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EDITORIAL

New steps of elastography for the diagnosis of chronic pancreatitis

Chronic pancreatitis is characterized by pancreatic infiltration with inflammatory cells, progressive fibrosis, and loss of both exocrine and endocrine tissue (1). The diagnosis of chronic pancreatitis is mainly based on the demonstration of the morphological and/or functional changes that develop during the course of the disease. Nowadays, the main techniques for the diagnosis of chronic pancreatitis include imaging tests, aiming to demonstrate morphological changes (2). Among them, the most important ones are magnetic resonance imaging (MRI) plus MRI cholangiopancreatography (MRCP), and endoscopic ultrasonography (EUS), which are highly sensitive for detecting the morphological changes of this disease (3-6). Procedures based on the evaluation of pancreatic function are of limited use, although the advent of endoscopic-related pancreatic function tests may render these methods increasingly used in the future (3,4). It is very important to highlight that, except in cases of suspicion of malignancy, pancreatic biopsy is usually not attempted to establish the diagnosis of chronic pancreatitis. Despite recent technological developments associated with MRI-MRCP and EUS, the diagnosis of chronic pancreatitis at early stages remains a challenge. However, diagnosis at early stages may be considered of special interest, since we might be able to control the progression of the disease and the development of complications. In this setting, the study by Llamoza-Torres et al. (5), published in this issue of the Spanish Journal of Gastroenterology, aims to develop a noninvasive technology for the early diagnosis of chronic pancreatitis, such as trans-abdominal ultrasound associated with a newer modality, such as elastography.

When trying to diagnose chronic pancreatitis, trans-abdominal ultrasound can be considered a first-step diagnostic method. However, its ability to diagnose the disease is limited to advanced stages, as it cannot detect early morphological changes in chronic pancreatitis (6). Another ultrasound-based technology is EUS, which is currently considered the most accurate method for the diagnosis of chronic pancreatitis, mainly because of its very high sensitivity. EUS allows to assess disease-related parenchymal and ductal changes with high accuracy (7,8). However, EUS is hampered by its subjectivity, and agreement among experts is far from optimal (9). In addition, there is a lack of standardization in terms of the technique, nomenclature, and quantitative criteria used for chronic pancreatitis. Trying to overcome all these limitations, the Rosemont classification attempted to integrate the published scientific evidence to develop consensus-based criteria for the EUS-based diagnosis of chronic pancreatitis (10). However, this classification needs to be further validated, has not really demonstrated any improvements over the former EUS classifications of chronic pancreatic based on the number of criteria, and still has not overcome the subjective evaluation of EUS findings (11,12).

Over the past decade, elastography has raised as a very useful and novel technique, allowing a real-time evaluation of tissue stiffness. This technique may be performed with either trans-abdominal ultrasound or EUS by using two different types of elastography based on different principles (13). These include strain elastography (mainly used with EUS) and shear-wave elastography (only available for use with trans-abdominal ultrasound). Using strain elastography, tissue stiffness is estimated by measuring the extent of strain generated by external pressure (14). In shear-wave elastography, stiffness is estimated by measuring the propagation speed of a shear wave, a transverse wave, generated by acoustic radiation impulse (ARFI) (15). Several studies evaluate the role of these methodologies in the analysis of superficial organs (breast, thyroid gland, among others) (16). Over the last years, there has been increasing interest in assessing the role of elastography on the management of pancreatic diseases, mainly for the evaluation of solid pancreatic tumors (17-19), but also in the study of chronic pancreatitis (15,20). Taking into account the significant advances of elastography, and several well-designed studies, different clinical practice guidelines for elastography have been published (21,22).

The study by Llamoza-Torres et al. is of real interest in this setting, as it provides very important and useful information, and establishes the diagnostic accuracy of trans-abdominal ultrasound-guided elastography, based on ARFI technology, in the evaluation of patients with suspected chronic pancreatitis (5). The authors finally evaluated 33 patients (16 with a final diagnosis of chronic pancreatitis), detecting differences between chronic pancreatitis and normal pancreas with an area under the ROC curve of 0.713. Interestingly, patients included in the study were well selected, and were initially evaluated by EUS and/or MRI-MRCP to establish their chronic pancreatitis status. Currently, this is the best combination to be used as gold standard for the diagnosis of this disease. Another important point of this study is patient selection, since no subjects had advanced-stage disease. This is very important, and highlights the role of this modality in the assessment of patients with early-stage chronic pancreatitis. When

comparing these data to those obtained by EUS-guided elastography (based on strain elastography), the latter shows better results in terms of accuracy. However, few studies have analyzed the role of EUS-guided elastography in the diagnosis of chronic pancreatitis. Iglesias-García et al. reported an area under the ROC curve of 0.949 when comparing the strain ratio evaluation with their gold standard (which was the same as Llamoza-Torres et al) (20). Itoh et al. found a very good correlation between different elastogram analyses and final histological specimens, with r values between 0.54 and 0.75 (23). These data are better than those published by Llamoza-Torres et al.; however, EUS may be considered an invasive technique (minimally invasive, probably) as compared to the trans-abdominal ultrasound modality used by this author. Regarding trans-abdominal ultrasound-guided elastography, again few data have been published regarding its role in the diagnosis of chronic pancreatitis. Yashima et al, reported an initial success rate for the elastographic evaluation of 60% (15), which was improved in a second study by Kawada et al. to 80% (24), with an overall accuracy not reaching 80%, similar to the data reported by Llamoza-Torres et al. Importantly, the gold standard defined by Llamoza-Torres et al. may be considered better than the one defined by Yashima (not using EUS). Finally, Harada et al. also found a good correlation between shear-wave elastography and histological grade of fibrosis (25). Taking all this information into account, the study by Llamoza-Torres et al. adds new and very valuable information on the potential role of elastography, based on this study of a noninvasive technique, for optimizing the diagnosis of chronic pancreatitis even at early stages of the disease.

Further multicenter trials would be of crucial interest to establish the role of all these elastographic techniques for the diagnosis of chronic pancreatitis, mainly at early stages of the disease.

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