Editorial

Contrast Enhanced Ultrasound for Solid Pancreatic Lesions: Does Timing after Contrast Injection also Matter?

Pancreatic cancer is one of the most common cancers and is associated with poor survival rates. Therefore, it is desirable that we have methods to diagnose pancreatic cancer at an early curable stage. Endoscopic ultrasound (EUS) has better diagnostic accuracy than other radiologic modalities.[1,2] Kitano *et al*. reported significantly higher sensitivity of EUS to diagnose small pancreatic (<2 cm) than CT.[2] However, B-mode EUS imaging is not able to differentiate between various types of solid pancreatic lesions (ductal adenocarcinoma, neuroendocrine tumor, and mass forming chronic pancreatitis). Tumors have different vascular pattern when compared to normal tissue, however, B-mode imaging cannot show small vessels or vessels with slow flow, and therefore, cannot show tissue perfusion.[3-5] Contrast-enhanced Doppler EUS has limitations in the form of blooming and motion artifacts.[4] Microbubbles are made of inner gas and outer shell material. They oscillate (expand and constrict) more than tissues because of their mechanical properties, and thus, produce more harmonics than tissues; these harmonics are then selectively picked up by EUS transducer. Thus, contrast-enhanced EUS overcomes the limitations of B-mode EUS or contrast Doppler EUS.[3,4] Contrast harmonic EUS (CH-EUS) identifies pancreatic ductal carcinomas as hypoenhancing solid lesions with a sensitivity of 88–96% and specificity of 88–94%.[5] It is also important to identify mass forming chronic pancreatitis (inflammatory mass), which appears isoenhancing to surrounding pancreatic parenchyma compared to hypoenhancing ductal carcinomas and hyperenhancing neuroendocrine tumors.[4,5] Contrast-enhanced EUS also helps in the better delineation of staging for various malignancies.[6]

In the current issue of Saudi Journal of Gastroenterology, Uekitani T *et al*.[7] described their experience with CH-EUS in 49 patients with solid pancreatic masses who had histological diagnosis or surgical resection. The final diagnosis were ductal carcinoma (n = 37), mass forming pancreatitis (n = 6), endocrine tumors (n = 3) and others (n = 3). The authors studied the vascular patterns of these masses with CH-EUS at 30–50 s (early phase) and 70–90 s (late phase) after administration of Sonazoid®. The authors noted a lower sensitivity of CH-EUS (73% in early phase and 83.8% in late phase) when compared to the B-mode EUS (89.2%); however, the specificity of CH-EUS was significantly more than B-mode EUS (91.7% versus 16.6%, respectively) for the diagnosis of ductal carcinoma. The diagnostic accuracy of CH-EUS was more (77.6% in early phase and 85.7% in late phase) than B-mode EUS (71.4%). The authors found that the late phase of CH-EUS had better sensitivity and accuracy than early phase with the same specificity. This difference in sensitivity and accuracy was due to 4 ductal carcinoma lesions which were better differentiated (hypovascular) in late phase. The limitations of the study include retrospective nature and small sample size; however, the study is important because it reports the effect of timing on sensitivity and accuracy after contrast injection and shows that late phase is better than early phase. This finding should be evaluated in a large sample size. The difference in the enhancement pattern between early phase and late phase after contrast injection may be related to abundant arterial supply in some tumors, which may lead to isovascular appearance; late phase shows an absence of venous signals (when compared to mass forming chronic pancreatitis).[8] It is important to note that CE-EUS complements EUS-guided fine-needle aspiration (EUS-FNA); however, it does not replace EUS-FNA at present. The main utility of CE-EUS is to decrease the false negative cases of EUS-FNA,[2,9] and 80–100% of false-negative cases in EUS-FNA can be correctly classified by CH-EUS.[5] CH-EUS also improves the detection of subtle lesions, and thus facilitates EUS-FNA.[5]

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