastasis

Site	Frequency	Percentage
Cervical	170	57.0
Supraclavicular	36	12.1
Axillary	20	6.7
Submandibular	29	9.7
Inguinal	19	6.4
Jugulodigastric	11	3.7
Pre & Para Aortic	4	1.3
Pre-Auricular	2	0.7
Post-Auricular	2	0.7
Submental	2	0.7
Mesenteric	1	0.3
Iliac	1	0.3
Inframammary	1	0.3
Total	**298***	**100**

Table 4: Distribution of number of cases

Note: *3 cases have lymphadenopathy at multiple sites.

DISCUSSION: FNAC of lymph node has a very important role in the diagnosis of metastatic lymphadenopathy especially in a developing country like ours where the cost of hospital stay and surgical procedures cannot be afforded by the patient.[9] FNAC is a diagnostic tool which is simple to perform, cost effective and has almost no complications. Lymphadenopathy is of importance to diagnose primary or secondary malignancies due to their accessibility for FNAC. The present study is an attempt to analyse the pattern of presentation of metastatic lesions in peripheral lymph nodes on fine needle aspiration.

The metastatic lymphadenopathy can be found in patients of all age groups ranging from an early to advanced age.[10] In the present study age range of patients with metastatic lymphadenopathy was wide from 1½year to 95year with mean age of presentation being 53.6 year. In our study peak incidence of metastatic lesion was in the 4th-6th decade. Our findings correlated well with that of Ahmad et al. and Sarda et al.[11,12] Age range was almost comparable to Nesreen H. Hafez et al (4.5-82years)[13] but was less according to S Prasad et al. (20 to 76 years)[14]; but the most common age group affected were almost similar. In study done by Nesreen H. Hafez et al the mean age (46 years)[13] was slightly lower than our study. These figures came in close comparison to other workers.[15]

Males were affected more by metastatic lymphadenopathy (79%) with Male: Female ratio being 3.8:1. This results were attributed to low incidence of various addictions in females. Similar results were shown by Mehrotra et al (3.8:1)[16] and comparable results were obtained in other Indian studies like S Prasad et al. (3:1)[14] & Bhattarcharjee et al (2.9:1).[17] However lower results have been reported by foreign authors.[18,19] Males had high risk for metastatic squamous cell carcinoma which was comparable with Betsill & Hagdu.[20]

Cervical group (57%) of lymph nodes was most commonly affected. It can be attributed to the easy accessibility of cervical lymph nodes for examination and evaluation, besides a large number of cases. Our results were supported by various studies done by Chhotray et al,[9] and Frable WJ.[21] However, Ojo et al found axillary nodes to be most common site of involvement followed by cervical lymph nodes.[22]

In the present study most common metastatic lesion was Squamous cell carcinoma which was in concordance with results of S Prasad et al.[14] and others.[1,17,23]

It was followed by metastatic adenocarcinoma and metastatic duct carcinoma breast. Our results were comparable to the studies conducted by Chhotrayet al,[9] Frable WJ[21] and Pilotti et al[24] where squamous cell carcinoma predominated over adenocarcinoma. Similar findings had been documented by several other researchers.[11,15,25]

CONCLUSION: FNAC is a easy, rapid, safe and non-expensive diagnostic technique. It is a useful diagnostic tool for the early diagnosis of metastatic lymphadenopathy in a resource challenged environment like ours. It is useful in detecting secondaries where primary tumour is evident as well as for detection of primary of unknown origin and for monitoring response to therapy.

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