IJPRP

Indian Journal of Pathology: Research and Practice
Volume 7 Number 9, September 2018
DOI: http://dx.doi.org/10.21088/ijprp.2278.148X.7918.11

Original Research Article

Cytological Evaluation of Metastatic Lymphadenopathy Over a four Year Period

Rupashree S[1], Geethalakshmi U[2], Ramesh Babu K[3]

[1,2]Associate Professor [3]Professor and Head, Department of Pathology, Shimoga Institute of Medical Sciences, Shimoga, Karnataka 577201, India.

Corresponding Author:
Geethalakshmi U, Associate Professor, Department of Pathology, SShimoga Institute of Medical Sciences, Shimoga, Karnataka 577201, India.

E-mail: drugeeths@gmail.com

Received on 02.07.2018,

Accepted on 31.08.2018

Abstract

Fine Needle Aspiration Cytology (FNAC) is a well known, reliable, inexpensive tool for diagnosing many palpable swellings. FNAC done to confirm metastatic deposits in lymph nodes has been studied thoroughly. FNAC not only confirms but also gives clue to the origin of primary tumor. Present study is undertaken to evaluate cytological features of metastatic deposits in any lymph nodes and to know the pattern of occurrence of various malignancies. Materials and Methods: A retrospective study is done in the department of Pathology, in a tertiary care teaching hospital. Previously diagnosed 135 cases of metastatic lymphadenopathy of patients attending various outpatient departments from the year 2013 to 2016, with history of malignancy or suspected metastasis to lymphnodes or cytologically diagnosed cases of malignant lymphadenopathy are selected for the study. Slides are retrieved from cytology section under department of Pathology. Hematoxylin and Eosin (H&E), Papanicolaou (PAP) stain and Leishman stained slides are examined for the cytological features of malignancy and also for the pattern and classification of various malignancies. Results obtained are tabulated and analysed.

Keywords: Fine Needle Aspiration Cytology; Metastasis; Lymph nodes.

Introduction

Fine needle aspiration cytology (FNAC) is an inexpensive and sensitive diagnostic tool for any palpable lesions in the body. FNAC is very useful in the diagnosis of lymph node enlargement. It aids in distinguishing any infection and malignancy especially in a developing country where Tuberculosis is common. With rising rate of malignancy, majority of lymphadenopathy in adults are likely to be non infectious. Cytology helps in confirmation of metastatic deposits, aids in knowing the nature and origin of primary malignancy [1,2]. Hence, this study was undertaken to highlight the role of FNAC in diagnosis of suspected and unsuspected metastatic lymphadenopathy.

Materials and Methods

This was a retrospective study over a four year period from May 2013 to 2016 done in the department of Pathology in a tertiary care teaching hospital. Patients with history of malignancy or suspected metastasis to lymph nodes or

cytologically diagnosed cases of malignant lymphadenopathy were selected for the study. Inadequate samples and primary lymph nodal malignancies were excluded from the study. A detailed history was taken and patients were examined clinically. Palpable lymph nodes were selected for needling. With aseptic precautions, FNAC was performed using 22 G needle and a disposable syringe. Material obtained were air dried and wet fixed and stained with Leishman stain, Papanicolaou stain and Hematoxyline & Eosin (H&E). In cases where aspirate yielded fluid material, fluid was centrifuged and the same above procedure was followed.

Results

In this study, a total of 3151 FNACs were done on patients attending out-patient departments in a tertiary care teaching hospital. Out of which 746 were lymph node aspirates. Among this, 182 were positive for malignancy (primary lymph nodal malignancies) and 135 cases were of metastatic lymphadenopathy.

The male to female ratio in this study was 2.6:1 (Table 1). Age of the patients ranged from 24-90 years. Most common age group of presentation was between 50-69 years. Youngest patient was 24 year old female and presented with supraclavicular lymphadenopathy, while oldest patient was 90 years male with a cervical lymph node enlargement (Table 2).

Majority (77%) of the cases presented with cervical lymphadenopathy and least (0.007%) were submental and occipital lymphadenopathy (Table 3).

