Endoscopic submucosal dissection (ESD) is a time-consuming and technically demanding technique [1–3]. The main difficulty is the lack of triangulated countertraction with current endoscopes [4]. To improve speed and efficacy of the procedure, an intriguing pulley method using dental floss together with endoscopic clips has recently been described [5]. However, current clip technology is unlikely to provide a robust and dependable anchor for this “pulley” technique.

To create a more stable pulley mechanism, we used a novel endoscopic suturing device (Overstitch, Apollo-Endosurgery, Austin, Texas, USA; ● Fig. 1). The device consists of a suture with an anchor/needle threaded through one endoscopic working channel. The anchor can be linked to a curved suturing-arm manipulated via a system-handle on the proximal end of a dual-channel therapeutic gastroscope (● Video 1). We believe the use of this system could greatly facilitate ESD by providing endoluminal triangulation and retraction (● Fig. 2).

In an anesthetized 45-kg pig, hypothesized gastric lesions (n = 2) were marked by mucosal burns (diameter 3 cm). After lifting the area with saline, a circumferential mucosal incision was performed using a standard needle knife. With the suturing device a suture was first endoluminally anchored at an anterior gastric fold (● Fig. 3), distal from the lesion. A second bite was placed through the lateral proximal edge of the specimen and the anchor/needle, serving as a lifting retainer, was released. To generate triangulation, another endoluminal pulley was created (● Fig. 4) at the contralateral mucosal edge. Both suture tails were withdrawn through the mouth and separately clamped with a hemostat. An isolated tip needle knife (IT-knife, Olympus, Center Valley, Pennsylvania, USA)
was used for submucosal dissection while alternately pulling on the sutures to lift and retract the specimen (● Fig. 5). All suture-pulleys (n = 4) were easily created within 5.3 ± 0.3 min. Subsequent submucosal dissections were successfully performed in 34.0 ± 1.4 min, without perforations (● Fig. 6, ● Video 2).

The use of an endoscopic suturing device could facilitate dissection of large superficial gastrointestinal lesions by enabling endolumenal triangulation.

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Competing interests: None

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