International Journal of Research in Medical Sciences
Meena P et al. Int J Res Med Sci. 2017 Oct;5(10):4523-4526
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: http://dx.doi.org/10.18203/2320-6012.ijrms20174589

Original Research Article

A study of metastatic lesions of lymph nodes by fine needle aspiration cytology

Pratibha Meena[1]*, Ranu Tiwari Mishra[2]

[1]Department of Pathology, LN Medical College and Research Centre, Bhopal, Madhya Pradesh, India
[2]Department of Pathology, N.S.C.B. Medical College, Jabalpur, Madhya Pradesh, India

Received: 03 August 2017
Accepted: 28 August 2017

***Correspondence:**
Dr. Pratibha Meena,
E-mail: pratibhameena1@gmail.com

ABSTRACT

Background: FNAC is rapidly emerging as a useful tool in the diagnosis of metastatic lesion of lymph nodes. FNAC not only confirms or excludes metastasis in a case of a known primary malignancy but, also, in most cases helps to detect occult primary malignancy. Aim of present study was to determine the frequency of metastatic lesions of lymph nodes.
Methods: This retrospective study was done of all metastatic lymph node lesions reported on FNAC, in the department of pathology, NSCB medical college, Jabalpur from January 2014 to December 2014 (One Year).
Results: Total cases of 400 lymph node aspiration were done, of which 120 cases were clinically suspicious of metastasis. Cytology results were positive for metastasis in 97 cases (80.8%). The most common site of aspiration was cervical lymph nodes (75.2%). Maximum number of cases of metastasis were in 51-60 years age group with male predominance (male:female 2.6:1). The most common metastasis was squamous cell carcinoma seen in 74 cases (76.2%), followed by metastatic mammary carcinoma (10.3%), remaining were adenocarcinoma, undifferentiated carcinoma, malignant melanoma, papillary thyroid carcinoma and transitional cell carcinoma.
Conclusions: FNAC is a rapid, safe and cost-effective technique. It gives early and accurate results with minimal invasion and reduces the need for surgical biopsies, thus saves cost and time to reach the final diagnosis. It is therefore concluded that FNAC is a useful tool in diagnosing metastatic lesions of lymph nodes with a good certainty.

Keywords: Fine needle aspiration cytology, Lymphadenopathy, Metastasis, Squamous cell carcinoma

INTRODUCTION

FNAC is rapidly emerging as a useful tool in the diagnosis of metastatic lesions of lymph nodes. Fine Needle Aspiration Cytology (FNAC) is a reliable, simple, safe, rapid and inexpensive method of establishing the diagnosis of lesions and masses at various sites and organs. Lymphadenopathy in an adult patient may be the first presenting clinical sign of non-hematologic malignancy.[1]

FNAC has been used extensively for the diagnosis of primary and secondary malignant disorders involving lymphnode.[2] FNAC not only confirms the presence of metastatic disease, but also gives the clue regarding the nature and origin of primary malignancy, prognosis as well in the management of patient for staging purposes. FNAC is useful for the detection of recurrence and new metastasis. In developing countries, infective lymphadenopathy is quite common, mostly due to high prevalence of tuberculosis. However, still a large percentage of cervical lymphadenopathy in adults turn out to be malignant.[3]

Cysts (congenital or acquired), abscesses, benign and malignant tumours may mimic lymph node metastasis, especially with a case of known tumour.[5] Cystic

metastasis or aspirate of low grade malignancies comprises most of false negative cases.[6]

FNAC avoids the physical and psychological trauma occasionally encountered after an open surgical biopsy, is convenient for the patient and physician alike, is a useful outpatient procedure, is relatively painless and provides a good correlation between cytology and histopathology.[4]

FNAC is a reliable diagnostic tool for lymphadenopathy in adult patients who are suspected for malignancy as it has less complication, is a simple procedure and can be repeated easily.[7] This procedure is cost effective and well tolerated by the patients and can be performed on outpatient basis.[3] Aim of this study was to determine the frequency of different metastatic lesions of lymph nodes.

