

Use of the over-the-scope clip (OTSC) system in the gastrointestinal tract: Experience at a third level center in Bogotá, Colombia

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Abstract

Perforations and fistulas of the gastrointestinal tract pose great therapeutic challenges and have usually been treated surgically. Recently, introduction of new endoscopic accessories has resulted in a growing trend of gastroenterological management of these patients. The “over-the-scope clip” (OTSC) system has shown itself to be useful for closing perforations of the gastrointestinal tract resulting from various causes. **Methods:** This paper presents a prospective case series of patients at a third level endoscopy center in Bogotá, Colombia who were treated in 2015. Experience with the use of the OTSC system in six patients with different indications is presented with at least three months of follow-up to assess recurrence. **Results:** Six cases, three men and three women, whose average age was 46.6 years were treated for a rectal perforation, a gastrocutaneous fistula following percutaneous gastrostomy, a posterior gastric fistula following bariatric surgery, gastric cancer through transmural clip resection, a rectal-vaginal fistula, and traumatic duodenal perforation. Successful closure of the lesion was achieved in five of the six cases, with a success rate of 83.3%. **Conclusions:** The OTSC system is useful system for closure of perforations of diverse etiologies in the gastrointestinal tract and is very efficient for closure of acute perforations. Nevertheless, it is not useful for chronic lesions such as rectal-vaginal fistulas. It may also be useful for new options such as transmural resection of early gastric cancer.

Keywords

Endoscopy, perforation, close, over-the-scope.

INTRODUCTION

The endoscopist faces daily complications such as perforations, intestinal bleeding, iatrogenic fistulas and anastomotic leaks. To reduce morbidity and mortality, we need to be using increasingly less invasive new techniques.

The frequency of gastrointestinal perforations is between 0.01% and 0.6% for diagnostic endoscopy, and between 0.6% and 5.5% for therapeutic endoscopy. (1) Higher perforation rates have been reported for polypectomies, endoscopic mucosal resection (EMR) and endoscopic submucosal dissection (ESD). (2) Surgery has been the cornerstone for managing these complications.

Endoclips have been used since 1997 to achieve endoscopic closure of gastrointestinal perforations and have been successfully applied to many indications. (3, 4) Nevertheless, through-the-scope (TTS) clips are limited because they must be passed through the endoscope which means that they cannot easily be used to close large perforations because of their size and because of restricted closing force.

The over-the-scope clip system (OTSC) is an endoscopic hemostatic clip that was initially used for the treatment of non-varicose gastrointestinal bleeding. (5) This clip, also called a bear trap, is made of elastic nitinol and is capable of producing complete closure of the tissue. (5, 6) This device was approved by the Food and Drug Administration

(FDA) in 2010. (7) Unlike the standard TTS clip, OTSC allows closure with a single application for lesions larger than 2 cm. (8) OTSC has also been used for resection of submucosal tumors, treatment of bleeding lesions and placement of esophageal stents. (6)

This article presents a series of cases that reflect our clinical experience with the use of OTSC in a third-level endoscopy center in Colombia.

MATERIALS AND METHODS

This article shows a series of consecutive prospective cases of patients treated at a third-level referral hospital in the city of Bogota, Colombia in 2015. Six cases are included. Indications for the use of OTSC were a rectal perforation, a gastrocutaneous fistula following a percutaneous gastrostomy, a gastric fistula following bariatric surgery, closure after resection of gastric cancer, a rectovaginal fistula and a duodenal perforation.

In all cases, an endoscope equipped with an Ovesco 12/6 gc series cap and a 220 tt OTSC clip were used.

RESULTS

In the last year there were six cases (Table 1).

Case 1

The patient was a 36 year-old woman who had had episodes of pelvic pain and amenorrhea who underwent vaginal surgery to release adhesions. During the procedure the gynecologist noticed fecal matter which was compatible with rectal perforation. Emergency sigmoidoscopy revealed a perforation that measured approximately 15 together with multiple rectal nodules. An Ovesco clip was placed and achieved complete closure of the perforation without complications. Nodule biopsies were compatible with endometriosis.

Case 2

A became bedridden 76-year-old patient with cerebrovascular disease (CVD), dysphagia and left hemiparesis underwent percutaneous endoscopic gastrostomy (PEG). Thirty days later, an abscess developed at the gastrostomy site that required removal of the feeding tube from the gastrostomy. Administration of antibiotics resulted in evident improvement, but at 15 days the fistulous orifice persisted with leakage of enteral nutrition through the hole despite advancing the tube to the second portion. It was decided to close the opening with an Ovesco clip using the twin grasper clip which allowed the two edges to be taken together and as the clip was placed. Immediate closure of the fistula was accomplished and the patient's subsequent evolution was satisfactory.

