

Laparoscopic Approach for the Retrieval of Retained Video Capsule Endoscopy

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ABSTRACT

Video capsule endoscopy is now a first-line tool in evaluating and diagnosing gastrointestinal bleeding, inflammatory bowel disease, and small bowel neoplasms. Capsule nonpassage or retention is an uncommon but clinically significant occurrence. How to best retrieve these retained capsules is currently being debated. We report a laparoscopic approach for the retrieval of a retained capsule in the terminal ileum.

Key Words: Video capsule endoscopy, Laparoscopic colectomy, Retained video capsule.

INTRODUCTION

Video capsule endoscopy is increasingly used for evaluation of small-bowel pathology. Its ease of use and patient tolerance has made it popular among gastroenterologists and patients alike. Currently, capsule endoscopy is most commonly used to evaluate obscure gastrointestinal bleeding, but its indications are broadening. Various reports have described the capsule becoming impacted or retained in the small bowel, requiring retrieval. This scenario may identify clinically significant pathology that requires surgical intervention. We report the case of a video capsule retrieved with laparoscopic techniques.

CASE REPORT

A 74-year-old female had a history of unidentified gastrointestinal bleeding and underwent a capsule endoscopy. The patient was not able to spontaneously pass the capsule and had intermittent obstructive symptoms. Her past medical history was significant for severe COPD, and she had undergone hysterectomy and appendectomy in the past. She had no history of inflammatory bowel disease or strictures of the small bowel. The gastroenterologist performed a colonoscopy, and the capsule was visualized in the terminal ileum. Attempts at endoscopic removal of the capsule were not successful. Therefore, she was seen in the surgery clinic for removal of the capsule. A decision was made to perform a laparoscopic exploration to evaluate the entire small bowel and colon to identify any associated pathology. Just before the procedure, an abdominal x-ray was taken, confirming the presence of the retained capsule in the right lower quadrant (**Figure 1**).

Operative Procedure

After proper informed consent was obtained, the patient was taken to the operating room. Laparoscopic instruments were placed through 4 trocars. The patient was found to have adhesions from her previous hysterectomy, which were divided without difficulty. Intraoperative examination of the small bowel revealed a stricture in the terminal ileum just proximal to the ileocecal valve with a bulge consistent with the retained capsule (**Figure 2**). The bowel was extensively evaluated, and no other ab-

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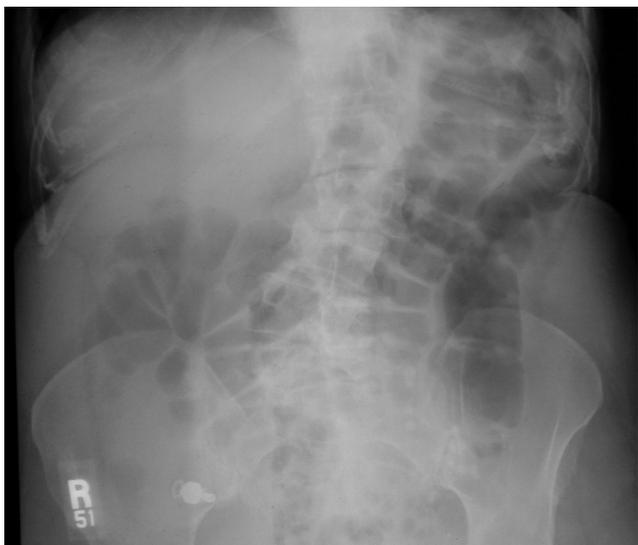


Figure 1. Plain radiograph confirming retention of video capsule.

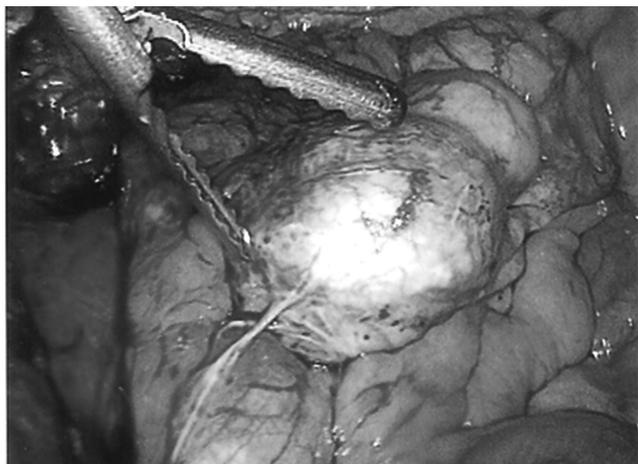


Figure 2. Intraoperative findings.

normalities were found. An ileocectomy was chosen to remove both the stricture and the retained video capsule. The right colon and transverse colon were mobilized. The mesenteric vessels were controlled with the LigaSure device (US Surgical Corporation, Norwalk, CT) and 2.0-mm vascular loads of the endo-GIA stapler (US Surgical Corporation, Norwalk, CT). The colon was transected distal to the cecum, and then delivered through a 4-cm infraumbilical incision. Careful inspection revealed the capsule in the terminal ileum at an area that was significantly strictured. The small bowel was transected proximal to the strictured area, and the specimen was sent to pathology. Next, a side-to-side anastomosis was formed between the

ileum and the colon with a 3.5-mm endo-GIA stapler and the incision was closed.

