ABSTRACT: BACKGROUND: Lymphadenopathy is one of the common clinical presentations of patients. It has a varied aetiology which varies from an inflammatory process to a malignant condition. Fine Needle Aspiration Cytology (FNAC) is an accurate, simple and an easy diagnostic technique in evaluation of the causes of lymphadenopathy, and the reports can be made available within an hour that will form the basis of treatment, reduce the number of surgical procedures and unnecessary surgical intervention. OBJECTIVES: To study the cytological features in lymphadenopathy and categorize them with respect to aetiology, age, sex and site of occurrence, and to have a histopathological correlation of FNAC findings, wherever possible. METHODS: All patients referred to the Department of Pathology of a Tertiary hospital for FNAC of superficial and deep lymph nodes in the study period were enrolled for the study. The patients were clinically evaluated and clinical details were obtained from the medical records. FNAC was performed and their diagnosis made. The data was analysed. In 41 cases, FNAC diagnosis was correlated with histopathological diagnosis. RESULTS: Out of the total 678 cases (including 22 guided cases) only 03 aspirates were inadequate for reporting. Most of the cases were in the age group of 20 - 29 years, with a male preponderance. The most commonly involved were cervical group of nodes, with the deep-seated nodes least involved. 83.33% of cases were diagnosed as benign lymphadenopathies, most of which were reactive lymphadenitis (50.44%). ZN stain for AFB was positive in 24.49% of cases with suspected tuberculosis. Maximum number of positive cases (56.75%) was found, when purulent material was aspirated. Metastatic deposits were seen in 12.68% of cases. Most common subtype was poorly differentiated carcinoma.17 cases were diagnosed as Lymphomas, of which 10 were Hodgkin’s lymphoma and 7 were Non-Hodgkin’s. Histopathological data was available for 41 cases. 38 cases correlated well with FNAC. There was good correlation between FNAC and histopathology with an overall agreement of 92.7% (38 out of 41). Considering histopathology as gold standard, specificity of FNAC was 92.7%. CONCLUSION: Fine Needle Aspiration Cytology (FNAC) is an accurate diagnostic technique in diagnosing aetiology of lymphadenopathies which is one of the commonest clinical presentations of patients attending a health care centre and which can have an inflammatory to a neoplastic aetiology. FNAC provides a speedy diagnosis which will help the clinician to confirm or exclude the clinical differential diagnosis made at first visit of the patient and helps him to further plan the treatment. With the advent of ultrasound and computerized tomographic machines, the evaluation of deep-seated lymph nodes has also become possible through Guided FNAC’s. KEYWORDS: FNAC, Lymphadenopathy, Histopathological Correlation.
INTRODUCTION: Fine Needle Aspiration Cytology (FNAC) is an accurate diagnostic technique in diagnosing aetiology of lymphadenopathies, very common clinical presentations of patients. The aetiology varies from an inflammatory process to a malignant condition. Very often lymphadenopathy may be the only manifestation of an underlying occult disease.(1) It is a simple and an easy technique and the reports can be made available within an hour. Before the advent of FNAC, the diagnosis of lymphadenopathies was done after surgical excision followed by histopathological examination. With the introduction of FNAC all the peripheral nodes that are easily accessible can be assessed through a needle to arrive at a workable diagnosis. With the help of ultrasound guided or computerized tomographic guided FNAC the evaluation of deep-seated lymph nodes has also become possible. A study of FNAC of Lymphadenopathies” was taken up with objectives of studying the cytological features in lymphadenopathy and categorize them with respect to aetiology, age, sex and site of occurrence. Histopathological correlation of FNAC findings was done, wherever possible.

MATERIALS AND METHODS:
Source of Data: All patients referred to the department of pathology of a tertiary care hospital, for FNAC of superficial and deep lymph nodes were included in our study. The patients were clinically evaluated, and the clinical details were obtained from the medical records. FNAC was done and the standard method for the procedure adopted. All the slides were reviewed and their diagnosis was made.
Duration of Study: Ours was a 3 years study (June 2006-May 2009).

