



Research Article

ROLE OF FINE NEEDLE ASPIRATION CYTOLOGY IN STUDY OF ENLARGED METASTATIC NECK NODES IN ADULT

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ABSTRACT

FNAC of neck node is a very cost effective, simple and free of complication procedure. It is well tolerated by the patient, done on an outpatient basis and repeatable. FNAC not only confirms the presence of metastasis but also gives clues regarding the nature and origin of the primary tumor. The diagnostic accuracy of FNAC in neck node malignancy is high and is above 90%.

Aims of The Study- This study was done to see the clinical and cytological profile of metastatic neck nodes in adults above 18 years in terms of:-

1. Cytological characterization.
2. To correlate cytological findings with the site of primary tumor
3. To identify problem areas in cytological interpretation in metastatic neck nodes

Material and Methods- A total of 100 cases of metastatic enlarged cervical lymph nodes registered from December 2009 to December 2010 were enrolled and studied through Fine Needle Aspiration Cytology.

Results- Maximum nodal metastasis is present in 5th and 6th decade. 65% were squamous cell carcinoma, 19% were poorly differentiated carcinoma, 12% adenocarcinoma and 3% nasopharyngeal carcinoma. Primary site could be identified in 69% cases. The commonest source of metastasis was oral cavity (46%), larynx (35%), lung (9%) and breast (4%).

Conclusion- FNAC is a quick, convenient and safe method for diagnosis of suspected/unsuspected metastatic neck nodes.

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INTRODUCTION

A neck mass in an adult, that is present for longer than a week is pathognomonic proven otherwise. In India, tubercular lymphadenitis is not at all uncommon but even so, a large percentage of all persistent adult neck masses turn out to be malignant, whereas in the pediatric age group neck masses are only rarely malignant. Lymph nodes harboring malignant disease tend to be firm, tender, matted, fixed and enlarged in size over time. When a lymph node rapidly increases in size, it leads to stretching of capsule and causes pain. With the help of consistency, we can have an idea about the nature of the lymph node.

Node metastases can be found in every neck level. Neck nodes from unknown primary sites present bilaterally in 10% of cases.^[1,2] In general, nodes in levels I–III are attributed to a presumable primary Squamous Cell Carcinoma located in the mucosa of the upper aero digestive tract, whereas nodes in levels IV and Vb more often arise from proximal esophageal and thyroid carcinomas, but can also originate from distant organs in the body, often containing adenocarcinoma or large

cell undifferentiated carcinoma.^[3,4,5] Lymph nodes with adenocarcinoma are frequently accompanied by multiple metastatic sites, such as lung, liver, and bones.^[6,7] Lymph nodes in level IIb and Va are more typical for nasopharyngeal cancer. Nodes in the parotid area originate most often from skin cancer and should be distinguished from primary parotid tumors and level I metastases from primary sub maxillary gland carcinomas. Melanoma containing nodes may occur in every level of the neck, often involving superficial, nuchal, level V, and parotid lymph nodes.

Neck node enlargement by metastatic tumor spread often show diffuse involvement, therefore a FNA or biopsy from an involved node will almost invariably result in diagnostic cells. The false- positive rate of lymph node FNAC for the detection of metastasis is quite low (in the range of 0.9-1.7%). Avoiding false-positive diagnosis is of obvious importance since therapeutic and surgical decisions are often based exclusively on cytology results.

Only repetitive negative or non-diagnostic FNACs are an indication for an incisional, excisional or (image-guided) true-cut biopsy. In general, high sensitivity and specificity percentages of 81% and 100%, respectively, are reported for FNAC allowing the clinician to be confident of malignancy in a clinically suspicious lesion but lower specificity percentages

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(57%) have also been found. [8,9,10,11] Moreover; the procedure is very cost effective, simple and free of complications, well tolerated by the patient, done on an outpatient basis and repeatable. India is imminently suited to use this procedure and this is borne out by the fact that it has flourished both in large institutions, in peripheral small community hospitals and in private clinics. Increased exposure and routine audits have improved the sensitivity and the accuracy of FNAC in all anatomic sites, particularly so in head and neck masses. FNAC not only confirms the metastasis but also gives clues regarding the nature and origin of the primary tumor. The most common use of FNAC in head and neck carcinoma is to rule out recurrence of metastasis since therapeutic decision can be made earlier and without need for further diagnostic surgery.

