

Fine Needle Aspiration Cytology of Metastatic Neck Lymph Nodes: A review of 100 cases

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Abstract: Background: FNAC of neck nodes is very cost effective, simple, free of complications & well tolerated by the patients, done on an outpatient basis and repeatable. India is eminently suited for this procedure. Increased exposure and routine audits have improved the sensitivity and accuracy of FNAC in all anatomical sites, particularly so, in head and neck masses. The false positive rate of lymph node metastasis is quite low. Enlarged lymph nodes were the first organ to be biopsied by FNA. Today, they are one of the most frequently sampled tissues. FNAC not only confirms the presence of metastasis but also gives clues regarding the nature and origin of the primary tumour. The diagnostic accuracy of FNAC in neck node malignancy is high. Methods: The material was obtained from outdoor and indoor patients, having suspected neck nodes, over a period of 2 years, more than 18 years of age, attending the cytology laboratory in the Department of Pathology, S.N.Medical College, Agra. Cervical lymph nodes were aspirated, and smears were prepared & processed following standard techniques. Cytologically diagnosed metastatic lymph nodes were included in the study. Relevant clinical data was collected. Findings were correlated with previous studies. A total number of 100 cases were examined. Results: A total of 100 cases of metastatic enlarged cervical lymph nodes were studied. Most number of cases was seen in males, in the age group of 51-60 years. Higher number of patients had known primary sites, seen in oral cavity. Confirmatory cytological diagnosis could be made in maximum number of cases. Conclusion: Fine needle aspiration cytology is a quick, convenient and safe method for diagnosis of suspected / unsuspected metastatic neck nodes. Presence of cystic change, extensive necrosis and inflammatory cells led to diagnostic difficulty which was largely overcome through careful clinical correlation followed by meticulous examination of the aspirates. [Virendra T et al NJIRM 2013; 4(5) : 76-80]

Key Words: metastatic nodes, lymph node, FNAC

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Introduction: Fine needle aspiration cytology of neck lymph nodes is very cost effective, simple and free of complications, well tolerated by the patients, done on an outpatient basis and repeatable. India is eminently suited for this procedure¹. Increased exposure and routine audits have improved the sensitivity and accuracy of FNAC in all anatomical sites, particularly so, in head and neck masses. The false positive rate of lymph node metastasis is quite low².

Enlarged lymph nodes were the first organ to be biopsied by FNA¹, today, they are one of the most frequently sampled tissues. The earliest report of a wider application of needle aspiration came from USA in 1921 when Gulhrie described using aspirated material to diagnose a variety of disease causing lymphadenopathy³.

Role of FNAC is pivotal in neck nodes metastasis not only because it confirms the presence of metastasis but it also gives clues, regarding the nature and origin of the primary tumour. Neck nodes enlarged by metastatic tumour spread, often show diffuse involvement, therefore a FNA biopsy from an

involved node will almost invariably result in diagnostic cells. The diagnostic accuracy of FNAC in neck node malignancy is high and is above 90%³.

Review of Literature: FNAC for cytological evaluation of neck mass was first reported by KON in 1847. However, this procedure did not gain acceptance at that time. In 1930s, Memorial Sloan Kettering rediscovered utility of FNAC in Head & Neck masses and use of needle aspiration of head and neck malignancy was first reported by Martin and Ellis(1930).

A resurgence of FNA occurred in 1950s led by physicians in Sweden; when FNA was commonly used for cytological examination of metastatic lesions in neck with excellent results. Since then, FNAC became a well accepted, safe & cost effective procedure in diagnosis of Head and Neck masses (Jonas T. Johnson et al 2006).

FNAC is now recognised as a simple procedure for quick diagnosis and tool for distinguishing inflammatory from benign & malignant lesion^{3,16}.

Material and Methods: Present study was done in Rural and Urban areas, in & around Agra region of North India.

Unit of Study: All patients, having cytologically diagnosed metastatic nodes in neck, from suspected patients received in the Department of Pathology.

Nature of Study: The study includes all patients with cytologically diagnosed metastatic neck nodes from outdoor & indoor patients undergoing FNAC for suspected neck nodes at Department of Pathology, SN Medical College, Agra, after taking permission from Institutions' Ethical Committee.

Study period: 2 years (2009 – 2011)

Sample Size: Total no. of cases studied were 100.

Study Schedule: An elaborate schedule was prepared before undertaking the study. A detailed clinical history and data was recorded from the patients who underwent FNAC. Cervical lymph nodes were aspirated by using a 22G needle attached to a 20 ml disposable syringe. The aspirated material was expressed on to slides and smears were prepared, dried and stained with MGG stain & PAP stain. Cytologically diagnosed metastatic lymph nodes were included in the study.

Analysis: The information collected from the history & examination was correlated with previous studies done in the similar field and results were compared & correlated.

