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Laparoscopic Removal of Retained Capsule Endoscopy due to Ileal Stricture from Infrequent NSAID Use

Melinda Nguyen[1], Toufic El-Khoury[2,3] and David Van der Poorten[1,3]*

[1]*Department of Gastroenterology and Hepatology, Westmead Hospital, Sydney, Australia*
[2]*Department of Colorectal Surgery, Westmead Hospital, Sydney, Australia*
[3]*Faculty of Medicine, University of Sydney, Sydney Australia*

Abstract

Background: Long term Capsule Endoscopy (CE) retention is an uncommon, but potentially serious complication of CE. It is most frequently due to Crohn's related small bowel strictures or neoplastic lesions but can be caused by post-surgical stenosis and non-steroidal anti-inflammatory drug (NSAID) enteropathy. We present a case of retained CE in the distal ileum due to NSAID enteropathy with striking photographs of the small bowel stricture and the moment of laparoscopic device retrieval.

Case report: An 83-year-old female on amlodipine and esomeprazole presented with a month-long history of melaena and was found to have iron deficiency anaemia. She had been investigated two years prior for a similar episode with gastroscopy, colonoscopy and CE without finding an underlying cause. Gastroscopy and colonoscopy were repeated, revealing gastritis and diverticular disease but no bleeding source. CE showed an inflamed distal ileal stricture, which prevented capsule passage. The patient was asymptomatic and X-ray and computed tomography (CT) confirmed retention of the capsule with no bowel obstruction. On directed questioning she admitted to infrequent use of a COX-II inhibitor for arthritis over the previous 3 years. She underwent double balloon enteroscopy with dilatation, which identified the stricture and the retained capsule, but it could not be safely retrieved at that time or one week later. She developed abdominal pain and ultimately proceeded to laparoscopic removal of the capsule and resection of the stricture. Histology was consistent with an NSAID etiology.

Conclusion: CE retention is a serious complication and can be caused by strictures related to occult NSAID use. Directed history taking and use of patency capsules could reduce the incidence of this problem.

Keywords: Retained capsule endoscopy; Laparoscopic; Anaemia; Histology; Diverticular disease

Introduction

Obscure gastrointestinal (GI) bleeding, where no underlying cause is found on gastroscopy or colonoscopy, is a difficult clinical problem that until 2001 was investigated through poorly predictive contrast imaging studies such as small bowel series, computed tomography (CT) or angiography, and often required surgery. Capsule Endoscopy (CE), introduced in 2001 [1], allowed for direct visualisation of the entire small bowel for the first time and in the intervening 18 years, the technology has greatly advanced, with high definition imaging, extended device battery life and intelligent reading software [2].

CE retention, where the device fails to reach the colon by the end of the study, is the most significant complication of CE and occurs in 0.9-1.4% of all procedures [3]. It is most commonly due to Crohn's related small bowel strictures, followed by neoplastic lesions, non-steroidal anti-inflammatory drug (NSAID) enteropathy and post-surgical stenosis [4]. Long-term retention, where the capsule stays within the GI tract for over two weeks or requires intervention for removal is even less common and frequently asymptomatic [3]. We report a case of retained CE in the distal ileum with striking photographs of the small bowel stricture and the moment the capsule was retrieved laparoscopically. In this case, initially unreported and infrequent NSAID use with a COX-II inhibitor was the cause of the tight small bowel stricture. Laparoscopic retrieval was ultimately required due to failure of double balloon enteroscopy.

Case Presentation

An 83-year-old female on amlodipine for hypertension and esomeprazole for reflux presented with a four-week history of intermittent melaena and was found to have iron deficiency anaemia (haemoglobin 85 g/L and ferritin 13 ug/L). She had no abdominal pain or constitutional symptoms and was hemodynamically stable. A similar episode two years prior had been investigated with gastroscopy, colonoscopy and capsule endoscopy without finding a specific cause for bleeding. Her iron stores were replaced with a ferric carboxymaltose iron infusion (1 g) and endoscopic tests were repeated, with gastroscopy revealing minor gastritis, while colonoscopy showed diverticular disease, but no active bleeding. CE using Pillcam SB3 (Medtronic) showed a tight inflammatory stricture in the distal Ileum (inner diameter <5 mm) that prevented capsule passage (Figure 1).