Inclusion Criteria:
1. All patients referred to the department of pathology for FNAC of lymph nodes in the study period.
2. Both Superficial and deep group of lymph node FNAC will be included. USG/CT SCAN guided FNAC were included.
3. FNAC from those lesions which was provisionally thought to be non-lymphoid origin and that which turned out to be from a lymph node.

Exclusion Criteria:
1. The FNAC of the swelling provisionally diagnosed lymph node swelling, later, after the procedure of FNAC turned out not to be from a lymph node.

A total of 678 patients were included in our study, reported to various clinical departments with history of swelling. These patients were clinically evaluated. The limitations and complications of FNAC were explained to the patient. An informed consent was obtained for the procedure. Lymph node to be aspirated was first examined thoroughly to determine the site of aspiration.

Procedure: Under aseptic precautions the node was held between the left index finger and thumb, followed by insertion of a 22 or 23 - gauge needle fitted to a 10 ml syringe and aspiration done. Four smears were made, two of them were alcohol fixed for PAP and H & E staining. The
other two were air-dried for staining with MGG. The smears were also air dried for ZN staining wherever necessary. For deep-seated nodes in the abdomen and pelvis, USG guided/CT guided FNAC was done using a 21 or 22 gauge disposable lumbar puncture-needle and syringe. Once the position of needle was confirmed by USG/CT, a similar procedure as mentioned above was followed for collection of material. In cases where fluid was aspirated, the smears were made from the centrifuged deposits followed by staining methods as mentioned above.

Lymph node biopsy was available in 41 cases. Lymph nodes were fixed in formalin, bits were given from entire node for routine processing. After the routine processing and paraffin embedding sections of three to four microns were taken. Clearing of the slides was done, which was followed by H & E staining. Special stains such as Reticulin and PAS were used wherever required.

Statistical analysis was done in 41 cases, where FNAC diagnosis was correlated with histopathological diagnosis. Interpretation of aspirate was done by assessing adequacy and representativeness of material in the smear.

- The assessment of the cyto-morphological features like the overall cell population, predominant pattern was done under low power, with the individual cell morphology studied under High power. Categorization of the aspirates was done based on the predominant population of cells, and interpreted.

RESULTS: A total of 678 cases were enrolled in the study period. Age of the patient varied from 6 months to 80 years. Maximum number of patients was seen from 20 to 29 years. Only 2 cases were seen in age group of 80-89 years. Out of 678 patients 368 were males and 310 were females. There was male preponderance of cases.

Presenting Complaints: The presenting complaint in 79% of patients was swelling (localized). Fever was the presenting complaint in 47% of the patients, another 11% of patients presented with undiagnosed weight loss. Aspiration was done in 678 cases, 3 aspirates yielded inadequate sample for cytologic interpretation.

Site of involvement: Cervical lymphnodes (506 cases) were the most commonly involved group of lymph nodes in the study group of 678 patients. Axillary nodes (56 cases), inguinal nodes (52 cases) and other nodes (76 cases) were involved. Other nodes also included deep nodes mostly the retroperitoneal. In 11 cases lymph nodes were involved at more than one site.

Consistency of nodes: In 67.2% of the cases nodes were firm in consistency. Hard nodes were present in 9.4% of cases. Most of the hard nodes were seen in malignant deposits. Most of the soft nodes (23.2%) were seen in suppurative lymphadenitis, granulomatous lymphadenitis and in metastasis of squamous cell carcinoma with liquefactive degeneration.

Number of nodes: In 70.2% of cases only a single node was involved. Multiple nodes at the same site were involved in 5% of the cases. Most of the multiple nodes were either due to granulomatous lymphadenitis or due to metastatic deposit.
**Guided Aspiration:** USG guided FNAC was done in 22 cases. Of the 22 cases 14 cases were due to tuberculosis, one nonspecific, 2 were suppurative, 3 were poorly differentiated metastasis and 2 were NHL of retroperitoneal lymph node.