Case 3

A 33-year-old patient underwent a gastric sleeve procedure to treat morbid obesity. On the fourth day after surgery, the patient was discharged without apparent complications. At 15 days after surgery, the patient was readmitted because of abdominal pain, fever, vomiting and general malaise. An abdominal CT scan revealed a large collection (Figure 1) raising suspicion of a gastric fistula. Upper endoscopy found an 8 mm subcardial gastric orifice (Figure 2), so a pediatric endoscope was used to enter the cavity. The purulent contents were aspirated and the hole was closed with an Ovesco clip (Figure 3). Intravenous antibiotics were administered, the patient was placed on a diet, and the patient began to improve. The patient was monitored for seven days. A check-up 10 later found that the patient had evolved satisfactorily.

Case 4

The patient was 65 years-old and had a 6mm IIC early gastric cancer located in the subcardial region towards the

Table 1. Demographic data, indications, size of lesions and success of technique

Number	Sex	Age	Indication	Lesion Size	Success of technique
1	F	36	Rectal perforation	15 mm	Yes
2	M	76	Gastrocutaneous fistula following gastrostomy	NA	Yes
3	F	33	Gastric fistula after bariatric surgery	8 mm	Yes
4	M	65	Resection of early gastric cancer	NA	Yes
5	F	55	Chronic rectovaginal fistula	15 mm	No
6	M	25	Duodenal perforation	20 mm	Yes

NA: Not applicable

posterior wall. The pathology report showed moderately differentiated gastric cancer and comorbidities included arterial hypertension with compensated heart failure. Total gastrectomy would have been indicated by the lesion alone, and endoscopic resection would have been contraindicated because the lesion was poorly differentiated and depressed lesion. Nevertheless, a gastrectomy would have been fatal in this patient given the comorbidities. It was

decided to place an Ovesco clip, form a pseudopolyp with the ulcerated lesion in the center, and resect it with a polypectomy loop above the clip. This achieved complete resection of the lesion, and - more importantly - the pathology report confirmed that the lesion had been resected with the muscularis propria which ensured a complete cure. The patient was discharged the next day, and at eight months follow-up there had been no recurrence (Figure 4).



