

ILEON PERFORATION AS A LATE COMPLICATION OF VIDEO CAPSULE ENDOSCOPY – A CASE REPORT AND REVIEW OF THE LITERATURE

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CASE REPORT

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Abstract

Wireless capsule endoscopy is a valuable and minimally invasive tool for evaluating the small bowel. This technology has revolutionized the field of gastrointestinal imaging, providing several advantages over traditional endoscopic methods. After 10 years, however, the first articles were published regarding acute complications such as retention and/or perforation of the small intestine after this procedure. We present the first case of perforation of the small intestine after 22 months after the administration of the video capsule in a multi-operated patient with adhesion syndrome and several areas of ileal stenosis.

Keywords: endoscopic video capsule, perforation, ileum

Introduction

Technological advances in recent years have significantly transformed diagnostic methods in digestive pathology, particularly in the exploration of the small intestine. The endoscopic video capsule (VCE) was first introduced at the beginning of the 21st century and is a prime example of a technological breakthrough. Since August 2001 over one million capsules have been used in clinical practice.

The VCE allows the acquisition of over 50,000 images with a resolution of 0.1 millimeters [1] in about eight hours of passage and is particularly valuable for exploring the small intestine, which is challenging to visualize using traditional endoscopic methods. Its ability to traverse the entire digestive tube, including the esophagus and

colon, allows for a comprehensive examination of the gastrointestinal tract.

Video capsule retention is the most common and serious complication. The retention was defined by the working group at the International Conference on Capsule Endoscopic (ICCE) as retention of the video capsule in the alimentary canal for more than two weeks due to a structural abnormality, requiring medical, endoscopic, or surgical treatment [2].

Since 2005, four cases of ileal perforations in elderly patients with Crohn's disease due to video capsule retention have been reported [3-6]. This manuscript reports the first case of ileal perforation through retained VCE recorded in our country and the sixth worldwide. The case's particularity is that it occurred 22 months after the ingestion of the VCE.

To identify relevant articles, we searched in PubMed or Google Scholar, using as search terms *giant hernia*, and *perforated ulcer*, and

excluding articles that were not written in English.

Case presentation

We report the case of a 63-year-old female patient with two prior surgical interventions: a total hysterectomy and strangulated hernia - the last emergency intervention 5 years ago. A year and a half prior to the current presentation, she was hospitalized with sub-occlusion symptomatology that resolved with conservative treatment (upper digestive aspiration, alimentation rest, transit stimulation).

The current episode started suddenly with diffuse abdominal pain, of high intensity, absence of transit, vomiting of food, and then cloudy bile; upon presentation, the patient was pale, and tired, with generalized abdominal muscle defense, leukocytosis 16,000/MMC. Abdominal X-ray showed no abnormal findings. With the diagnosis of generalized peritonitis, emergency intervention was required; a midline incision was performed, ileal adhesion block previously fixed to the sub umbilical scar, and a large amount of intestinal content drains through a 0.5 cm perforation, approximately 45-50 cm from the ileocecal valve. After the completion of the intervention - enterectomy, reimplantation of ileum in ascending colon, toilet, drainage, the piece is examined: ileum with a thick, cardboard wall, shows a perforation on the antimesenteric edge at the level of a pseudo diverticular dilatation in which there is a brownish-green foreign body with a smooth surface of approximately 2/1cm. Initially, it was considered a gallstone, but the enigma was solved after washing: the retained video capsule (Figure 1, 2). During the chronological reconstruction of the facts, we found out that one year and ten months ago, for the suspicion of Crohn's disease, it was explored endoscopically with the video capsule, which he followed for two weeks and without having physical evidence of the

elimination, he considered that the event had occurred.

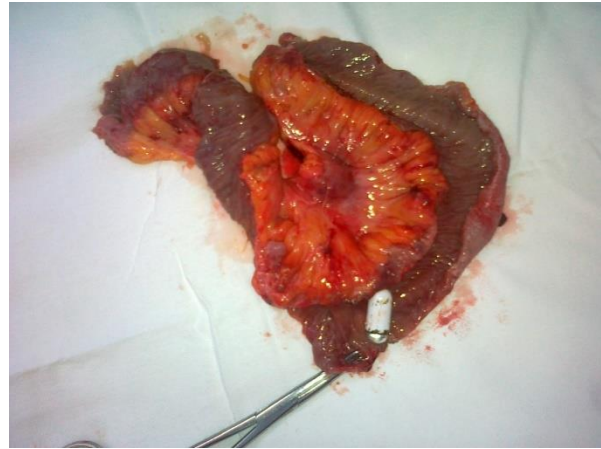


Figure 1- Ileon perforation after VCE retention



Figure 2 - Video capsule

Approximately 2 weeks after the ingestion of VCE, it was suspected that it was not eliminated, which is why the patient was examined colonoscopically, including the last cm of the ileum, without being able to identify VCE. This explains the sub-occlusive episode four months after the video endoscopic examination. Reviewing the abdominal x-ray from admission compared to another performed postoperatively reveals the retained device (Figure 3).

Discussions

Most retained capsules are asymptomatic. In a retrospective study of 1000 capsule video endoscopies, the retention rate

was 1.4%, but none of the patients had symptoms as a result of capsule retention [7].