The modes of presentation were weight loss, swelling, and fever. Fever and swelling were present in 9 cases (40.9%) each, and weight loss was present in 3 cases (13.3%).

**AFB Positivity:** Out of 52 cases of AFB positive aspirates, 2 cases showed caseous aspirate, 8 cases showed grayish white aspirate, and 42 cases showed frank purulent aspirate.

**Diagnosis of lymphadenopathies on FNAC:** Of the total numbers of 678 cases, 565 cases were benign lymphadenopathies, 86 were metastasis, and 17 cases of lymphomas. In 3 cases the aspirate was inadequate and hence inconclusive.

**Distribution of benign lymphadenopathies on FNAC:** Reactive lymphadenitis constituted 50.44% of cases while granulomatous lymphadenitis constituted 35.92% of cases. 11.15% cases of suppurative lymphadenopathy were diagnosed. In two cases opinion was difficult as the aspirate was hemorrhagic and scanty. There was no evidence of malignancy.

| FNAC diagnosis                  | No. Of cases | %  |
|--------------------------------|--------------|----|
| Reactive lymphadenitis          | 285          | 50.44|
| Suppurative lymphadenitis       | 63           | 11.15|
| Granulomatous lymphadenitis     | 203          | 35.92|
| Others                         | 12           | 2.12|
| **Total**                      | **563**      | **100**|

Table 1: Distribution of cases in benign lesions

**Tuberculous Lymphadenitis:** A total of 204 with cytological evaluation suggestive of tuberculosis were studied. 99 patients had findings suggestive of granulomatous lesion, 31 had caseation, and 74 patients had suppurative adenitis.

In fifty two patients (25.49%) aspirate was AFB positive. In nodes with caseous aspirate, 6.4% were AFB positive. In 74 nodes with purulent aspirate, 42 cases (56.75%) were AFB positive. The details are shown in the table below:

| Major cytological features       | No. of cases | %     | AFB positivity |
|----------------------------------|--------------|-------|----------------|
| Granulomatous without necrosis   | 99           | 48.52%| 8.08%, (n=8)   |
| Suppurative                      | 74           | 36.27%| 56.75%, (n=42) |
| Caseation necrosis               | 31           | 15.19%| 6.4%, (n=2)    |
| **Total**                        | **204**      | **100**| **25.49%, (n=52)**|

Table 2: Correlation of major cytological features in tuberculous lymphadenitis
**Distribution of Metastatic Lesions:** Cytological evidence of metastasis was present in 12.68% of cases. Of this 32.55% of cases were from squamous cell carcinoma, 24.41% were from adenocarcinoma, and 40.69% from poorly differentiated carcinoma. The two cases were papillary carcinoma of thyroid and malignant melanoma.

**LYMPHOMAS:** Seventeen cases of lymphomas were diagnosed, 7 were categorized as NHL and 10 cases were of Hodgkin’s lymphoma. In four cases there were leukemic deposits, the diagnosis of which was confirmed with the haematological studies.

**HIV LESIONS:** In our study a total number of thirty seven cases were positive for HIV antibody test. Cytologically, 19 cases were diagnosed as granulomatous lymphadenitis. Aspirate failed in one patient in spite of repeated attempts. The other diagnoses were as shown in the table below.

| Cyto-diagnosis                        | No. of cases | %   |
|---------------------------------------|--------------|-----|
| Reactive Lymphadenitis                 | 8            | 21.6|
| Granulomatous Lymphadenitis            | 21           | 56.75|
| Others-Nonspecific*                    | 2            | 5.4 |
| Hodgkin’s                              | 2            | 5.4 |
| NHL                                    | 3            | 8.1 |
| Failed aspirate                        | 1            | 2.7 |
| **Total**                              | **37**       | **100** |

Table 3: Distribution of HIV Cases

Cryptococcus was found in 38 year old male patient. In another patient Castleman’s disease was diagnosed.

