CASE REPORT

Meckel's diverticulum in an adult: an obscure presentation of gastrointestinal bleeding

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Accepted 12 April 2016

SUMMARY

A 17-year-old boy, with a background of haemophilia A, presented to hospital with an episode of brisk and painless per rectal (PR) bleeding. Initial investigation with gastroscopy and colonoscopy revealed no source of bleeding. Examination of the small bowel including MRI, CT angiogram and capsule endoscopy revealed no abnormalities. Double balloon enteroscopy (DBE) from an antegrade position was attempted, with no abnormalities noted. The symptoms persisted and DBE was attempted again from a retrograde approach and a diverticulum was subsequently noted. Laparoscopic surgery was performed identifying a diverticulum as the source of bleeding, 110 cm from the ileocaecal valve, which is more proximal than is normally seen. Histological examination revealed a Meckel's diverticulum. The case described here, although more unusual in adults, demonstrates that complete visualisation of the small bowel remains challenging and that newer modalities of enteroscopy including DBE can help aid in the diagnosis of obscure gastrointestinal bleeding.

BACKGROUND

Present in 2% of the population, with a 2:1 male to female preponderance, Meckel's diverticulum (MD) is commonly located within 2 feet of the ileocaecal valve.^{1 2} Frequently asymptomatic or found incidentally, clinical manifestations include acute abdominal complaints and gastrointestinal (GI) bleeding;¹⁻³ however, obtaining a diagnosis can be challenging.

While more commonly seen in children, MD should remain on the physician's differential list when approaching a patient with obscure GI bleeding. Diagnosis can prove challenging and the physician should be aware of the recommended approach to investigation, and the associated benefits and limitations of these steps.

CASE PRESENTATION

A 17-year-old boy, with a background of haemophilia A, was referred to a tertiary centre, with a 9-week history of recurrent, large volume, painless, fresh PR bleeding. He had suffered three collapses secondary to anaemia over this period and had required transfusion of several blood products including packed cells and recombinant factor VII.

On admission, he was haemodynamically stable with a soft, non-tender abdomen and there were no peripheral stigmata of GI disease. Systemic

examination was unremarkable. PR examination revealed fresh blood with no haemorrhoids and no fissures.

The patient reported being otherwise fit and well with no abdominal pain, no altered bowel habit, no weight loss and no dysphagia. He was a non-smoker and consumed no alcohol. He had been diagnosed with haemophilia at the age of 3 years, and took daily tranexamic and folic acid but nil else.

INVESTIGATIONS

Initial gastroscopy and colonoscopy carried out at his local hospital showed no active bleeding and no areas of abnormal mucosa.

On arrival at the tertiary centre, a Meckel's scan, small bowel MRI and CT angiogram were performed with no abnormalities noted. With symptoms persisting, a capsule endoscopy (CE) was carried out to assess the entire length of the small bowel but the source of bleeding was not successfully identified.

Understanding the limitations of the above imaging techniques, DBE was the next imaging modality of choice. Although a challenging procedure, it would allow the endoscopist a more detailed examination of the small bowel; with the potential to biopsy or treat any areas of concern. This was carried out from an antegrade approach requiring nine pushes. Unfortunately, the bowel preparation was limited, which in turn hindered endoscopic views. No abnormalities were otherwise detected.

With the patient haemodynamically stable, he was subsequently discharged home for monitoring. Unfortunately, he experienced a further episode of PR bleeding, which necessitated an admission with further blood transfusions. A decision was taken to attempt DBE again, this time using a retrograde approach—a more challenging procedure—but one that was felt to be essential to locate the source of the problem.

The procedure was performed under conscious sedation and required 20 pushes. On this occasion, diffuse aphthous ulceration from the transverse colon to the rectum was seen and a diverticulum also noted (figure 1). While the diverticulum was found more proximally than would normally be seen with a MD, it remained a differential. Therefore, the patient was reviewed by the surgical team and subsequently consented for laparoscopic resection of the diverticulum.

DIFFERENTIAL DIAGNOSIS

Differentials at the time of presentation included inflammatory bowel disease (IBD), tumours of the

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To cite: Pattni V, Wright K, Marden P, et al. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2015-213852

Figure 1 Double-balloon enteroscopy from below demonstrating an ileal diverticulum.

bowel, either benign or malignant, vascular malformation and MD.

