

# Fine Needle Aspiration in the Evaluation of Children With Peripheral Lymphadenopathy

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In a developing country like Pakistan fine needle aspiration is a simple, cheap and well-tolerated procedure. Two hundred and forty F.N.A's were carried out during the 30 month period from April 1997 to October 1999. The ages of the patients ranged between 3 months to 16 years. There were 136 (56.6%) males and 104(43.3%) females. Most of the aspirated nodes were in the cervical region. Aspirated material in 12 cases (5%) was inadequate for cytologic diagnosis. In the remaining 228 cases, 129 (56.5%) were diagnosed as reactive lymphadenitis, 49(31.5%) were tuberculous lymphadenitis, 29(12.7%) were chronic lymphadenitis, 12(5.4%) were granulomatous lymphadenitis, 4 (1.8%) of Hodgkin's lymphoma and 1(0.41%) case each of Histiocytosis-X and Gaucher's disease. Three cases (1.3%) were suspicious for malignancy. FNAC of enlarged lymph nodes in children is a safe and reliable procedure that often obviates the need for an excisional biopsy.

**Key Words:** - Fine needle Aspiration Cytology, Superficial lymph nodes.

Superficial lymphadenopathy is a sign of inflammation, lymphoma or metastatic malignant tumor<sup>1</sup>. For the differential diagnoses of unexplained lymphadenopathy, Fine Needle Aspiration cytology is being used increasingly in the assessment of patients and it gives immediate definitive diagnoses and helps to guide appropriate specialist referral and further investigations<sup>2</sup>. The usefulness of the procedure in the staging and diagnosis of various malignant and lymphoproliferative tumors, as well as its role in distinguishing reactive hyperplastic lymph nodes from lymphoma has been documented in the literature<sup>3</sup>.

The technique of FNA was introduced in the 1930's by Martin & Ellis<sup>4</sup> and Stewart<sup>5</sup> in United States and it was subsequently popularized by others in Europe<sup>6, 7</sup>. Now it is a popular procedure world wide. It is simple, cheap and well tolerated procedure that is well established as a method of definitive diagnosis of palpable masses and is especially suitable in a developing country like Pakistan<sup>3</sup>. It offers an excellent alternative to excisional biopsy, does not require hospital admission or anaesthesia and does not leave a scar<sup>2</sup>. It is ideal for monitoring the course of disease and response to therapy.

Fine needle aspiration of different organs like lymph node, thyroid, breast and even of deep seated organs under ultrasound guidance can be performed. This study was carried out to evaluate children with lymphadenopathy.

## Aim

To report the experience with fine needle aspiration biopsy for the diagnosis of lymphadenopathy in children.

## Patients and methods

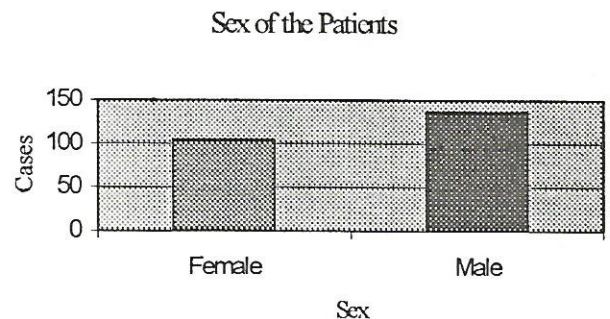
A total of 240 fine needle aspirations of lymph nodes (Graph 1) were carried out in the histopathology department of CH & ICH, Lahore during the 30 months period from April 1997 to October 1999. The ages of the patients ranged between 3 months to 16 years. There were 136

(56.6%) males and 104 (43.3%) females.(As shown in Graph 1). The most commonly aspirated nodes were cervical (91%) followed by axillary (7%) and inguinal 2%. As shown in Table-I.