**AFB positivity in HIV patients:** In 37 patients who were HIV positive, AFB was positive in 13 patients, and in one patient aspirate failed. In 8 patients AFB was negative. In 16 patients AFB testing was not done as the cytological diagnosis was not benign lesion. The details of correlation of aspirate with AFB positivity are as shown below.

| Type of Aspirate | AFB Positive | AFB Negative | AFB not done | Total |
|------------------|--------------|--------------|--------------|-------|
| Sanguineous      | 0            | 0            | 9            | 9     |
| Purulent         | 10           | 2            | 0            | 12    |
| Caseous material | 2            | 2            | 0            | 4     |
| Blood            | 0            | 0            | 0            | 0     |
| Grey white       | 1            | 4            | 6            | 11    |
| Failed/Scanty    | 0            | 0            | 1            | 1     |
| **Total**        | **13**       | **8**        | **16**       | **37** |

Table 4: Correlation of aspirate with AFB positivity in HIV patients (n=37)
CORRELATION OF FNAC AND HISTOPATHOLOGY: The initial cytological diagnosis was compared with the gold standard histopathological diagnosis in 41 cases. The details are as shown in the following table.

| FNAC diagnosis          | No | Hpe correlation                  | No. of cases correlated |
|-------------------------|----|----------------------------------|-------------------------|
| Reactive                | 9  | 8=reactive, 1=NHL                | 8                       |
| Suppurative             | 2  | 2= Suppurative                   | 2                       |
| Granulomatous           | 8  | 1=HD, 7=Tubercular               | 7                       |
| Benign others           | 4  | 1=Castleman’s, 1=Rosai Dorfman’s, 1=nonspecific, 1=NHL | 3                       |
| Metastasis-others       | 1  | 1=thyroid papillary              | 1                       |
| Adenocarcinoma (Metastasis) | 6  | 6=Adenocarcinoma                  | 6                       |
| NHL                     | 4  | 2=small cell, 2= mixed cellularity | 4                       |
| HD                      | 7  | 7=HD                             | 7                       |
| **TOTAL**               | **41** |                                      | **38**                  |

Table 5: Correlation of FNAC and HPE

| FNAC | HPE | 1* | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Total |
|------|-----|----|---|---|---|---|---|---|---|-------|
| 1    | 8   | 0  | 0 | 0 | 0 | 0 | 1 | 0 | 9    |
| 2    | 0   | 0  | 0 | 0 | 0 | 0 | 0 | 0 | 2    |
| 3    | 0   | 0  | 7 | 0 | 0 | 0 | 0 | 1 | 8    |
| 4    | 0   | 0  | 0 | 3 | 0 | 0 | 1 | 0 | 4    |
| 5    | 0   | 0  | 0 | 0 | 1 | 0 | 0 | 0 | 1    |
| 6    | 0   | 0  | 0 | 0 | 6 | 0 | 0 | 0 | 6    |
| 7    | 0   | 0  | 0 | 0 | 0 | 4 | 0 | 0 | 4    |
| 8    | 0   | 0  | 0 | 0 | 0 | 0 | 7 | 0 | 7    |
| **Total** | **8** | **2** | **7** | **3** | **1** | **6** | **6** | **8** | **41** |

Table 6a: Correlation table of FNAC and HPE

{*1=Reactive, 2=suppurative, 3=granulomatous, 4=benign nonspecific, 5=Metastasis (thyroid-papillary), 6=Metastatic Adenocarcinoma, 7=NHL (Non-Hodgkin’s Lymphoma), 8=HD (Hodgkin’s Lymphoma)}

