

## CASE REPORT

# Hepatocolic fistula managed with a novel Padlock® device for endoscopic closure

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## ABSTRACT

Recent advances in endoscopic therapeutics allow conditions such as fistulas of the digestive system to be treated endoscopically. These cases were recently managed with surgery. The Padlock® system includes a nitinol clip that was recently introduced for endoscopic therapy. There are few reports with regard to its use in the daily clinical practice. We report a case of a colonic fistula that was endoscopically managed with this novel over-the-scope nitinol clip system.

**Key words:** Therapeutic endoscopy. Over-the-scope clip. Fistula closure.

## CASE REPORT

We report the case of a 92-year-old woman with a history of high blood pressure and temporal arteritis, under treatment with lisinopril and prednisone. The patient presented to the Emergency Room with fever and pain in the right upper quadrant of the abdomen of seven days duration. She had mild pain on deep palpation of the right hypochondrium. An abdominal CT scan was performed which revealed a calcified hydatid cyst and a 6 cm focal lesion with an air-fluid level consistent with a liver abscess in liver segment V. The latter lesion was in intimate contact with the hepatic angle of the colon (Fig. 1A). A percutaneous drain was placed by the Interventional Radiology Department, which allowed purulent material to be removed and contrast medium to be introduced into the cavity. No communication was found with the bile duct but the contrast reached the colon hepatic flexure (Fig. 1B). The initial clinical symptoms persisted after radiologic drainage, and cultures of the fluid collected from the lesion were positive for *Escherichia coli* and *Streptococcus constellatus*.

The fistulous tract observed by the radiographic study was confirmed by colonoscopy. The scan revealed a

7-8 mm fistulous orifice at the hepatic flexure which was 60 cm away from the anal margin with detritus discharge (Fig. 2A). The drain bag immediately filled with air upon air insufflation within the area. No diverticula were observed. Once specific consent was obtained, a Padlock Clip™ (Aponos Medical, Kingston, NH, United States) of the Pro-Select™ model (11 mm in diameter) was mounted on the tip of an Olympus GIF 1TQ160 video-gastroscope. Once the lesion was localized (Fig. 2B), the surrounding mucosa was aspirated into the plastic cap. The metallic endoclip was then released by gently pressing on the handle designed for this purpose. The metallic ring closed the colonic defect, leaving a mucosal pseudopolyp behind (Fig. 2C). Subsequently, the external drain was opened and air no longer passed into the bag attached to the radiologic drain. Complete closure of the fistulous tract was confirmed by a CT scan (Fig. 2D). The patient remained asymptomatic with no further drainage and was discharged from hospital after a seven day course of antibiotic therapy.

## DISCUSSION

The development of novel mechanical endoscopic closure systems allows for the management of some gastrointestinal fistula types in an effective, simple and safe manner (1). A new device was recently introduced with improved and appealing characteristics (2,3). Although similar in concept to the Ovesco® clip design, the setup is different, it does not involve the working channel and allows improved cleaning and aspiration. This system does not include forceps and suction is only used to introduce tissue into the cap before release (4). The new clip consists of an 11-mm hexagonal nitinol ring with six inner needles; the whole assembly lies within a plastic cap that is then fitted to the tip of the endoscope. Once the lesion is localized,

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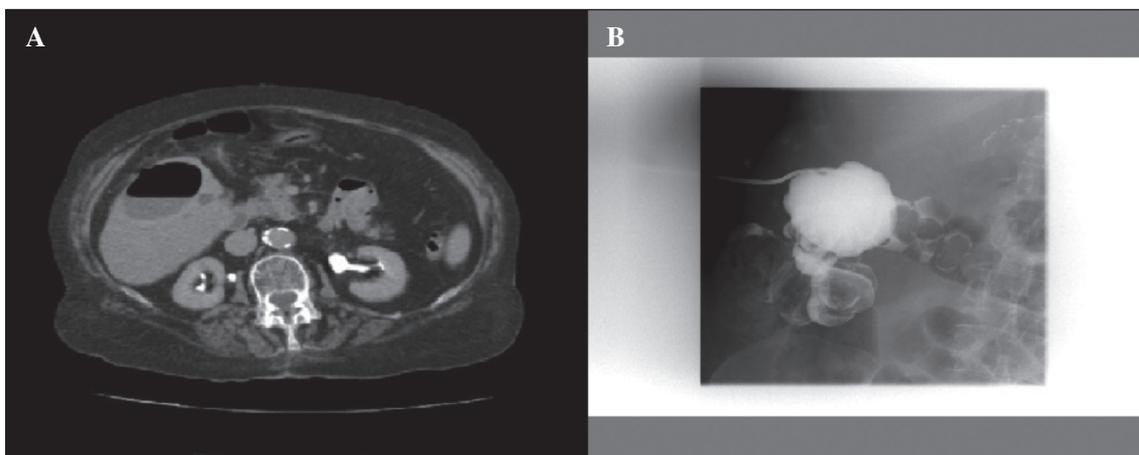


Fig. 1. A. A collection with an air-fluid level is seen in the liver segment V, which is in intimate contact with the colonic wall. B. A radiopaque contrast medium fills the cavity and reaches the colon at the hepatic flexure.