Results: In our present study, the results are tabulated as below,

Table 1: Distribution of cases according to age

S.No.	Age (Range)	No. of Cases	Percentage (%)
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	100%

The maximum numbers of lymph node metastasis were observed in 5th & 6th decade

Table 2: Distribution of cases according to sex

S.No.	Sex	No. of Cases	Percentage (%)
1.	Male	80	80%

2.	Female	20	20%
	Total	100	100%

The male : female ratio in lymph node metastasis was (80/20) = 4:1, it means primary neoplasm metastatic to cervical lymph node was more common in male population

Table 3: Distribution of cases according to known/unknown primary sites

S.No.	Primary	No. of Cases	Percentage (%)
1.	Known	69	69%
2.	Unknown	31	31%
	Total	100	100%

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

Table 4: Distribution of cases according to known primary sites

S.No.	Primary	No. of Cases	Percentage (%)
1.	Before Aspiration	22	32%
2.	After Aspiration	47	68%
	Total	69	100%

In 69 cases of cervical lymph node metastasis, primary site were known, before aspiration in 32% cases and after aspiration in 68% cases

Table 5: Distribution of cases according to known primary of 69 cases

S.No.	Primary Site	No. of Cases	Percentage (%)
1.	Oral Cavity	32	46%
2.	Larynx	24	35%
3.	Lung	6	9%
4.	Nasopharynx	3	4%
5.	Breast	4	6%
	Total	69	100%

In 69 cases of cervical lymph node metastasis most common known primary site was oral cavity in 46% followed by larynx (35%), lung (9%), breast (6%) and Nasopharynx (4%).

Table 6: Cytological diagnosis of cervical lymph node metastasis

S.No.	Primary	No. of Cases	Percentage (%)
1.	Squamous cell carcinoma	65	65%
2.	Adenocarcinoma	12	12%
3.	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, most common metastatic tumor to the cervical lymph nodes, then poorly differentiated carcinoma 19%, followed by adenocarcinoma 12%, Nasopharyngeal carcinoma 3% and 1% small cell carcinoma.

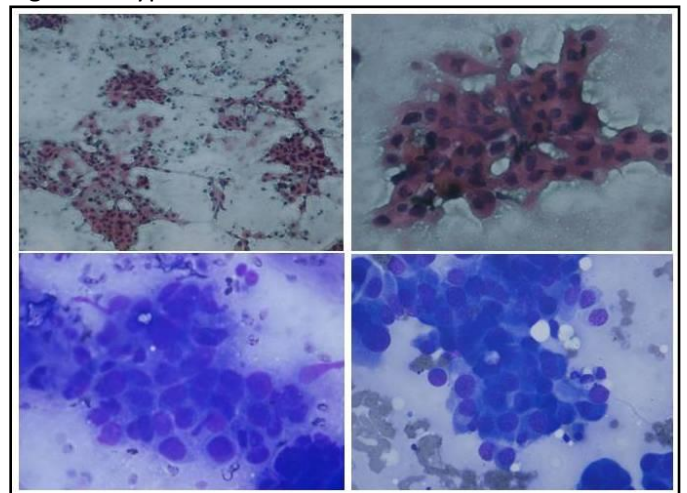
Table 7: Cytological diagnosis with known primary site

S. No.	Primary site known	Cytological diagnosis	No. of Case	(%)
1.	Oral Cavity	WD SCC	15	47%
		MD SCC	14	44%
		PD SCC	03	9%
2.	Larynx	WD SCC	10	42%
		MD SCC	8	33%
		PD SCC	6	25%
3.	Lung	PD SCC	1	17%
4.	Lung	Metastatic Adenocarcinoma	4	50%
5.	Breast	Metastatic Adenocarcinoma	4	50%
6.	Nasopharynx	Metastatic Nasopharyngeal carcinoma	3	100%
7.	Lung	Small Cell Carcinoma	1	100%
	Total	-	69	100%

Table 8: Cytological diagnosis with unknown primary

S. No	Cytological diagnosis	Unknown Primary	No. of Case	(%)
1.	Squamous Cell Carcinoma (65%)	08	08	12%
2.	Adenocarcinoma (12%)	4	4	33%
3.	PD Carcinoma (19%)	19	19	100%

Figures: Atypical cells seen in FNA smears



Discussion: In the present study a total of 100 cytologically diagnosed metastatic neck nodes in adult population were studied for cytomorphological features and correlated clinically with primary size. The studied showed the most common age group for neck node metastasis to be 5th and 6th decade. This is similar to the results obtained by Bhattacharjee et al¹ & Mehrotra et al⁴. The sex ratio was heavily skewed towards males (4:1). This is similar to other Indian studies undertaken by Mehrotra et al (3.8:1)⁴ & Bhattacharjee et al (2.9:1)¹ & differs from other foreign studies (Engzell et al 1.07:1⁵ and Ustun et al 1:2⁶). The prevalent use of smokeless tobacco by Indian males which predisposes oral cavity tumours could conceivably be responsible for this.