Agreement between FNAC and Histopathology=38 out of 41=92.7%, considering histopathology as gold standard specificity of FNAC is 92.7%.
Out of 41 cases, 38 cases showed correlation. The cytological diagnosis was accurate in lymphomas and metastatic lesions. In non-malignant conditions, no correlation was found in 3 cases.

| FNAC     | Histopathological Diagnosis | Total |
|----------|-----------------------------|-------|
|          | Malignant                   | Nonmalignant |
| Malignant| 18                          | 0      | 18   |
| Non malignant | 3                     | 20     | 23   |
|          | 21                          | 20     | 41   |

Table 6b: correlation of FNAC and HPE (For malignant lesions)

(Sensitivity 85.71%, Specificity 100%).

| FNAC     | Histopathological Diagnosis | Total |
|----------|-----------------------------|-------|
|          | Benign                      | Non benign |
| Benign   | 3                           | 1      | 4    |
| Non benign | 0                       | 37     | 37   |
| Total    | 3                           | 38     | 41   |

Table 6c: Correlation of FNAC and HPE (For benign lesions)

(Sensitivity 100%, Specificity 97.4%)

**Rare Lesions:** Rosai-Dorfman disease was diagnosed in a 50 year old man with cervical lymphadenopathy. Castleman’s disease was diagnosed in a 28 year old man. Microfilaria was found in two patients of 25 & 40 years of age. One interesting case of cryptococcal lymphadenitis was found in a 38 year old HIV positive patient. Leukemic infiltrates were found in a few cases, which were confirmed by blood and the bone marrow studies.

**Fig. 1:** Granulomatous lymphadenitis showing well defined epithelioid cell granuloma. (Geimsa, x40).
Fig. 2: AFB (ZN stain x100).

Fig. 3a: FNA filarial lymphadenitis showing sheathed microfilaria in a scant lymphocytic & fluid background. (Geimsa, x40)

Fig. 3b: HPE filarial lymphadenitis showing cross section of the embryonated filarial worm (H & E, x 40).
Fig. 4: FNAC cryptococcal lymphadenitis showing spores with thick capsule (H & E, x40).

Fig. 5: FNA lymph node non hodgkin’s lymphoma. Monotinous population of large lymphoid cells with irregular borders, clumped chromatin (Geimsa, x 40).

Fig. 6a: FNA lymph node Hodgkin’s lymphoma showing mononuclear RS cells (Geimsa, x40).
**Fig. 6b:** HPE LYMPH NODE HODGKIN’S LYMPHOMA SHOWING CLASSICAL RS CELLS WITH SCLEROSIS (H&E, 400x).

![Fig. 6b](image_url)

**Fig. 7:** Leukemic deposits lymph node showing large monocytoid cells with open chromatin prominent nucleoli (Geimsa, x100)

![Fig. 7](image_url)

**Fig. 8:** Squamous cell carcinoma deposits showing pleomorphic dispersed cells with prussian blue cytoplasm & large hyperchromatic nucleus (Geimsa, x40).

![Fig. 8](image_url)
**Fig. 9:** Adenocarcinoma deposits showing large cells in acinar pattern with open chromatin prominent nucleoli (Geimsa, x40).

![Fig. 9](image_url)

**Fig. 10:** Malignant melanoma deposits showing large cells with plasmacytoid appearance with brown to black pigment in the cytoplasm (Geimsa x40).

![Fig. 10](image_url)

**Fig. 11a:** Papillary carcinoma thyroid deposits follicular cells with psamomma bodies (geimsa, x10).

![Fig. 11a](image_url)
DISCUSSION: FNAC of lymph nodes is one of the routinely used diagnostic procedures in patients presenting with lymphadenopathy. In our study extending over three-year duration 678 patients underwent FNAC of the nodes. Age of the patient varied from 6 months to 80 years. Maximum number of patients was seen from 20 to 29 years. The ratio of number-of males to females was 5:4 with male preponderance, which correlated with other studies. Swelling was the presenting complaint in 79% of patients. The other important modes of presentations were fever 47% of cases, and weight loss in 11% of cases.