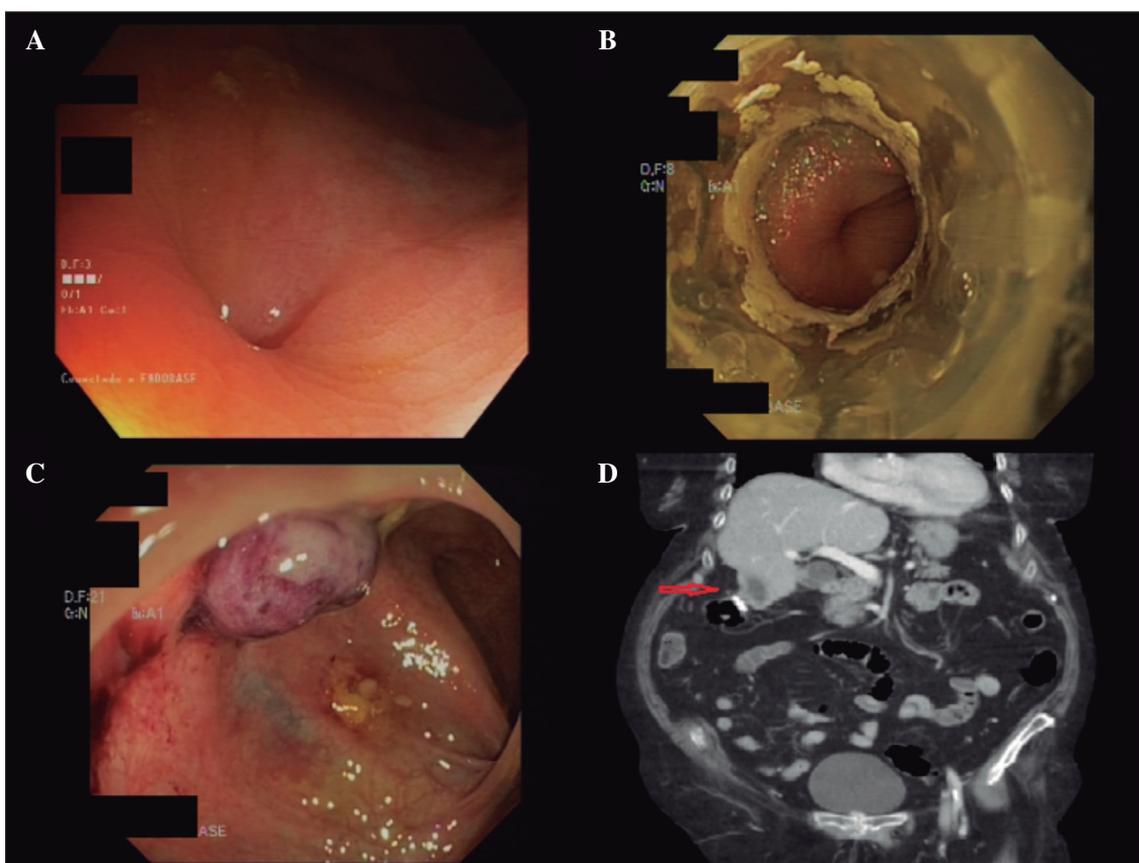


Fig. 2. A. A fistulous orifice is shown at the hepatic flexure of the colon. B. The same lesion is seen via the Padlock® system cap mounted on the tip of a videoendoscope. C. The pseudopolyp induced above the clip that closed the wall defect is seen. D. Monitoring CT scan revealing the clip between the residual collection and the colonic wall (red arrow).

the tissue in the target area is introduced into the cap by aspiration and the clip is then released by pressing a plastic push button (the Lock-it™ delivery system) at the end of a wire running externally along the shaft of the endoscope. Two cap models are available: a standard cap for endo-

scopes 9.5-11 mm in diameter and a Pro-Select™ cap for endoscopes 11.5-14 mm in diameter. Aspirated specimen depth may vary from 8 mm to 20 mm.

The high elasticity conferred by nitinol to the endoclip pushes the six inner prongs into the suctioned portion,

thus closing the defects or bleeding points. On release, a pseudopolyp is formed above the clip. A high resistance to air pressure has been reported in porcine models, reaching up to 68 mmHg (5). The clip is radiopaque and its placement does not contraindicate subsequent MRI scans.

Reports on its use in daily practice are scarce and there are some heterogeneous series that have studied its location and applications (2,4,6,7). The system has been primarily used to control relapsed bleeding and for closing perforations or fistulae at various levels. To our knowledge, this is the first case to report the use of the system for the treatment of a fistula in the proximal colon.

Hepatocolic fistulas are uncommon and usually originate from collections communicating with the bile duct (8). They may also develop secondary to a pyogenic abscess (9). There is no well-defined protocol for clinical management, likely due to their unusual nature. Some authors recommend conservative measures with or without a radiographic procedure using drains. Other options should be considered for persistent clinical scenarios.

Each fistula or digestive wall defect must be approached on an individual basis according to clinical status and patient comorbidity. Etiology, characteristics and location should also be taken into account. The development of novel endoscopic closure mechanisms is changing the classic paradigm with regard to the need for surgery as a therapeutic option (10). Its main advantage is the ability to close the GI orifice using a minimally invasive approach with a lower morbidity. The procedure's simplicity is particularly valued by endoscopists, as with the Padlock® system used in this patient. Placement was straightforward using an endoscope, the hepatic flexure of the colon was reached, the view provided by the cap was adequate and the working channel was free to provide efficient washes and aspirations.

Although further endoscopies were not performed to check the status of the mucosa at the site of the pseudopolyp formed on fistula closure, the clip does not seem to induce ischemic problems. Further studies are needed to confirm the efficacy and safety of the novel Padlock® system for endoscopic closure. Easy over-the-scope assembly and release is a factor to be considered when using this device.

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