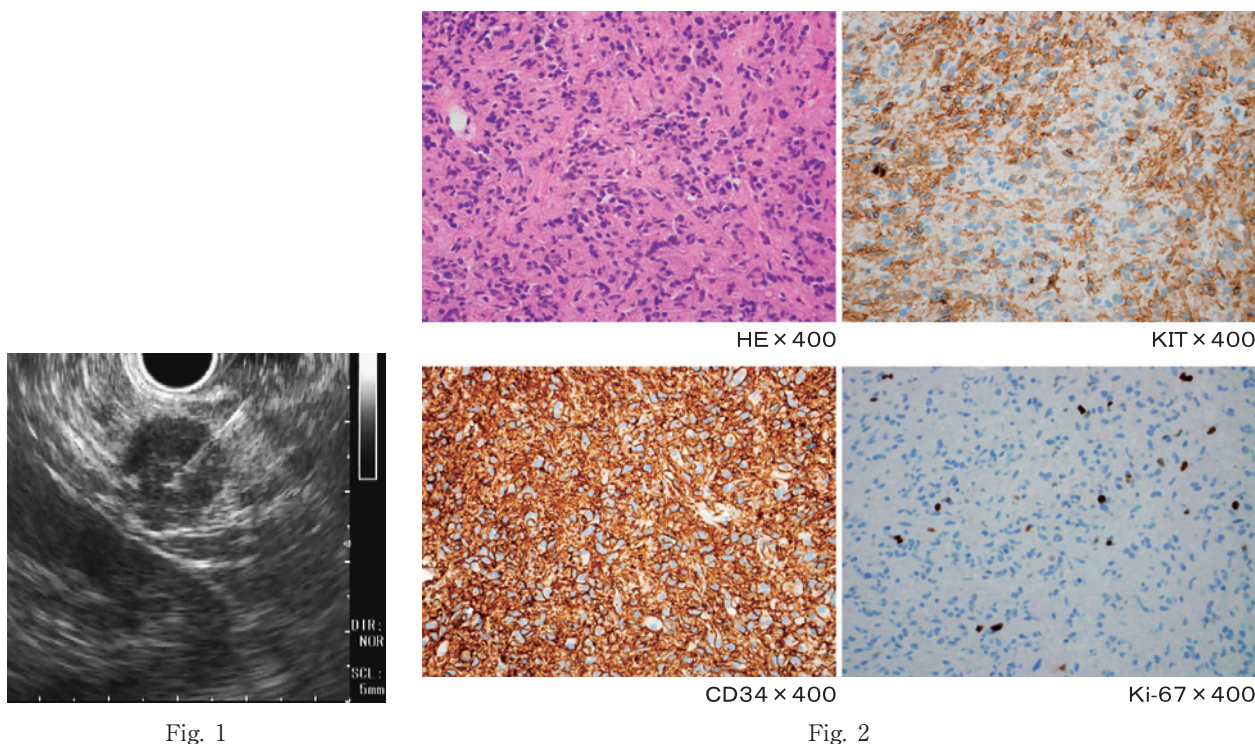


Preoperative Diagnosis of Abdominal Diseases with Endoscopic Ultrasonography

Yoshiaki Mizuguchi, Yasuhiro Mamada, Yoshiharu Nakamura, Akira Matsushita,
Masato Yoshioka, Yoichi Kawano, Tetsuya Shimizu, Tomohiro Kanda,
Itsuo Fujita and Eiji Uchida

Department of Surgery, Nippon Medical School



In the diagnosis of abdominal diseases, especially hepatobiliary diseases, there has been rapid progress in noninvasive imaging methods, including ultrasonography, computed tomography (CT), and magnetic resonance cholangiopancreatography, that enable the detection of smaller lesions at an earlier stage. However, the smallest lesions remain difficult to detect and to diagnose accurately.

Endoscopic ultrasonography (EUS) is a less-invasive endoscopic technique that provides detailed images of the abdominal organs, especially the pancreas. It has been recognized as a minimally invasive and maximally accurate diagnostic technique^{1,2}. EUS obtains information in addition to that obtained with CT or magnetic resonance imaging. For diagnosing small, solid tumors of the pancreas (less than 3 cm), EUS is more accurate than US or CT³.

