

Bowel Obstruction and Hydronephrosis Due to an Over-the-Scope Clip

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ABSTRACT

An over-the-scope clip is a type of endoscopically placed clip used to treat gastrointestinal perforation, bleeding, or fistula. After the defect heals, the clip usually passes uneventfully through the gastrointestinal tract. An uncommon complication of over-the-scope clip placement is intestinal obstruction caused by luminal stenosis at the site of clip placement. Intestinal obstruction can rarely cause other downstream complications such as hydronephrosis from extrinsic compression of the urinary tract. We report a rare case of bilateral hydronephrosis caused by bowel obstruction from a migrated endoscopically placed clip.

INTRODUCTION

Endoscopic clips were first used in the 1980s to treat bleeding, gastrointestinal perforation or leakage, and to close fistulas.¹ Traditional through-the-scope clips have limitations related to weaker grasping force and limited size of the jaws.^{2,3} Over-the-scope clips (OTSCs) are large metal clips that were developed to allow closure of large gastrointestinal luminal defects.¹ OTSCs have been demonstrated to successfully manage gastrointestinal perforations, bleeding, fistulas, and leaks. One study reviewed clinical outcomes from 1,517 cases between 2010 and 2018 in which an OTSC was applied.⁴ The OTSC proved effective in treating bleeding (85%) and perforation (85%). The OTSC was least successful at fistula repair, with a 52% clinical success rate in 388 cases. Among the 1,517 cases, the frequency of OTSC-related adverse events was low at 1.7%. These complications included intraluminal stenosis causing obstruction, micro-perforation, or OTSC positional deviation.⁴

CASE REPORT

A 50-year-old woman presented to the emergency department with an 11-day history of nausea, vomiting, decreased oral intake, and postprandial abdominal pain. Her medical history was significant for cervical cancer that was treated by radiation therapy, which was complicated by radiation enteritis, enterocutaneous fistula, and recurrent small bowel obstructions. The patient required small bowel resection and partial colectomy with end colostomy and placement of a percutaneous endoscopic gastrostomy (PEG) tube at that time. She developed short-gut syndrome and required total parenteral nutrition. Her PEG tube was removed 8 months before admission. Because of persistent leakage at her PEG site, a 6/11t OTSC (Ovesco Endoscopy USA, Cary, NC) was subsequently placed to close a chronic PEG-site fistula 4 months before admission.

Her vital signs were within normal limits on initial presentation. On examination, her previous PEG site was erythematous, but without any drainage, and her ostomy bag was filled with soft brown stool. Her abdomen was minimally tender to palpation. On initial laboratory work, white blood cell count, hemoglobin, and platelets were within normal limits, as were her blood urea nitrogen and creatinine. Initial abdominal x-ray showed a distended small bowel and a clip in the left abdomen.

Esophagogastroduodenoscopy was performed shortly after her admission to evaluate for peptic ulcer disease, given her postprandial abdominal pain and reported ibuprofen use. No ulcers were appreciated, and the previous OTSC clip was not visualized, and it was

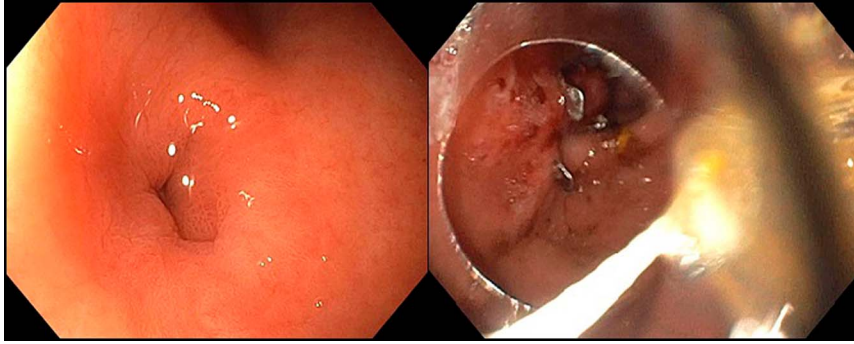


Figure 1. Endoscopic image of the gastrocutaneous fistula before (left) and after (right) over-the-scope clip placement.

presumed to have recently migrated. A 2-mm fistula was discovered on the anterior wall of the stomach, and a second 6/11t OTSC endoscopic clip was placed to occlude the persistent gastrocutaneous fistula (Figure 1).

The patient developed worsening abdominal pain in addition to decreased ostomy output. An abdominal x-ray showed dilation of the small bowel and colon, a large stool burden in the large bowel, and 2 OTSCs (Figure 2). Manual disimpaction of her ostomy was unsuccessful because of perceived stenosis or obstruction in the ostomy. Abdominal and pelvic computed tomography scans, separated by a few days were obtained because of persistent abdominal pain that demonstrated worsening small bowel dilation and diffuse colonic dilation and development of moderate left-sided hydronephrosis and severe right-sided hydronephrosis (Figures 2 and 3). Enhancement and thickening in the region of the ostomy was noted, but no obstructing mass could be identified. Again, 2 OTSC clips were apparent, one at the PEG site in the stomach and the other just proximal to the colostomy stoma. The urology team was consulted for hydronephrosis, and in the setting of preserved renal function and no infection, they deemed that no acute

intervention was indicated. The surgery team was consulted to evaluate the colostomy and discovered instead of a stricture that the OTSC clip was a few centimeters from the abdominal wall stoma and causing an obstruction. The clip was retrieved with forceps, resulting in decompression of her bowel.

