The American Journal of Surgery (2014) 208, 1003-1008

The American Journal of Surgery®

Southwestern Surgical Congress

Core needle biopsy is a safe and accurate initial diagnostic procedure for suspected lymphoma

Brian M. Nguyen, M.D.[a], Chelsea Halprin, B.S.[a], Yuliya Olimpiadi, B.S.[a], Peter Traum, M.D.[b], James J. Yeh, M.D.[c], Christine Dauphine, M.D.[a,*]

[a]Division of Surgical Oncology, Department of Surgery; [b]Department of Pathology; [c]Division of Hematology and Medical Oncology, Department of Medicine, Harbor-UCLA Medical Center, 1000 West Carson Box 25, Torrance, CA 90502, USA

KEYWORDS:
Core biopsy;
Core needle biopsy;
Lymphoma;
Diagnosis;
Ultrasound;
Ultrasound-guided biopsy

Abstract

BACKGROUND: Excisional biopsy is currently recommended for the analysis of lymphadenopathy suspicious for lymphoma. This study aims to evaluate the efficacy and safety of image-guided core needle biopsy (IGCNB) for the diagnosis of lymphoma using a standard protocol for tissue acquisition and analysis.

METHODS: All IGCNBs from 2008 to 2014 performed under the study protocol were included in analysis. Demographics, pathology results, additional studies, and follow-up information were recorded.

RESULTS: Seventy-three IGCNBs were performed in 71 consecutive patients. Lymphoma was diagnosed in 37 patients (51%). All 37 patients (100%) were subtyped and treated based on IGCNB results. The remaining 36 IGCNBs in 34 patients did not have subsequent diagnosis of lymphoma in a mean follow-up of 15 months (range, 0 to 54 months). There were no complications.

CONCLUSIONS: IGCNB performed under a standard protocol is effective and safe and should be considered as an initial diagnostic tool for the evaluation of lymphadenopathy suspicious for lymphoma.

Evaluation of lymphadenopathy requires tissue sampling for diagnosis. Excisional or incisional biopsies are currently recommended for the initial diagnosis of lymphoma, as these methods obtain sufficient tissue samples for pathologic evaluation of the lymph node.[1] Adequate assessment of the nodal architecture distinguishes lymphoma from benign reactive hyperplasia, metastatic carcinoma, infectious processes, and other lymphoproliferative disorders.[2] Prognosis and management of lymphoma is guided by the specific subtype.[3] Although open surgical biopsy readily provides sufficient tissue for pathologic assessment, disadvantages of this approach include the need for operating room time, possible need for general anesthesia, postoperative incisional pain, and procedural risks such as nerve and vascular injury, hematoma, seroma, and wound infection.[4]

In recent years, image-guided core needle biopsy has been demonstrated to be effective in the diagnosis of lymphoma[3,5–11] and has been associated with fewer

The authors declare no conflicts of interest.

This manuscript has been seen and approved by all the authors, and the material presented in this manuscript is previously unpublished.

* Corresponding author. Tel.: +1-310-222-6715; fax: +1-310-782-1562.

E-mail address: cdauphine@dhs.lacounty.gov

Manuscript received March 27, 2014; revised manuscript August 31, 2014

0002-9610/$ - see front matter © 2014 Elsevier Inc. All rights reserved.
http://dx.doi.org/10.1016/j.amjsurg.2014.09.001

complications and procedural costs.[12] Despite emerging evidence supporting this approach, many pathologists and clinicians are reluctant to adopt image-guided core needle biopsy in the evaluation of lymphadenopathy, citing the need to assess lymph node architecture through excisional biopsy to reach an accurate diagnosis.[6]

The aim of this study was to evaluate the efficacy and safety of image-guided core needle biopsy in the diagnostic workup of lymphadenopathy suspicious for lymphoma using a standard protocol for tissue acquisition and analysis.

