Do elastography EUS and contrast harmonic EUS help?

Masayuki Kitano

Associate Professor, Department of Gastroenterology and Hepatology, Kinki University Faculty of Medicine

1. Principle of EUS elastography and contrast-enhanced EUS

Recent developments in endoscopic ultrasonography (EUS) imaging technology have enhanced its diagnostic ability, particularly in terms of characterizing conventional EUS-detected lesions. The newest EUS modalities are tissue elastography and contrast enhancement, which measure elasticity and vascularity, respectively, and thereby can depict tissue structure in detail. Hard elasticity on EUS elastography and hypo-enhancement on contrast-enhanced EUS are suggestive of ductal carcinomas in the pancreas.

2. Role of EUS elastography and contrast-enhanced EUSin diagnosis of digestive diseases

A systemic review and meta-analysis showed that EUS elastography differentiates benign from malignant pancreatic masses with a pooled sensitivity and specificity of 95%-99% and 67%-74%, respectively. Contrast-enhanced EUS differentiates benign from malignant pancreatic masses with a pooled sensitivity and specificity of 94% and 89%, respectively.EUS elastography is also used for diagnosis of chronic pancreatitis. A significant linear correlation is obtained between the strain ratio and the number of EUS criteria of chronic pancreatitis. The accuracy with which EUS elastography diagnosed chronic pancreatitis was 91%. These methods are also useful for differentiating malignant from benign lymph nodes, characterizing gallbladder lesions, and estimating the malignant potential of gastrointestinal stromal tumors.

3. Contrast-enhanced EUS for EUS-FNA

Contrast-enhanced EUS can complement EUS-FNA in terms of identifying pancreatic ductal carcinomas that have false-negative EUS-FNA findings. When pancreatic lesions with hypo-enhancement on contrast-enhanced EUS were regarded as ductal carcinomas in patients with negative EUS-FNA findings, the sensitivity of ductal carcinoma diagnosis increased from 92% (EUS-FNA alone) to 100% (both EUS-FNA and contrast-enhanced harmonic EUS). Moreover, amulticenter study showed that five false-negative EUS-FNA cases were correctly classified by contrast-enhanced EUS.

Since contrast-enhanced EUS clearly depicts subtle lesions that conventional EUS cannot identify, it can also be used to identify the target of EUS-FNA. Moreover, it can be used to locate a specific site within a lesion that would be more suitable for EUS-FNA than other sites. Identifying and avoiding the avascular sites in a lesion may help avoid sampling necrotic areas and improve the sensitivity of pancreatic tumor diagnosis by EUS-FNA. Contrast-enhanced EUS may also be helpful in terms of assessing lymph nodes that cannot be accessed by EUS-FNA because of an intervening tumor or vessels; it can also help eliminate the time andrisk associated with performing EUS-FNA at a second site.