Table 1. Anatomical location of FNA. of lymph nodes

Site	No. of Cases	%age
Cervical	223	91%
Axillary	12	7%
Inguinal	5	2%

Graph 1



At the time of aspiration relevant clinical information was obtained regarding age and sex of patient, the size and site of the lesion, time of onset and duration of the swelling. The results of the laboratory investigations were also noted. We used 20 gauge 10 cc syringes for aspiration. The site was carefully palpated and skin was cleaned with methylated spirit and iodine. The lump was held firmly between the thumb and forefinger of the left hand, the needle tip was pushed into the lesion, moved to and fro for a few seconds and then aspirated. This aspirated material was smeared on the glass slides and fixed in absolute alcohol. After fixation Hematoxylin and Eosin stain was performed in all the cases and Z.N and other special stain

were performed in selected cases. Purulent and cheesy aspirates were sent for routine culture and A.F.B. culture in microbiology department.

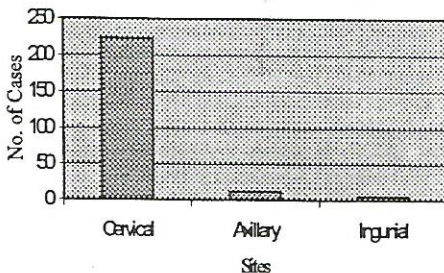
## Results

Out of 240 aspirations the material was inadequate in 12 cases. In the remaining 228 cases, the result was (Table-II).

Table II Results of FNA of lymph node

Diagnosis	No. of cases	%age
Reactive Hyperplasia Lymph nodes.	129	56.5%
Tuberculous lymphadenitis	49	31.5%
Chronic lymphadenitis	29	12.7%
Granulomatous lymphadenitis	12	5.4%
Hodgkin's lymphoma	4	1.8%
Histiocytosis - X	1	0.41%
Gaucher's disease	1	0.41%
Suspicious for malignancy	3	1.3%

Anatomical Location of FNA of Lymph Nodes



One hundred and twenty nine cases (56.5%) were diagnosed as reactive hyperplasia of lymph nodes. The smear's showed good cellularity and a mixed population of lymphocytes at various stages of maturation, like lymphocytes, centrocytes, centroblasts, immunoblasts etc. Tingible body macrophages in the smear provides helpful evidence of germinal center sampling<sup>8,9</sup>. In 49 (31.5%) cases, diagnosis of tuberculous lymphadenitis was given. Such smears showed clusters of epithelioid cells with elongated nuclei, pale finely granular chromatin, faintly staining cytoplasm, Langhan's type of giant cells and areas of caseation necrosis<sup>10, 11</sup>. In a few cases superadded pyogenic inflammation was also present. Z.N. staining was performed in 23 cases and only 2 cases were found to be positive for AFB. Routine culture was positive in one case only, in which staph aureus was isolated. On AFB culture, growth was found in three cases. In 12 (5.4%) cases diagnosis of granulo matous lymphadenitis was given as smears showed small clusters of epithelioid cells with no caseation. Z.N. staining was done in five cases. All of them proved to be negative for AFB. On routine culture and culture for AFB, no growth was obtained in any case. However the possibility of tuberculosis could not be ruled out in these cases. Twenty nine cases (12.7%) were

diagnosed as chronic lymphadenitis as smears showed mature lymphocytes, increased number of plasma cells and fibrosis.

Four cases (1.8%) revealed Hodgkins Lymphoma. In these cases typical Reed Sternberg cells and its mononuclear variants were present against a reactive background<sup>12</sup>. All these cases were confirmed on subsequent excisional biopsies. One case (0.41%) showed the morphology of Histiocytosis-X with Langerhan cells having large convoluted nuclei, eosinophils and a few multinucleated giant cells. It was also confirmed on subsequent biopsy. In another case (0.41%) we gave the diagnosis of Gaucher's disease as typical large cells having crumpled tissue paper like appearance of cytoplasm and central nuclei were present. These cells were PAS positive. Patient could not be evaluated further as parents refused to do so. Three cases were diagnosed as suspicious for malignancy, as smear contained rare cells that were abnormal but not overtly malignant, leaving a margin of doubt. One case was later diagnosed as Hodgkin's disease, second as reactive hyperplasia and in third case patient did not turn up.