MATERIAL AND METHODS

A total of 100 cases of metastatic enlarged cervical lymph nodes registered from December 2009 to December 2010 were enrolled and studied through Fine Needle Aspiration Cytology. All patients were adults above 18 years. Cervical lymph nodes were aspirated by using a 22 G needle attached to a 20ml disposable syringe. The aspirated material was expressed on to the slides and smear prepared, dried and stained with MGG stain.

Aims and Objectives

This study was done to analyze the clinical and cytological profile of metastatic neck nodes in adults above 18 years in terms of:-

1. To look for effectiveness of FNAC in study of enlarged metastatic neck nodes
2. To correlate cytological findings with the site of primary tumor
3. Cytological characterization.

RESULTS

A total 100 cases of metastatic enlarged cervical lymph nodes were studied through Fine Needle Aspiration Cytology. Following results were obtained

Table 1 Distribution of cases according to age

S.No.	Age in years	Number of cases	%age
1	18-30	1	1%
2	31-40	9	9%
3	41-50	26	26%
4	51-60	31	31%
5	61-70	21	21%
6	71-80	12	12%
	Total	100	

The maximum lymph node metastases were observed in 5th and 6th decade,

Male: Female ratio in lymph node metastasis was 80/20=4:1.

Table 2 Distribution of cases according to primary sites status

S.No.	Primary	No. of cases	percentage
1.	Known	69	68%
	Before aspiration	22	32%
2.	Unknown	31	31%
	After aspiration	47	68%

In 100 cases of cervical lymph node metastasis, primary site were known in 69 cases and unknown in 31 cases. In 69 cases of cervical lymph node metastasis, primary site was known

before aspiration in 32% cases and after aspiration in 68% cases.

Table 3 Cytological diagnosis of cervical lymph node metastasis

S.No.	cytology	Number of cases	%age
1	Squamous cell carcinoma	65	65%
2	Adenocarcinoma	12	12%
3	Undifferentiated nasopharyngeal carcinoma	3	3%
4	Poorly differentiated carcinoma	19	19%
5	Small cell carcinoma	1	1%
	Total	100	100%

Out of 100 cases studied 65% were metastatic squamous cell carcinoma, followed by poorly differentiated carcinoma in 19%.

Table 4 Showing primary site in known cases

S.No.	Primary site	Number of cases	%age
1	Oral cavity	32	46.37%
2	Larynx	24	34.78%
3	Lung	6	8.6%
4	Nasopharynx	3	4.3%
5	Breast	4	5.79%
	Total	69	100%

In 69 cases of cervical lymph node metastasis, most common known primary site was oral cavity in 46.37% followed by larynx 34.78%, lung (8.6%), breast (5.79%) and nasopharynx (4.3%).

Table 5 Cytological diagnosis with known primary site

S.No.	Primary site known	Cytological diagnosis	Number of cases	%age
1	Oral cavity	WDSCC	15	21.73%
		MDSCC	14	20.28%
		PDSCC	3	4.34%
2	Larynx	WDSCC	10	14.49%
		M DSCC	8	11.59%
		PDSCC	6	8.69%
3	Lung	PDSCC	1	1.44%
4	Lung	Metastatic adenocarcinoma	4	5.79%
5	Breast	Metastatic adenocarcinoma	4	5.79%
6	Nasopharynx	Metastatic nasopharyngeal carcinoma	3	4.34%
7	Lung	Small-cell carcinoma	1	1.44%
			69	100%

Out of 65 cases of metastatic squamous cell carcinoma primary were known in 57 cases and most common primary sites were oral cavity(56%) followed by larynx(42%) and lung(17%).