Aspiration was done in 678 cases, 3 aspirates yielded inadequate sample for cytologic interpretation. This was due to small size of the node, scanty cellularity, necrosis, obscurity of cells by blood. The comparison of inadequate aspirate in different studies is shown below.

| Studies                        | Total of Cases | Inadequate Aspirate | %   |
|-------------------------------|----------------|---------------------|-----|
| Barbara L steel et al         | 1103           | 120                 | 11  |
| Arun Kumar et al              | 1161           | 163                 | 14  |
| Anastosiaserranoega et al     | 693            | 55                  | 8   |
| Frable WJ&Frable MA1          | 322            | 10                  | 3.1 |
| Present study                 | 678            | 3                   | 0.3 |

Table 7: Distribution of adequacy of aspirates in various studies²,³,⁴,⁵,⁶

Site of Node Involvement: Cervical group and deep-seated lymph nodes were the most common and least commonly involved nodes respectively. The involvement of nodes correlated well with other studies.

Size of the Node: In 32.5% % of the cases the size of the node measured less than 1x1 centimeter, in 43 % of the cases the size measured 1.1x1 to 2x2 centimeter, in 12.5% of cases size measured 2.1x2 to 3x3 centimeter and in 8.8% sizes were more than 3.1x3cms. Most of the reactive nodes were smaller than malignant nodes.
Consistency of Nodes: Majority of nodes (67.2%) were firm to palpate. In 9.4% of cases nodes were hard to palpate. Most of the hard nodes were associated with malignancy, while soft nodes were associated with suppurative lymphadenitis.

Number of Nodes at each Site: Most of nodes aspirated were solitary (n=476, 70.2%). In only 34 cases (5%) there were more than three nodes at the given site.

Guided FNAC: Guided aspiration was done in 22 cases; the modes of presentation were weight loss, swelling, and fever. Fever and swelling were present in 9 cases (40.9%) each and, weight loss was present in 3 cases (13.3%). The symptomatology in guided cases was similar to study by Ibrahim et al. Adequate material was obtained in all the cases. No untoward complications occurred in any of the cases during guided aspiration. Our study correlated with study by Sanjay Gupta et al where adequate material was obtained in 85.2% of cases.

Color of Aspirate: In 42.33% cases sanguineous fluid was aspirated, in 19.32% cases purulent fluid & in 19.02% cases aspirate was grey white in color. The caseous/cheesy material was aspirated in 4.71% and bloody aspirate in 14.15% cases. In all but 3 cases, the aspirate was satisfactory.

Type of aspirates in AFB positive cases: In 52 cases aspirate was AFB positive. Out of 52 cases of AFB positive aspirates, 3.84% cases showed caseous aspirate, 15.38% cases showed grayish white aspirate and 80.76% cases showed frank purulent aspirate.

Incidence of Lymphadenopathies: Aspirates were benign in 83.33% of cases; metastatic deposits were found in 12.68 % of cases and lymphomas in 2.5% of cases. The comparison of present findings which correlated with other studies is as follows:

| Lesions                | Arun Kumar et al | Patra et al | John J. et al | Leon Van De et al | Raghuveer et al | Present study |
|------------------------|------------------|-------------|---------------|-------------------|-----------------|--------------|
| Benign lymphadenopathy | 67.2%            | 75%         | 94%           | 57%               | 45%             | 83.33%       |
| Malignant deposit      | 10%              | 10%         | 15%           | 16%               | 28%             | 12.68%       |
| Lymphomas              | 1.8%             | 7%          | 4%            | 27%               | 6%              | 2.5%         |

Table 8: Distribution of incidence of lymphadenopathies in various studies

BENIGN LYMPHADENOPATHIES:

Reactive Lymphadenitis: We diagnosed 285 cases of reactive lymphadenopathy (42.03% of total 678 cases). Our study correlated with studies by Patra et al where 39 % of aspirated nodes were reactive. In as much as half (50.44%) of benign cases (n=565) the reactive lymphadenitis was present.
**Suppurative Lymphadenitis:** Suppurative lymphadenitis was diagnosed in 9.29% of total of 678 cases. The distribution of cases correlated with other studies.

