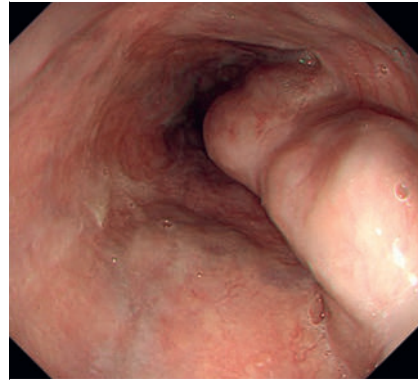
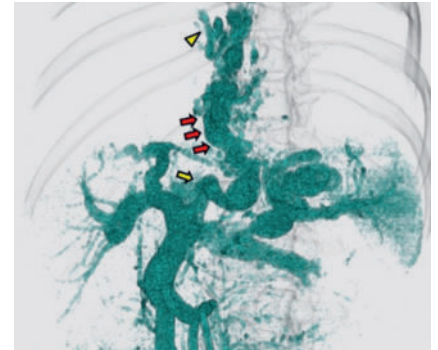


A new treatment for endoscopic ultrasound-guided vascular intervention: coiling with sclerotherapy for esophageal varices

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► **Fig. 1** Endoscopic image of thick, highly developed varices at 2 o'clock.

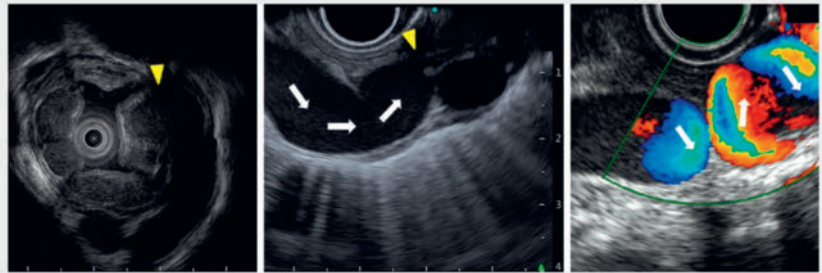


► **Fig. 2** 3 D computed tomography image showing the hemodynamics of a pipeline varix (red arrows) that fed from the left gastric vein (yellow arrow) to the azygos vein (yellow arrowhead).

► **Video 1** A new single-session treatment is performed for pipeline esophageal varices consisting of endoscopic ultrasound-guided vascular intervention with a combination of coiling and sclerotherapy.

In recent years, interventional endoscopic ultrasound (EUS) has been applied to the treatment of vascular lesions such as isolated gastric varices and intractable gastrointestinal bleeding [1]. For esophageal varices, it is usual to perform endoscopic injection sclerotherapy (EIS) or endoscopic variceal ligation (EVL) [2,3]; however, varices of thick diameter without palisade vessels (so-called pipeline varices) are often difficult to treat [4]. This report is the world's first of a new treatment for EUS-guided vascular intervention using a combination of coiling with sclerotherapy for esophageal varices.

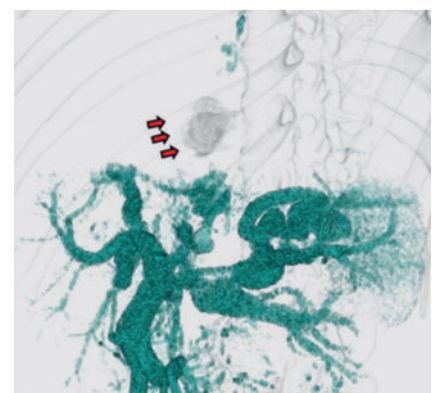
► **Video 1** shows a typical case. The patient, a 57-year-old man, had alcoholic cirrhosis and thick esophageal varices (► **Fig. 1**). Contrast-enhanced computed tomography (3D-CT) and an EUS showed pipeline varix hemodynamics that fed from the left gastric vein to the azygos vein (► **Fig. 2** and ► **Fig. 3**). First, an overtube was inserted; EVL was then performed on the varices on the proximal



► **Fig. 3** Endoscopic ultrasound images showing varices in which there were no palisade vessels (yellow arrowheads), with the pipeline varix flowing from left to right (white arrows).



► **Fig. 4** Fluoroscopic image showing additional coils that were placed, with injection of sclerosant into the feeder vessel.



► **Fig. 5** 3 D computed tomography image 1 week after the procedure showing the coils that had been placed (red arrows) and no further evidence of the varices.

side. The varices were then punctured using a 19G fine-needle aspiration needle (EZ shot3 plus; Olympus Corp., Tokyo, Japan) near the junction. A 0.035-inch hydrocoil (Azur; Terumo Corp., Tokyo, Japan) was placed. The blood flow was checked by injecting a contrast medium and using the EUS color Doppler function and some additional coils were placed. A sclerosant (ethanolamine oleate) was injected into the feeder vessel (► Fig. 4), with subsequent cessation of the blood flow. After 1 week, it was confirmed that blood flow had been completely stopped with only the one session of treatment (► Fig. 5). Moreover, no adverse events occurred.

EUS-guided vascular intervention for esophageal variceal bleeding has been previously reported [5]; however, our new treatment, coiling and sclerotherapy for esophageal varices, has an effect that combines EVL (local blood flow blocking) and EIS (blood flow control including the blood supply route). It is believed this treatment will contribute greatly, even for thick and intractable esophageal varices.

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Conflict of Interest

The authors declare that they have no conflict of interest.

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