Out of 12 cases of metastatic adenocarcinoma primary were known in 8 cases with 4 from lung and 4 from breast.

Table 6 An overview of cytological finding

S.No.	Cytological diagnosis	Total no. of cases	Known primary	Unknown primary
1	Squamous-cell carcinoma (65%)	65	57(87.69%)	8(12.30%)
2	Adenocarcinoma (12%)	12	8(66.66%)	4(33.33%)
3	Poorly differentiated carcinoma (19%)	19	0	19(100%)
4	Undifferentiated nasopharyngeal carcinoma (3%)	3	3(100%)	0
5	Small cell carcinoma (1%)	1	1(100%)	0

Out of 65 cases of metastatic squamous cell carcinoma, primaries were unknown in 8 cases and Out of 12 cases of

metastatic adenocarcinoma primary were unknown in 4 cases. In all three case of metastatic nasopharyngeal carcinoma primary were known. In one case of metastatic small cell carcinoma, the primary site was lung.

Out of 65 cases of metastatic squamous cell carcinoma-44% were well differentiated squamous cell carcinoma, 40% moderately differentiated squamous cell carcinoma and 16% were poorly differentiated squamous cell carcinoma.

In well differentiated, moderately differentiated and poorly differentiated squamous cell carcinoma, keratin was present in 100% cases while cystic changes were seen in 37% in well differentiated, 8% in moderately differentiated squamous cell carcinoma.

Out of 12 cases of Adenocarcinoma, 9 cases (75%) were well differentiated, 2 cases (17%) moderately differentiated and 1 case (8%) was poorly differentiated adenocarcinoma type.

Presence of extensively necrotic aspirate was some times associated with paucity of viable malignant cells which led to diagnostic difficulty.

Presence of cystic changes in some metastatic nodes was occasionally associated with paucity of malignant cells. Careful scrutiny of the smear which was necessitated on clinical grounds usually proved fruitful.

Metastatic nasopharyngeal carcinoma created confusion in diagnosis with Non-Hodgkin's Lymphoma. Presence of some clustering helped excluding that possibility.

Metastatic small cell carcinoma also led to some diagnostic overlap with Non -Hodgkin's Lymphoma. Presence of some nuclear moulding and streaking of nuclear material helped in excluding that possibility.

DISCUSSION

The use of Fine Needle Aspiration Cytology (FNAC) for the diagnosis of metastatic malignancies in the lymph nodes is a well-established method.^[12] Lymphadenopathy may be the first sign of malignancy in a patient. FNAC not only confirms the presence of metastatic disease, but also gives clues regarding the nature and origin of the primary tumor. In patients with enlarged lymph nodes and previously documented malignancy, FNAC can obviate further surgery performed merely to confirm the presence of metastasis. Lymph nodes that are clinically suspicious for metastasis are one of the most common indications for FNAC. FNAC has a significantly lower risk of subsequent complications, including tumor recurrence, as compared to excision biopsy.^[12, 13] FNAC is of considerable value in disease staging and documentation of recurrence. More than 90% of lymph node metastases are diagnosed by initial aspiration.^[12] The diagnostic accuracy of FNAC in neck node malignancy is high and is above 90%. The commonest malignancies that metastasize to neck nodes are oral cavity, oro-pharynx, salivary glands, thyroid, lung, breast and pharynx.

In the present prospective study, a total of 100 cases of metastatic cervical nodes in adult population were studied for cytomorphological features correlated clinically with primary site.

In the present study the most common age group of neck node metastasis was 5th and 6th decade. The sex ratio was heavily

skewed towards males that are 4:1. Both the results are similar to other Indian studies undertaken by Mehrotra *et al* and Bhattacharjee *et al*.^[13, 14] The prevalent use of tobacco by Indian males which predisposes oral cavity tumors could conceivably be responsible for this.