The patient's ostomy output increased to baseline with interval improvement in abdominal symptoms. The patient was able to tolerate her normal short-gut diet and had normal ostomy output without abdominal pain at the time of discharge. One month later, a follow-up computed tomography scan showed resolution of the left-sided hydronephrosis and significant improvement in right-sided hydronephrosis (Figure 4).

DISCUSSION

OTSCs are designed to tightly clamp tissue, and removal often requires specific techniques or tools. When indicated, OTSCs can be removed using a specially-designed clip cutter.⁵ Alternatively, OTSCs can be removed after using argon plasma coagulation to super heat and fracture the metal at the lateral

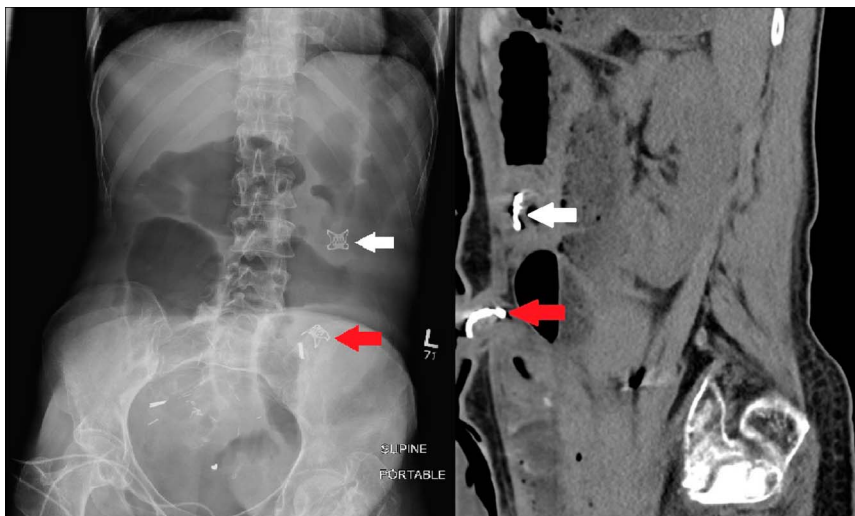


Figure 2. Abdominal x-ray (left) and sagittal-view abdominal and pelvic computed tomography (right) showing dilated loops of bowel. The white arrows point to the over-the-scope clip at the previous percutaneous endoscopic gastrostomy site. The red arrows point to the over-the-scope clip near the colostomy.



Figure 3. Abdominal and pelvic computed tomography showing bilateral hydronephrosis and bowel obstruction with evidence of bilateral ureteral compression caused by mass effect from dilated loops of bowel.

hinge of the clip.^{5,6} In many cases, the OTSC will spontaneously detach after healing of the treated lesion, with the clip typically passing uneventfully.⁷ Although mechanical bowel obstruction has been reported because of luminal narrowing at the site of clip placement, our case may be the first report of an OTSC causing bowel obstruction that then led to clinically significant bilateral hydronephrosis.⁸ The proposed mechanism in this clinical scenario is the dilated loops of large bowel causing direct compression of the ureters as they pass over the iliopsoas bilaterally. There have been case reports of extrinsic ureteral compression by ascites and pelvic malignancies causing bilateral hydronephrosis.^{9,10} However, there is minimal published evidence of bowel obstruction causing this phenomenon, and there are no reports of bowel obstruction caused by a migrated endoscopically placed clip leading to bilateral hydronephrosis.

Our patient had cervical cancer complicated by radiation enteritis requiring surgery, including an end colostomy, and thus,



Figure 4. Abdominal and pelvic computed tomography 1 month after discharge showing significant improvement in right-sided hydronephrosis and resolution of left-sided hydronephrosis.

the differential diagnosis for the cause of her bowel obstruction and bilateral hydronephrosis was broad. However, this case very elegantly demonstrates the important clinical principle attributed to William of Ockham: “entities must not be multiplied without necessity” or paraphrased for medicine—that a simple unified diagnosis devoid of multiple assumptions is often correct.¹¹ As shown in this case, although a variety of other tests or treatment strategies might have been mistakenly pursued (eg, ureteral stenting), the simple removal of an impacted endoscopic clip resulted in resolution of both hydronephrosis and bowel obstruction, and more invasive surgical interventions were avoided.

DISCLOSURES

Author contributions: W. Tung wrote the manuscript and is the article guarantor. JR Shultz wrote the manuscript. BD Schirmer, AC Copland, and AY Wang edited the manuscript.

Financial disclosure: None to report.

Informed consent was obtained for this case report.

Received June 18, 2019; Accepted October 1, 2019

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