CASE REPORT

Appendicitis following capsule endoscopy

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SUMMARY

A 19-year-old woman presented to the emergency department with abdominal pain 10 h after ingesting a capsule endoscope. The pain subsequently localised to the right iliac fossa with guarding and cough/percussion tenderness. Follow-up pelvic ultrasound showed a tender non-compressible appendix consistent with appendicitis. The patient underwent a laparoscopic appendectomy with good recovery. This report describes an unusual presentation of appendicitis following ingestion of a capsule endoscope.

BACKGROUND

Capsule endoscopy is a commonly employed diagnostic imaging modality for the small bowel. The simplicity of the device as well as its size has made it a very tolerable and easy to perform test. There have been previously described cases of small bowel obstruction¹ and appendicitis² relating to physical obstruction caused by the capsule. Currently, we are uncertain what rare complications can occur with capsule endoscopy. This report outlines a case of appendicitis following ingestion of a capsule endoscope, the diagnostic dilemmas and the role of imaging in finally determining the diagnosis.

CASE PRESENTATION

A 19-year-old woman presented in the evening to the emergency department with colicky periumbilical abdominal pain. It initially started at 19:00 and subsequently migrated to the right iliac fossa 45 min later. Earlier that day, at 9:00, she had swallowed a PillCam Capsule endoscope. There was no associated fever, nausea or vomiting. She had not opened her bowels since ingesting the capsule.

Her history included iron deficiency anaemia, for which she was, at the time, been investigated. Over the past 12 months, she had experienced intermittent diarrhoea and a 10 kg weight loss. A gastroscopy and colonoscopy were carried out, which were unremarkable. The patient's last menstrual period was 10 days prior and she did not have any surgical history.

On review, her temperature was 35.7° with a heart rate of 60 bpm and blood pressure 107/64 mm Hg. She had right iliac fossa guarding with percussion and cough tenderness. Bowel sounds were present. Cardiovascular and respiratory examinations were unremarkable. Initial concerns were directed at possible complications relating to ingestion of the capsule endoscope.

INVESTIGATIONS

An abdominal X-ray was performed to localise the capsule endoscopy (figure 1). It was found to be

projected over the left iliac fossa, likely within the descending colon. Urine analysis was negative for nitrites, leucocytes and pregnancy. Blood testing was carried out (table 1), which included inflammatory markers. White cell count was 11.4×10^9 and C reactive protein <3 mg/L. Bedside ultrasound showed a small amount of free fluid in the region of interest.

TREATMENT

The patient later had a surgical review and a pelvic ultrasound was performed the next day. It showed a thickened, exquisitely tender non-compressible appendix (figure 2), consistent with acute appendicitis. There was a moderate amount of free fluid in the cul-de-sac as well as the region of interest (figure 3). The ovaries and uterus were normal in size.

OUTCOME AND FOLLOW-UP

The patient subsequently had a laparoscopic appendectomy with good recovery.

DISCUSSION

Since 2001, wireless capsule endoscopy has provided advancement in the evaluation of the small bowel. Weighing <4 g and measuring 26 mm by 11 mm (figure 4), it takes between 50 000–80 000 images (2 images/s) over an 8 h period, allowing for detection of small bowel lesions and gastrointestinal bleeds.

There are known technical limitations³ of capsule endoscopy relating to failure of the device and battery malfunction, which can lead to gap

Figure 1 Supine abdominal X-ray: red arrow showing capsule endoscopy. Black arrow showing jewellery.

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Table 1 Laboratory findings

Laboratory parameter	Value	Reference range
Haemoglobin	142	115–165 g/L
White cell count	11.4*	3.9–11.1×10 ⁹
Platelets	220	150–400×10 ⁹
Red cell count	5	3.6–5.0×10 ¹²
Sodium	139	135–145 mmol/L
Potassium	3.4	3.2–5 mmol/L
Chloride	106	95–110 mmol/L
Bicarbonate	26	22–32 mmol/L
Urea	3.3	2.5–6.5 mmol/L
Creatinine	67	45–90 µmol/L
C reactive protein	<3	<3 mg/L

Figure 2 Ultrasound image of right iliac fossa, transverse view: arrow showing thickened appendix.

Figure 3 Ultrasound image of right iliac fossa, sagittal view (FF; free fluid).

recordings (8.59% of cases). They contribute overall to the 15% incomplete small bowel examinations that occur. There are, however, significant clinical complications including retained capsule, which occurs in 1.9% of cases and requires endoscopic or surgical retrieval. Cases of small bowel obstruction have also been documented in the literature, as well as impaction within the appendiceal orifice, leading to appendicitis.²

In this case, the capsule had passed through the caecum and it is unclear whether the passage of the capsule itself led to

Figure 4 Photograph showing the size of a capsule endoscope.

Box 1 Contraindications to wireless capsule endoscopy

Absolute contraindications

- ▶ Clinical or radiographic evidence of bowel obstruction
- ▶ Extensive and active Crohn's disease of the small bowel
- ▶ Intestinal pseudo-obstruction
- ▶ Young children (<10 years)

Relative contraindications

- ▶ Cardiac pacemakers or other implanted electromedical devices
- ▶ Dysphagia
- ▶ Previous abdominal/pelvic surgery
- ▶ Pregnancy
- ▶ Extensive intestinal diverticulosis

appendicitis or whether the condition was related to an alternative mechanism. The close proximity of events suggests that appendicitis followed the ingestion of the capsule endoscope.

Even though the capsule is relatively small, its solid uncompressible characteristic may lead to other undocumented sequelae including damage to the gastrointestinal tract mucosa. In order to minimise such complications, there are some contraindications to capsule endoscopy (box 1).

Learning points

- ▶ Abdominal X-ray remains a good modality for initial localisation of a capsule endoscope.
- ▶ While it is common for patients to experience some discomfort with capsule endoscopy, disproportionate symptoms and signs should flag for complications and other pathology.
- ▶ Appropriate follow-up and review may lead to early identification of complications.

Competing interests None declared.

Patient consent Obtained.

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