

Study of Cytopathological Spectrum of Lymphadenopathy at Tertiary Care Hospital, Gujarat, India

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Abstract

Introduction: Lymph nodes are most widely distributed and easily accessible component of lymphoid tissue. Lymphadenopathy is a commonly encountered clinical problem which has multitude of causes varying from non-neoplastic to neoplastic conditions like inflammation, infection, primary or metastatic tumors. Fine needle aspiration cytology (FNAC) is a very simple, quick, and cost-effective method of sampling of superficial masses. This technique is an outpatient department (OPD) procedure and causes minimal trauma to the patient and carries virtually no risk of complication. The main goal of FNA is to determine the presence or absence of neoplasm, assure the clinical benign impression of the mass, and if malignant, to determine the type of malignancy. **Aim:** To evaluate and diagnose the causes of lymph node swelling for early and prompt treatment as FNAC is the minimally invasive procedure and report can be issued within 2 to 3 hours. **Materials and method:** Total 110 cases of FNAC of lymph node was studied at the Department of Pathology, GAIMS, Bhuj during period from July 2022 to March 2023. Patients were explained about the procedure and consent was taken. FNAC was done, smears were prepared and subsequently stained using H&E, PAP, Giemsa stain and ZN stain for AFB. **Observation and Result:** Out of total 110 cases, 61 (55.45%) were male and 49 (44.54%) were female patient. Age ranges from first year of life to 78 years of life, with maximum cases 32 (29.09%) were in age group of >40 years. Based on anatomical site, cervical lymphadenopathy was found to be more common, seen in 85(77.27%) cases out of 110 cases. The non-neoplastic lesions were predominated, diagnosed in 85 (77.27%) patients as compared to neoplastic lesions diagnosed in 25 (22.73%) cases. In non-neoplastic lesions, non-specific reactive lymphadenitis was the most frequent diagnosis with 43 (39.09%) cases followed by tuberculous lymphadenitis diagnosed in 22 (20.00%) case. In neoplastic lesions, metastatic squamous cell carcinoma was common in 18(16.36%) cases, whereas, the primary neoplastic lesions of lymph node (lymphoproliferative disease) constituted only about 07(6.36%) cases. **Conclusion:** FNAC is less invasive and less time consuming procedure yielding result in 1 to 3 hours of procedure. That's why FNAC must be first line of investigation in lymphadenopathy to differentiate neoplastic from non-neoplastic lesion and guide the surgeon for line of treatment.

Keywords: Lymphadenopathy, FNAC, non neoplastic lesion, Neoplastic lesion

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Introduction

Lymph nodes are most widely distributed and easily accessible component of lymphoid tissue.^[1,2] Aspiration of lymph nodes for diagnostic purpose was first reported in 1904 by Grieg and Gray in the diagnosis of Trypanosomiasis. In 1921, Guthrie attempted to correlate lymph node aspiration cytology with various disease processes.^[3,4] Lymphadenopathy is a commonly encountered clinical problem which has multitude of causes varying from non-neoplastic to neoplastic conditions like inflammation, infection, primary or metastatic tumors.^[5] Fine needle aspiration cytology(FNAC) is a very simple, quick, and cost-effective method of sampling of superficial masses.^[6] This technique is an outpatient department (OPD) procedure and causes minimal trauma to the patient and carries virtually no risk of complication. Fine needle aspiration cytology can be performed under local anesthesia and is particularly useful if a neck lump is thought to be malignant. Till now, there is no evidence that the tumor spreads through the skin track created by the fine

hypodermic needle used in this technique.^[7] This procedure (FNAC) can be both diagnostic and therapeutic in cystic swellings.^[8] The main goal of FNA is to determine the presence or absence of neoplasm, assure the clinical benign impression of the mass, and if malignant, to determine the type of malignancy.^[9,10]

Aim

To evaluate and diagnose the causes of lymph node swelling for early and prompt treatment as FNAC is the minimally invasive procedure and report can be issued within 2 to 3 hours.