FNAC yielded grey white material in 28.8% cases and haemorrhagic aspirate in 27.4% (Table 4)

Most common subtype of malignancy was squamous cell carcinoma (66.66%) followed by poorly / undifferentiated carcinoma (13.33%) (Table 5).

Majority (60.7%) had a known primary malignancy and the frequent site of primary malignancy being aerodigestive tract (38.5%) (Table 6).

Table 1: Age Distribution

Age group	No of cases	Percentage
20- 30	7	5.2
30-49	27	20
50-69	70	52
70-89	29	21
>90	2	1.5

Table 2: Gender distribution

Sex	No of cases	Percentage
Male	98	72.6
Female	37	27.4

Table 3: Site of Lymphadenopathy

Sl No	Site	Number	Percentage
1	Cervical	104	77
2	Axillary	6	4.4
3	Supraclavicular	9	6.6
4	Submandibular	7	5.2
5	Inguinal	5	3.7
6	Jugulo-Digastric	2	1.5
7	Occipital	1	0.7
8	Submental	1	0.7

Table 4: Type of aspirate

Sl No	Aspirate	No of cases	Percentage
1	Haemorrhagic	37	27.4
2	Pus	34	25.2
3	Grey white material	39	28.9
4	Fluid	19	14.1
5	Mucoid	20	14.8
6	Blackish brown material	1	0.7

Table 5: Distribution showing various types of malignancies

Sl No	Types of malignancies	No of cases	Percentage
1	Squamous cell carcinoma	90	66.6
2	Adenocarcinoma	18	13.3
3	Poorly / Undifferentiated carcinoma	18	13.3
4	Malignant Melanoma	3	2.2
5	Mucoepidermoid carcinoma	2	1.5
6	Unknown malignancy	4	2.9

Table 6: Distribution showing Known and unknown Primary malignancy

Sl. no	Sites of primary malignancy	No of cases	Percentage
1	Aerodigestive	52	38.5
2	GIT	4	2.9
3	Lung	3	2.2
4	Liver	1	0.7
5	Breast	8	5.9
6	Prostate	3	2.2
7	Melanoma	2	1.5
8	Mucoepidermoid carcinoma	3	2.2
9	Carcinoma Penis	3	2.2
10	Ovary	1	0.7
11	Skin (heel and chest wall)	2	1.5
	Unknown	53	39.3

Discussion

FNAC of palpable lymph node swelling is useful, inexpensive and simple investigation. In contrast to primary lymphomas, metastatic lymphadenopathy presents with clusters and aggregates of abnormal non lymphoid cells with absence of lymphoglandular bodies [3]. Majority of the studies done on lymph node swellings have revealed malignancies [4,5].

FNAC has value in disease staging and documentation of metastatic tumours in primary and occult tumors. Studies have revealed that there is good correlation between FNAC and histopathology in case of Metastatic lymphadenopathy [6].

In the current study, patients age group distribution varied from 20 yrs to 90yrs, majority of the cases in 5th and 6th decade. Male to female ratio is 2.6:1 in our study which correlates with the study done by Wilkinson AR et al. [7]. Cervical group of lymph nodes were frequently involved which was similar to the study by Mehdi G et al. [8].

FNAC yielded grey white material in majority of the cases followed by hemorrhagic aspirate. Many cases of Squamous cell carcinoma (SCC) and those which showed secondary infection yielded pus like aspirate. Aspirate from metastatic Adenocarcinoma and Mucoepidermoid carcinoma was mucoid material. Blackish brown material was obtained from a case of metastatic malignant melanoma.

Our study revealed SCC as the most common metastatic tumor followed by adenocarcinoma / poorly differentiated carcinoma and other tumours. This finding is similar to the study done by Mehdi G et al. [8] and Vasilj A et al. [9]. Wet and dry smears from metastatic SCC showed moderate to high cellularity with tumour cells arranged in diffuse sheets, clusters, groups and scattered singly. These cells showed pleomorphic hyperchromatic nuclei some with nucleoli and moderate to abundant densely eosinophilic cytoplasm [3]. Well differentiated cases showed individual cell keratinisation and keratinous debris in the background (Fig. 1). Cases with secondary infection showed necrotic material and dense inflammatory cells in the background. Some cases showed foreign body giant cell response to keratin (Fig. 2).