In the present study, the most common primary site of metastasis was oral cavity followed by the larynx. This is similar to the result obtained by Izhar N Bagwan *et al* and Karabi Kohar *et al*.^[15,16]

In the present study, primary site of malignancy could be identified in approximately 69% of cases of metastasis with the help of FNAC and clinical data. FNAC helped in defining the tumor type and along with clinical history and other investigations also helped in identifying the tumor site

In the present study the most common cytological type diagnosed from metastatic neck nodes was squamous cell carcinoma. This is similar to the results obtained by Kiran Alam *et al* and Ustun *et al*.^[17,18] In the metastatic tumor, squamous cell carcinoma was the most common tumor followed by carcinoma breast and adenocarcinoma. Our findings are similar to other Indian studies where squamous cell carcinoma predominated over adenocarcinoma.

In the present study all 65% cases of metastatic squamous cell carcinoma showed a typical nuclear feature and presence of keratin and necrosis in 48% cases. The similar results obtained by the Bhagwan *et al* and Kiran Alam *et al*.^[15,17]

In this study, in metastatic squamous cell carcinoma cystic changes were noted in 14 % cases while study by Bhagwan *et al* revealed cystic changes in 8% of cases and in 3% cases in Kiran Alam *et al* study.^[15,17]

In case of metastatic undifferentiated carcinoma, nasopharynx followed by lung should be considered as the most common primary tumour sites.

In the present study, metastatic adenocarcinoma to the cervical lymph node showed that cells were arranged in cohesive groups of various sizes, nucleus was eccentrically placed with prominent nucleoli. The mucin was present in 67% of cases. These results are similar to Bhagwan *et al* and Kiran *et al* study.^[15,17]

When a tumor looks very bizarre or anaplastic in a setting of an occult primary, sites such as upper aero digestive tract, lung, thyroid and pancreas should be seriously considered as the likely sources of the primary tumor. Pseudo sarcomas or spindle cell and metastatic adenocarcinoma of the head and neck region can originate from either salivary glands or thyroid. Other primary sites include breast, lung, kidney, prostate and gonads, etc.

In the present study metastatic poorly differentiated carcinoma to the cervical lymph node showed that cells were mainly present in tightly cohesive cluster and showed a typical nuclear features and presence of mitosis. These results are similar to Bhagwan *et al* and Kiran *et al* study.^[15,17] In the present study metastatic nasopharyngeal carcinoma showed that the cells were mainly dispersed with cohesive clusters which shows similarity to the results obtained by Mohanty *et al* (mainly dispersed cells) and differs from the results of Jairam *et al* (mainly clustered and occasionally dissociated).

In metastatic squamous carcinoma (SCC), head and neck was the most common site of primary. Cancer of mouth/oropharynx is the most frequent cancer in males (16.4%) and third most frequent in females (8.8%) in India. Oral cancers account for a large number of malignancies, especially in a country like ours and they often present as cervical lymphadenopathy. Hence, FNAC can play a very important role in early diagnosis and timely intervention in metastatic cancers, especially in resource challenged environment like ours.

The accuracy of cytology, immunocytochemistry and transmission electron microscopy (TEM) using biopsy results as gold standard in diagnosing tumor category are 78% by cytology and 91% by the latter.^[11] But in a resource challenged environment like ours, FNAC still remains the most acceptable, cheap and easily accessible modality for the diagnosis of metastatic lymphadenopathy.

CONCLUSION

FNAC is a quick, convenient and safe method for diagnosis of suspected/unsuspected metastatic neck nodes. FNAC also gives an idea about the primary site of origin thereby avoiding more invasive procedure like biopsy. Apart from this FNAC is a very economic and fast procedure which is very well suited in government set-up. FNAC of head and neck masses proved to be a useful tool in diagnosing metastasis with good certainty. FNAC is a logical extension of the more formalized biopsy procedure, lending itself to saving of time and cost, and is convenient for both patient and physician in the management and follow up of malignant lymphadenopathies. FNAC helps in defining the tumor type while clinical history and investigations help in identifying the tumor site. FNAC plays a very important role in diagnosis of neck nodes especially in a developing country like India where cost factor is a major challenge in treatment.

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