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Original Research Article

Role of Fine Needle Aspiration Cytology in Diagnosis of Metastatic Lymph Node Lesions: An Observational Study

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Abstract

Aim: The aim of the study was to find out the cytological diagnosis of metastatic lymph node lesions.

Methods: The present study was conducted in the Department of Pathology, Darbhanga Medical College and Hospital, Laheriasarai, Darbhanga, Bihar, India and study of all metastatic lymph node on FNAC samples reported over a period of 1.5 years during year 2019 to 2020

Results: The age of the patient ranged from 24 to 80 years with a mean of 60.4 years. The incidence was seen to peak at the age range above 60 years showing 144 cases (60%), followed by 84 cases (35%) in the age group 40 to 59 years. There were 12 cases (5%) below 40 years of age. The incidence of metastasis was more in female (144 cases, 60%) as compared to male (96 cases, 40%). The most common subtype of metastatic malignant tumor was adenocarcinoma and was observed in 156 cases. The metastatic lymph nodes were located in anterior and posterior cervical triangles, supraclavicular area, axilla, abdomen and inguinal region. The most common sites were the cervical triangles comprising 120 cases followed by 72 cases from supraclavicular nodes.

Conclusion: To conclude, in developing countries, like ours, FNAC is a cheap quick and reliable method to assess suspicious lymphadenopathy.

Keywords: Fine needle aspiration cytology; Lymphadenopathy; Metastasis

Introduction

Fine needle aspiration cytology (FNAC) of enlarged lymph nodes is a useful screening test. Studies in the past have shown metastatic malignancy to be a major cause of enlargement of supraclavicular lymph nodes. [1,2] Enlarged lymph nodes are easily accessible for fine needle aspiration and hence fine needle aspiration cytology (FNAC) is a very simple and important diagnostic tool for lymph node lesions.

Malignancies in lymph nodes in our country are predominantly metastatic in nature with an incidence varying from 65.7% [3] to 80.4% [4] and lymphomas range from 2% [5] to 15.3% [4] among lymph nodes aspirated from all sites. Although histopathological examination is considered to be gold standard in diagnosis especially in lymphomas, FNAC maybe the only tool for diagnosis and further

management of the patients in some cases of metastatic malignancy.

Lymphadenopathy in an adult patient may be the first presenting clinical sign of hematologic or non-hematologic malignancy. FNAC not only confirms the presence of metastatic disease, but also gives the clue regarding the nature and origin of primary malignancy. FNAC is useful for the detection of recurrence and new metastasis. In developing country like India, infective lymphadenopathy is quite common, mostly due to high prevalence of tuberculosis. However, still a large percentage of cervical lymhadenopathy presenting in our hospital turn out to be malignant as this institute is a cancer care centre. Cysts (congenital or acquired), abscesses, benign and malignant tumors may mimic lymph node metastasis, especially with a case of known tumor. [6] Cystic metastasis or aspirate of low-grade malignancies compose most of false negative cases. [7,8] This procedure is cheap, easily repeatable and well tolerated by the patients and can be performed on outpatient basis. [9]

In developing country like India, infective lymphadenopathy is quite common, mostly due to high prevalence of tuberculosis. However, still a large percentage of cervical lymhadenopathy in adults turn out to be malignant. Cysts (congenital or acquired), abscesses, benign and malignant tumors may mimic lymph node metastasis, especially with a case of known tumor. [6] Cystic metastasis or aspirate of low-grade malignancies compose most of false negative cases. [7,8] This procedure is cheap, easily repeatable and well tolerated by the patients and can be performed on outpatient basis. [9] The aim of the study was to find out the cytological diagnosis of metastatic lymph node lesions.

Materials and Methods

The present study was conducted in the Department of Pathology, Darbhanga Medical College and Hospital, Laheriasarai, Darbhanga, Bihar, India and study of all metastatic lymph node on FNAC samples reported over a period of 1.5 years during year 2019 to 2020

Out of total 1500 cases of FNAC, 240 cases (16%) were of lymph nodes. Among these, there were a total of 48 nodes reported as “positive for metastasis” accounting for 20% of all lymph node FNACs and 2% of all FNAC cases. Other lymph nodes were reported as “reactive” and “infective” in 168 cases (70%), “positive for metastasis” in 48 cases (20%), “hematologic malignancy” in 5 cases (2%) and “unsatisfactory” in 19 smears (8%).

All FNACs were performed using a 22- or 23-gauge needle. An average of 1-2 passes and a minimum of 5 slides were made, Slides were routinely stained with both May Grunwald Giemsa and Papanicolaou (PAP) stains and wherever applicable, Periodic Acid Schiff stain was used. In case of deep-seated lesions, Ultrasonography (USG) and Computerised Tomography (CT) guided FNAC was performed. Smears showing adequate cellular material was considered as “satisfactory” and were reported as “positive for metastasis” with further sub typing wherever possible. All the clinical and pathological data were collected and analyzed using Graphpad Prism version 5 software.

