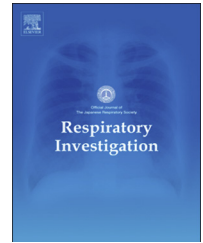




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Original article

Endobronchial ultrasound-guided transbronchial needle aspiration is useful as an initial procedure for the diagnosis of lymphoma



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ABSTRACT

Background: The usefulness of endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) for evaluating hilar, mediastinal and central parenchymal lesions has been well established. However, its utility for diagnosing lymphoma is controversial. The aim of this study was to evaluate the diagnostic utility of EBUS-TBNA for the definitive diagnosis of de novo lymphoma with subtype classification.

Methods: Patients with lymphoma who underwent EBUS-TBNA for diagnostic purposes at a single institution between March 2004 and May 2013 were retrospectively reviewed.

Results: Of the 971 patients who underwent EBUS-TBNA during the study period, 19 patients, who did not have a previous history of lymphoma, had a final diagnosis of lymphoma. EBUS-TBNA provided a diagnosis accompanied with subtype classification in 6 patients (32%), a suspicious but not definitive classification in 10 patients (53%), and a negative classification in 3 patients (16%). Immunohistochemical staining for definitive diagnosis was performed in 15 of 16 patients (94%), with suspicious results from routine hematoxylin and eosin staining. No procedure-related complications occurred.

Conclusions: EBUS-TBNA is a useful initial diagnostic procedure, aiding decisions for the management of patients with suspected lymphoma, even though the sensitivity of EBUS-TBNA for diagnosing lymphoma with subtype classification was lower than previously reported.

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Abbreviations: EBUS-TBNA, endobronchial ultrasound-guided transbronchial needle aspiration; EUS-FNA, endoscopic ultrasound-guided fine-needle aspiration; ROSE, rapid on-site cytological examination

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1. Introduction

Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) has been reported to be an accurate, minimally invasive, and cost-effective procedure for the diagnosis of hilar, mediastinal, and central parenchymal lesions [1]. The diagnostic sensitivities of EBUS-TBNA for lung cancer, intrathoracic lymph node metastasis from extra-thoracic malignancy, sarcoidosis, and tuberculosis have been reported to range from 46 to 100% [1–5], 83 to 88% [6], 54 to 96% [7–10], and 85 to 94% [11,12], respectively.

Malignant lymphoma is one of the diseases involving hilar and mediastinal lymph nodes that can be accessible with EBUS. However, for the definitive diagnosis of lymphoma with subtype classification, an adequate volume of sample is required. The reported sensitivity of EBUS-TBNA for the definitive diagnosis of lymphoma varies widely in the literature, from 38 to 91% [13–18]; thus, the usefulness of the procedure is controversial [1]. The aim of the present study was to evaluate the diagnostic utility of EBUS-TBNA for the definitive diagnosis of de novo lymphoma with subtype classification.

2. Materials and methods

2.1. Patients

Between March 2004 and May 2013, a total of 971 patients underwent EBUS-TBNA at Nagoya Medical Center. Twenty-three of the patients had newly diagnosed, relapsed, or previously diagnosed lymphoma. Four patients with a previous history of lymphoma were excluded from the analysis. Thus, the 19 patients with newly diagnosed lymphoma were retrospectively analyzed. Prior to EBUS-TBNA, written informed consent for the procedure was obtained from all patients. This study was approved by the Institutional Review Board of Nagoya Medical Center (Approval date: November 26, 2014; identifier: 2014-802).

2.2. EBUS-TBNA procedure

EBUS-TBNA procedures were performed under local anesthesia using lidocaine combined with intravenous midazolam for conscious sedation in 16 patients. Three patients with airway stenosis due to lymphoma, which required emergency bronchoscopic treatment before diagnosis, underwent EBUS-TBNA under general anesthesia. A convex-probe EBUS bronchoscope (BF-UC260F-OL8 or BF-UC260FW; Olympus, Tokyo, Japan) and ultrasound image processor (EU-C2000 or EU-ME1; Olympus) with a dedicated 21- or 22-gauge needle (NA-201SX-4021 or NA-201SX-4022; Olympus) were used. The EBUS-TBNA procedure was performed in a manner similar to that described previously [9]. The target lesion, puncture number, termination of EBUS-TBNA, needle type, and the use of rapid on-site cytological examination (ROSE) were decided by the operator.

2.3. Specimen handling

Specimens aspirated into the needle were pushed out with a central stylet onto glass slides. Visible tissues were collected and transferred into a formalin container preceding histological examination and/or immunohistochemistry. Specimens on the glass slides were fixed in 95% alcohol for the cytological examination. The remaining samples in the needle were expelled into saline for culture. ROSE was used as requested for evaluating adequacy of the specimen using air-dried, alcohol-fixed, and Diff-Quik stained specimens (Koku-saishiyaku; Kobe, Japan). Flow cytometry and other ancillary tests were not routinely used in this study.

2.4. Diagnosis of lymphoma

Cytological specimens were interpreted separately as positive, suspicious, and negative. The diagnosis of lymphoma with subtype classification from histology specimens obtained by EBUS-TBNA, which did not require further invasive procedures, was analyzed as a diagnostic EBUS-TBNA result. On the contrary, the diagnosis of lymphoma without subtypes or negative for malignant cells, which required further diagnostic procedures, was analyzed as a non-diagnostic EBUS-TBNA result.

2.5. Statistical analysis

Statistical analyses were processed by statistical software program (PASW statistics 16; SPSS Inc., Chicago, IL., USA). Means and percentages were presented as appropriate. Continuous variables were analyzed using the Mann-Whitney U test, and dichotomous variables were analyzed using Fisher's exact test. The results were considered statistically significant when the two-tailed p-value was less than or equal to 0.05.

3. Results

3.1. Patient characteristics

A total of 19 patients who were diagnosed with lymphoma were included in this study. Patient characteristics are shown in [Table 1](#). Diffuse large B-cell lymphoma was the most frequent subtype.

3.2. EBUS-TBNA procedures

Details of EBUS-TBNA procedures are shown in [Table 2](#). Twenty-six lesions with a median shortest diameter of 26 mm (mean \pm SD 27.9 \pm 13.7 mm, range 10–72 mm) on chest computed tomography image were examined. Stations 4R and 7 were the most frequently examined lesions. No procedure-related complication occurred in this study.

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