EUS can be used to guide needle biopsies in abnormal areas of the pancreas, thereby avoiding exploratory surgery. In Japan, the technique of EUS-guided fine-needle aspiration (FNA) has been covered by medical insurance since the start of 2010. Our institution began to perform this technique at the end of 2011 (**Fig. 1**). Thus far, the sensitivity of this technique for the preoperative diagnosis of solid pancreatic tumor is 83.3%. Here, we will describe how our method of using EUS for the preoperative diagnosis of abdominal diseases, including hepatobiliary, pancreatic, and submucosal lesions.

Case 1

A 60-year old woman was referred to our hospital for EUS examination of a submucosal tumor of the stomach. Magnetic resonance imaging had shown that the tumor was located on the outside of the posterior stomach wall. She underwent EUS-FNA, in which a 19-G needle was used to obtain a tumor specimen. On the

Correspondence to Yoshiaki Mizuguchi, Department of Surgery, Nippon Medical School, 1-1-5 Sendagi, Bunkyo-ku, Tokyo 113-8603, Japan

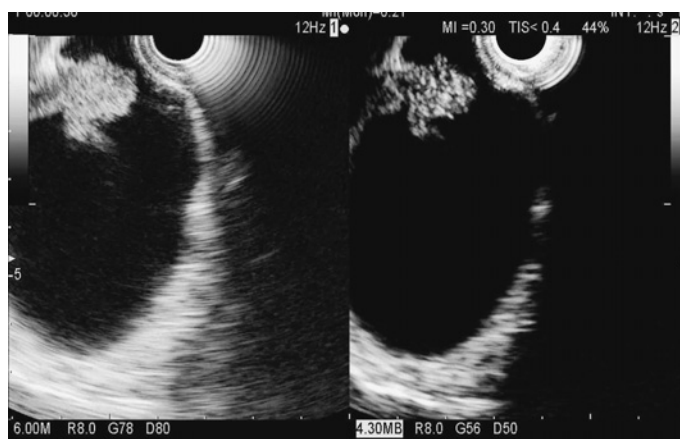


Fig. 3

basis of histological examination of the specimen after hemotoxylin and eosin staining and immunohistological staining for c-kit (diffusely positive), CD34 (diffusely positive), α -smooth muscle antigen (weak and patchy positivity), and S100 (negative) (**Fig. 2**), the tumor was diagnosed preoperatively as a gastrointestinal stromal tumor. Surgical extirpation of the tumor was performed, and the histologic examination of the resected tumor confirmed the results of the preoperative EUS-FNA biopsy.

Case 2

A 65-year old man who was being followed up for immunoglobulin A nephropathy was referred to our department because transabdominal US and plain abdominal CT showed an elevated lesion in the gallbladder. EUS demonstrated that the irregular tumor of the gallbladder body had infiltrated the subserosa. EUS with Sonazoid contrast agent clearly showed that the tumor had abundant blood flow and was likely malignant (**Fig. 3**). The patient underwent surgery, and the tumor was diagnosed, on the basis of intraoperative examination of frozen sections, as a cancer that had invaded the subserosa.

Conflict of Interest: The authors have no conflicts of interest to declare.

Fig. 1 Representative photo of EUS-FNA.

A fine needle inserted into the pancreatic tumor under EUS guidance can be used to aspirate tumor cells/tissue. The average numbers of passes and strokes during FNA at our institution are 3 and 20, respectively. A 25-G or 22-G needle is used for cytologic examination, whereas a 19-G needle is used for histologic examination.

Fig. 2 Pathological examination of a specimen from EUS-guided FNA biopsy.

Immunohistochemical analysis showed that the lesion was positive for c-Kit and CD34. The MIB-1 (Ki-67) labeling index was 1% to 5%.

Fig. 3 A demographic photo of EUS with Sonazoid contrast agent.

EUS with Sonazoid indicated that the mass had abundant blood flow, which is a feature of malignant gallbladder tumors. Each dot in the mass in the photo on the right indicates Sonazoid in the vessels. Left, normal view; Right, Sonazoid mode view.

References

1. Beane JD, House MG, Cote GA, et al.: Outcomes after preoperative endoscopic ultrasonography and biopsy in patients undergoing distal pancreatectomy. *Surgery* 2011; 150: 844–853.
2. Krishna NB, LaBundy JL, Saripalli S, Safdar R, Agarwal B: Diagnostic value of EUS-FNA in patients suspected of having pancreatic cancer with a focal lesion on CT scan/MRI but without obstructive jaundice. *Pancreas* 2009; 38: 625–630.
3. Volmar KE, Vollmer RT, Jowell PS, Nelson RC, Xie HB: Pancreatic FNA in 1000 cases: a comparison of imaging modalities. *Gastrointest Endosc* 2005; 61: 854–861.