

# Fine Needle Aspiration Cytology in Metastatic Lymph Nodes: A Study from Bihar.

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Received: May 2017

Accepted: May 2017

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## ABSTRACT

**Background:** In a country like India which has got resource constraints, Fine needle aspiration cytology is a less time consuming, reliable, suitable for moribund patients as well as an inexpensive diagnostic method. It is suitable for the developing countries like India and state like Bihar for the diagnosis of lymphadenopathy at any approachable site. Fine needle aspiration cytology not only gives first hand idea about the cause of lymphadenopathy but also confirms the presence of metastatic disease. In most cases, it gives the clue regarding the origin of the primary tumor. The aim of the study was to find out the cytological diagnosis of metastatic lymph node lesions. **Methods:** A combined prospective and retrospective study was done of all metastatic lymph node lesions (including both superficial and deep nodes) reported in Department of Pathology, Mahavir Cancer Sansthan And Research Institute, Patna, from January 2015 to March 2017. **Results:** A total of 2000 cases of fine needle aspiration cytology were taken for study in which 540 cases were of lymph node. Cytology results were unsatisfactory in 30 specimens (5.55%), "reactive" or "infective" in 120 specimens (22.22%), positive for metastasis in 374 specimens (69.23%) and hematolymphoid malignancies include 16 cases (3%). The most common site was anterior and posterior triangles cervical nodes. The most common malignancy was adenocarcinoma, seen in 164 cases (44%), followed by metastatic squamous cells carcinoma (108 cases, 29 %). **Conclusion:** Fine needle aspiration cytology of lymphadenopathy is a useful tool in diagnosing metastatic lesions with good certainty.

**Keywords:** Fine needle aspiration cytology; Lymphadenopathy; Metastasis.

## INTRODUCTION

The use of Fine Needle Aspiration Cytology (FNAC) for the diagnosis of metastatic malignancies in the lymph node is a well-established method.<sup>[1]</sup> 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 lymphadenopathy 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.<sup>[2]</sup> Cystic metastasis or aspirate of low grade malignancies compose most of false negative cases.<sup>[3,4]</sup> This procedure is cheap, easily repeatable and well tolerated by the patients and can be performed on outpatient basis.<sup>[5]</sup>

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

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## MATERIALS AND METHODS

This is a combined prospective and retrospective study of all metastatic lymph node on FNAC samples reported over a period of 2.5 years from January 2015 to March 2017.

This study was carried out in the Department of Pathology, Mahavir Cancer Sansthan and Research Institute, Patna. 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

Out of total 2000 cases of FNAC, 540 cases (12%) were of lymph nodes. Among these, there were a total of 374 nodes reported as “positive for metastasis” accounting for 69.74 % of all lymph node FNACs and 18.70% of all FNAC cases. Other lymph nodes were reported as “reactive” and “infective” in 166 cases (30.74%), “positive for metastasis” in 374 cases (69.74%), “hematologic malignancy” in 16 cases (3%) and “unsatisfactory” in 30 smears (5.55%). The causes of “unsatisfactory smears” were scant cellular yield, obscuring blood, and also thick cohesive clusters. The metastatic lymph nodes were located in anterior and posteriorcervical triangles, supraclavicular area, axilla, abdomen and inguinal region. The most common sites were the cervical triangles comprising 23 cases followed by 15 cases from supraclavicular nodes.

The age of the patient ranged from 04 to 86 years with a mean of 43.1 years. The incidence was seen to peak at the age range of 40 - 49 years showing 183 cases (49 %), followed by 108 cases (29 %) in the age group 50 to 59 years. There were 45 cases (12 %) below 40 years of age. The incidence of metastasis were more in female (209 cases, 56%) as compared to male (165 cases, 44%) with male to female ratio 1:1.26. The most common subtype of metastatic malignant tumor was adenocarcinoma and was observed in 164 cases. The metastasis had occurred from primary carcinomas in breast, lung, stomach, colon, prostate and rectum. This was followed by squamous cell carcinoma (108 cases). The primary sites of these squamous cell carcinoma included tongue, lip, alveolus, buccal mucosa, palate, lung and oesophagus. Nodes were found to be positive in known primary thyroid carcinomas, pancreatic carcinoma, germ cell tumor, small cell carcinoma carcinoma and malignant melanoma.

## DISCUSSION

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.<sup>[2]</sup> Common metastatic tumors include malignancies from breast, oral cavity, thyroid, respiratory system, gastrointestinal tract, male and female genital

tracts.<sup>[5]</sup> 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.<sup>[6,7]</sup> 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.<sup>[8,9]</sup> Cells with abundant clear cytoplasm also raise a suspicion of metastasis from the renal and adrenal tumors.<sup>[10]</sup> In our study 4 cases of papillary thyroid carcinoma showed metastatic deposit in lymph nodes; where the cell clusters were in papillary pattern with central fibrovascular core along with the characteristic vesicular nuclei with nuclear grooving and intranuclear inclusion . Some of the follicular cells demonstrated features of squamoid differentiation. 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 dysplastic /pyknotic nuclei in PAP stain. In well differentiated squamous cell carcinoma, the tumor cells show individual cell keratinization.<sup>[10,11]</sup> 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.<sup>[10,12]</sup> In our study, metastatic ductal carcinoma constituted a significant proportion of cases where most of the female patients presented with breast lumps or were post mastectomy cases undergoing treatment for carcinoma Breast. Many cases had axillary lymphadenopathy while few cases had axillary, supraclavicular and cervical lymphadenopathy. The smears yielded high cellularity with several loose clusters of tumor cells. Some of such cases were difficult to diagnose and needed immunocytochemistry. Malignant ductal cells have moderate to abundant cytoplasm with pleomorphic nuclei and prominent single to multiple nucleoli. Tumor giant cells were also noted in occasional cases. Metastatic small cell carcinoma was seen in 7 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, frequent moulding and background typically showed crush artefact with karyorrhectic

debris which is considered to be because of excessively delicate cytoplasm.<sup>[11,13]</sup> Sometimes, these background findings may make it difficult to differentiate from lymphoma where clinical findings (more generalised lymphadenopathy) may be helpful to differentiate.<sup>[10]</sup> Melanomas can be seen anywhere in the body for example gastrointestinal tract especially rectum, eyeballs, head, neck, great toe, etc., and it is notorious to metastasize to any , specifically cervical or inguinal nodes . Our study showed 3 cases of metastatic melanoma, 1 in cervical and 2 in 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 melanin pigment were seen in all the 3 cases. Contrary with that other studies have observed melanin pigment in 25% of melanoma metastasis cases.<sup>[9,14]</sup>

### CONCLUSION

Cytology evaluation along with proper clinico-radiological correlation are quite useful in diagnosing metastasis with good degree of certainty. To conclude, in developing countries, like ours, though core needle biopsy and immunohistochemistry is gradually replacing FNAC but still it has not lost it's space as it is a cheap, quick, suitable for moribund patients and reliable method to assess suspicious lymphadenopathy.

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**How to cite this article:** Arundhati, Jha PC. Fine Needle Aspiration Cytology in Metastatic Lymph Nodes: A Study from Bihar. *Ann. Int. Med. Den. Res.* 2017; 3(4): PT28-PT30.

**Source of Support:** Nil, **Conflict of Interest:** None declared