



ORIGINAL RESEARCH PAPER

Pathology

CYTOLOGICAL EXAMINATION OF LYMPH NODES IN METASTATIC DISEASE.

KEY WORDS: Lymph node, Metastasis, Cytopathology

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ABSTRACT

Background: Lymphadenopathy is a heterogeneous entity with many underlying causes, ranging from self-limiting benign disease to severe neoplastic proliferations. Fine-needle aspiration is a cost-effective and reliable tool for initial investigation of enlarged lymph nodes.

Materials and Methods: A study was conducted in department of pathology Gajra Raja Medical College Gwalior on 142 patients with metastatic disease in order to evaluate the efficacy of cytology in diagnosing malignancies metastasizing to the lymph node and predicting their primary origin as well as to find the relative frequency of different malignancies. The findings were also correlated with histopathology.

Results: Cervical lymph nodes were the most frequently involved group, followed by axillary, supraclavicular, and inguinal lymph nodes. Squamous cell carcinoma (SCC) and adenocarcinoma were the most common cytological diagnosis. Among the cases with known primary tumors, head and neck was the most common site followed by breast carcinoma. Most common lymph node group to be aspirated in cases with unknown primary was cervical lymph node, and SCC was most frequently diagnosed cases.

Conclusion: Fine-needle aspiration cytology has a very high sensitivity and positive predictive value and hence, a presumptive diagnosis can be made along with the detection of the primary site in case of metastatic disease.

INTRODUCTION:

Lymph node enlargement is a very common presenting symptom. The cytological examination of lymph nodes is a simple, cost-effective procedure which may provide valuable information regarding the disease process, including both neoplastic and nonneoplastic conditions. Cytological examination of lymph node may be done either by fine-needle aspiration cytology (FNAC) or preparation of imprint/touch smears.

Fine-needle aspiration cytology has become a well-established method for the diagnosis of metastasis to the lymph nodes. [1] This simple technique has gained wide acceptance since it offers several advantage to patients and physicians alike. The technique is relatively painless and minimally invasive; produces fast results, and its accuracy can approach that of histopathology in providing a definite diagnosis. [2] It is cost-effective and is now the first-line investigation technique for significantly enlarged lymph node. This method is applicable both to lesions that are easily palpable and to deeply located lesions under radiological guidance. The results of fine-needle aspiration (FNA) compare favorably with those of tissue biopsies; in some situations, the aspirate has qualities of a microbiopsy. [3] The study done by Haque and Talukder concludes that before resorting to surgical intervention FNAC is a helpful procedure in the diagnosis of both neoplastic and nonneoplastic lesions of the lymph node.

The aim of our study was to assess the efficacy of cytology in the diagnosis of malignancies metastasizing to the lymph nodes, predicting their primary origin and to find the relative frequency of different malignancies. The findings were also correlated with histopathology wherever possible.

MATERIALS AND METHODS:

The present study was a prospective study, conducted in department of pathology Gajra Raja Medical College Gwalior from January 2016 to January 2018 on 142 patients under investigation for lymphadenopathy. Only those cases of lymphadenopathy, which were positive for metastatic malignancy, were included in our study. A detailed clinical history and finding of physical examination were recorded. Of the total of 142 patients, 140 patients underwent FNA, of which 4 cases were aspirated under CT guidance, and imprint smears were submitted for evaluation in two patients. The smears obtained were stained using Papanicolaou, hematoxylin and eosin and May-Grunwald-Giemsa stains. Histopathological correlation was possible in 36 cases where biopsies were available, either of the lymph node or the primary lesion.

RESULT:

Table 1 - Analysis of anatomical LN regions aspirated

S.N.	Lymph node group	Male	Female	Total
1	Cervical	74 (80.43%)	11 (22%)	85(59.85%)
2	Supraclavicular	07 (07.60%)	08 (16%)	15(10.56%)
3	Axillary	05 (05.43%)	20 (40%)	25(17.60%)
4	Inguinal	04 (04.34%)	06 (12%)	10(07.04%)
5	Mediastinal	02 (02.17%)	02 (04%)	04(02.81%)
6	Mesenteric	00 (00%)	01 (02%)	01 (0.70%)
7	Preauricularl	00 (00%)	01 (02%)	01 (0.70%)
8	Occipital	00 (00%)	01 (02%)	01 (0.70%)
9	Total	92(64.78%)	50(35.21%)	142(100%)

Table 2: Cytological diagnosis of total No. of cases

S.N.	Cytological diagnosis	No. of cases in male	No. of cases in female	Total cases (male and female)
1	Squamous cell carcinoma (SCC)	61(64.22%)	09(19.14%)	70(49.19%)
2	Adeno-carcinoma	12(12.63%)	27(57.44%)	39(27.46%)
3	Mucoepidermoid carcinoma	03(03.15%)	03(06.38%)	06(04.22%)
4	Malignant melanoma	02(02.10%)	01(02.12%)	03(02.11%)
4	Undifferentiated or Poorly differentiated carcinoma	15(15.78%)	05(10.63%)	20(14.08%)
5	Papillary carcinoma	02(02.10%)	01(02.12%)	03(02.11%)
6	Bronchoalveolar carcinoma	00 (00%)	01(02.12%)	01 (0.70%)
7	Total No.	95(66.90%)	47(33.09%)	142 (100%)

Of the total of 142 cases, 92 (64.78%) were males, and 50 (35.21%) were females. The largest number of cases was in the age group of 50-60 years followed by 40-50 years. Among the males, the peak incidence of lymphadenopathy was noted at age 50-60 years, whereas in females the peak was observed

a decade earlier at 40-50 years of age.