METHODS

This was a retrospective study done of all metastatic lymph node lesions diagnosed on FNAC, in the department of pathology, NSCB medical college, Jabalpur from January 2014 to December 2014 (One Year). Out of the total 400 lymph node aspiration were done of which 97 cases of metastatic malignancy were included in the study. FNAC of all patients were performed in Department of Pathology, Netaji Subhash Chandra Bose medical college and Hospital, Jabalpur.

A detailed history, clinical examination and relevant investigations were done. Patients were explained about the procedure and all sterile precautions were taken. FNAC was performed by using 5 ml disposable syringe with 22 G or 24 G 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. In case of deep seated lesions, ultrasonography (USG) guided FNAC was performed 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. Cytomorphological features like the overall cell population, predominant pattern was assessed by examination under low power. Then the individual cell morphology was studied under high power. Cytological findings were noted in all the cases. In some of the cases where the biopsy was done, their histopathology was correlated with the cytological diagnosis.

RESULTS

In present study, out of total 400 cases of lymph node aspirations done, metastatic cytological results were positive in 97 cases. Other lymph nodes were reported as "reactive" and "infective". As shown in Table 1, out of 97 cases of metastatic tumors, maximum no. of cases was metastatic squamous cell carcinoma in present study (74 cases/76.28%), followed by duct carcinoma breast (9 cases/10%) and there was one case each of malignant melanoma foot, transitional cell carcinoma bladder and papillary carcinoma thyroid.

The case of malignant melanoma foot was incidentally detected, as the patient presented only with inguinal lymph node enlargement without any other complaint when FNAC was performed the smear of unsuspected melanoma showed dispersed single cells with eccentrically placed nucleus, prominent nucleoli and variable amount of melanin pigment in a lymphoid cells background, with strong suspicion of malignant melanoma when we examined the patient thoroughly there was lesion in foot which was brownish black in colour.

Table 1: Distribution of different pathological subtypes of metastasis.

Pathological subtypes	No. of cases	%
Squamous cell carcinoma	74	76
Duct carcinoma breast	09	10
Adenocarcinoma	05	05
Malignant melanoma	01	01
Transitional cell carcinoma	01	01
Papillary carcinoma thyroid	01	01
Poorly differentiated/undifferentiated	06	06
Total	97	100

When FNAC of lesion was performed it revealed similar findings and the case came out to be malignant melanoma.

Similarly, the case of transitional cell carcinoma bladder was also first detected when FNAC from lymph node revealed cells arranged in multilayered aggregates having nuclear pleomorphism and hyperchromasia, when patient was further investigated it came out to be transitional cell carcinoma urinary bladder. These two cases strongly emphasize the importance of FNAC, as apart from being simple, less invasive and cost effective, how important it can be to first detect metastasis malignancy and guide towards further investigations and management of the patient.

In present study, the age of the patients ranged from 22 to 83 years (Table 2). Maximum number of cases of metastasis were in 51 to 60 years of age group, followed by 31-40 years of age group, there were only 4 cases in > 70 years of age group and no case was identified in < 20 years of age group.

As shown in Table 3 the incidence of metastasis was more in males (73.1%) as compared to females (26.8%), with male to female ratio 2.6:1.

Table 2: Incidence of metastatic lesions according to age.

	Age distribution (years)							
Metastatic lesion	<10	11-20	21-30	31-40	41-50	51-60	61-70	70
Scc	-	-	03	12	13	31	11	04
Ca breast	-	-	02	04	02	01	-	-
Adeno Ca	-	-	01	01	02	01	-	-
Papillary Ca thyroid	-	-	-	-	01	-	-	-
Transitional cell Ca	-	-	-	-	-	-	01	-
Melanoma	-	-	-	-	-	-	01	-
Undiff	-	-	-	02	-	02	02	-
Total	-	-	06	19	18	35	15	04

Table 3: Incidence of metastatic lesions according to gender.

Metastatic lesion	Males	Females
Squamous Cell Ca	60	14
Ductal Ca breast	-	09
Adenocarcinoma	04	01
Papillary carcinoma thyroid	01	-
Transitional cell carcinoma	01	-
Malignant melanoma	01	-
Undifferentiated	03	03
Total	70	27

The metastatic lymph nodes were located in anterior and posterior cervical triangles, supraclavicular area, axilla, abdomen and inguinal region.

