Endoscopic Ultrasound Elastography for Pancreatic Cancer Diagnosis: A Step Forward?

Woo Jin Lee

Pancreatobiliary Cancer Clinic, Center for Liver Cancer, National Cancer Center, Goyang, Korea

Endoscopic ultrasound (EUS) is not only useful for providing excellent images for detection and staging of pancreatic cancer; it also provides guidance for fine needle aspiration (FNA) and biopsies detected during a standard procedure. Overall accuracy of EUS-FNA can be considered excellent, with sensitivities between 80% and 85%, and specificities close to 100%. However, differentiation between pancreatic cancer and focal pancreatitis remains a challenge based only on B-mode imaging, particularly in cases of advanced chronic pancreatitis. EUS-FNA and/or biopsy are technically demanding and multiple punctures of the lesions can be necessary to obtain sufficient tissue for cytohistologic assessment. EUS-FNA can also be associated with false negative results, mainly in patients with solid pancreatic masses with the underlying diagnosis of chronic pancreatitis. Furthermore, EUS and EUS-FNA are associated with a small, but not insignificant, morbidity.

Therefore, new methods allowing better characterization of lesions evaluated by EUS are essential to avoid unnecessary FNA and/or biopsies, to allow more accurate characterization of lesions before the puncture, and possibly to reduce complication rates. One of these new available methods is elastography.[1,2]

In the present study, Lee et al.[3] first reported the performance of EUS elastography on the pancreas in Korean subjects with normal pancreas and pancreatic cancer. Although the sample size was relatively small, the present study provides evidence supporting EUS elastography as a useful tool for the evaluation of pancreatic cancer.

The possible clinical usefulness of this new technique lies in the field of discrimination between benign inflammatory lesions and malignant tumors. Several studies have attempted to establish EUS-imaging criteria, but despite the high resolution of EUS, overall accuracy in this setting is not higher than 75%. On the other hand, overall accuracy of EUS elastography in the differential diagnosis of solid pancreatic lesions was reported with sensitivities between 91% and 100%, and specificities between 65% and 94%.[4-8] However, interpretation is not straightforward because the lesions are not colored homogeneously and steadily throughout the procedure. These limitations affect interobserver agreement and can lead to different clinical findings, particularly when differentiating between chronic pancreatitis and pancreatic cancer. As such, qualitative EUS elastography is now considered to be obsolete. Quantitative EUS elastography has emerged as a more objective technique than qualitative EUS elastography because it enables numerical measurements of tissue stiffness. Still, many technical issues can explain the disappointing results in terms of specificity, such as size inequality between the lesion and the reference area, deep position of the target relative to the transducer, degree of transducer compression and angulation.

A recent prospective study reported that the diagnostic utility of quantitative EUS elastography for discriminating pancreatic masses was modest,[9] suggesting that the technique should only be used to supplement EUS-FNA rather than to replace it. EUS elastography can be helpful in decision making in the appropriate clinical context for every individual patient. Pancreatic cancers can be very heterogeneous tumors, with adjacent neoplastic areas, necrotic regions and inflammatory tissue. This heterogeneity accounts for inaccurate results of EUS-FNA par-

ticularly in routine clinical settings in which on-site cytology is unavailable. In this respect, EUS elastography should guide EUS-FNA, and can indicate to the physician where the neoplastic cells are most likely to be found.

EUS elastography, both qualitative and quantitative, is an emerging technique, with the capability to differentiate fibrotic or inflammatory tissue from malignant lesions. This new methodology has proven to be useful in the differential diagnosis of solid pancreatic masses and lymph nodes, but also in the evaluation of patients with suspected chronic pancreatitis. However, further research is needed to completely define the place of this technique in routine clinical work and also to determine future indications.

Conflicts of Interest

The author has no financial conflicts of interest.

REFERENCES

1. Iglesias-Garcia J, Domínguez-Muñoz JE. Endoscopic ultrasound image enhancement elastography. Gastrointest Endosc Clin N Am 2012; 22:333-348.
2. Fusaroli P, Eloubeidi MA. Pancreatic cancer: image enhancement by endoscopic ultrasonography-elastography. Nat Rev Gastroenterol Hepatol 2012;9:623-624.
3. Lee TH, Cho YD, Cha SW, et al. Endoscopic ultrasound elastography for the pancreas in korea: a preliminary single center study. Clin Endosc 2013;46:172-177.
4. Iglesias-Garcia J, Larino-Noia J, Abdulkader I, Forteza J, Dominguez-Munoz JE. Quantitative endoscopic ultrasound elastography: an accurate method for the differentiation of solid pancreatic masses. Gastroenterology 2010;139:1172-1180.
5. Pei Q, Zou X, Zhang X, Chen M, Guo Y, Luo H. Diagnostic value of EUS elastography in differentiation of benign and malignant solid pancreatic masses: a meta-analysis. Pancreatology 2012;12:402-408.
6. Xu W, Shi J, Li X, Zeng X, Lin Y. Endoscopic ultrasound elastography for differentiation of benign and malignant pancreatic masses: a systemic review and meta-analysis. Eur J Gastroenterol Hepatol 2013;25: 218-224.
7. Mei M, Ni J, Liu D, Jin P, Sun L. EUS elastography for diagnosis of solid pancreatic masses: a meta-analysis. Gastrointest Endosc. Epub 2012 Nov 27. DOI: http://dx.doi.org/0.1016/j.gie.2012.09.035.
8. Hu DM, Gong TT, Zhu Q. Endoscopic ultrasound elastography for differential diagnosis of pancreatic masses: a meta-analysis. Dig Dis Sci. Epub 2013 Jan 10. DOI: http://dx.doi.org/10.1007/s10620-012-2428-5.
9. Dawwas MF, Taha H, Leeds JS, Nayar MK, Oppong KW. Diagnostic accuracy of quantitative EUS elastography for discriminating malignant from benign solid pancreatic masses: a prospective, single-center study. Gastrointest Endosc 2012;76:953-961.