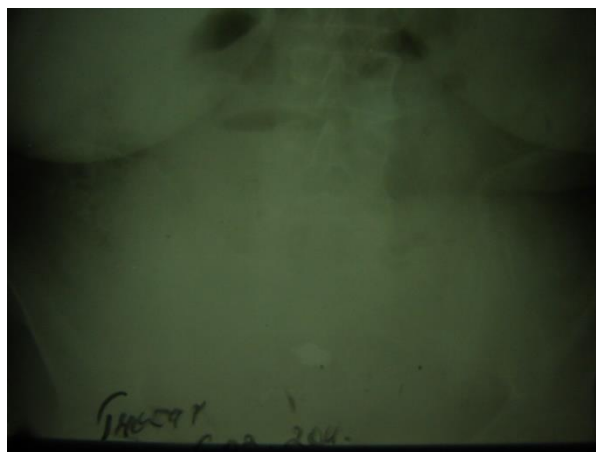


Figure 3 - Abdominal X-Ray

In a systematic review recently published by Laio et al. which included 22840 cases, 184 capsules were retained: 104 in prospective studies and 46 in retrospective studies. Retention rates in prospective and retrospective studies were 1% and 1.7%, respectively, with an overall retention rate of 1.4%. In the same analysis, the retention rates according to the condition: intestinal hemorrhage, Crohn's disease, and neoplastic lesions were 1.2%, 2.6%, and 2.1%, respectively. The most common reason for retention was Crohn's disease (35.3%), neoplastic lesions (22%), NSAID-induced enteropathy (18%), postsurgical stenosis and adhesions (9.9%), tuberculosis (2.2%), radiation enteritis (2.2%). Other etiologies, such as Meckel's diverticulum, intestinal diverticulosis, and multifocal intestinal stenosis are reported with frequencies lower than 2% [8, 9].

Currently, moderate intestinal stenosis and strictures are considered by many doctors to be a contraindication for VCE administration for fear of retention. A retrospective review was performed using a 568 video endoscopy cases database between August 2001 and November 2003. This study aimed to evaluate the safety and efficacy of video endoscopy in diagnosing patients with

suspected intestinal stenosis or obstruction. It was concluded that exploration can help identify the etiology and level of an obstruction that may be occlusive. Keeping the capsule may indicate the presence of a lesion that requires surgical intervention, so intestinal obstruction or stenosis are not contraindications for the procedure. It is understood, however, that retention may lead to surgical intervention in a patient who might otherwise have been treated medically [10].

Normally, the complete passage of the capsule takes place in 72 hours. As a general attitude, VCE retention over 7 days requires radiological exploration. If the capsule has not passed after 7 days, the recovery procedures begin. However, there have been reported cases of capsules retained over 2 years without incident [11].

Cases of laparoscopic recoveries under radiological guidance have been reported [12]. VCE was contraindicated in patients with known intestinal strictures, obstruction, extensive Crohn's disease, swallowing disorders, pseudo-obstruction, motility disorders, pacemakers, and defibrillators; relative contraindications include pregnancy, chronic NSAID use, diverticular disease, and previous abdominal surgery [13].

To date, 9 cases of video capsule retention with intestinal perforation have been reported in patients with Chron's disease 6 cases [14,15], small bowel neoplastic stenotic lesion 2 cases, and one with peritoneal adhesions [3].

The first case was reported in 2005 by P. Gonzalez Carro et al. [3] an 80-year-old patient with a history of cholecystectomy 10 years previously. Two months after the video capsule ingestion the patient presented with peritonitis and was found to have diffuse peritonitis secondary to perforation of the distal ileum.

In 2007 A. Repici et al. [5], Um et al. [4], 2009 Dhavan A. Parikh et al. [6], 2011 JS Palmer et al. [15], 2012 Yitzhak A. et al. [16], 2012 De Palma G. D. et al. [14] reported cases

of small bowel perforation after ingestion of video capsule at patients with Chron disease. These perforations appeared a few hours after ingestion of the capsule, until at a maximum of 17 days.

De Palma G. D. et al. [14] in 2012 reported a case of a patient after ingestion of a video capsule that was impacted at a stenosis due to a previously undiagnosed ileal adenocarcinoma. The last case was reported by Martínez Camacho C. et al. [17] in 2019, perforation in the jejunum near a neoplastic stenotic lesion.

The uniqueness of the presented case is the fact that the perforation occurred 22 weeks after the ingestion of the video capsule, in fact in a patient with a history of surgical interventions (hysterectomy and strangulated incisional hernia).

A recent innovation, (Imaging Ltd, Israel) is the capsule designed to dissolve in the gastro-intestinal tract, after two-three days if it is retained. It is the same size as the standard capsule, contains barium, and can therefore be detected radiologically. The use of this capsule helps prevent retention and increases the safety of wireless endoscopy [18,19].

Conclusions

VCE remains the preferred method for endoscopic exploration of the small intestine. This case illustrates the importance of appropriate patient selection and correct assessment of small bowel patency and functional capacity before wireless video endoscopy, considering the increasing role of this procedure in the investigation of intestinal inflammatory and tumoral pathology. In reality, the risk of iatrogenic damage to the patient is very small, and the benefit/risk ratio is clearly in favor of the benefit. Patients with Chron's Disease, tumor suspicion, post-operative adhesions, NSAID-induced enteropathy, and intestinal strictures have a higher risk of impacting the video capsule and intestinal occlusion, then an emergency

surgical intervention is discussed. No deaths have been reported with this technology.

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