The patient was asymptomatic and subsequent abdominal X-ray and then CT scan confirmed the capsule was retained in the mid to distal ileum with no evidence of bowel obstruction or dilation. The stricture was not identified on CT and there was no bowel wall thickening or inflammatory changes. On directed questioning the patient was found to be sporadically taking Meloxicam 7.5 mg for arthritis over the preceding three years (2-3 days per month), which was thought to be the likely underlying cause of the stricture. The patient proceeded to retrograde double balloon enteroscopy (DBE, Fujifilm) which identified the stricture 80 cm proximal to the ileo-caecal valve. Balloon dilation of the stricture to 10 mm revealed the capsule sitting tangentially beyond the stricture, but it could not be safely retrieved. The stricture was

***Corresponding author:** David Van der Poorten, Department of Gastroenterology and Hepatology, Westmead Hospital, Hawkesbury Rd Westmead NSW 2154, Sydney, Australia, Tel: +61287110160; E-mail: david.vanderpoorten@sydney.edu.au

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dilated to 13.5 mm five days later and the double balloon enteroscope passed 30 cm proximally, but the capsule was not identified.

In the following days, the patient developed intermittent abdominal pain and the capsule remained in the ileum on imaging. Given her age and clinical deterioration following the multiple procedures, it was felt that she was at risk of bowel obstruction and/or perforation. She therefore underwent laparoscopy where the stricture and capsule were easily identified in the distal ileum. The culprit section of small bowel was brought to the surface on an Alexis Wound Protector (Applied Medical), the capsule removed and the stricture resected (Figures 2 and 3). Histology of the stricture showed benign mucosal ulceration with no significant inflammation in keeping with an NSAID related aetiology. The patient recovered well from surgery and will avoid all NSAIDs in the future.

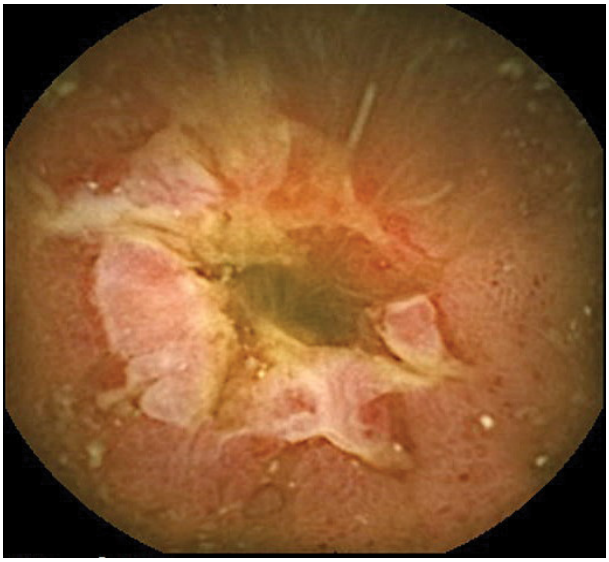

Figure 1: Tight stricture in the distal small bowel seen on capsule endoscopy (Pillcam SB3).

Figure 2: Pillcam identified in the distal ileum prior to removal.

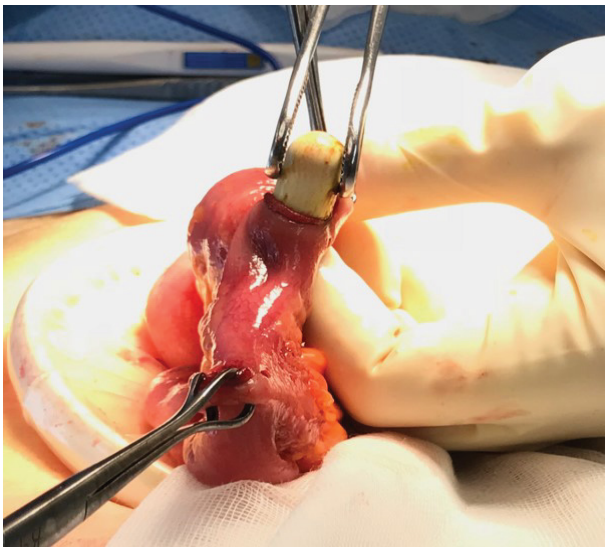

Figure 3: Moment of Pillcam removal from distal ileum.

