CASE REPORT

The longest duration of retention of a video capsule

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SUMMARY

An underweight 15-year-old boy had a video capsule endoscopy (VCE) to investigate iron deficient anaemia associated with elevated platelet and white cell counts. The suspicion was of subclinical small bowel Crohn's disease after the findings of a radiolabelled white cell scan. The VCE in May 2007 found patchy inflammation and superficial ulcers in the terminal ileum consistent with Crohn's disease. By March 2008, the patient remained asymptomatic but the capsule had not passed. He was treated with steroids to improve the inflammation and allow the capsule to pass. This was unsuccessful. Abdominal X-rays appeared to show that it was in the rectum. CT of the abdomen and pelvis in July 2012 showed that it was actually in the mid-distal ileum within a mass of inflamed and matted small bowel loops. He was last reviewed in March 2014. He has now retained the capsule asymptotically for 6 years and 10 months.

BACKGROUND

Video capsule endoscopy (VCE) is the accepted tool for direct visualisation of the small bowel. It is non-invasive and is considered safe and sensitive for the detection of small bowel pathology. The capsule is usually excreted in the faeces 24–48 h after its ingestion. This case report presents the longest period of retention of a video capsule in the literature. At the time of writing this case report, the longest current reported duration of retention of a video capsule is 4.5 years. The patient remains asymptomatic with no obstructive symptoms despite the duration of retention. He also remains asymptomatic from the point of view of his Crohn's disease despite the fistulation evident on the CT scan.

CASE PRESENTATION

A 15-year-old boy was under investigation by a haematologist for iron deficient, microcytic and hypochromic anaemia associated with elevated platelet and white cell counts. He had no significant family history nor did he have any other comorbidity and was attending school regularly without upset to his daily life. He was underweight but had no specific gastrointestinal symptoms. In any case, he was referred for gastrointestinal investigation. Coeliac serology was negative. Small bowel series was unremarkable. A radiolabelled white scan showed increased activity in the distal small bowel indicating an inflammatory process. The impression was then of subclinical Crohn's disease. A PillCam SB VCE was arranged for assessment of the terminal ileum. This was performed in May 2007 and showed areas of patchy

inflammation and superficial ulcers in the terminal ileum consistent with Crohn's disease. No stricturing lesions were identified by the capsule.

By March 2008, he remained asymptomatic of his Crohn's disease but the capsule had still not passed. It was decided to start him on steroids to improve the inflammation and hopefully allow the capsule to pass. This was unsuccessful. Serial plain abdominal X-rays showed that it was in the rectum (figure 1). A colonoscopy was performed in May 2012 in order to retrieve the capsule; this was also unsuccessful as the capsule was not visualised. CT of the abdomen and pelvis in July 2012 showed that it was located in a mass of inflamed and matted small bowel loops in the mid-distal ileum. This length of affected small bowel was approximately 30–45 cm. There may also have been elements of fibrotic stricture formation in this area given the variable small bowel dilation. CT imaging, however, is limited in its ability to fully differentiate inflammatory and fibrotic strictures. The CT scan also demonstrated fistulation between loops of small bowel and sigmoid colon (figure 2).

Despite the radiological findings, the patient remains completely asymptomatic and is putting on weight. He has no obstructive symptoms as a result of the retained capsule. His prolonged clinical remission has allowed us time to consider the best management approach for him.

TREATMENT

The patient, now 22 years of age, attends the gastroenterology outpatient department for ongoing review. He was most recently reviewed in March 2014. He remains in clinical remission with azathioprine and pentasa. We do not plan to remove the capsule endoscopically or surgically.

DISCUSSION

Capsule endoscopy, first introduced by Iddan in 2000,¹ has become a commonly used investigation for evaluation of the small bowel. It is indicated for investigation of obscure gastrointestinal bleeding, evaluation of Crohn's disease, polyposis syndromes and for patients with complicated coeliac disease.² It is considered to be a sensitive modality for the detection of small bowel lesions.