Materials and method

Total 110 cases of FNAC of lymph node was studied at the Department of Pathology, GAIMS, Bhuj during period from July 2022 to March 2023. After collecting clinical details, relevant questions pertaining to the etiological cause along with history of the lesions were noted. Patients were explained about the procedure and consent was taken. Under aseptic precautions, a 23-gauge needle with syringe was inserted into the lesion and sufficient negative pressure given to aspirate adequate material. Smears were prepared from the aspirate on multiple glass slides. As per the staining procedure, the smears were either air dried or fixed using methanol and subsequently stained using H&E, PAP, Giemsa stain and ZN stain for AFB. FNAC diagnosis was correlated with relevant clinical details and investigations.

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Observation and result

A total 110 cases of FNAC of palpable lymph nodes were studied. The age of the patients ranged from first year of life to 78 years with mean age of presentation was 34 years in males and 31 years in females for all lymph node lesions. The youngest patient was a case of reactive lymphadenopathy and the oldest patient was a case of lymphoproliferative disease. The maximum number of patients 32

(29.09%) were in the age group of >40 years followed by 22 (20.00%) in 21-30 years and 20 (18.18%) cases in the age group of above 31-40 years. Minimum number of cases 17 (15.45%) were found in age group of 11-20 years. In this study, slight male predominance was seen with male: female ratio of 1.2:1. Male patients constituted 61 (55.45%) and female patients were 49 (44.54%) out of 110 patients. (Table1)

Table 1: Age wise distribution in male and female

| Age (years) | Male (%) | Female (%) | Total cases (%) |
|-------------|------------|------------|-----------------|
| 0-10 | 10 (9.09) | 09 (8.18) | 19 (17.27) |
| 11-20 | 13 (11.81) | 04 (3.63) | 17 (15.45) |
| 21-30 | 10 (9.09) | 12 (10.90) | 22 (20.00) |
| 31-40 | 11 (10.00) | 09 (8.18) | 20 (18.18) |
| >40 | 17 (15.45) | 15 (13.63) | 32 (29.09) |
| Total | 61 (55.45) | 49 (44.54) | 110 (100.00) |

Out of various anatomical groups of lymph nodes, cervical lymph nodes were the commonest group to be affected in all the types of lymph node lesions. Cervical lymphadenopathy seen in 85(77.27%) out of 110 cases, followed by submandibular lymphadenopathy in 9

(8.18%) cases. Other lymph node groups included supraclavicular 5 (4.5%), axillary 5 (4.5%), inguinal lymph nodes 4 (3.63%), and least common site being submental 2 (1.88%) cases (Table 2).

Table 2: Site wise distribution in male and female

| Site | Male (%) | Female (%) | Total Cases (%) |
|---|------------|------------|-----------------|
| Anterior and posterior triangle of neck | 45 (40.90) | 40 (36.36) | 85 (77.27) |
| Supraclavicular | 3 (2.72) | 2 (1.81) | 05 (4.5) |
| Submental | 2 (1.81) | 0 (0.0) | 02 (1.88) |
| Submandibular | 6 (5.45) | 3 (2.72) | 09 (8.18) |
| Axillary | 4 (3.63) | 1 (0.90) | 05 (4.54) |
| Inguinal | 1 (0.90) | 3 (2.72) | 04 (3.63) |
| Total | 61 | 49 | 110 (100.00) |

The spectrum of lymph node lesions studied by FNAC were divided into non-neoplastic and neoplastic lesions. The non-neoplastic lesions were predominated, diagnosed in 85 (77.27%) patients as compared to neoplastic lesions diagnosed in 25 (22.73%) cases. In non-neoplastic lesions, non-specific reactive lymphadenitis (Figure 1) was the most frequent diagnosis with 43 (39.09%) cases, followed by other lesions. Total 41 (37.27%) cases had granulomatous change, out of which Acid-fast bacilli (AFB) (Figure 3) seen in 22 (53.65%) cases and these cases were diagnosed as tuberculous lymphadenitis (Figure 2)

and remaining 19 (46.34%) were diagnosed as granulomatous lymphadenitis. One case (0.09%) of Rosai- Dorfman disease (Figure 4) was diagnosed in an 18 years old female patient presented with right cervical lymph node swelling. In neoplastic lesions, metastatic squamous cell carcinoma (Figure 5) was common in 18(16.36%) cases, whereas, the primary neoplastic lesions of lymph node (lymphoproliferative disease) (Figure 6) constituted only about 07(6.36%) cases. (Table 3)