**Granulomatous Lymphadenitis:** Granulomatous lymphadenitis was diagnosed in 29.94% of total 678 cases. This finding correlated with studies by Arun Kumar Gupta et al\(^4\) (34%), and Malacar et al\(^13\) 26(39%).

**Ziehl Neelson stain for AFB:** Ziehl Neelson staining for AFB was positive in 24.49% of cases with TB lymphadenitis. W.F. Ng et al\(^14\) was reported positivity in 41.6% cases, S. S Ahmed et al\(^15\) have reported positivity in 46% of cases, while Arora & Arora (1990) have reported positivity in 37.5% of cases.\(^6\)

| Patterns            | S.S. Ahmed et al\(^15\) | W.F Ng et al\(^14\) | Arora & Arora\(^6\) | Present study |
|---------------------|--------------------------|---------------------|---------------------|---------------|
| AFB Positivity      | 46%                      | 41.6%               | 37.5%               | 24.49%        |

**Table 9:** Distribution of patterns of AFB positivity in various studies

In 74 cases of necrotic aspirates ZN stain was done. AFB was positive in 42 cases. Similar findings were found in study by Malakaret al.\(^13\) In 56.75% of purulent aspirates AFB was positive. Similar finding were found by S.S. Ahmed et al.\(^15\)

**METASTATIC DEPOSIT:** Lymph node aspirates in 86 cases showed metastatic deposits. The finding of metastatic deposit correlated well with other studies mentioned below:

| Metastatic deposit       | % of cases |
|--------------------------|------------|
| Arun Kumar Gupta et al\(^4\) | 10%        |
| Anastasio Seranno Egea et al | 24%    |
| R.K. Narang et al\(^16\)   | 23%        |
| Present Study            | **12.68%** |

**Table 10:** Distribution of metastatic deposits in various studies

**Squamous Cell Carcinoma:** Squamous cell carcinoma was diagnosed (32.55%) metastatic deposits in lymph nodes. The primary sites of origin are from malignancies of head and neck region, lung, cervix and gut.

**Adenocarcinoma:** Diagnosis of adenocarcinoma was made in 24.41% of metastatic deposits. The Diagnosis of adenocarcinoma was made in 24.41% of metastatic deposits. The primary sites of origin are from malignancies of breast, stomach, anal canal and lung.

**Poorly Differentiated Carcinoma:** We diagnosed 35 cases (40.69%) of poorly differentiated carcinoma. This was the most common form of metastasis found in our study.
The comparison of metastasis of various types is as follows:

| Type of metastasis            | Liu et al\(^{17}\) | Raghuveer et al\(^{9,12}\) | Present study |
|-------------------------------|--------------------|---------------------------|---------------|
| Squamous cell carcinoma       | 42%                | 66%                       | 32.55%        |
| Adenocarcinoma                | 24%                | 23%                       | 24.41%        |
| Poorly differentiated carcinoma| 34%                | 7%                        | 40.69%        |

**Table 11: Distribution of different metastasis deposits in various studies**

**LYMPHOMAS:** Lymphomas constituted 2.5% of cases in our study. This was in accordance with other studies.

**Hodgkin’s Lymphoma:** Ten cases of Hodgkin’s lymphoma with characteristic bimodal age distribution was diagnosed, of them five cases were less than 20 years of age while one case was in a 80 year old person.\(^{17}\) Histopathological correlation was done in seven cases. All cases correlated with cytological diagnosis. Two cases were seen in HIV patients.

