

Role of Fine-Needle Aspiration Cytology in Diagnosis of Hematological Neoplasms

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Lymph node enlargement is a very common condition that may be part of a localized or generalized disease process. Physicians commonly use fine-needle aspiration (FNA) for lymph node evaluation, as it provides a fast and relatively cost-effective way of determining the diagnosis and the subsequent patient management. Ancillary testing for cellular markers (immunophenotyping) by flow cytometry can be done by saving material in a cell culture type liquid media (RPMI). The material saved can be obtained by either rinsing out the remainder of the aspirate from the needle or performing a separate pass specifically for this purpose. Cell blocks can also be used to perform ancillary studies (cytochemistry).

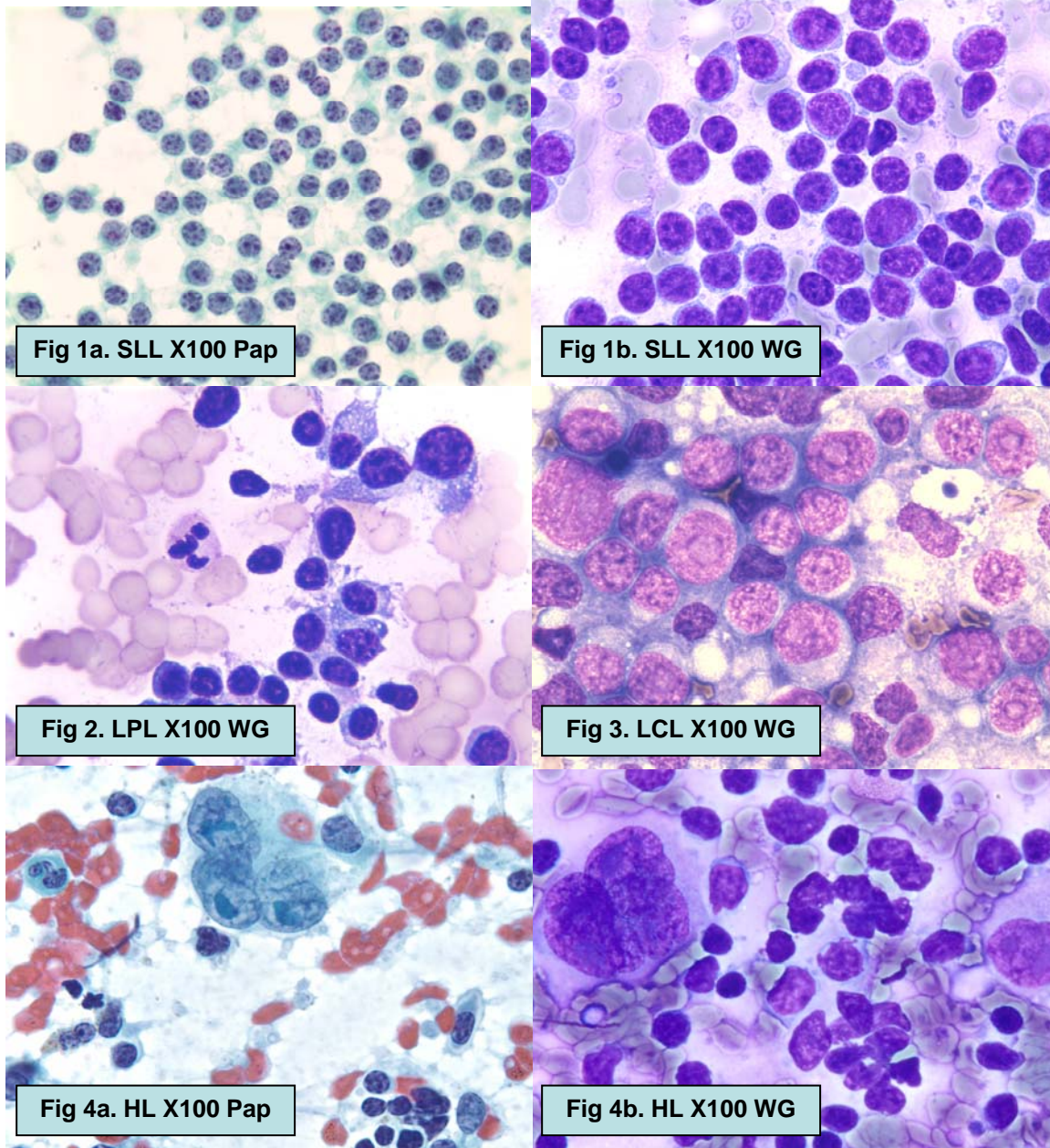
Enlarged lymph nodes can have either benign or malignant neoplastic diseases. Malignant hematological neoplasms can be broadly grouped as Hodgkin and non-Hodgkin lymphomas. In non-Hodgkin lymphoma, a triad of morphology, immunology, and genetics is used for diagnosis. The cytological features can be morphologically grouped into those with small cells such as small lymphocytic lymphoma and those with large cells such as large cell lymphoma. In the small cell type, the aspirate largely consists of a homogenous population of lymphocytes without tingible-body macrophages, and rare transformed larger cells¹ (Figures 1a, 1b, and 2). In large cell lymphomas, the cells may be up to five times the size of a mature lymphocyte, with nuclear pleomorphism and moderate amounts of cytoplasm (Figure 3). Immunophenotyping by flow cytometry may identify unique antigens that help definitely identify the lymphoma.^{2,3} The presence of CD10 can identify those lymphomas that may have follicular architecture; unique combinations of cell markers can confirm the presence of small lymphocytic and mantle cell lymphoma. Genetic analysis can confirm typical translocations seen in many non-Hodgkin lymphomas.⁴

Hodgkin lymphoma requires the presence of classic Reed-Sternberg cells^{5,6,7} or variants amidst a heterogeneous lymphocytic cellular aspirate (Figures 4a and 4b). Flow cytometry has no role in assisting in the diagnosis of Hodgkin lymphoma,³ but special stains on a cell block are helpful in confirming Hodgkin lymphoma.⁸ In general, subclassification of Hodgkin lymphoma is not possible using fine-needle aspiration.²

General points in the use of FNA cytology of hematological neoplasms:

- FNA is widely used for diagnosis; it is a direct and rapid method of evaluating patients with enlarged lymph nodes.
- Ancillary studies are critical in the evaluation of lymphoma and can easily be performed on material obtained from FNA. Flow cytometry has the advantage of detecting many cell markers on a small sample of cells.^{3,9}
- In Hodgkin lymphoma, the presence of the characteristic Reed-Sternberg cell is essential to the diagnosis.⁵
- FNA is useful in the follow-up of newly enlarged lymph nodes in patients with a known lymphoma.
- Knowledge of the clinical presentation of the patient is crucial to the interpretation of FNA.

- In summary, FNA is an important tool in the evaluation of enlarged lymph nodes. Ancillary studies and clinical correlation are essential in attaining the diagnosis.



SLL: Small Lymphocytic Lymphoma; LPL: Lymphoplasmacytic Lymphoma
 LCL: Large Cell Lymphoma; HL: Hodgkin Lymphoma

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