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Water pressure method combined with magnifying endoscopy for esophageal endoscopic submucosal dissection

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Dear Editor,

Poor visual field and limited submucosal space could obstruct endoscopic submucosal dissection (ESD) and increase the risk of complications. In this manuscript, we presented ESD assisted by water pressure method (WPM) and magnifying endoscopy for a difficult case of early esophageal cancer.

Case report

A 60-year-old man was referred to our center for treatment of esophageal cancer. White light endoscopy showed a 3-cm slightly depressed lesion on the posterior wall of the lower esophagus (Fig. 1A). Notably, there was a remarkable compression from the descending aorta. Based on the findings of magnifying endoscopy (Fig. 1B), a presumptive diagnosis of superficial esophageal squamous cell carcinoma (ESCC) was made and ESD was scheduled. After circumferential mucosal incision, submucosal dissection proceeded. However, the dissection plane was vague, possibly ascribed to external esophageal compression, and intraoperative bleeding occurred (Fig. 1C). Given the operative difficulty, WPM was applied. Normal saline was infused and active water stream was provided using water-jet function. The floating force and water pressure effectively expanded the submucosal operation space below the mucosal flap (Fig. 1D). Meanwhile, when combined with magnifying endoscopy, submucosal fibers and vessels were better visualized (Fig. 1E), facilitating the identification of the excision line (Fig. 1F). Intraoperative bleeding was also easily identified that facilitated hemostasis (Fig. 1G). Subsequent dissection was uncomplicated and \textit{en bloc} resection was achieved (Fig. H-I), with an overall
operation time of 30 min. No delayed complications occurred. Pathological findings showed ESCC invading the lamina propria mucosa (pT1a-LPM) with negative margins and no lymphovascular invasion.

**Discussion**

ESD has been a standard treatment for early esophageal cancer with a high R0 resection rate and safety. However, due to a narrow space and thin wall, esophageal ESD sometimes could be difficult, especially when lacking adequate submucosal dissection space and secure visual field (1). Standard ESD may pose a higher risk of muscular injury and perforation, increasing the risk of post-ESD stricture (2). Several techniques, like clip-with-line traction method, emerge to overcome these issues (3). WPM is a method using the water-jet function that provides a similar traction effect (4); meanwhile, its magnified effect enables better visualization of the dissection plane that could be enhanced when combined with magnifying endoscopy. For complex cases, WPM combined with magnifying endoscopy can be considered as an adjunct to improve the efficacy and safety of ESD.

**References:**


Fig. 1. (A) White light imaging revealed a 3-cm reddish slightly depressed lesion located on the posterior wall of the lower esophagus, with remarkable external compression from the descending aorta. (B) Magnifying endoscopy with blue laser imaging showed a well-demarcated brownish area with type B1-B2 vessels using the Japan Esophageal Society classification. (C) Active hemorrhage occurred that obstructed the visual field. (D) Water pressure method (WPM) effectively expanded the operation space below the mucosal flap. (E) When combined with magnifying endoscopy, submucosal fibers and vessels were better visualized. (F) The excision line was clearly identified during the following dissection under WPM with low magnification. (G) Minor bleeding point (yellow arrow) was readily visualized to deal. (H) The wound after resection. (I) The en bloc resected specimen.