Methods

Institutional review board approval was obtained before the initiation of this study. All patients that were referred to the outpatient general surgical service at Harbor-UCLA Medical Center between April 2008 and January 2014 for biopsy of cervical, axillary, or groin lymph nodes for suspected lymphoma were included in this study. Patients with mediastinal or intra-abdominal lymphadenopathy were excluded, as these areas were inaccessible to an ultrasound-guided core needle approach. Patients were also excluded if the lymphadenopathy was associated with a known primary malignancy other than lymphoma that accounted for the abnormal lymph nodes. Patients underwent a standard protocol of evaluation as detailed below.

Basic demographic information and pathology results were recorded for each patient, along with any history of other conditions (human immunodeficiency virus infection, rheumatoid arthritis, systemic lupus erythematosus) that could be associated with lymphadenopathy. The pathologic results of any subsequent excisional biopsies, when performed, were evaluated for discordance with image-guided core needle biopsy. The initiation of definitive therapy based on the results of the core needle biopsy was considered to be a successful image-guided core needle biopsy, whereas any alteration in therapy based on subsequent excisional biopsy was considered a failure. For patients whose core biopsies identified nonmalignant processes, clinic records were reviewed for evidence of further biopsies or other evidence of a subsequent lymphoma diagnosis. Procedural complications were also assessed for both image-guided core needle biopsy and excisional biopsies.

Procedural protocol

All needle biopsies were performed by a single surgeon (C.D.) under ultrasound guidance with a spring-loaded 14-ga Achieve core biopsy needle with coaxial introducer (CareFusion Corporation, San Diego, CA). Ultrasonography was used to select the largest and most superficial abnormal appearing node, and color Doppler was used to confirm the absence of large blood vessels in the planned biopsy trajectory. In the axilla, the needle was inserted at the anterior axillary line and fired posteriorly while the arm was positioned in a relaxed pose with the hand lying beside the patient's ear. In the cervical region, stab incisions were made medial to the lymph node and the needle fired laterally with the face positioned away and sternocleidomastoid muscles relaxed. In the groin, the needle was inserted lateral to the lymph node and fired medially.

The biopsy site was sterilized using a chlorhexidine and alcohol formulation and the skin, subcutaneous fat, and tissues surrounding the lymph node were anesthetized with 10 to 20 mL of .5% lidocaine with epinephrine. A stab incision was made with an 11 blade through the skin at the site of the biopsy to facilitate entry of the core needle. Under ultrasound guidance, 8 to 10 core specimens were obtained from the suspicious lymph node. If a pass was unsuccessful, it was not counted. Half of the samples were then placed on a nonadhesive gauze pad soaked in saline, and the remaining half were placed in 10% buffered formalin solution with zinc. Small Steri-Strips (3M Steri-Strips, St. Paul, MN) and a gauze pad were used as dressing. Pressure was held over the biopsy site by the patient for 5 minutes. All patients were instructed to resume normal activities the following day, avoiding submersion of the wound in a bathtub, pool, or Jacuzzi for 1 week.

Excisional biopsies were subsequently performed if requested by the hematology service.

Pathologic analysis

Tissue specimens were sent immediately to the pathology department for processing. The cores sent in formalin were set aside for later use, whereas the 4 to 5 cores placed on a saline-soaked gauze were processed on receipt. Touch imprints were made and then stained with Diff-Quick and/or hematoxylin and eosin, and a portion was left unstained. Based on the initial evaluation of the adequacy of the specimen and assessment of cytologic morphology, flow cytometry would be performed if non-Hodgkin lymphoma remained in the differential diagnosis. Otherwise, standard processing by formalin fixation and paraffin embedding of tissue with an initial hematoxylin and eosin stain and subsequent directed immunohistochemical staining with or without ancillary molecular studies were performed. The initially submitted formalin-fixed cores were available, and in cases in which initial cytomorphologic analysis by touch imprints obviated the need or adequacy for workup by flow cytometry, additional formalin-fixed and paraffin-embedded tissue was available for histologic analysis.

Results

A total of 73 ultrasound-guided core needle biopsies were performed in 71 consecutive patients after the standardized protocol. The mean age of the group was 43.1 years (range, 18 to 71 years) and 40 (56%) were female. The number of biopsies per site were as follows: 46 in the axilla, 19 in the groin, and 8 in the supraclavicular or