Table 3: Cytological spectrum of lesions in lymph nodes in male and female

| Diagnosis | Male (%) | Female (%) | Total Cases (%) |
|---|------------|------------|-----------------|
| Non-neoplastic lesions | | | |
| Reactive/ Non-specific reactive lymphadenitis | 21 (19.09) | 22(20.00) | 43 (39.09) |
| Tuberculous lymphadenitis | 13 (11.81) | 09 (8.18) | 22 (20.00) |
| Granulomatous lymphadenitis | 11 (10.00) | 08 (7.27) | 19 (17.27) |
| Rosai Dorfman disease | 00 (0.00) | 01 (0.90) | 01 (0.90) |
| Total non-neoplastic lesions | 45 | 40 | 85 |
| Neoplastic lesions | | | |
| Metastatic Squamous Cell Carcinoma | 13 (11.81) | 05 (4.54) | 18 (16.36) |
| Lymphoproliferative disease | 03 (2.72) | 04 (3.63) | 07 (6.36) |
| Total neoplastic lesions | 16 | 09 | 25 |
| Total | 61 | 49 | 110 (100.00) |

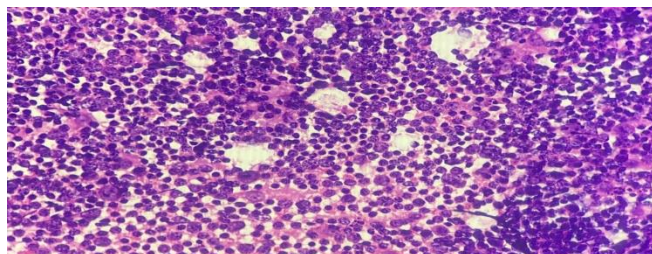


Figure 1: Reactive lymphadenitis (40x, H & E Stain) showing polymorphous lymphoid population with histiocytes

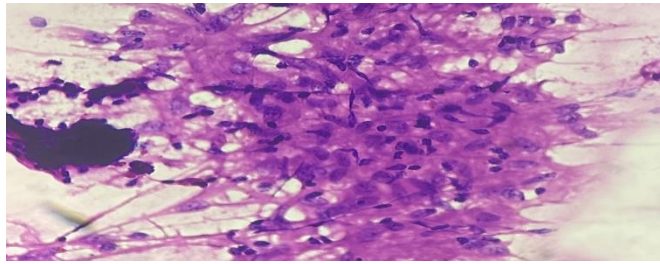


Figure 2: Tuberculous lymphadenitis (40x, H& E Stain) showing epithelioid cell granuloma with caseous necrosis

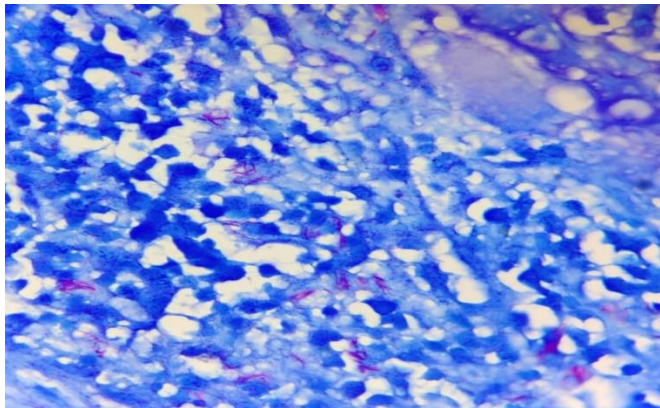


Figure 3: ZN stain (100x, Oil Immersion) showing red coloured rod shaped tuberculous bacilli