The most common primary site of metastasis was oral cavity followed by the larynx, which was similar to the results obtained by Izhar. N. Bagwan et al⁷ (oral cavity), Karabi Kohar et al⁸ (oral cavity), Malika Afroz et al.⁹ (larynx followed by oral cavity) and

differs from the Chinese study undertaken by Chih Hsu et al.¹⁰ (Naso pharynx). The work of Chih Hsu et al was carried out in China where nasopharyngeal carcinoma is endemic. Hence it was found to be commonest cytological types of metastatic malignancy.

In the present study the most common cytologically diagnosed malignancy metastatising to neck nodes was squamous cell carcinoma. This is similar to the results obtained by the Kiran Alam et al.¹¹ (squamous cell carcinoma), Izhar. N. Bagwan et al⁷ (squamous cell carcinoma) Ustun et al⁶ (squamous cell carcinoma) and differ from the results of Chih Hsu et al¹⁰ (Nasopharyngeal carcinoma). The work of Chih Hsu et al was carried out in China where nasopharyngeal carcinoma is endemic. Hence it was found to be commonest cytological types of metastatic malignancy.

The metastatic squamous cell carcinoma showed necrosis in 48% cases. Burgers et al¹², Thompson et al¹³, Izhar. N. Bagwan et al⁷ also commented upon the presence of necrosis.

In our study, all 65% cases of metastatic squamous cell carcinoma showed a typical nuclear features (increased N:C ratio, nuclear membrane irregularities, nuclear hyperchromatism, centrally placed nuclei and nuclear pleomorphism) and presence of keratin which correlated with that of results obtained by the Izhar. N. Bagwan et al,⁷ & Kiran Alam et al.¹¹

The presence of mature looking squamous cell sometimes led to consideration of epidermal / bronchial cyst careful cytologic evaluations coupled with clinical correlation proved useful. The similar result was obtained by the Izhar. N. Bagwan et al.⁷ In metastatic squamous cell carcinoma cystic changes were noted in 14% cases. In the study of Izhar. N. Bagwan et al,⁷ cystic changes were noted in 8% cases and study of Kiran Alam et al¹¹ the cystic changes were noted in 3% cases.

The metastatic adenocarcinoma to the cervical lymph nodes, in our study showed that cells were arranged in cohesive groups of various size, nucleus was eccentrically placed with prominent nucleoli. This is similar to the result obtained by the Izhar. N.

Bagwan et al.⁷ & Kiran Alam et al.¹¹. The mucin was present in 67% cases of present study. They also mentioned regarding mucin but did not comment on frequency.

The metastatic poorly differentiated carcinoma to the cervical lymph nodes showed that cells were mainly present in tightly cohesive clusters and showed a typical nuclear features and presence of mitosis. This is similar to the result obtained by the Izhar. N. Bagwan et al.⁷ & Kiran Alam et al.^{11,17}

In our study, metastatic nasopharyngeal carcinoma showed that the cells were mainly dispersed with cohesive clusters. This is similar to the results obtained by Mohanty et al¹⁴ (mainly dispersed cells) and differs from the results of Jayram et al.¹⁵ (mainly clustered and occasionally dissociated). The nuclei were vesicular with prominent nucleoli, similar to the results obtained by the Chank M.K. et al, Jairam et al¹⁵, mohanty et al¹⁴ and Izhar. N. Bagwan et al.⁷

Table 9: Comparison of Sex Distribution:

Authors	Sex Ratio (M:F)
Mehrotra et al (2005) ⁴	3.8 : 1
Bhattacharjee et al (2006) ¹	2.9 : 1
Engzell et al (1971) ⁵	1.07 : 1
Ustun et al (2002) ⁶	1 : 2
Present study (2009)	4 : 1

Table 10: Comparison of most common primary site for metastasis:

Authors	Most common site
Izhar. N. Bagwan et al(2007) ⁷	Oral cavity
Karabi Kohar et al(2008) ⁸	Oral cavity
Malika Afroz et al. (2009) ⁹	Larynx
Chih Hsu et al. (1990) ¹⁰	Nasopharynx
Present study (2009)	Oral cavity

Conclusion: FNAC of suspicious neck nodes is a safe & easy procedure, which gives an accurate diagnosis in most of the cases. It is thus concluded that fine needle aspiration cytology is a quick, convenient method for diagnosis of suspected / unsuspected metastatic neck nodes. The few diagnostic dilemmas can be largely overcome through careful clinical correlation followed by meticulous examination of the aspirates

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Conflict of interest: None

Funding: None