Discussion

Overall CE is a very safe, well tolerated and non-invasive investigation. Capsule retention is the most important and severe complication, with an overall incidence of 0.9-1.4% [3]. Retention is most commonly due to Crohn's disease (48%), followed by NSAID-induced strictures (12%). Less common causes are peptic strictures, pyloric stenosis, oesophageal diverticulum, tumours, post-operative anastomotic stenosis and cysts [3]. Following retention, it is safe to observe patients who are asymptomatic with no signs of obstruction on X-ray or CT and no major pathology revealed on the CE. Up to 30% of patients will pass the capsule within two weeks and there has even been one report of spontaneous passage 4.5 years after the initial procedure [5].

In large case series previously, surgical intervention was required to retrieve capsules in 58.7%, while 12% utilised endoscopic means and the remainder either medical management or none at all [6]. More recent data suggests that surgery may be required in less than 10% of patients with non-malignant capsule retention and only when balloon enteroscopy or medical therapy has failed [7].

In our patient, there was a tight, inflamed stricture seen narrowing the lumen to under 5 mm, excluding the possibility of spontaneous capsule passage. The underlying aetiology was initially unclear, but on directed questioning, likely to be NSAID enteropathy due to the three-year history of intermittent use of the COX-II selective NSAID meloxicam. No specific medical therapy is available to treat small bowel NSAID strictures and balloon enteroscopy has been widely reported for retrieval of CE and therapeutic dilation of non-malignant small bowel strictures [7]. A retrograde approach was used in this case and the stricture found 80 cm proximal to the intracaecal valve. Dilation was performed at two separate procedures to a diameter that should have allowed the capsule to pass (13.5 mm), but the capsule was not located and the patient subsequently developed abdominal pain. She therefore proceeded to laparoscopic surgery and ultimately had a good outcome with the additional benefit of histological confirmation of the underlying aetiology. It should be remembered that capsule retention can be a blessing in disguise, as it was in our patient, diagnosing and allowing definitive therapy for the underlying of cause of chronic

obscure GI bleeding. One group has taken this idea further, evaluating CE in patients with recurrent subacute small bowel obstruction where prior endoscopic tests and imaging were negative [8].

CE was able to successfully diagnose the cause of small bowel obstruction in 12 out of 31 cases with only three capsule retentions and no cases of acute small bowel obstruction. The two cases requiring surgery were performed safely and without complication by laparoscopy. More studies are needed to explore the potential value and safety of CE in this setting.

NSAID enteropathy is very common based on CE and balloon enteroscopy studies, with an incidence up to 71% in chronic NSAID users, although clinically manifested disease remains relatively rare [9]. In the early stages of NSAID enteropathy there are erosions and aphthous ulcers [10], and retrospectively the cause of our patient's iron deficiency anaemia three years early was almost certainly from this, albeit not seen on the initial capsule study. A later manifestation and pathognomonic for NSAID enteropathy is the diaphragm, an abnormal scarring reaction that creates a thin fibrous septa [9], narrowing and potentially obstructing the lumen, as with our case. NSAID enteropathy can be difficult to diagnose as patients frequently take NSAIDs in a self-directed way and do not consider them as a "regular" medication to reveal on history taking. As little as seven days of NSAID use can cause small bowel erosions as seen on CE [11] and selective COX-II inhibitors do not offer significant protection [9]. Concomitant PPIs are also not protective and may even increase the incidence of enteropathy, despite protecting against peptic ulceration. Limited data are available suggesting that prostaglandins and probiotics may reduce the risk of NSAID enteropathy [9].

Predicting capsule retention is difficult and requires a degree of clinical suspicion. Imaging studies such as MRI enterography or CT are useful to detect mass lesions but are frequently negative in patients who go on to have capsule retention. Indeed, in two large retrospective studies, 93% and 100% of patients with retention had a normal CT prior, with the majority of cases due to NSAID enteropathy [12]. Patency capsules have been developed to assist with predicting retention. The capsule starts dissolving 30 hours after ingestion and safety for subsequent CE is confirmed if the capsule is passed prior to this or is identified in the colon by X-ray at this time. We did not use a patency capsule in this case because the patient did not have symptoms of obstruction, the NSAID use was unknown and the history of a previous unremarkable CE study.

Conclusion

In conclusion, CE retention due to NSAID strictures is an important but difficult to predict problem and almost always requires capsule retrieval as no medical therapies are available. Careful, targeted history to identify NSAID use is vital, as is use of patency capsule in higher risk cases, given imaging is not reliable.

Acknowledgements

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