The age of the patient, polymorphous population of cells and atypical cells should raise a suspicion of Hodgkin’s lymphoma that the diagnosis can be confirmed by Immunocytochemistry.

**Non-Hodgkin’s Lymphomas:** Fine needle aspiration of lymph nodes revealed 7 cases of Non-Hodgkin’s Lymphoma. Four cases diagnosed as NHL on cytology correlated with histopathology. Ruth L. Katz emphasized that an attempt to diagnose and sub classify NHL on cytology must be made\(^{18}\) However a definitive diagnosis is possible only through multiparametric approach through the use of IHC and flow cytometry.

4 cases were sub classified into following types. Two were small cell type and two cases were mixed cellularity type. Three cases were seen in HIV patients. Two cases were guided aspirates.

**HIV Positive Cases:** From a total of 678 patients, 37 were positive for HIV antibody test. Comparison with other studies is represented below.

|                      | Uma NaharSarika\(^{19}\) | Kent Bottles et al\(^{20}\) | Our study |
|----------------------|--------------------------|-----------------------------|-----------|
| Reactive lymphadenitis| 40%                      | 50%                         | 21.6%     |
| Granulomatous Lymphadenitis | 36%             | 10%                          | 56.75%    |
| Lymphoma             | 4%                       | 17%                         | 13.8%     |
| Others               | 4%                       | 23%                         | 5.4%      |

**Table 12: Distribution of HIV positive cases in various studies**

**Rare Lesions:** Rosai-Dorfman disease was diagnosed in 50 year old man with cervical lymphadenopathy. Castleman’s disease was diagnosed in a 28 year old man. Microfilaria was found in two patients of 25 &40 years of age. One interesting case of cryptococcal lymphadenitis was found in a 38 year old HIV positive patient. Leukemic infiltrates were also found in a few patients.
**CORRELATION OF FNAC AND HISTOPATHOLOGY:** There was good correlation between FNAC and histopathology in 41 cases. The Overall agreement between FNAC and histopathology was 92.7% (38 out of 41). Considering histopathology as gold standard specificity of FNAC is 92.7%. In malignant lesions, the sensitivity and specificity of FNAC in diagnosing malignancy were 85.71% and 100% respectively. In non-malignant (Benign) lesions, however showed that sensitivity and specificity of FNAC were 100% and 97.4% respectively. This shows that FNAC is good tool for diagnosis considering all the advantages.

**CONCLUSIONS:** This study has been undertaken to evaluate the role of FNAC in diagnosis of both superficial and deep lymphadenopathies. Lymphadenopathy is one of the commonest clinical presentations of patients, attending the outpatient Department and inpatient departments. Etiology varies from an inflammatory process to a malignant condition. FNAC diagnosis will help the clinician to confirm or exclude the clinical differential diagnosis made at first visit of the patient to the OPD. Speedy cytological diagnosis helps the clinician to further plan the treatment. Fine Needle Aspiration Cytology (FNAC) is an accurate diagnostic technique in diagnosing etiology of lymphadenopathies. It is simple, easy technique and reports can be made available within an hour.

Before the advent of FNAC the diagnosis of lymphadenopathies was done after Surgical excision followed by histopathological examination. With the introduction of FNAC all the peripheral nodes that are easily accessible can be assessed through a needle to arrive at a workable diagnosis. With the help of ultrasound guided or computerized tomographic guided FNAC the evaluation of deep-seated lymph nodes has also become possible. Lymphomas were diagnosed in 17 cases. 10 cases of Hodgkin’s lymphoma and 7 cases of NHL were diagnosed.

Histopathological correlation was done in 41 cases. 38 cases correlated well with FNAC. There was good correlation between FNAC and histopathology in 41 cases. The overall agreement between FNAC and histopathology was 92.7% (38 out of 41). Considering histopathology as gold standard specificity of FNAC is 92.7%.

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