Fine-needle aspiration and imprint smears from various lymph node groups in the body that were included in our study are depicted in [Table 1].

On cytological evaluation of lymph nodes from different anatomical regions or groups, it was seen that the cervical lymph nodes were the most frequently aspirated (59.85% cases) followed by axillary (17.60% cases), supraclavicular (10.56% cases), and inguinal (7.04% cases). Among males, cervical lymph nodes were the most frequently involved group (80.43%). However, among females, the most frequently aspirated lymph nodes were in the axillary region (40%). Mediastinal lymph nodes were analyzed in 4 cases, by guided aspiration. Other lymph node groups included 1 case of mesenteric lymph node enlargement and one each of preauricular and occipital lymph nodes.

The breakup of cytological diagnosis is given in [Table 2]. In general, incidence of squamous cell carcinoma (SCC) was the highest (70 cases, 49.19%), followed by 39 cases (27.46%) of adenocarcinoma. Six cases (4.22%) were diagnosed as mucoepidermoid carcinoma, three as melanoma. There were 20 cases (14.08%) of undifferentiated or poorly differentiated carcinoma. A diagnosis of poorly differentiated or undifferentiated carcinoma case was not possible to type the malignancy on the basis of cytology. The most common cytological diagnosis among males was SCC while it was adenocarcinoma in female patients.

Of the 142 patients included in our study, primary site of the tumor could not be established in 20 patients (14.08%). The most common lymph node groups to be aspirated was cervical (59.85%) followed by axillary (17.60%). Other involved groups were supraclavicular, inguinal, and mediastinal.

DISCUSSION:

Lymph node aspiration has become an established method in the wide field of FNAC. It has a very important role in the diagnosis of malignant lymphadenopathies especially in a developing country like India. [5]

Overall incidence of malignancy especially SCC was found to be higher in males with a male. This may be due to the high incidence of smoking (especially bidi smoking) and chewing of betel nut preparation which are proven carcinogens. [6] Other studies hence also noted a higher male to female ratio. [1],[4]

The largest number of patients in our study belonged to fifth to seventh decade, very much similar to the findings of Agarwal et al. [7] Furthermore, the maximum number of aspirations was obtained from cervical lymph nodes. This may be chiefly attributed to the large number of cases with metastatic head and neck malignancy; another important reason is the easy accessibility of cervical lymph nodes for examination and evaluation. These observations coincide with other similar published reports. [8],[9],[10],[11]

In our study, SCC was the most common cytological diagnosis followed by adenocarcinoma. Our findings were in accordance with other pioneer workers. [5],[9],[10],[12]

Cancer of mouth/oropharynx is the most frequent cancer in males and third most frequent in females in India, a fact with the findings of our study were concordant. [13] Breast carcinoma was the second most common primary site to be involved.

The primary site of the tumor could not be established in 20 patients in our study. The reasons for this were either referral of the patient to a higher center, death of the patient or inability to detect primary site even after extensive investigation including ultrasonography, computed tomography and magnetic resonance imaging. Positron emission tomography scan was not done as it is an expensive procedure and not easily available to all patients. Most common lymph node group to be aspirated in cases of unknown primary was again the cervical group, similar to the findings of

other studies. [14] The most common cytological diagnosis in this category was again SCC, with a fair number of cases of adenocarcinoma and poorly differentiated carcinoma as well. Cytological features and the lymph node group involved were correlated with the clinical features to search for the unknown primary in these cases.

Of 122 patients with known primary tumors metastasizing to lymph node, it was possible to make a cytohistological correlation in 36 cases. In the remaining 106 cases, histopathological data were not available for correlation due to several reasons. In the majority of cases, the primary was located in head and neck region. Hence, the initial treatment comprising of radiotherapy was administered based on cytological diagnosis alone. Surgical resection was done only in clinical advanced cases where tissue was available for histopathology. The other reasons for this limitation were referral of patients to other advanced centers for treatment, noncompliance of patient for follow-up, or death of the patient.

The accuracy of cytology, immunocytochemistry, and transmission electron microscopy using biopsy results as the gold standard in diagnosing for tumor. [15] But in a resource-challenged environment like ours, FNAC still remains the most acceptable, cheap, and easily accessible modality with no/minimal complication for the diagnosis of metastatic lymphadenopathy.

In the end, we conclude that cytology has a high efficacy of diagnosis. It also has the added advantage of being able to predict the primary site (where origin of the tumor is unknown) in several cases. The latter is beneficial to the treating surgeon and extremely helpful in deciding the line of therapy. Because of the high rate of accuracy of cytological diagnosis, it precludes the need for biopsy/surgery, which is a boon, as it saves precious resources, time and avoids trauma to the patients. We should stress, however that FNAC is not a substitute for conventional histopathology. It should be regarded as an essential component of preoperative/pre-treatment diagnosis, when correlated clinicoradiologically and with other investigations.

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