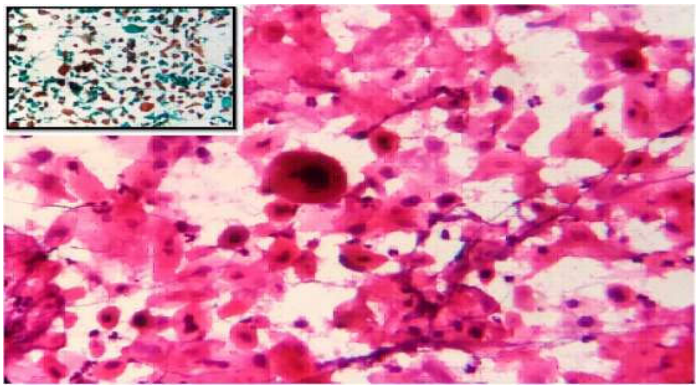

Fig. 1: Tumour cells showing individual cell keratinisation and keratinous debris in the background in a case of metastatic SCC. (H& E, 40X). Inset show Pap stain of the same tumour.

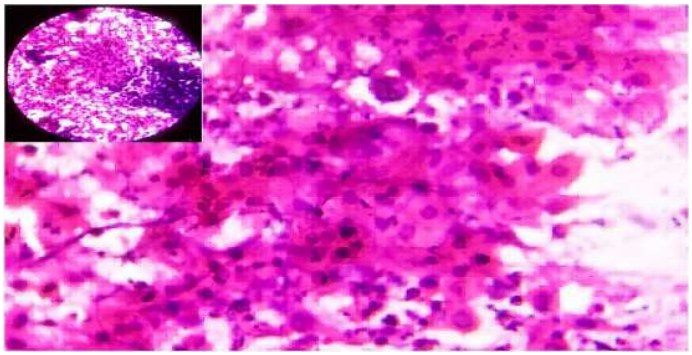

Fig. 2: Background shows necrotic material and dense inflammatory infiltrate. Inset showing foreign body giant cell reaction to keratin in a case of metastatic SCC (H& E, 40X).

Similar studies by Bhagwan IN et al. [10] and Chute DJ et al. also showed SCC as the most common type of metastatic malignancy.

Except for two cases each in supraclavicular and inguinal lymph nodes, all other cases of SCC were found in the nodes of the head and neck region (cervical, submental, jugulodigastic, preauricular and submandibular group of lymph nodes) [8].

In the present study, poorly differentiated / undifferentiated carcinoma is the second most common entity showing scant cellularity (13.3%). Mehdi G et al. [8] and Alam K et al. [12] also showed cases of poorly differentiated carcinoma. These cases revealed highly pleomorphic tumour cells arranged in clusters and singly scattered with high N/C ratio, hyperchromatic nuclei, prominent nucleoli, moderate cytoplasm admixed with bizarre tumour giant cells against a background of necrotic debris and haemorrhage (Fig. 3).

FNAC from metastatic Adenocarcinoma revealed moderate cellularity with cells being arranged in acinar, papillaroid, and three dimensional clusters [13]. Cells showed vesicular nuclei, prominent nucleoli, moderate to abundant pale eosinophilic to vacuolated cytoplasm (Fig. 4). Those cases which yielded mucinous fluid showed homogenous mucoid material in the background (Fig. 5).

In the current study, FNA from inguinal lymph nodes showed metastatic deposits from Melanoma which yielded brown black brown material on aspiration. Smears showed high cellularity with highly pleomorphic and dyscohesive tumour cells having large nuclei, prominent 1-2 macronucleoli along with intra and extra cellular melanin pigment (Fig. 6). This finding was similar to the study done by Ghartimagar et al. [14].