## Discussion

Fine needle aspiration biopsy has proved its usefulness in the diagnosis of a wide variety of benign and malignant lesions<sup>13</sup>. Cytomorphologic examination of lymph node aspirates is a simple and non-invasive method saving surgical intervention, as acute and sub acute lymphadenitis can be treated by antibiotics indicated by cultures. In patients with known clinical or confirmed malignancy, Fine Needle Aspiration can provide an immediate preliminary diagnosis of recurrent or metastatic malignancy thus surgical biopsy may be avoided.

Our results in this series indicate that reactive lymphadenopathy constitutes a significant proportion of the findings in aspirates of enlarged lymphnodes. In children reactive hyperplasia is usually due to viral infection that can regress spontaneously. Similarly tuberculous lymphadenitis can be diagnosed by F.N.A thereby preventing undue excisional biopsy.

In fine needle aspirates from superficial lymph nodes, diagnostic accuracy is influenced by many factors, including the size of the node, the technique used in aspiration and the degree of fibrosis<sup>9</sup>. In view of these factors when a cytological diagnosis is negative in a patient with a clinical suspicion of malignancy, either a repeat aspiration or an excisional biopsy is mandatory. The reported percentage of inadequate smears varies from 10-20%<sup>14,15,16</sup>. In our series 5 % samples were inadequate 56.5% were diagnosed as reactive hyperplasia which is slightly more than a similar study carried out in Chile by Rios and other investigators in 1999<sup>17</sup>. However chronic lymphadenitis was the commonest inflammatory lesion diagnosed in adults according to parsad et al<sup>18</sup>. We encountered tuberculosis in 31.5% of cases, which is

higher than reported incidence by Thomas & Adeyi in Nigeria in 1999 (25.7%)<sup>19</sup>. This shows higher incidence in developing countries like ours. In 5.4% of the cases, diagnosis of granulomatous lymphadenitis was given in which epithelioid granulomas were present but no caseation was seen. They were proved to be Z.N negative and culture of aspirated material was negative for AFB. Majority of these patients were already on ATT trial, started by General Practitioner and referred to this hospital. These patients were reevaluated here. So the actual incidence of tuberculosis could be much higher as tuberculosis could not be ruled out in these cases diagnosed as granulomatous lymphadenitis. According to our results, Fine Needle Aspiration is justified as first diagnostic step of lymph node if tuberculosis is suspected. A positive result can be regarded as conclusive and spare surgical intervention. Since negative results do not exclude tuberculosis they justify surgical excision for final diagnosis, if tuberculosis is suspected clinically<sup>11</sup>

Chronic lymphadenitis was diagnosed in only 12.7 % of cases in children whereas it is more common in adults according to Prasad and other investigators<sup>18</sup>. Fine needle cytology is an accurate diagnostic procedure in most cases of lymphomas. However the relative importance of lymphoma in FNA practice is variable being dependent both on the patient population and local referral policy. Hsu et al reported only 13 lymphomas comprising 1.8 % of all malignant aspirates in a series of 735 aspirates from patients in Hong Kong<sup>20</sup>. In contrast Prasad and Colleagues found that lymphomas accounted for 31.6 of all lymph node aspirates in Indian patients<sup>18</sup>.

In our study Hodgkin disease was diagnosed in 1.8 % of cases while no case of NHL was reported which is similar to study conducted in children in Kenya by Buchino et al<sup>21</sup>. However they diagnosed one case of NHL out of 110. A study conducted in Chile shows 4.7 % Hodgkins disease and no NHL<sup>16</sup>. Overall incidence of lymphoma is much lower in our study in contrast to study carried out in Nigeria in 1999 which was 16.9 %<sup>19</sup>.

In summary this study reveals an overall diagnostic accuracy of FNA of lymph node, however a very small number of cases i.e three were misdiagnosed either because of sampling error or misinterpretation. It is emphasized that lymph node FNA cytology is complement to histological assessment and that biopsy is advisable in cases with apparent clinical discrepancy.

### Conclusion

F.N.A. of enlarged lymph nodes in children is a safe and reliable procedure that obviates the need for an excisional biopsy as surgery carries significant risks of complications,

invasion, time consumption and prohibitive cost. And in our study its adequacy rate was 95%.

The relatively non-invasive and cost effective nature of the FNA remains a preferred method in developing countries where there are limited funds and facilities.

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