Acute iatrogenic gastric perforation during endoscopic ultrasound (EUS) for malignant biliary obstruction: intraoperative over-the-scope clip closure and EUS-guided biliary drainage with lumen-apposing metal stent

A 72-year-old woman presented with a 2-month history of jaundice and abdominal pain. A computed tomography scan revealed a large mass in the pancreatic head with dilated bile ducts. Endoscopic ultrasound (EUS)-guided fine-needle biopsy (FNB) and endoscopic retrograde cholangiopancreatography were scheduled for tissue acquisition and jaundice resolution.

The EUS was performed under general anesthesia using a linear echoendoscope (GF-UCT140; Olympus, Tokyo, Japan) with carbon dioxide insufflation. A neoplastic infiltration of the duodenal bulb (Mutignani type I [1]) was observed. However, during the advancing maneuvers of the echoendoscope toward the duodenum, we detected a full-thickness, round-shaped defect, of 14 mm in diameter, in the gastric lesser curvature, with direct access into the peritoneal cavity (Fig. 1, Video 1).

A gastroscope preloaded with an over-the-scope (OTS) clip (14/6t) was immediately used to close the iatrogenic perforation, with margin apposition and subsequent restoration of intraluminal distension (Fig. 2).

EUS-FNB of the pancreatic lesion was then performed and a duodenal uncovered self-expandable metal stent was deployed over-the-wire across the stricture. A trans-stent duodenoscopy was carefully performed and, under fluoroscopy, sphincterotomy was attempted multiple times without successful cannulation of the biliary ducts.

Finally, under EUS and radiologic guidance, an EUS-guided choledochoduodenostomy was performed using a 10 × 20 mm electrocautery-enhanced lumen-apposing metal stent (Hot Spaxus; Taewoong Medical, Gimpo-si, South Korea) (Fig. 3).

A broad-spectrum antibiotic was administered for 7 days and the patient was asymptomatic at the 3-month follow-up, with a progressive drop in bilirubin. Although rare, iatrogenic gastric perforation is a critical complication of EUS and may be fatal in elderly patients and those with neoplasia, especially if not recognized rapidly [2]. Immediate diagnosis is crucial and, even if technically demanding, the intraprocedural application of minimally invasive endoscopic treatment is feasible and safe, reducing the necessity for urgent surgery and its complication-related morbidity and mortality. Moreover, the completion of the required E-Videos

Video 1 Application of an over-the-scope clip for immediate full-thickness closure of an iatrogenic gastric perforation that occurred during diagnostic endoscopic ultrasound.

Fig. 1 Iatrogenic gastric perforation occurred caused by traumatic mechanical traction at the rigid tip of the echoendoscope. a The full-thickness defect. b Peritoneal exploration. The blue dashed line encompasses the liver.
procedure should be always pursued in order to avoid delayed diagnosis and potential medicolegal issues.

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Competing interests

The authors declare that they have no conflict of interest.

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Fig. 2 Placement of an over-the-scope clip achieved a watertight closure of the defect and distension of the gastric lumen.

Fig. 3 Stent placement. a Endoscopic ultrasound-guided biliary drainage. Placement of the lumen-apposing metal stent (LAMS; Hot Spaxus; Taewoong Medical, Gimpo-si, South Korea) required the use of a guidewire (asterisk) to maintain direct biliary access during placement due to the difficult positioning and long length of the echoendoscope (arrow: LAMS electrocautery delivery system). b Final cholangiography confirmed no pathological leakage. Double asterisk, over-the-scope clip; red arrowheads, LAMS; blue lines, duodenal stent.