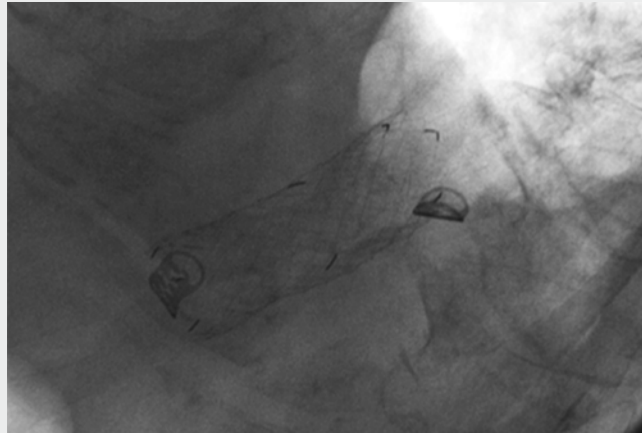


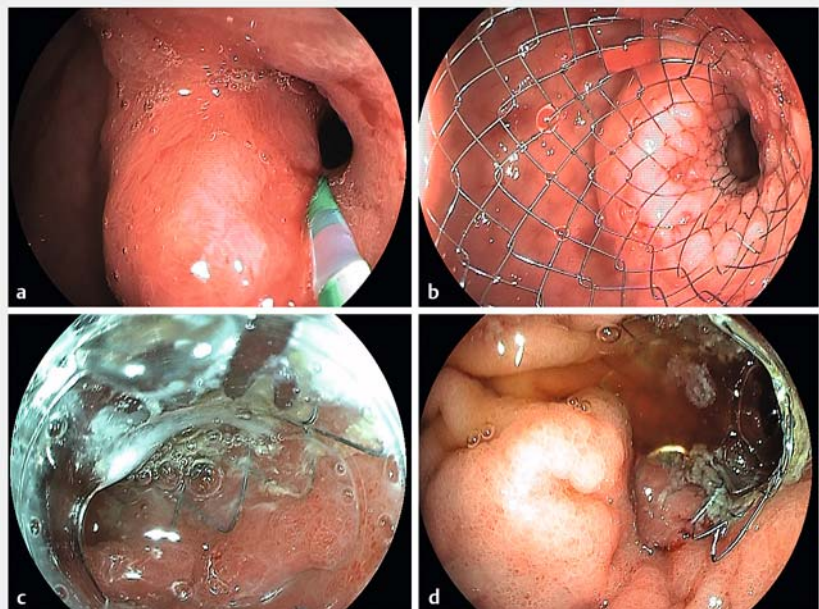
Double-sided anchoring of a newly placed mid-gastric metal stent using novel dedicated over-the-scope clips to allow safe through-the-stent ERCP

The patient was an 85-year-old woman who had been diagnosed with advanced gastric cancer including diffuse peritoneal spread 3 months previously. She had recently been admitted after four cycles of palliative chemotherapy because of progressive signs of luminal occlusion, as well as jaundice. Laboratory assessment was significant for increased cholestasis parameters (γ -glutamyltransferase 1084 U/L, alkaline phosphatase 977 U/L, bilirubin 0.6 mg/dL) and minor systemic inflammation (C-reactive protein 3.4 mg/dL). Therefore, antibiotic treatment was commenced for suspected cholangitis.