Postoperative Course

The patient tolerated the procedure well. She was advanced to sips of clear liquid on the evening of postoperative day 1. She was tolerating oral intake, but on postoperative day 4 she developed abdominal distension consistent with an ileus. On postoperative day 5, she had passage of flatus and was restarted on her clear liquid diet. By postoperative day 7, she was tolerating her diet well with no nausea or vomiting and was discharged home. She was seen several weeks later in the surgery clinic and was doing well without any complications. Final pathology demonstrated no evidence of inflammatory bowel disease or malignancy. Despite the fact that no pathologic bleeding site was found, the patient has had no further bleeding or obstructive symptoms at 1-year follow-up.

DISCUSSION

Since its introduction several years ago, capsule endoscopy has rapidly become an important diagnostic modality in the evaluation of several gastrointestinal conditions.^{1,2} The ease of administration and the ability to visualize the entire small bowel are two of the main advantages of capsule endoscopy. As patients request less invasive approaches to their medical care, primary care physicians and surgeons alike will be increasingly exposed to capsule endoscopy.

Video capsule endoscopy is most commonly used to detect obscure gastrointestinal bleeding not located by endoscopy. The role of video capsule endoscopy has expanded to inflammatory bowel disease, small-bowel neoplasms, malabsorption disorders, iatrogenic disease (NSAID strictures), radiation enteritis, clarification of previous imaging, and chronic abdominal pain.³ Capsule endoscopy has been contraindicated in patients with known small-bowel obstruction, strictures, extensive Crohn's disease, swallowing disorders, pseudo obstruction, motility disorders, cardiac pacemakers, and defibrillators. Relative contraindications include pregnancy, chronic NSAID use, extensive diverticular disease, gastroparesis, and previous pelvic or abdominal surgeries.⁴

Recently, capsule endoscopy has been reported for use in the evaluation for recurrent small-bowel obstruction and strictures. In one study, 19 patients with suspected small-bowel obstruction underwent capsule endoscopy. A definitive diagnosis was made in 32% of the cases. In 3 cases,

the capsule was retained and laparotomy was required, but in no instance was the capsule the cause of an acute small-bowel obstruction.⁵ Although controversial, this provides an example of the potential for expansion of this new technology.

The most frequently reported complication of capsule endoscopy is retention or nonpassage. The capsule typically passes within 72 hours of administration. The retention rate appears to be between 0.75% to 3% but may be higher in patients with Crohn's disease.^{3,6,7} If the capsule has not passed after 7 days, then a plain film is obtained. After this time, capsule retrieval may be required. However, capsules have been retained for over 2 years without incident.⁸

Various methods for retrieval have been reported. Endoscopic retrieval and extraction by push-and-pull enteroscopy with the double-balloon technique have been used with success.^{8,9} As presented in this case, surgical retrieval is often required secondary to the underlying pathologic process causing the stricture or obstruction. In fact, it is widely felt that a retained capsule is diagnostic of a clinically relevant stricture or mass.

We describe a safe laparoscopic retrieval of a capsule endoscopy retained in the terminal ileum secondary to scar tissue. Others have reported open surgical techniques in the management of this problem. A review of capsule endoscopy at 2 referral centers revealed 7 of 197 capsules retained. Of the seven, 2 were removed endoscopically and 5 required laparotomy. The surgical findings included nonspecific inflammatory strictures (twice), a radiation stricture, a Crohn's stricture, and an umbilical hernia.⁷ Two cases of open surgical retrieval of an impacted capsule requiring stricturoplasty and a segmental resection have recently been reported in patients with known Crohn's disease.¹⁰

Retention or nonpassage of the capsule endoscopy is an uncommon occurrence that is likely to become a more frequent surgical situation as the indications for the technology broaden. In the meantime, several steps are suggested to prevent this problem. For example, many would recommend small bowel follow through or enteroclysis before capsule endoscopy in patients with known Crohn's disease or suspected strictures. In addition, a standard bowel preparation or even a dose of metoclopramide before capsule administration has been shown to increase the rate of complete small-bowel examinations.^{11,12} In the near future, dissolvable

radio-opaque patency capsules may prove beneficial for patients with known small-bowel strictures. As in our case, patients with strictures in the small bowel or intraabdominal scar tissue may make passage of the capsule difficult to predict. Using the fundamentals of safe laparoscopy and maintaining the principles of surgical management in specific disease processes, successful outcomes can be expected in patients with retained capsules.

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