Histomorphological Patterns of Lesions in Lymph Node Biopsies in a Tertiary Care Hospital

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Abstract

Background: Lymphadenopathy is one of the most common presentations of inflammatory and neoplastic disorders. Detailed assessment is required to reveal an underlying pathology. Clinical features along with radiology images may not be sufficient for diagnosis of lymph node enlargement. Hence, lymph node biopsy has become a mandatory tool to arrive at a definitive diagnosis.

Methods: This cross-sectional retrospective study was conducted in the Department of Pathology, Rajshahi Medical College over a period of one year from July 2022 to June 2023. A total of 130 cases of lymph node biopsies were included in this study as the study subjects purposively. Specimen of tissue was fixed with 10% formalin and stained with haematoxyline and eosin stain, followed by histopathological examination. Statistical analysis was performed using Microsoft Excel.

Result: A total of 130 lymph node biopsies were studied with ages ranging from 13 to 72 years. Most of the cases (54%) belonged to 21-40 years. Female patients were 52% and male patients were 48%. Reactive hyperplasia was the commonest lesion accounting for 37% of cases (48 cases), followed by metastatic deposits showed in 36 cases (28%).Reactive hyperplasia was common in early age group while 69% of metastatic deposits were found in age group above 40 years. Duct cell carcinoma was the commonest metastatic carcinoma (42%) in this present study.

Conclusion: To establish the causes of lymphadenopathy, lymph node biopsy plays an important role. It is less expensive than other tests when investigating the cause of enlarged lymph nodes.

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Introduction

The integral part of the immune system is formed by the lymph nodes whose job is to adequately deal with foreign substances.[1] Swelling of lymph nodes that are abnormal in terms of size and/or number is known as lymphadenopathy. Lymphadenopathy is usually classified as generalized lymphadenopathy or localized lymphadenopathy. More than half of the patients present with localized lymphadenopathy and the rests present with general lymphadenopathy.[2]

Lymphadenopathy is a common clinical problem and biopsies are undertaken to determine the causes of nodal enlargement. There are various causes of lymphadenopathy such asacute or chronic inflammation, primary malignancy of the lymphoid system, metastasis from an occult primary malignancy, or non-specific hyperplasia. Diagnosis of enlarged lymph nodes cannot be easily done based on clinical grounds or by routine laboratory investigations alone.[3]

The histologic pattern of lymphadenopathy is also different for different age groups. Malignancies are more common in adults as compared to children. Most common cause of lymphadenopathy in children is reactive hyperplasia.[4] Patients older than 40 years with lymphadenopathy, without any obvious cause, have about a 4% chance of malignancy. However, it is reduced to 0.4% only in case of patients under 40 years of age.[5] Granulomatous lymphadenitis is also observed followed by reactive lymphadenitis as a common cause of lymphadenopathy.[6]

Enlarged palpable lymph node as a primary presenting sign is a very common problem in clinical practice.It has become essential to define diseases presenting with enlarged lymph nodes considering numerous causes of lymphadenopathy.[7]

To find out the causes of lymph node enlargement is not an easy task. It is a challenge for surgeons to assess its clinical behavior and come to a final diagnosis. Those diseases which can be neoplastic also demand correct diagnosis for further management.[8] For diagnosis the causes of enlarged lymph node, excisional biopsy and histopathological analysis are considered as the 'gold standard'.[5]

So, this study was undertaken to determine the histopathological spectrum of lymph node biopsies.

Methods

This cross-sectional study was conducted in the Department of Pathology, Rajshahi Medical College over one year from July 2022 to June 2023. A total of 130 patients who underwent lymph node biopsies were included in this hospital-based, non-interventional study. A purposive method of sampling was employed. The specimens were processed for histopathological examination. Specimens with incomplete records were excluded from the study. A pre-designed proforma was used to record all the demographic and laboratory data including age, gender, site of biopsy, and a clinical diagnosis made based on morphology and cut section appearance. The specimen of tissue was fixed with 10% formalin and stained with hematoxyline and an eosin stain was examined. Statistical analysis was performed using Microsoft Excel.

Result

A total of 130 samples of lymph node biopsies were received for histopathological evaluation at our Hospital, a tertiary care hospital located in Rajshahi, Bangladesh. The biopsies were studied with an age range of 13 to 72 years. Majority of cases were age group of 21-40 years (54%). Age-wise distribution