The most serious adverse event related to capsule endoscopy is retention of the capsule. This is defined as the presence of the capsule within the gastrointestinal tract for at least 2 weeks, or when it is retained indefinitely unless an intervention is initiated.³ A review of 2300 VCE examinations by Höög *et al* in 2012 observed a rate of capsule retention of 1.3%. This equated to 31 cases.⁴ Retention of the capsule can lead to intestinal

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Figure 1 Abdominal X-ray appearing to demonstrate the capsule in the rectum.

obstruction and/or perforation. A case series by Lin *et al*⁵ illustrates this.

Retention is seen to happen more frequently in those with known Crohn's disease and in those with suspected small bowel tumour. The risk of capsule retention in those with known Crohn's disease is as high as 13%.^{6,7} Other causes of retention are non-steroidal anti-inflammatory drug-induced enteropathy, postsurgical stenosis and adhesions, tuberculosis, ischaemia-induced stenosis, radiation enteritis, Meckel's diverticulum, peptic ulcer and cryptogenic multifocal stenosing enteritis.^{7,8}

Separate reports by Fry *et al*⁹ and de Magalhães Costa *et al*¹⁰ also describe cases of broken capsules following retention.

The ongoing management of our patient posed a certain dilemma. We had a young patient with CT evidence of fistulating Crohn's disease and a retained video capsule. Both of these issues pose risks in the medium-to-long term. As stated above, there are risks of bowel obstruction or perforation. There is also a risk of the capsule breaking. Any one of these issues could

Figure 2 CT image showing mesenteric tethering of small bowel loops and fistulous tracts between small bowel and sigmoid colon.

result in an acute surgical abdomen requiring emergency laparotomy. However, as the patient has always been well, this has given us time to consider all the management options.

The most commonly employed strategy is surgical removal of the capsule. In the case series presented by Höög *et al*, 27 of the 31 patients with retained capsules underwent surgical removal even though only 9 displayed features of intestinal obstruction. There were postoperative deaths in 3 of the 27 cases, 2 due to anastomotic breakdown and 1 due to multiorgan failure.⁴

Another option is endoscopic retrieval with either colonoscopy or double-balloon enteroscopy. The previously reported longest duration of capsule retention was eventually retrieved in this way by colonoscopy.¹¹

A third option is the use of biologics such as the antitumour necrosis factor- α antibody infliximab. In the case series by Höög *et al*, one patient with capsule retention due to a Crohn's disease stricture was given infliximab. He then passed the capsule 2.5 years after its ingestion.⁴

A fourth and final option is conservative and expectant management. This is the strategy that we have decided to employ after thorough discussion with the patient. The colorectal surgical team has advised us that any elective surgical procedure would involve the resection of an extensive segment of diseased small bowel along with removal of the involved sigmoid colon. The patient is currently asymptomatic and has no obstructive symptoms. As such, we currently feel that the risk of surgical complications such as anastomotic breakdown outweigh the risk of ongoing retention of the capsule.

We do not feel that endoscopic retrieval of the capsule is possible. The capsule is situated within a mass of tethered and inflamed small bowel loops in the mid-distal ileum. As such, the likelihood of reaching this area and removing it with double-balloon enteroscopy is very low.

Furthermore, we do not feel that it is appropriate to expose the patient to the risk of potential side effects from biologics while he is well. As he has no symptoms that we can titrate this therapy against, we do not know how long we should continue this treatment once it is started.

We have also had a thorough discussion with the patient, presenting all management options and risks, and the potential benefits of each. The patient agrees with our choice.

Learning points

- ▶ Retention of capsule endoscopy is a rare complication with reported incidence of 1–2%.
- ▶ Retention is more common in patients with Crohn's disease and video capsule endoscopy should be used with caution. One study has reported a retention incidence of 13% in these patients.
- ▶ CT scan should be considered to locate the capsule when retained. We felt incorrectly that the capsule was retained in the rectum because of the appearance on the abdominal X-ray.
- ▶ In the absence of a foreign metallic body, MRI is usually the first-line radiological investigation for evaluation of Crohn's disease.
- ▶ There are a number of options for the management of patients with a retained capsule. Each should be considered on a case-by-case basis in order to deliver a patient-centred and patient-tailored approach.

Contributors This patient has been managed as an outpatient by CR. CH reviewed the patient during one of his outpatient visits. Owing to the unexpected outcome as described, CH decided to write this case report. CR reviewed the case report, and he agrees with the submission for publication.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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