

A novel technique to improve endoscopic accessibility in laparoscopic endoscopic cooperative surgery for a duodenal lesion ▶

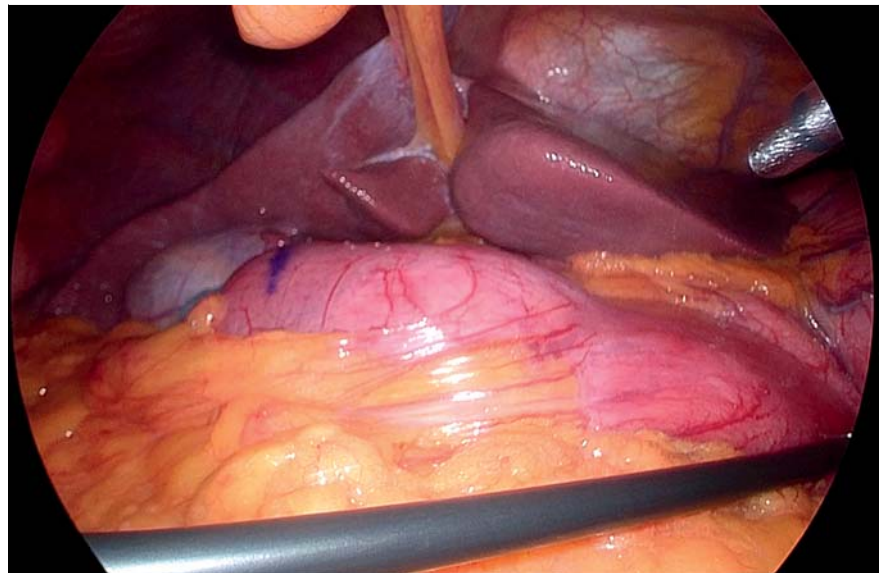
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Endoscopic submucosal dissection (ESD) for superficial duodenal epithelial tumors (SDETs) is technically difficult to perform as the narrow and tortuous duodenal lumen restricts endoscopic maneuvers. In addition, delayed perforation due to exposure to bile and pancreatic juices may cause potentially fatal peritonitis. Laparoscopic endoscopic cooperative surgery for SDETs (D-LECS), which consists mainly of ESD and laparoscopic reinforcement of the ESD site, has been developed to prevent this severe adverse event [1, 2]. However, ESD is considered particularly difficult when endoscopic accessibility is poor due to flexural sites, such as the superior duodenal angle [3]. Here, we present a novel technique in collaboration with laparoscopy to improve endoscopic accessibility of duodenal lesions located at the superior duodenal angle.

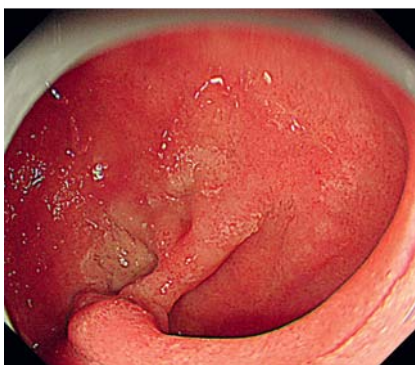
A 58-year-old man underwent a screening esophagogastroduodenoscopy, which revealed a slightly depressed lesion at the superior duodenal angle (▶ Fig. 1). Forward-viewing endoscopy did not provide acceptable accessibility to the anal side of the lesion. We considered it difficult to perform ESD in this situation and planned to perform the procedure in conjunction with laparoscopy.

Therefore, we first performed the Kocher maneuver to partially detach the duodenum from the retroperitoneum, and then straightened the superior duodenal angle by pulling the stomach toward the oral side (▶ Fig. 2). As expected, use of laparoscopy effectively changed endoscopic visualization and accessibility to the lesion (▶ Fig. 3). ESD for duodenal lesions could be safely performed using a

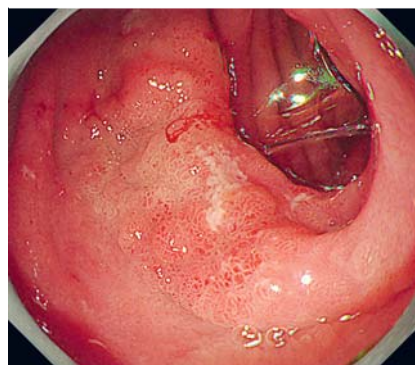
scissor-type knife and traction device (▶ Fig. 4, ▶ Fig. 5). After ESD was complete, the mucosal defect was reinforced using a laparoscopic hand-sewing suturing technique in the seromuscular layer. Finally, the endoscope was inserted and passed over the resected area to ensure the absence of stenosis or leakage (▶ Video 1).



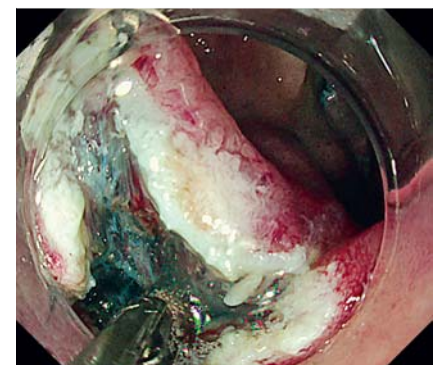
▶ Fig. 2 The superior duodenal angle was straightened by pulling the stomach toward the oral side.



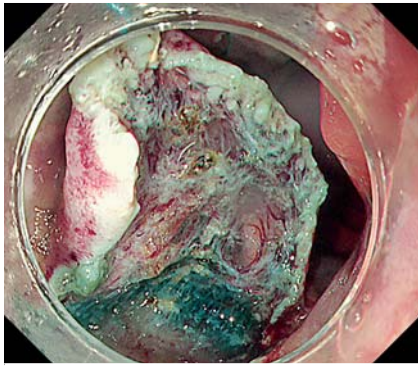
▶ Fig. 1 A slightly depressed lesion was located at the superior duodenal angle.



▶ Fig. 3 Endoscopic visualization and accessibility to the lesion was effectively changed with laparoscopic assistance.



▶ Fig. 4 Endoscopic submucosal dissection was performed using a scissor-type knife.



► **Fig. 5** Traction devices provided better visualization.

D-LECS is expected to improve endoscopic visualization and accessibility to the lesion, as well as reinforcement by suturing the mucosal defect after ESD.

Competing interests

The authors declare that they have no conflict of interest.

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▶ VIDEO



► **Video 1** Laparoscopic assistance improved endoscopic visualization and accessibility of duodenal lesions located at the superior duodenal angle. Audio source: The sound of this video uses Ondoku (www.ondoku3.com). **Video text:** A slightly depressed lesion is located at the superior duodenal angle. Laparoscopic marking of the lesion at the superior duodenal angle. First, we performed the Kocher maneuver to partially detach the duodenum from the retroperitoneum. The superior duodenal angle was straightened by pulling the stomach towards the oral side. The lumen was straightened and the entire lesion could be endoscopically recognized. Compared to the preoperative image, endoscopic visualization and accessibility to the lesion were effectively improved. Injection. Circumferential mucosal cutting. A traction device was attached to the side of the lesion. The other end of the traction device was fixed, considering the direction in which you wanted to tow. Submucosal dissection under good field of view. En bloc resection was achieved without adverse events. Marking the area to be sutured. The mucosal defect was reinforced using seromuscular sutures. Sutures were completed. The endoscope was passed over the resected area without stenosis.

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