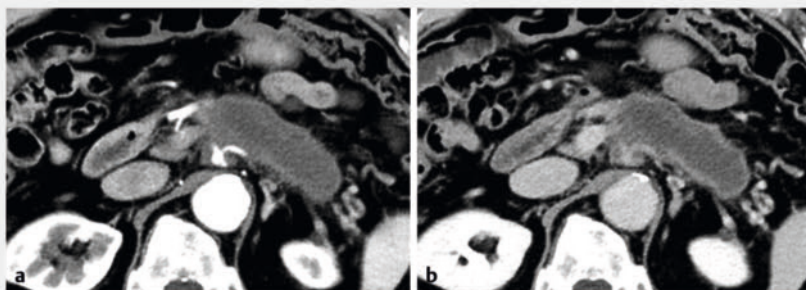


Detective flow imaging endoscopic ultrasound for locating optimal puncture site for a poorly vascularized pancreatic mass ▶

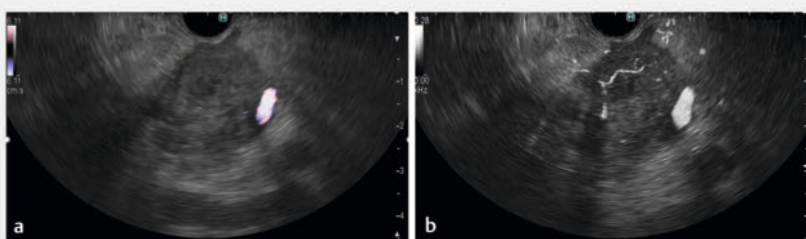
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Endoscopic ultrasound-guided fine-needle biopsy (EUS-FNB) is an established procedure with high diagnostic accuracy for tissue acquisition and pathological diagnosis of pancreatic ductal adenocarcinoma (PDAC) [1]. However, EUS-FNB sometimes demonstrates inconclusive results in PDAC rich in necrotic or fibrotic components [2, 3]. In such cases, identifying hot spot areas with viable cancerous cells is important to obtain adequate samples. Detective flow imaging (DFI) is a novel Doppler imaging technology that visualizes low-velocity blood flow in the absence of motion artifacts [4, 5], which was challenging to visualize on conventional color Doppler imaging. Herein, we present a case in which DFI imaging helped determine the hot spot area during EUS-FNB for a poorly vascularized pancreatic mass.

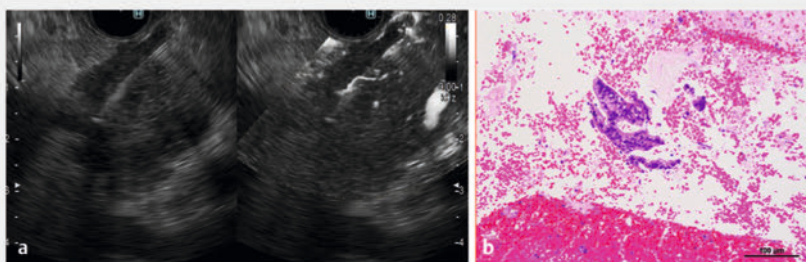
An 85-year-old male patient was referred to our hospital for pancreatic mass evaluation. Contrast-enhanced computed tomography revealed a large hypodense mass in the pancreatic body and tail with poor contrast enhancement (▶ Fig. 1). EUS detected a well-defined heterogeneous mass in the pancreatic body. EUS-FNB was performed using a 22-gauge Franseen needle (Acquire; Boston Scientific, Natick, Massachusetts, United States) with three needle passes. However, the acquired materials contained only fibrotic and necrotic components without epithelial cells. Repeated EUS-FNB was required to confirm the diagnosis. Previous EUS-FNB findings indicated that the tumor contained abundant fibrotic tissues; thus, intratumoral vessel evaluation using the DFI was planned. Conventional color Doppler imaging revealed no intratumoral vessels (▶ Fig. 2a), whereas DFI imaging demonstrated fine, irregular intratumoral vessels, indicating a hot spot area (▶ Fig. 2b). EUS-FNB with DFI guidance was performed using the same needle type against the area where vessels were displayed on DFI (▶ Fig. 3a, ▶ Video 1). The acquired specimen contained cancerous tissue, resulting in a final diagnosis of PDAC (▶ Fig. 3b). This case indicates



▶ Fig. 1 Contrast-enhanced computed tomography showing a large hypodense mass in the pancreatic body and tail with very poor contrast enhancement. a Early phase. b Delayed phase.



▶ Fig. 2 a Conventional color Doppler endoscopic ultrasound (EUS) showing no intratumoral vessels. b Detective flow imaging EUS illustrating fine irregular vessels inside the pancreatic mass.

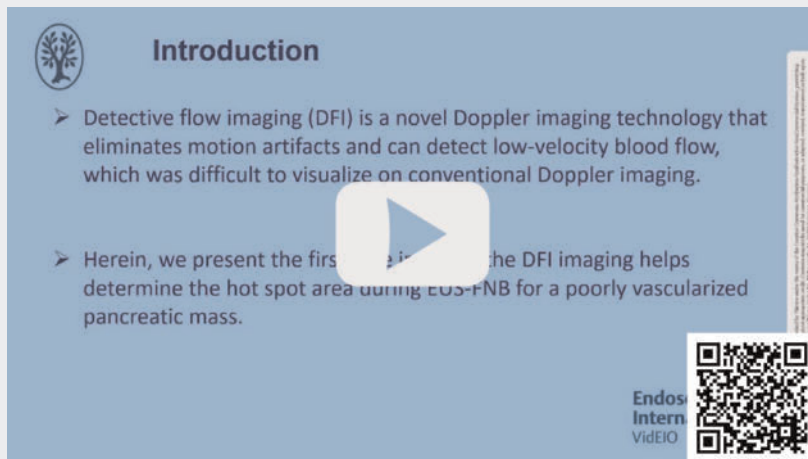


▶ Fig. 3 a EUS-guided tissue acquisition was performed using a Franseen needle on DFI guidance against the area where intratumoral vessels were displayed. b Histopathological evaluation of the acquired specimen demonstrating atypical cell clusters with irregularly sized nuclei, resulting in pancreatic ductal adenocarcinoma diagnosis.

played on DFI (▶ Fig. 3a, ▶ Video 1). The acquired specimen contained cancerous tissue, resulting in a final diagnosis of PDAC (▶ Fig. 3b). This case indicates

that DFI helps determine the optimal puncture site for diagnosis of poorly vascularized PDAC.

VIDEO



▶ **Video 1** Detective flow imaging helps determine the optimal puncture site for poorly vascularized pancreatic mass.

Bibliography

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Conflict of Interest

The authors declare that they have no conflict of interest.

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