Figure 1. Tomographic image of collection in the gastric area

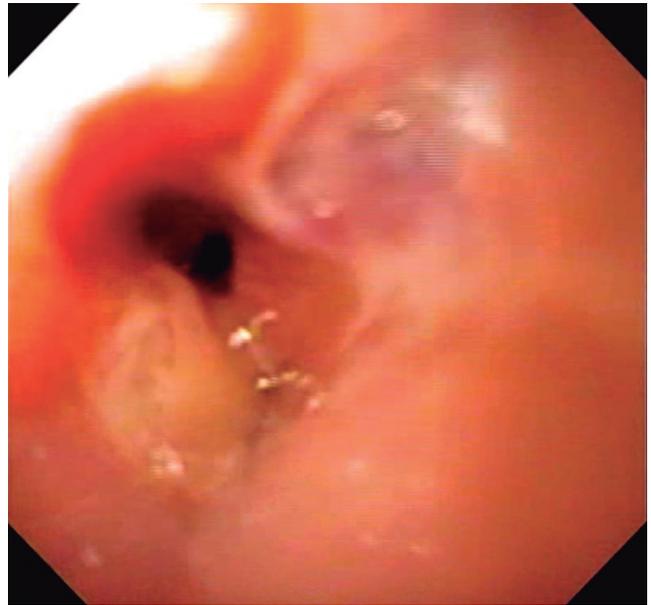


Figure 2. 8 mm subcardial gastric orifice

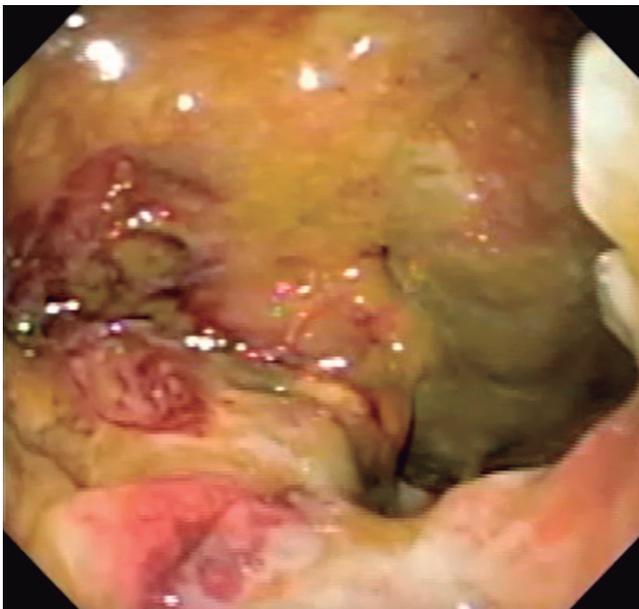


Figure 3. Gastric cavity with purulent contents and closure with Ovesco clip

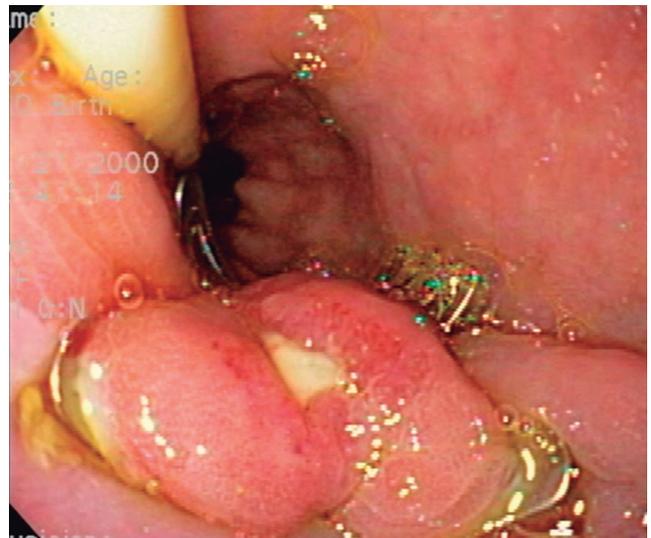


Figure 4. Pseudopolyp with lesion, ulcer in the center and closure with an Ovesco clip

Case 5

A 55-year-old patient reported recurrence of fecal matter in her vagina for more than 6 months. A colonoscopy revealed an approximately 15 mm in diameter hole communicating to the vagina at 25 cm in the sigmoid colon. It was decided to place an Ovesco clip to achieve immediate closure of the fistula. The patient reported improvement the following day and was discharged, but returned ten days later because of fecal matter in her vagina. Another revealed that the same fistulous orifice remained open, so she was sent to general surgery.

Case 6

The patient was 25 years-old patient and had two gunshot wounds in the abdomen. An emergency laparotomy found multiple intestinal holes requiring multiple sutures and drainage. One of the holes was in the upper right quadrant. Eight days later the patient was still in the intensive care unit in poor condition. Duodenal drainage showed bilious material, and an endoscopy confirmed a 20 mm fistula in the wall contralateral to the papilla. It was decided to close the fistula with an Ovesco clip with the help of the twin grasper clip. The patient evolved satisfactorily and was discharged on the 15th day after admission.

DISCUSSION

This prospective case series is a sample drawn from our experience in the management of perforations in the gastrointestinal tract (GIT) using the OTSC clip. It shows the broad spectrum of indications that can be addressed with these clips. Success was achieved with this technique in five out of the six cases as can be seen in the description of cases and Table 1. We achieved 83.3% effectiveness in closing perforations of the gastrointestinal tract using OTSC clips. This is comparable to reports in the literature world-wide. The only indication for which the technique was not successful was a chronic rectovaginal fistula. The overall success rates of OTSC clips in the literature range from 75% to 100% for iatrogenic gastrointestinal perforations, 38% to 100% for closure of gastrointestinal fistulas, 50% to 100% for anastomotic leakage, and 71% to 100% for bleeding lesions. (9, 10)

Voermans et al. reported success rates for endoscopic closure of 100% in the esophagus, 100% in the stomach, 75% in the small intestine and 92% in the colon. (11)

Another study has examined the efficacy of OTSC for management of both chronic and acute postoperative colorectal fistulas and leaks. (12) The study included cases in which the fistula orifice was less than 15 mm at its maximum diameter without evidence of abscess or luminal

narrowing. The success rates were 86% (7/8) for acute fistulas and 83% (5/6) for chronic fistulas in a total sample of fourteen patents. The study included two cases of rectovaginal fistulas. OTSC has also been shown to reduce the need for surgery and lengths of hospital stays. (13)

A recent meta-analysis that included 24 studies and 466 perforations evaluated the success of different endoscopic methods in closing acute gastrointestinal perforations. (14) The endoscopic modalities used were endoclips, OTSC, and self-expanding metal stents. Of all the perforations, 398 (85.4%) were closed with endoclips, 66 (14.2%) with the OTSC and two (0.4%) with self-expanding metal stents.

Successful endoscopic closure was achieved in 419 cases (89.9%) with a 95% confidence interval of 87% to 93%. Successful closure was achieved in 90.2% of the cases that used endoclips (95% CI: 87% -93%), in 87.8% of the cases that used OTSC (95% CI: 78% -95%), and in 100% of the cases that used SEMs.

An interesting application in our study was the use of the Ovesco clip to form a pseudopolyp which was then resected transmurally thereby eliminating early gastric cancer and close the defect simultaneously. To our knowledge, this is the first case described in the literature.

CONCLUSIONS

The over-the-scope-clip (OTSC) is useful for closing perforations of the gastrointestinal tract. It has a success rate that is over 80% and has a very low percentage of complications. In our experience we achieved 100% success in the management of acute perforations although we did not achieve closure of a chronic rectovaginal fistula.

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