Double-tunnel endoscopic submucosal tunnel dissection for circumferential superficial esophageal neoplasms

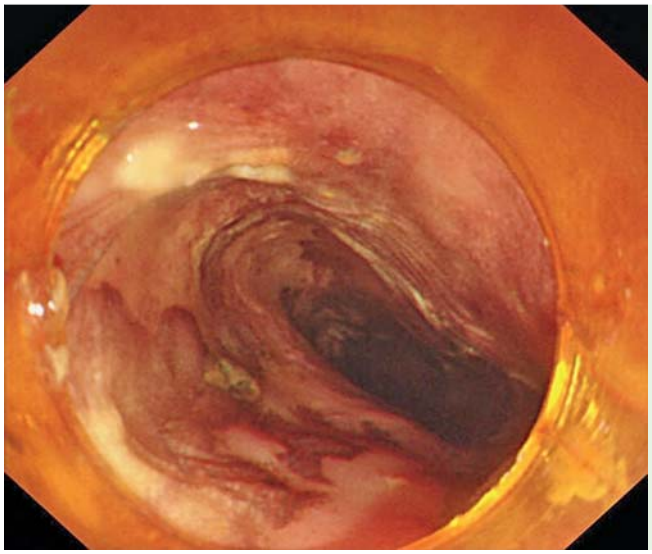

Fig. 1 Chromoendoscopy with iodine staining showing a superficial esophageal cancer (0-IIb) that discontinuously occupied nearly the whole circumference of the esophagus, at about 28 cm to 36 cm from the incisors.

Endoscopic submucosal tunnel dissection (ESTD) was first introduced by us as a new strategy for rapid resection of large esophageal neoplasms [1]. However, for circumferential superficial esophageal neoplasms (CSENs), an obscured view and poor submucosal lifting have been experienced during lateral resection of the final one-third of the circumference. In our early experience using single-tunnel ESTD to treat four patients with CSENs, the mean operation time was 382.5 minutes and one patient experienced a perforation. To counteract the problems with this technique, we have now successfully performed a double-tunnel ESTD procedure on a patient with an 8-cm CSEN.

A 66-year-old man was referred for resection of an 8-cm CSEN, at about 28 cm to 36 cm from the incisors (**Fig. 1**; **Video 1**). After marking the margin of the lesion, successive circular incisions were made at the anal and oral margins using a dual knife (KD-650L; Olympus, Tokyo, Japan) and an insulated-tip knife (KD-611L; Olympus) (**Fig. 2a**). The first submucosal tunnel was created in the oral to anal direction using a triangular knife (KD-640L; Olympus), with endoscopic hemostasis of visible vessels or active bleeding being actively performed, either with a knife or with a hot forceps. A second tunnel was then created, running in the opposite direction to the first, using the same technique (**Fig. 2b**). Finally, the narrow borders between the two tunnels were easily resected (**Fig. 2c**), which allowed for complete removal of the lesion (**Fig. 3**). To prevent postoperative stricture, a 14-cm retrievable, fully-covered esophageal stent (CZES-II; Sigma, Huaian, China) was placed after preventive coagulation of the artificial ulcer had been performed (**Fig. 4**).

The whole operation took 97 minutes and the patient's recovery was uneventful. Histopathological examination revealed a micro-invasive squamous carcinoma limited to the lamina propria mucosae without vascular invasion, and the resection margins were free of cancer.

Recently, there have been an increasing number of reports on the use of ESTD for large esophageal neoplasms [2,3], which have also described the advantage this technique has over endoscopic submucosal dissection (ESD), namely improved speed of dissection [4]. Compared with the single-tunnel procedure, the double-tunnel ESTD procedure made it easier to dissect most of the esophageal circumference and offered significant improvements in the endoscopic view and the ease of submucosal lifting. This is the first report of the use of double-tunnel ESTD for a CSEN, which appears to be not only safe and feasible, but also more efficient.

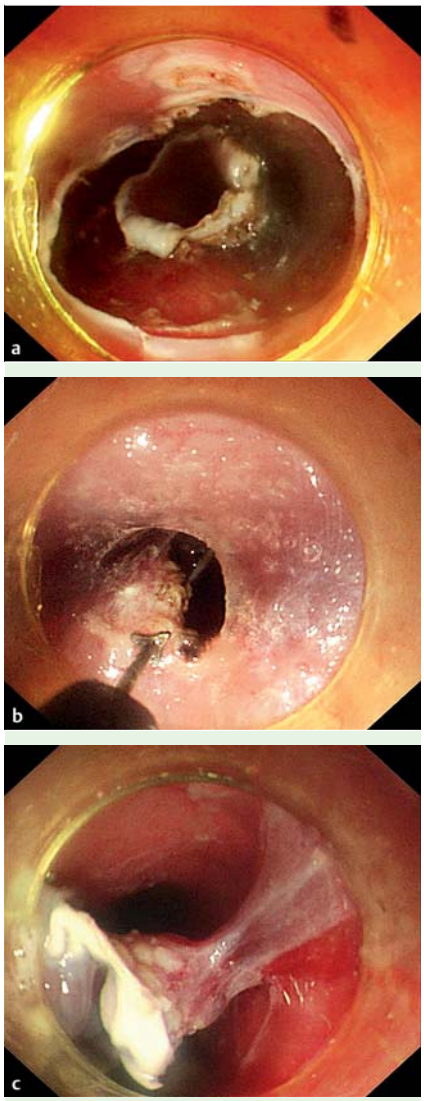

Fig. 2 Endoscopic view showing: **a** circular incisions at the anal and oral margins of the lesion that were made with a dual knife and an insulated-tip knife; **b** the two submucosal tunnels that were created by submucosal dissection with a triangular knife; **c** the narrow borders left following completion of the two tunnels, which could then be easily resected.

Video 1

Double-tunnel endoscopic submucosal tunnel dissection being performed for a circumferential superficial esophageal neoplasm.

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Competing interests: None

Fig. 3 The specimen that was retrieved (approximately 60 mm in length) and is shown covering a 5-mL syringe.

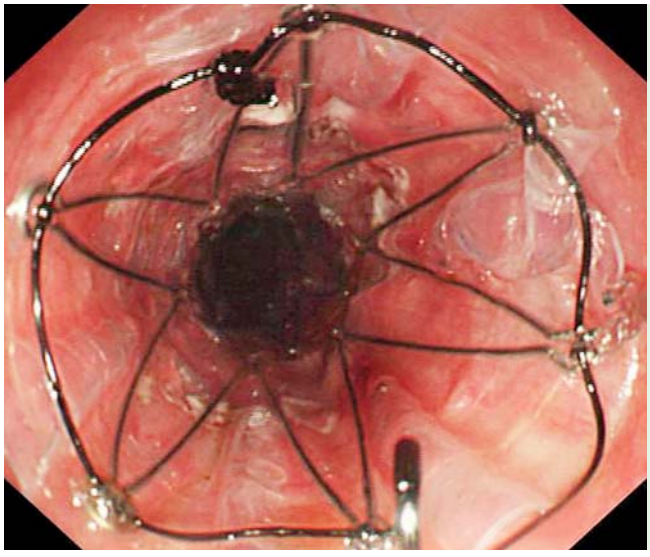

Fig. 4 The 14-cm retrievable, fully-covered esophageal stent positioned in the esophagus after preventive coagulation of the artificial ulcer had been performed.

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