of lymphadenopathy is given in Table I. Out of 130 cases, female patients were 78 (56%) and male patients were 62 (44%). The male-female ratio was 1:1.3. Most of the cases were diagnosed as reactive change which accounted for 48 cases (37%) followed by metastatic deposits (36 cases, 28%). The number of lymphomas (either Hodgkin or Non-Hodgkin)and tubercular lymphadenitis were 22 cases (17%) and 21 cases (16%) respectively. Only 3 cases (4%) were diagnosed as chronic lymphadenitis (Table II). The most frequently biopsied lymph node group was cervical lymph nodes. 39 cases (30%) were reported at the cervical location. This was followed by 35 cases (27%) of lymph node which were in the abdominal location. Rest of the locations such as axillary, inguinal, submandibular and supraclavicular region accounted for 23% (30 cases),10% (13 cases), 4% (5 cases), and 6% (8 cases) respectively (Table- III). Out of 36 cases of metastasis, the majority of cases had metastatic infiltrating duct carcinoma (42%), followed by metastatic adenocarcinoma (28%) and metastatic squamous cell carcinoma (11%). Three cases (8%) were accounted for metastatic papillary thyroid carcinoma. A single case (3%) of lymph node biopsy showed metastatic undifferentiated carcinoma (Table IV).Inthe present study, reactive lymphadenitis was the common cause of lymphadenopathy in all age groups. The proportion of metastasis was found to be higher in the age group above 40 years i.e. 25 cases (69%) as compared to 11 cases (28%) below 40 years of age (Table V).

Table I: Age-wise distribution of lymphadenopathy (n = 130)

Age group (years)	Number (n)	%
<20	07	5
21-30	32	25
31-40	37	29
41-50	21	16
51-60	19	14
>60	14	11
Total	130	100

Table II: Histopathological diagnosis of lymph node biopsies (n = 130)

Histopathological diagnosis	No of cases	%
Reactive hyperplasia	48	37
Tubercular lymphadenitis	21	16
Chronic lymphadenitis	03	02
Hodgkin Lymphoma	05	04
Non-Hodgkin Lymphoma	17	13
Metastatic Deposits	36	28
Total	130	100

Table III: Anatomical distribution of lymphadenopathy (n=130)

Site of lymph node	Number (n)	%
Cervical	39	30
Submandibular	05	04
Supraclavicular	08	06
Axillary	30	23
Abdominal	35	27
Inguinal	13	10
Total	130	100

Table IV: Distribution of different subtypes of metastatic tumors amongst lymph node biopsies (n=36)

Histopathologic diagnosis	Number (n)	%
Duct cell carcinoma	15	42
Adenocarcinoma	10	28
Mucinous carcinoma	03	08
Squamous cell carcinoma	04	11
Papillary thyroid carcinoma	03	08
Others	01	03
Total	36	100

Table V**:** Diagnosis of lymph node biopsies based on age (n=130)

Age(years)	Reactive change	Tubercular lymphadenitis	HD	NHL	Metastasis	others	Total
<20	04	02	-	-	01	-	07
21-30	18	06	01	01	05	01	32
31-40	22	07	01	02	05	-	37
41-50	02	02	01	05	10	01	21
51-60	01	03	01	07	07	-	19
>61	01	01	01	02	08	01	14
Total	48	21	05	17	36	04	130

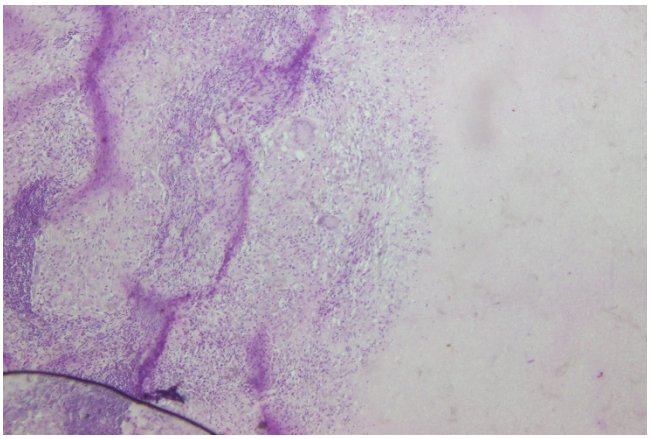

Figure 1. Photomicrograph showing Tubercular lymphadenitis in the mesenteric lymph node. (H&E×100)

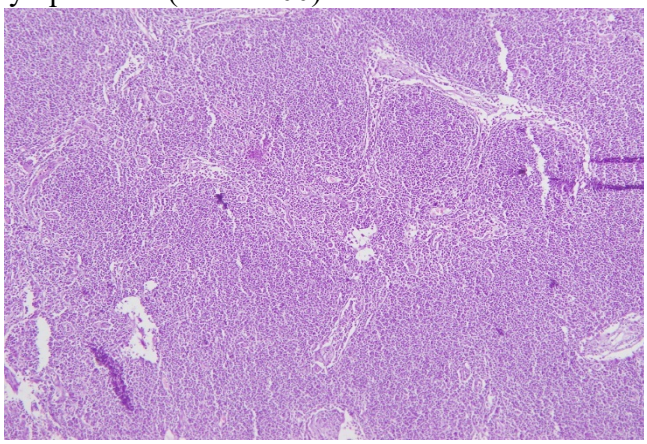

Figure 2. Photomicrograph showing reactive hyperplasia in cervical lymph node (H&E×100).

