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

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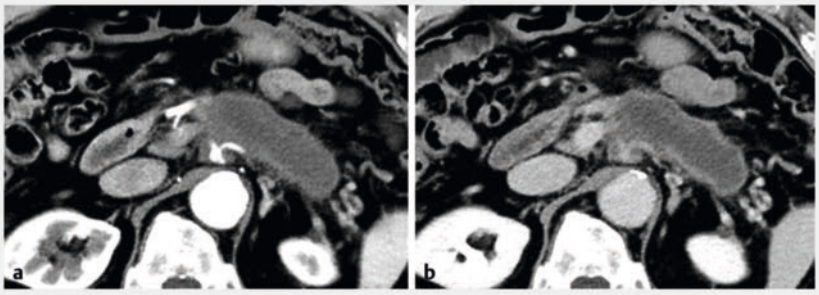
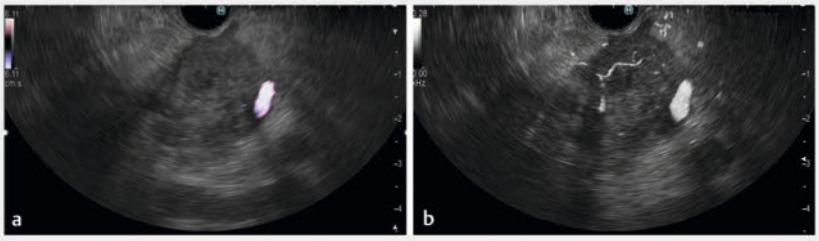
Endoscopic ultrasound-guided fine-needle biopsy (EUS-FNB) is an established procedure with high diagnostic accuracy for tissue acquisition and pathological diagnosis of pancreatic ductal adenocarcinoma (PDAC) [1]. However, EUS-FNB sometimes demonstrates inconclusive results in PDAC rich in necrotic or 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.

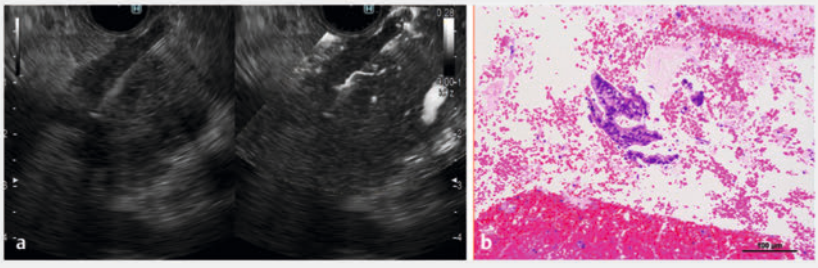
An 85-year-old male patient was referred to our hospital for pancreatic mass evaluation. Contrast-enhanced computed tomography revealed a large hypodense mass in the pancreatic body and tail with poor contrast enhancement (▶ **Fig. 1**). EUS detected a well-defined heterogeneous mass in the pancreatic 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 that DFI helps determine the optimal puncture site for diagnosis of poorly vascularized PDAC.



▶ **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.

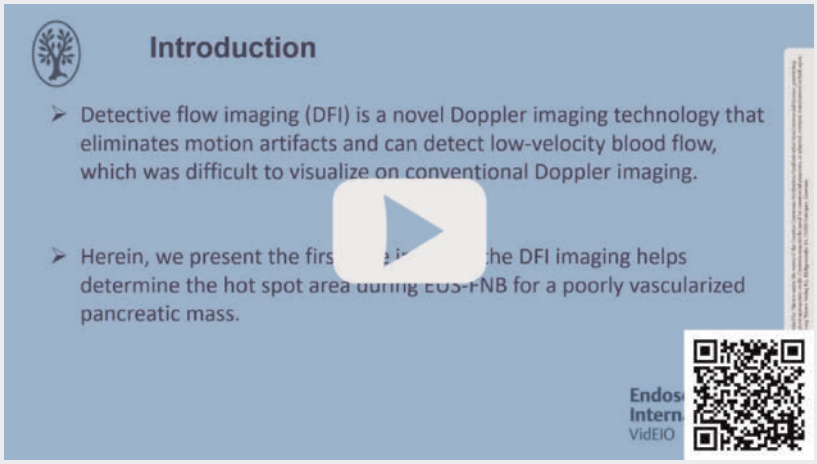


▶ **Fig. 2** **a** Conventional color Doppler endoscopic ultrasound (EUS) showing no intratumoral vessels. **b** Detective flow imaging EUS illustrating fine irregular vessels inside the pancreatic mass.



▶ **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.

VIDEO



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

Conflict of Interest

The authors declare that they have no conflict of interest.

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References

[1] van Riet PA, Erler NS, Bruno MJ et al. Comparison of fine-needle aspiration and fine-needle biopsy devices for endoscopic ultrasound-guided sampling of solid lesions: a systemic review and meta-analysis. Endoscopy 2021; 53: 1063–1064 doi:10.1055/a-1206-555232583392
[2] Numata K, Ozawa Y, Kobayashi N et al. Contrast-enhanced sonography of pancreatic carcinoma: correlations with pathological findings. J Gastroenterol 2005; 40: 631–640
[3] Kamata K, Takenaka M, Omoto S et al. Impact of avascular areas, as measured by contrast-enhanced harmonic EUS, on the accuracy of FNA for pancreatic adenocarcinoma. Gastrointest Endosc 2018; 87: 158–163 doi:10.1016/j.gie.2017.05.05228619244
[4] Yamashita Y, Yoshikawa T, Yamazaki H et al. A novel endoscopic ultrasonography imaging technique for depicting microcirculation in pancreatobiliary lesions without the need for contrast-enhancement: A prospective exploratory study. Diagnostics (Basel) 2021; 11: 2018
[5] Yamashita Y, Yoshikawa T, Kawaji Y et al. Novel endoscopic ultrasonography imaging technique for visualizing microcirculation without contrast enhancement in subepithelial lesions: prospective study. Dig Endosc 2021; 33: 955–961

Bibliography
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