Beyond Solid Pancreatic Mass Lesions: Liver, Lymphoma, Sarcoidosis, and Others

Ichiro Yasuda, M.D., Ph.D.

Department of Gastroenterology, Teikyo University Mizonokuchi Hospital, Kawasaki, Japan

Introduction

Since Vilmann et al. published the initial report of EUS-FNA of the pancreas in 1992, this technique has become widely used to reliably obtain specimens from lesions around the gastrointestinal tract. The major target lesions of EUS-FNA are pancreatic masses, upper abdominal lymph nodes, and upper gastrointestinal submucosal tumors. Recently, however, the target lesions of EUS-FNA are expanding to various other organs and diseases.

Mediastinum

Wiersema et al. initially reported the use of EUS-FNA in the mediastinal lymph nodes in 1993. The mediastinum is one of the most suited sites of EUS-FNA, because the echoendoscope remains straight in the esophagus and the puncture needle is easy to maneuver in this position. After this initial report, numerous others have shown the efficacy of EUS-FNA in mediastinal lesions.

1. Nodal staging of lung cancer

Mediastinal lymph node staging (N-staging) is essential to optimize the treatment of lung cancer. Transesophageal EUS-FNA has been evaluated for N-staging of lung cancer, as this technique is much less invasive than mediastinoscopy and possibly more accurate than PET-CT. However, EUS-FNA does not provide access to the pretracheal and hilar lymph nodes. More recently, endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) has been introduced as a novel technique for accessing the pretracheal and hilar lymph nodes. However, it is difficult to access the aortopulmonary window and paraesophageal stations using this approach. As EUS reaches these regions, EUS and EBUS can work complementarily, and a combined endoscopic approach using EUS-FNA and EBUS-TBNA provides excellent diagnostic performance.

2. Sarcoidosis

Sarcoidosis is a systemic disorder of unknown cause that is characterized by the pathologic hallmark of noncaseating granuloma. Bilateral hilar lymphadenopathy (BHL) is a major clinical feature of sarcoidosis, but it is
sometimes difficult to exclude other diseases such as tuberculosis and lymphoma, especially in cases where there are no pulmonary abnormalities (stage I). Recently, we evaluated the yield of EUS-FNA using a large-gauge needle (19G) for histologic confirmation of stage I sarcoidosis. We found that EUS-FNA with a 19G needle played a significant role in the diagnosis.5

Adrenal gland

Although it has been widely recognized that the left adrenal gland can be visualized easily and clearly by EUS and can be sampled in real-time from the stomach by EUS-FNA, we recently showed that the right adrenal gland was also visible in most of cases by EUS and that EUS-FNA can be performed.6

Liver

The liver is a common site of metastases for various malignancies. EUS-FNA of liver masses has also been attempted, and several studies showed that it is a relatively safe and sensitive procedure. EUS-FNA may be considered when liver lesions are poorly accessible to US- or CT-guided FNA.7

Spleen

Splenic tumors are occasionally found in clinical practice but the diagnosis is often difficult if only serologic and imaging tests are used. Therefore, pathologic sampling is required in such cases. EUS provides a good image of the spleen through the gastric wall, and transgastric EUS-FNA may be easier to perform than the percutaneous approach.8

Gallbladder

EUS-FNA can also diagnose gallbladder masses safely and accurately. This method should be considered particularly in cases of suspected xanthogranulomatous cholecystitis in order to avoid unnecessary extensive surgery.9

Bile duct

Recently, we reported that EUS-FNA was a sensitive and safe diagnostic modality for patients with suspected malignant biliary stricture and can be an additional option in cases where endoscopic brush cytology and biopsy produced negative results.10

Lymphadenopathy of unknown origin

The diagnosis of mediastinal and intra-abdominal lymphadenopathy is sometimes difficult, especially in patients who have no other primary lesions. Open thoracic surgery, laparotomy, or other procedures such as mediastinoscopy or laparoscopy are often required; however, these procedures are invasive, costly, and require a
great deal of time and manpower.

1. **Lymphoma**

   Lymphoma is one of the main causes of unknown lymphadenopathy. EUS–FNA is a safe and accurate diagnostic procedure for lesions surrounding the gastrointestinal tract. However, diagnosing lymphoma using the EUS–FNA technique remains a challenge, owing to limitations in the amount of material sampled. Therefore, we evaluated the yield of EUS–FNA biopsy using a large-gauge (19G) needle in patients with mediastinal and intra-abdominal lymphadenopathy of unknown origin, particularly in relation to subclassification of the lymphomas. The overall accuracy of EUS–FNAB for unknown lymphadenopathy was 98%, and it was possible to classify the lymphomas in 88% of cases. In addition, immunophenotyping is usually possible, while cytogenetic abnormalities can be identified in a relatively limited number of patients. Finally, we believe that open thoracic surgery, laparotomy, and other invasive diagnostic procedures such as mediastinoscopy and laparoscopy can be avoided, as EUS–FNA with a 19G needle is a safe and accurate tool for diagnosing lymphoma.

2. **Aortic bifurcation**

   We found that aortic bifurcation was visible by transduodenal US scanning and FNA of the lesions near the aortoiliac bifurcation was also possible using either the transgastric or transduodenal approach.

3. **After curative surgical resection and chemotherapy**

   The diagnosis of lymphadenopathy after treatment of malignancy is sometimes difficult, especially in patients whose treatment is deemed curative and without local recurrence or those who have increased serum levels of related tumor markers. Lymphadenopathy after treatment of malignancy is not a definitive sign of recurrence. Therefore, pathologic sampling and diagnosis are essential for determining the appropriate treatment. For this purpose, EUS-FNA is a safe, convenient, and minimally invasive procedure with high diagnostic value.

**Conclusions**

EUS can visualize the posterior mediastinum and broad abdominal cavity. In addition, use of a large-gauge needle enables collection of a histopathologic sample. Therefore, most abdominal and posterior mediastinal organs and lesions can be targets of EUS-FNA.

**References**