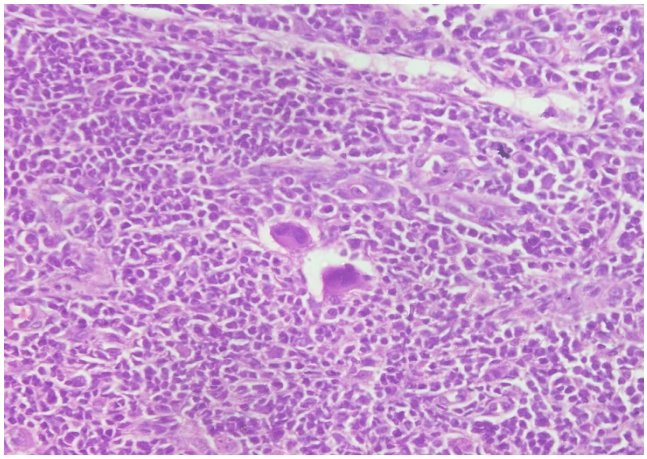

Figure 3. Photomicrograph showing Hodgkin lymphoma in cervical lymph node (H&E×100).

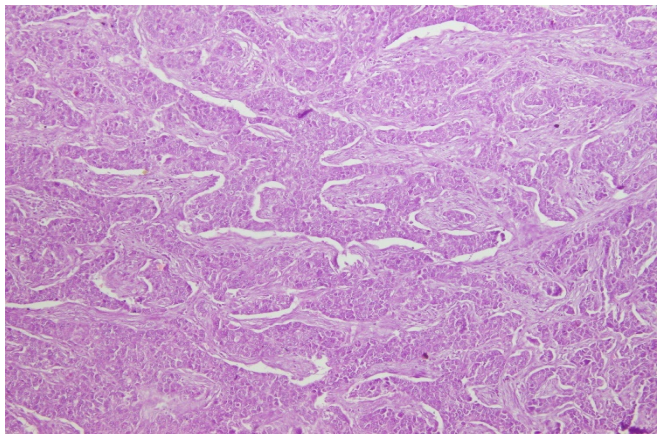

Figure 4**.** Photomicrograph showing Metastatic DCC in axillary lymph node (H&E×100).

Discussion

Patients with lymphadenopathy, either localized or generalized are very commonly seen in routine practice. Excisional biopsy and histopathological analysis help in early diagnosis, which is essential for the management of enlarged lymph nodes.[9] This study was conducted over one year to analyze the histopathological findings of lymph node biopsies at a tertiary care center.

In current study, the most common age group was 31-40 years (29%) ranging from 17 to 72 years. The age of the patients was slightly higher in other studies where the maximum numbers of cases was in the 41-50 years age group.[10,11]

Majority of the biopsies turned out to be of females (78 cases, 56%) in our study with male to female ratio being 1:1.3. These results were similar with the results reported by other studies where female dominance was seen.[6,7,9] In somestudies conducted by Roy et al,. and Maula et al,.the maledominancewith ratio of 1.7:1 and 1.2:1 was seen respectively.[12,13]

We found the most common benign lesion causing lymphadenopathy was reactive hyperplasia (37%) followed by metastatic

deposits (28%). Similarly, reactive hyperplasia was also more common in most of the studies.[9,14] By contrast, in a study from Bangladesh found that lymphomas were the most common cause of lymphadenopathy, 15 as well as other studies reported that granulomatous lymphadenitis was the most common lymph node disease.[2,3]

In present study, out of 130 lymph nodes received for histopathological evaluation, majority lymph nodes were from cervical region (30%) followed by mesenteric lymph nodes (27%) and 23% were from the axillary region. Study findings were consistent with the findings of other studies that also reported that the cervical region was the most commonly involved group of lymphadenopathies.[6,16]

Out of 36 metastatic tumors, 15 cases (42%) were reported as infiltrating duct cell carcinoma followed by 4 cases (11%) assquamous cell carcinoma and 10 cases (28%) as adenocarcinoma. Only 8% of casesreported as metastatic mucinous carcinoma of therectum and 8% of cases as metastatic papillary carcinoma of the thyroid were found in this current study. This result was similar to the study results of others.[16]But in another study, squamous cell carcinoma, followed by infiltrating ductal carcinoma and metastatic adenocarcinoma were observed as the most common type of lymph node metastasis.[14]

In our study, 42 cases of malignant lymphadenopathy (73%) were usually clustered in age groups more than 40 years. Only 27% of cases occurred before 40 years of age. This result was dissimilar to that of Bibi S et al,.in where the majority of these lesions were in the age group ≥ 60 years.[7] However, in a study conducted by Zahir ST et al,. there was no significant relationship between pathologic findings with age. It may be attributed to fewer malignant cases included in this study.[17]

So, lymph node biopsy remains a useful diagnostic tool to assess the architecture of the gland and gives an accurate diagnosis with minimal risk to the patient.

Conclusion

Enlarged lymph nodes are one of the most common problems in clinical practice and offer an important diagnostic clue to the etiology of the underlying conditions. The causes of lymphadenopathy cannot be ascertained on clinical grounds alone and histopathological examination helps in categorizing the causes.

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