Endoscopic ultrasound-guided portal-systemic pressure gradient measurement

Portal hypertension is defined by the hepatic venous pressure gradient and is measured via a percutaneous transhepatic route [1]. We describe a novel technique for direct portal pressure measurement using endoscopic ultrasound (EUS). A 27-year-old man with Noonan syndrome and congenital heart disease presented with recurrent gastrointestinal bleeding, which continued despite cardiac surgery. Angiography failed to visualize these vessels, but the gastroduodenal artery and adjacent aberrant vessel were embolized prophylactically placed in the gastroduodenal artery (orange arrow) and communicating branch (green arrow). Given continued uncertainty with regard to the prior hepatic venous pressure gradient and diagnosis, EUS was used to re-measure the portal pressure. The portal vein was accessed using a 22-gauge fine needle aspiration (FNA) needle (Wilson-Cook Medical Inc., Winston-Salem, North Carolina, United States). Portal blood was aspirated through the needle, which was connected to an arterial pressure catheter (Fig. 4). After calibration, the portal pressure measured 11 mmHg, thereby excluding significant portal hypertension. The middle hepatic vein pressure was then measured at 10 mmHg, confirming a 1 mmHg pressure gradient as recorded by interventional radiology. There was no evidence of bleeding and the hemoglobin was stable 4 days later.

Prior EUS-guided portal pressure measurements in porcine models correlated with percutaneous measurements [2–4]. This is the first clinical report demonstrating the feasibility and apparent safety of portal vein and hepatic vein pressure measurements by EUS, thereby allowing diagnosis of arteriovenous malformations as have been reported in Noonan syndrome [5].

Competing interests: None

References
3 Giday SA, Clarke JO, Buscaglia JM et al. EUS-guided portal vein catheterization: a promising novel approach for portal angiography and portal vein pressure measure-
Fig. 3  a Routine endoscopy revealed multiple duodenal serpiginous folds before therapy. b Their appearance following EUS-guided coil insertion therapy.

Fig. 4  a EUS demonstrates the portal vein with power Doppler imaging. b Fine needle aspiration (FNA) needle position during pressure monitoring.
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Bibliography
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Fig. 5 a Fluoroscopy demonstrating the echoendoscope position during pressure monitoring of the portal vein. b Fluoroscopy demonstrating the echoendoscope position during pressure monitoring of the middle hepatic vein. c EUS demonstrates the middle hepatic vein with power Doppler imaging. d FNA needle position during pressure monitoring.