

Chapter 2

Handling of the Lymph Node Biopsy

Key words: Triage, imprint, cytology, molecular, cytogenetics, immunohistology, flow cytometry, electron microscopy, bacterial culture.

Introduction

As with other diagnostic situations, failure to obtain an optimal biopsy is the greatest obstacle to achieving a correct diagnosis. The sample should be representative of the lesion, and, more so in lymphoid disorders, it needs to be optimally preserved and processed for a number of ancillary investigations that have become essential for the proper assessment of lymphoproliferative disorders. A timely and accurate diagnosis of optimally preserved representative material that allows the examination of relevant prognostic and predictive parameters is essential for correct management.

The Biopsy

The biopsy sample must be removed with minimal damage to the tissue. The sample should be representative. Often, when a group of superficial lymph nodes are enlarged, it is the deepest or largest node that reflects the pathology, the others often being reactive. Lymph nodes should be excised intact if possible, with minimal trauma to the specimen as lymphoid cells are fragile and

readily develop artifacts of traction and pressure, especially when the lymph node is fibrotic or removed from confined spaces such as the mediastinum.

Needle or core biopsies taken under imaging guidance are used increasingly, especially when lesions are intra-abdominal or retroperitoneal as it removes the need for laparotomy and the procedure is associated with low morbidity. The limited material restricts the use of some ancillary techniques of examination, but a properly fixed core of tissue can provide good morphological preservation and allow immunohistochemical examination for the precise identification of most common lymphomas. Fine-needle aspiration biopsy has a limited role. It is useful for identifying metastatic disease, confirming recurrence, and staging in some types of lymphoma but is inadequate for subtyping of lymphoma and differentiating most lymphomas from reactive processes. Aspirated samples are useful for flow cytometry as an adjunct to a needle core biopsy sample.

The site of lymphadenopathy does not correlate with a specific etiology. However, some general comments can be made about nodes involved by lymphoma. They tend to be non-tender and often remain mobile, present as generalized lymphadenopathy or involve localized nodes in the neck, axilla or inguinal region, produce asymmetrical enlargement of the mediastinum, or form large palpable or viscera-displacing masses in the abdomen or retroperitoneum. Lymph nodes involved by Hodgkin lymphoma, while non-tender are often fixed and matted. Solitary tender nodes in other sites are generally associated with systemic infections or localized infection in the draining area, e.g., scalp infections produce hyperplasia of occipital or cervical nodes, infections in the hands produce enlargement of epitrochlear nodes, and inguinal lymphadenomegaly may be due to lymphogranuloma venereum, syphilis, and gonococcal, herpetic and mycoplasmal infections. Infections and metastatic carcinoma generally produce tender nodes that may or may not be fixed to surrounding tissues.

Lymph Node Triage

Lymph node specimens need to be assessed individually with regard to the investigations that may be required. As the amount of tissue available may be limited, apportionment of the specimen for the various ancillary investigations will depend on the differential diagnoses considered. It is therefore necessary to formulate a list of possible diagnoses based on the age, gender, relevant clinical history and physical findings, and the biopsy

site as soon as the fresh specimen arrives in the laboratory. For convenience, many laboratories develop fresh lymph node protocols which can be modified according to the quantity or volume of material received. While optimally preserved cytomorphology and immunohistochemistry are the minimal requirements today, consideration should be given to flow cytometry, cytogenetics, and molecular studies. Electron microscopy is less often performed. In the case of infectious diseases, bacterial or viral cultures will be needed, and electron microscopy and storage of fresh frozen tissue may be the requirements for additional studies or research.

An example of a fresh lymph node protocol is provided below in **Table 2.1**.

Table 2.1
Fresh lymph node protocol

1.	Slice, with a new scalpel, the node at 2-mm intervals perpendicular to its long axis.
2.	Prepare touch imprints by gently pressing a clean glass slide on the freshly cut surface of the node, taking care not to drag. Do not prepare more than two imprints per cut surface. The imprints may be air-dried and stained with Diff-Quick or Giemsa, fixed in ethanol for Papanicolaou stain, or fixed in a 10% formalin–100% ethanol mixture (50:50 by volume) for hematoxylin–eosin stain. Imprints fixed in 10% formal-saline and air-dried are particularly useful for immunostaining; alternatively, rehydrated air-dried specimens can be used.
3.	The slice from which imprints are prepared can be frozen for storage and used as required.
4.	Fresh tissue from one pole of the specimen is submitted for flow cytometry.
5.	The other pole is submitted fresh for molecular studies.
6.	If required, fresh material is submitted for cytogenetics and diced tissue fixed in 2.5% glutaraldehyde at 4°C for electron microscopy.
7.	The remaining tissue should be fixed overnight for histology and immunohistochemistry. Fixed tissue can also be employed for some molecular studies.

Note: Should there be anticipated delays in transporting the fresh specimens for flow cytometry or molecular studies, they should be placed in physiological saline, Hanks solution, or RPMI 1640 culture medium at 4°C.



<http://www.springer.com/978-1-4419-7175-3>

A Pattern Approach to Lymph Node Diagnosis

Leong, A.S.-Y.

2011, XIII, 418 p., Hardcover

ISBN: 978-1-4419-7175-3