Results

Table 1: Demographic details

Age in years	N%
Below 40 years	12 (5%)
40-59 years	84 (35%)
Above 60 years	144 (60%)

Gender	
Male	144 (60%)
Female	96 (40%)

The age of the patient ranged from 24 to 80 years with a mean of 60.4 years. The incidence was seen to peak at the age range above 60 years showing 144 cases (60%), followed by 84 cases (35%) in the age group 40 to 59 years. There were 12 cases (5%) below 40 years of age. The incidence of metastasis were more in female (144 cases, 60%) as compared to male (96 cases, 40%).

Table 2: Distribution of different pathological subtypes of metastasis

Pathological Subtypes	N%
Adenocarcinoma	156 (65%)
Squamous cell carcinoma	36 (15%)
Breast ductal carcinoma	12 (5%)
Papillary carcinoma thyroid	6 (2.5%)
Small cell carcinoma	6 (2.5%)
Non-small cell carcinoma	18 (7.5%)
Malignant melanoma	6 (2.5%)
Total	240 (100%)

The most common subtype of metastatic malignant tumor was adenocarcinoma and was observed in 156 cases. The metastasis had occurred form primary carcinomas in lung, stomach, colon and rectum. This was followed by squamous cell carcinoma (36 cases).

Table 3: Distribution of number of cases according to sites of lymphadenopathy

Sites of Lymphadenopathy	N%
Cervical triangles	120 (50%)
Supraclavicular	72 (30%)
Axillary	30 (12.5%)
Abdominal	3 (1.25%)
Inguinal	15 (6.25%)

The metastatic lymph nodes were located in anterior and posterior cervical triangles, supraclavicular area, axilla, abdomen and inguinal region. The most common sites were the cervical triangles comprising 120 cases followed by 72 cases from supraclavicular nodes.

Discussion

Fine needle aspiration cytology (FNAC) is used routinely as a first-line diagnostic test. The majority of studies reveal a malignant cause for palpable supraclavicular lymph nodes. [1,2] FNAC is of considerable value in disease staging and documentation of metastasis in known and occult tumors. FNAC is a reliable diagnostic tool for lymphadenopathy in adult patients who are suspected for malignancy as it has less complication, is a simple invasive procedure and can be repeated easily. More than 90% of lymph node metastasis are diagnosed by initial aspiration. [6] Common metastatic tumors include malignancies from breast, oral cavity, thyroid, respiratory system, gastrointestinal tract, male and female genital tracts. [9]

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In the present study, adenocarcinoma was the most common metastatic tumor. In well differentiated adenocarcinoma, it showed cells with acinar and occasionally

papillary arrangement and also singly scattered. The individual cells are usually large, cuboidal to columnar with moderate amount of cytoplasm and pleomorphic nuclei with prominent nucleoli. Cells even show vacuolated cytoplasm indicating intracellular mucin secretion. Background may show pink homogenous mucoid material if the mucin content of the tumor is high.

In other studies also the most common metastatic subtype were adenocarcinoma. [10,11] However, often it becomes difficult to distinguish between adenocarcinoma and poorly differentiated squamous cell carcinoma when the cell clusters show thick nuclear membrane and prominent nucleoli. [12,13] Cells with abundant clear cytoplasm also raise a suspicion of metastasis from the renal tumors. [14]

Metastatic squamous cell carcinoma was the second most common entity in our study. Tumor cells are seen mostly in sheets and singly scattered. The cells had dense cytoplasm with hyperchromatic nuclei in Giemsa stain and the cells show cynophilic or orangeophilic cytoplasm with pyknotic nuclei in PAP stain. In well differentiated squamous cell carcinoma, the tumor cells show individual cell keratinization. [14,15] The tumor cells often show necrotic material in the background. So in case of scanty cellularity with abundant necrotic material, a careful search for the tumor cells is required. Other studies showed squamous cell carcinoma as the most common metastatic tumor. [14,16]

Metastatic small cell carcinoma was seen in 12 cases where the patient had suspicious mass lesion in the lung. Here the cells have scant cytoplasm with nuclei two to three times larger than small lymphocytes. Nuclei usually demonstrate the classical “salt and pepper” chromatin with indistinct nucleoli and frequent moulding. Streaking artefact along with karyorrhectic debris are seen in the background. [15,17] Sometimes, these background findings may make it difficult to differentiate from lymphoma where clinical findings (more generalised lymphadenopathy) may be helpful to differentiate. [14]

Melanomas can be seen anywhere in the body for example eyeballs, head, neck, great toe to name a few, and it is notorious to metastasize to any , specifically cervical or inguinal nodes . Our study showed 6 cases of metastatic melanoma, 3 each in cervical and inguinal lymph nodes. These smears showed discohesive pleomorphic cells with binucleate or multinucleate forms. The nuclei are large with characteristic prominent 1-2 macronucleoli. Intra and extracellular mealanin pigment were seen both cases. Contrary with that other studies have observed melanin pigment in 25% of melanoma metastasis cases. [13,18,19]

Conclusion

Cytology evaluation along with proper clinico-radiological correlation is quite useful in diagnosing metastasis with good degree of certainty. To conclude, in developing countries, like ours, FNAC is a cheap quick and reliable method to assess suspicious lymphadenopathy. Furthermore, the histological architecture from cell blocks can be correlated with cytology, and such material can be used for appropriate histochemical and immunomarker studies, which can be useful in enhancing the diagnosis.

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