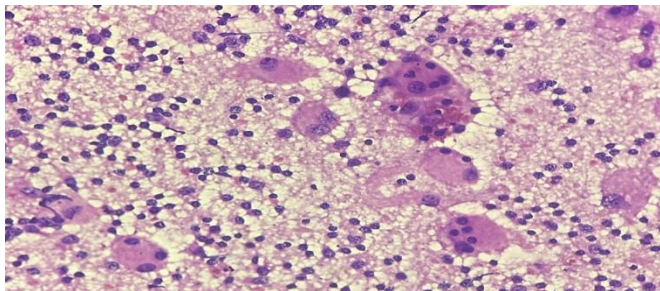


Figure 4: Rosai Dorfman disease (40x, H& E Stain) showing emperipolesis

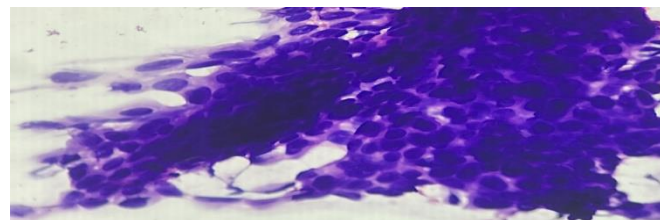


Figure 5: Metastasis (40x, H& E Stain) showing sheet of malignant squamous cells

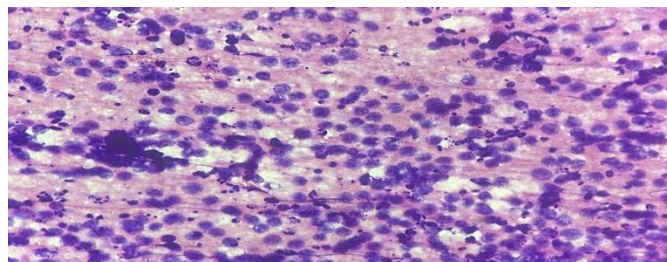


Figure 6: Lymphoproliferative disease (40x, H & E Stain) showing monomorphous lymphoid cells with coarse granular chromatin

Discussion

A total 110 cases were studied in our study, out of which 85(77.26%) cases were non neoplastic and 25(22.74%) were neoplastic. Similar finding was also observed by Bhatta et al having 189(91.74%) non neoplastic and 17(8.26%) neoplastic cases out of 206 cases.^[11]

In our study male: female ratio was (1.2:1) which is similar to the study by Bhatta et al having male: female ratio of 1.1:1.^[11]

The most common site of lymphadenopathy in our study was anterior and posterior triangle of neck (cervical region) 85 cases (77.27%) out of 110 cases. Similar finding was also observed by B. Nikethan et al having 256(80%) cases of cervical lymphadenopathy out of 1800.^[12]

In the present study out of 110 cases, 43(39%) cases were of reactive lymphadenitis followed by tuberculous lymphadenitis 22 (20%) cases. These findings were similar to study by Bhatta et al having 112(54.36%) cases of reactive lymphadenitis and tuberculous lymphadenitis 74(35.92%) cases out of 206 cases.^[11]

In studies like Hashmi et al 207(44.02%) cases, Patil Rt et al study 592(40%) cases, Nirmal Amit K et al 124 (44.60%) cases, B. Nikethan et al 89(60.9%) cases of tuberculous lymphadenitis as the most common pathology. ^[12,13,14,15] In our study tuberculous lymphadenitis 22(20%) was the 2nd most common cause of lymphadenopathy. This difference in compare to other study might be due to demographic and socio economic impact on disease diagnosis. In our study, metastatic carcinoma was the most common neoplastic lesion 18(72%) cases out of 25 cases of neoplastic lesion. Similar observation was reported by Bhatta et al having 13(76.47%) cases of metastasis out of 17 cases of neoplastic lesion and study by Nirmal Amit K et al having 23(76.67%) metastatic lesions out of 30 cases of neoplastic lymphadenopathy. ^[11,15]

Conclusion

FNAC of lymph node is a very useful and simple less invasive tool in the diagnosis of lymphadenopathy. It helps to differentiate infective from neoplastic lesions. Thus, avoiding unnecessary surgeries. FNAC combined with clinical correlation can be used as first line investigation in work up of lymph node lesions.

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