A safe approach to perform endoscopic mucosal resection of a duodenal adenocarcinoma located close to a duodenal diverticulum

Fig. 1 Endoscopic views in an 83-year-old woman showing: **a** a polypoid duodenal lesion located close to; **b** a duodenal diverticulum that was proximal to the papilla of Vater.

Fig. 2 Views during chromoendoscopy in the duodenum using 0.2% indigo carmine solution showing: **a** the margin of the tumor clearly delineated; **b** the submucosal cushion that was created by injecting a mixture of indigo carmine and saline into the base of the lesion; **c** an endoscopic appearance that is consistent with complete resection (R0); **d** the hemoclips that were placed to close the mucosal defect.

Not infrequently duodenal adenomas and adenocarcinomas are located in difficult or awkward positions that can impede their resection endoscopically. Duodenal diverticuli are common, occurring in 5% of individuals. Herein, we describe a safe technique for the removal of an early duo-

denal adenocarcinoma that was located close to a diverticulum.

An 83-year-old woman with a history of hypertension was found to have a duodenal polypoid lesion located close to a diverticulum (● Fig. 1). A biopsy specimen was suspicious for a well-differentiated

adenocarcinoma. The patient's preference was to undergo an endoscopic excision.

The following steps that allowed endoscopic resection to be safely performed were followed (● Video 1). (i) The margin of the tumor was delineated by chromoendoscopy using 0.2% indigo carmine solution (● Fig. 2a). (ii) An indigo carmine and saline mixture was injected into the base of the lesion to create a submucosal cushion. Submucosal injection into the distal side of the tumor pushed the lesion away from the diverticulum and resulted in it being positioned en face to the endoscope (● Fig. 2b). (iii) The tip of a snare (SnareMaster; Olympus Medical, Tokyo, Japan) was used to precut the distal side of the lesion. Freeing up of the tissue by precutting allowed the tip of the snare to be anchored and stabilized, which subsequently allowed the lesion to be more readily ensnared. (iv) The snare was then placed circumferentially around the tumor; and (v) the lesion was resected in one piece (● Fig. 2c). (vi) Complete closure of the defect was accomplished with hemoclips (Olympus Medical) (● Fig. 2d). The patient's postoperative course was uneventful. She started a soft diet 1 day after the procedure and was discharged home 5 days later. Histology of the resected specimen revealed a 13-mm, intramucosal, well-differentiated tubular adenocarcinoma, without evidence of lymphovascular invasion.

Endoscopic resection techniques have now become accepted therapies for the removal of duodenal neoplasms [1–3]. However, complications are much more common than when resecting stomach or colorectal lesions, especially with endoscopic submucosal dissection [1,4,5], because the duodenum has a very thin wall and the mucosal defect is exposed to the digestive forces of bile and pancreatic juice. Therefore, a careful approach, such as described in this case, is mandatory.

Video 1

A video showing the steps necessary to safely perform duodenal endoscopic resection. A polypoid duodenal lesion was found proximal to a duodenal diverticulum near to the papilla of Vater. Superficial chromoendoscopy with indigo carmine was used to delineate the tumor margins and a submucosal cushion was created. The distal side of the lesion was precut using the tip of a snare. This allowed the snare to be anchored and stabilized, before it was placed circumferentially around the tumor. The lesion was resected in one piece and the defect was closed completely with hemoclips.

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