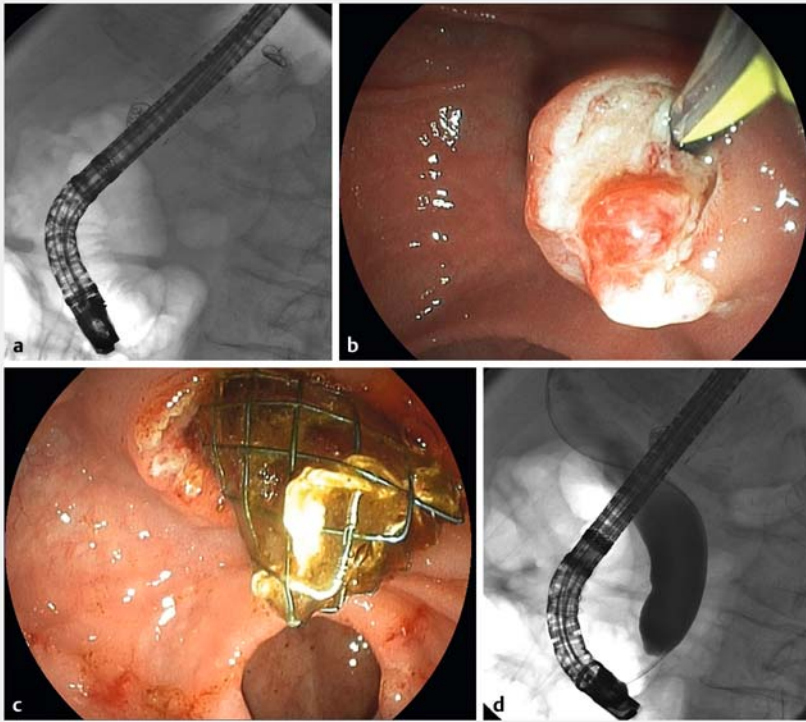
Standard upper gastrointestinal endoscopy confirmed a short, high grade malignant obstruction in the middle third of the stomach, while the distal antrum was found to be tumor-free after successful passage of a pediatric gastroscope (► **Fig. 1 a**). An uncovered 60×20-mm gastroduodenal self-expanding metal stent (SEMS; Taewoong Medical) was placed without difficulty, using a double-lumen gastroscope (► **Fig. 1 b**). Two days later, after adequate spontaneous stent expansion, both the iso- and antiperistaltic stent ends were fixed by clips. To this end, we used a novel dedicated over-the-scope (OTS) clip system (stentfix OTSC; Ovesco Endoscopy, Tübingen, Germany), which is an evolution of conventional OTS clip technology with indentations in the cap and brackets bowed to the outside to optimize engagement (► **Fig. 1 c, d**). Following the switch to a therapeutic duodenoscope, careful advancement through the mid-gastric SEMS (► **Fig. 2 a**) proved easy. It was then possible, without further difficulty, to perform the endoscopic retrograde cholangiopancreatography (ERCP) procedure, including a freehand needle-knife precut (► **Fig. 2 b**) for difficult biliary access, and implantation of a biliary SEMS (► **Fig. 2 c**) for a short pre-papillary high grade stricture (► **Fig. 2 d**; ► **Video 1**).



► **Video 1** The video illustrates double anchoring of a mid-gastric self-expanding metal stent using stentfix OTSCs to allow through-the-stent endoscopic retrograde cholangiopancreatography.



► **Fig. 1** Endoscopic views showing: **a** a short high grade stricture in the middle third of the stomach with a cannula for guidewire insertion; **b** a 60×20-mm uncovered gastroduodenal self-expanding metal stent that has been inserted across the stricture; **c** clip fixation of the oral end of the stent using a novel dedicated over-the-scope clip (stentfix OTSC) that has indentations in the application cap; **d** the final result with optimal and tight stent fixation (the differential bowing of the clip brackets compared with conventional over-the-scope clip technology is visible).



► **Fig. 2** Views during endoscopic retrograde cholangiopancreatography (ERCP) showing: **a** uncomplicated duodenoscope advancement and short-axis en face positioning for through-the-stent ERCP (note the fluoroscopic appearance of the stentfix OTSCs in situ; **b** successful freehand needle-knife precut access after failed guidewire cannulation; **c, d** implantation of a biliary self-expanding metal stent for a pre-papillary high grade stricture after maximum-incision endoscopic papillotomy.

Combined biliary and gastroduodenal outlet obstruction typically arises in pancreatic cancer and is categorized by the Mutignani classification, which may guide clinical decision-making [1]. In contrast, the situation in this clinical report, with its combined mid-gastric and biliary obstruction, is quite uncommon, in addition to the pioneering novel concept of securing the stent for through-the-stent ERCP by double-sided fixation [2]. As is illustrated herein, the innovative and recently marketed stentfix OTSC system enriches the endoscopist's toolbox in standard and special settings related to gastrointestinal stenting [3].

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Competing interests

The authors declare that they have no conflict of interest.

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