Present study showed 3 cases of Mucoepidermoid carcinoma which yielded scanty mucoid fluid

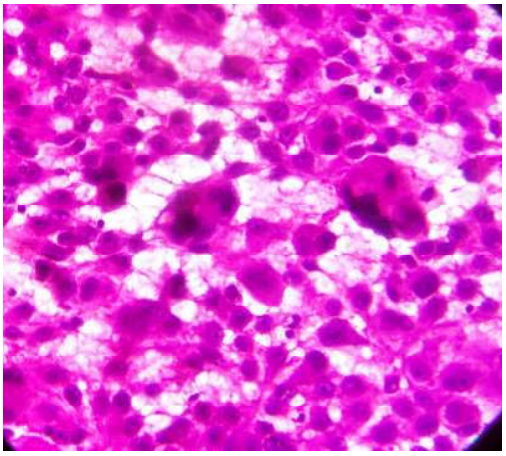

Fig. 3: Highly pleomorphic tumour cells in sheets with bizarre tumour giant cells in metastatic poorly differentiated carcinoma (H& E, 40X)

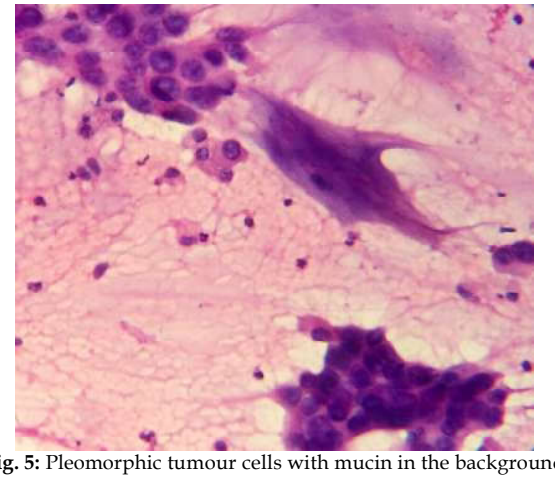

Fig. 5: Pleomorphic tumour cells with mucin in the background in metastatic adenocarcinoma. (H& E, 40X)

Fig. 4: Tumor cells arranged in acinar and three dimensional clusters in metastatic adenocarcinoma. (H& E, 40X) Inset shows Leishman stain of the same.

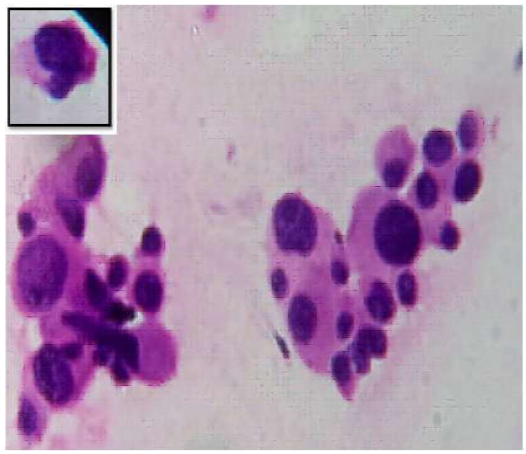

Fig. 6: Highly pleomorphic and dyscohesive plasmacytoid cells with prominent macronucleoli in a case of metastatic malignant melanoma. Inset shows bizarre tumour cells. (H& E, 40X)

mixed with hemorrhage. These smears showed scant cellularity with an admixture of epithelial and mucus secreting cells against a dirty mucinous background with interspersed macrophages and inflammatory infiltrate. Some of these epithelial cells were intermediate cells and few others showed squamous differentiation [15].

In our study, 60.7% of the cases showed primary tumour, majority of them being aerodigestive tract malignancy (63.4%) which showed SCC metastasis. These sites were oral cavity, tonsils, pharynx, larynx and esophagus. Second common primary tumour was carcinoma breast. Other rare sites of primary tumours were liver, ovary and skin. Metastatic adenocarcinoma showed known primary sites from Gastro Intestinal Tract, Breast, liver, prostate and ovary.

Conclusion

In a developing country like India, FNAC is a rapid, accurate and economical mode of tissue diagnosis and proved to be an excellent first line mode of investigation in case of enlarged lymphadenopathy. FNAC helps in confirming the origin of primary tumor and also to know the pattern of occurrence of various malignancies.

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