As shown in Table 4 the most common site was Cervical lymph nodes comprising 73 cases (75.2%), followed by supraclavicular lymph node comprising 14 cases (15%) and there was only one case metastasizing to paraaortic lymph node.

As shown in Table 5, amongst the cases of metastatic squamous cell carcinoma most common primary site was aero digestive tract, other sites included cervix in females and in other cases the primary was unknown.

In adenocarcinoma, the most common primary site was gastrointestinal tract followed by gall bladder, in other cases the primary site was unknown.

Table 4: Distribution of number of cases according to sites of lymphadenopathy.

Sites of lymphadenopathy	No. of cases	Percentage
Cervical	73	75%
Supraclavicular	14	15%
Axillary	5	5%
Inguinal	4	4%
Para aortic/abdominal	1	1%
Total	97	100%

Table 5: Distribution of cases according to primary site.

Primary site	No. of cases	Cytological diagnosis
Aero digestive tract	5 (60%)	Squamous cell carcinoma
Breast	09 (10%)	Duct carcinoma breast
GIT	04 (04%)	Adenocarcinoma (3) undifferentiated (1)
Female genital tract	03 (03%)	Cervix SCC (2) Ca uterus (1)
Gall bladder	02 (02%)	Adenocarcinoma (1) undifferentiated (1)
Lung	02 (02%)	Undifferentiated Ca
Thyroid	01 (01%)	Papillary Ca thyroid
Urinary bladder	01 (01%)	Transitional cell Ca
Skin (foot)	01(01%)	Malignant Melanoma
Unknown primary	16 (16%)	SCC (14) Adeno Ca (1)
Total cases	97 cases	

Table 6: Correlation of cytological and histopathological diagnosis.

No. of cases	Cytological diagnosis	Histological diagnosis	Accuracy rate (%)
7	Metastatic duct carcinoma breast	Metastatic duct carcinoma breast	100%
2	Metastatic squamous cell carcinoma	Metastatic squamous cell carcinoma	100%
1	Metastatic malignant melanoma	Metastatic malignant melanoma	100%
1	Metastatic transitional cell carcinoma	Metastatic transitional cell carcinoma	100%

DISCUSSION

Enlarged lymph nodes are easily accessible for fine needle aspiration and hence fine needle aspiration cytology (FNAC).[10] In present study, out of total 400 cases of lymph node aspirations done, metastatic cytological results were positive in 97 cases, other lymph nodes were reported as "reactive" and "infective". The age of the patients ranged from 22 to 83 years in this study. The most common age group affected in metastatic tumour, in present study was 51-60 years which correlate with other study of Khajuria et al and Pandav AB et al However, Mandakini et al found maximum cases in age group 41-50 years.[7-9]

The metastatic lymph nodes were located in anterior and posterior cervical triangles, supraclavicular area, axilla, abdomen and inguinal region, the most common site was Cervical lymph nodes comprising 73 cases. In present study, maximum no. of cases was found in cervical region and metastatic squamous cell carcinoma was the most frequent subtype. Similar findings were observed by Khajuria et al Wilkinson et al and Mandakini et al.[7,8,10] In present study, out of 97 cases of metastatic tumors, maximum no. of cases was metastatic squamous cell carcinoma, followed by duct carcinoma breast in present study. Our findings correlated with other studies of Wilkinson et al, Pandav AB et al and mandakini et al.[7,9,10] The incidence of metastasis was more in males (73.1%) as compared to females (26.8%), with male to female ratio 2.6:1. Male preponderance was noted in our study, which correlates with other studies of Khajuria et al and Pandav AB et al.[8,9] This may be because of decreased incidence of various addictions in females. In present study, primary site of malignancy could be identified in approximately 74.2% of cases of metastasis with the help of FNAC and clinical data.

CONCLUSION

FNAC is a rapid, safe and cost-effective technique. It gives early and accurate results with minimal invasion and reduces the need for surgical biopsies. Thus, saves cost and time to reach to final diagnosis. It is therefore concluded that FNAC is a useful tool in diagnosis of metastatic lymphadenopathy with good certainty.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Meena P, Mishra RT. A study of metastatic lesions of lymph nodes by fine needle aspiration cytology. Int J Res Med Sci 2017;5:4523-6.