Endoscopic ultrasonography of the small bowel

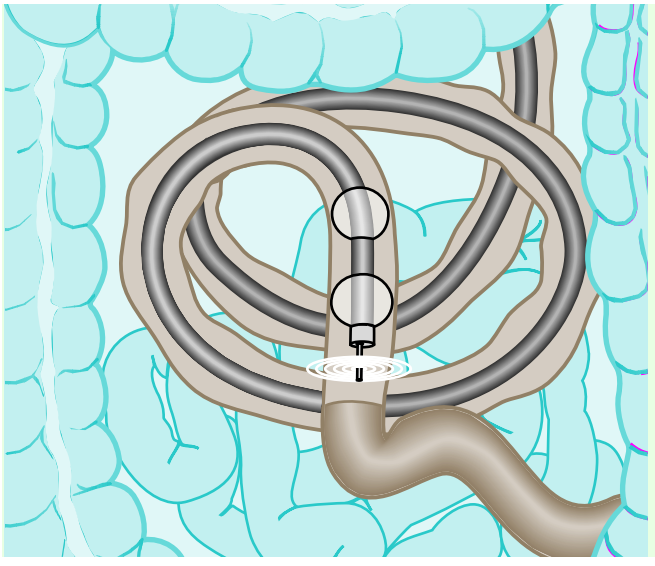

Fig. 1 A typical position of the enteroscope in situ. The ultrasound transducer is protruding from the tip of the enteroscope.

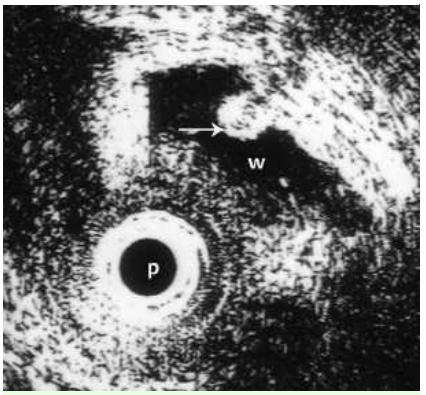

Fig. 2 A small polyp in the bowel (arrow), water in the lumen (w), and ultrasound probe (p).

We report our first experience with endoscopic ultrasonography (EUS) of the small bowel performed through an enteroscope, with emphasis on some technical challenges encountered.

A 59-year-old woman was examined for suspected gastrointestinal bleeding from the small bowel. Capsule endoscopy had revealed a minor epithelial lesion in the mid part of the small bowel, and a small subepithelial or polypoid lesion was suspected. Double balloon enteroscopy (DBE) was performed (Fujinon double balloon endoscope EN-450T5 [Fujinon Co., Omiya, Japan], working channel 2.8 mm, length 200 cm, diameter 9.3 mm), and an ultrasound miniprobe (Fujinon SP-702 P2620L, length 270 cm, diameter 2.6 mm, frequency 20 MHz with mechanical 360-degrees rotating transducer) was inserted through the working channel of the enteroscope. Ultrasound scanning was performed continuously as the probe was pulled back (▶ **Fig. 1**). DBE was negative, but a small mucosal elevation was detected by EUS (▶ **Fig. 2**). The clinical significance of this finding, however, has not been confirmed.

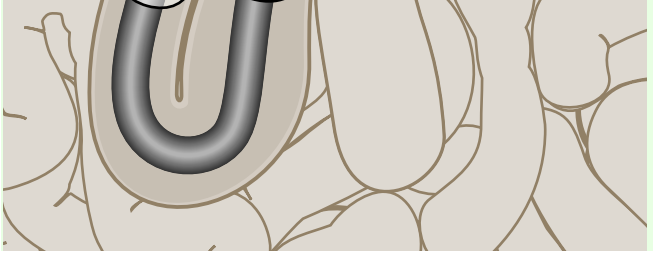

Fig. 3 Close up of the distal end of the enteroscope with the ultrasound transducer in a bent position making ultrasound imaging difficult. In this position the ultrasound transducer rotates slowly until the bowel is straightened by retracting the enteroscope.

EUS of the small bowel can be performed by introducing a miniprobe through an enteroscope. We found the procedure to be technically demanding due to the length and the curved shape of the enteroscope. Our preliminary experience indicates that the ultrasound miniprobe must be inserted very carefully to avoid breakage, and a simultaneous slow retraction of the enteroscope can make it easier to advance the probe safely.

We applied a mechanical rotating ultrasound probe. The rotation speed of the transducer was unstable, dependent on the position of the enteroscope (▶ **Fig. 3**). It was also challenging to achieve optimal focus and good acoustic coupling to the gastrointestinal wall. Scanning conditions were improved when the enteroscope was straightened during retraction.

Electronic miniprobes may be preferable and fitting a balloon to the probe tip may also improve performance.

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S. Odegaard, H. L. von Volkmann, R. F. Havre, L. B. Nesje
National Centre for Ultrasound in Gastroenterology, Department of Medicine, Haukeland University Hospital, Bergen, Norway

Bibliography
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Corresponding author
S. Odegaard, MD, PhD
National Centre for Ultrasound in Gastroenterology
Department of Medicine
Haukeland University Hospital
Institute of Medicine
University of Bergen
NO-5021 Bergen
Norway
Fax: +47-55-972950
svein.odegaard@helse-bergen.no