IBD should always be considered in a patient presenting with rectal bleeding, particularly if imaging goes on to demonstrate ulceration within the bowel. Ulcerative colitis, the most common form of IBD, has a peak incidence between the ages of 15 and 25 years, and is characterised by inflammation from the rectum through the colon. While our patient showed this characteristic ulcerative pattern, the absence of any changes in bowel habit, lack of abdominal pain and normal C reactive protein made this diagnosis less likely.

Cross-sectional and endoscopic imaging had failed to identify any mass lesions or vascular abnormalities; these diagnoses were also therefore excluded.

The symptoms could, however, be explained by the presence of a MD.

TREATMENT

Laparoscopic surgery was carried out and the diverticulum identified on DBE was found and excised 110 cm proximal to the ileocaecal valve.

OUTCOME AND FOLLOW-UP

The resected tissue was sent for histological examination and confirmed as an MD containing gastric mucosa.

The patient made a swift recovery postoperatively and was discharged home without further complications. He was reviewed in clinic 6 weeks later, where he reported feeling well, with no further episodes of PR bleeding.

DISCUSSION

MD is the most common congenital abnormality of the GI tract and is a remnant of the omphalomesenteric duct. Such diverticulae may contain gastric, pancreatic or duodenal mucosa. Traditional modalities for investigation include Technetium Tc 99 m radionuclide scintigraphy (Meckel's scan), barium studies CT or arteriography. A Meckel's scan has a sensitivity of 80–90% in paediatric patients but this decrease to 62% in adults.^{1 4 5} It aims to identify areas of ectopic gastric mucosa within the GI tract. False negatives arise in patients with fast bleeding from the ectopic mucosa, impaired vascular supply or insufficient gastric mucosa.^{1 2 6}

This particular case presented the physician with several additional and interesting points to consider: the patient's underlying diagnosis of Haemophilia and subsequent presentation with brisk bleeding confounded the traditionally used Technetium Tc 99 m radionuclide scintigraphy scan. Furthermore, a MD is usually located within 2 feet of the ileocaecal valve. However, the human body does not always follow prescribed patterns and as this case shows, there are always exceptions to the rule.

MD frequently presents with obscure GI bleeding and current British Society of Gastroenterology guidelines on the topic recommend the following sequence of investigation:⁷

1. Gastroscopy and colonoscopy
2. Second look Gastroscopy
3. CE
4. Push enteroscopy or double-balloon enteroscopy (DBE)

Complete visualisation of the small bowel has long posed a challenge to the endoscopist; with its location and tortuosity, access is difficult and often poorly tolerated by patients.^{7 8} CE can be a useful starting point, particularly in patients who may be frail or poorly tolerant of invasive investigation.⁹ If an abnormality is noted it can guide the endoscopist's approach with the next stage of investigation, thus limiting the need for more than one procedure.¹⁰ However, CE has been shown to offer a lower diagnostic yield than DBE in the pick-up of MD.^{9 11 12} This is due in part to poor visualisation of the luminal wall during peristalsis, a lack of active bleeding, ulceration or the diverticulum's orientation off the bowel.^{6 10 13}

DBE allows for high-resolution visualisation, biopsy and intervention along the entire length of the GI tract. Initiated from either an antegrade or retrograde approach, it can be performed under conscious sedation or general anaesthetic. It has been shown to offer a high diagnostic yield with few complications and is rapidly becoming the modality of choice in the diagnosis of small bowel pathology.^{9 14–16}

When considering its value in the management of MD, DBE has uses beyond simply locating the diverticulum and any associated neighbouring ulceration. For example, it allows for biopsy, giving histological confirmation; targeted therapy, including temporary homeostasis; or marking with India Ink to aid surgical resection.^{9 10 17} Indeed, precise marking has allowed for single incision laparoscopic surgery, limiting trauma and sedation time for patients.^{18 19}

MD remains an unusual cause of GI bleeding in adults, but should be considered in all patients presenting with obscure GI bleeding. As this case has demonstrated, obtaining this diagnosis can be a challenging exercise. It is therefore important to consider any confounding factors in the patient's presentation and to acknowledge the limitation of routine investigations, with a view to using alternative modalities of enteroscopy if indicated.

Learning points

- ▶ While uncommon in adults, Meckel's diverticulum should remain a possible differential in those presenting with obscure gastrointestinal bleeding. Recognising it as a possibility allows for early initiation of management and improved patient outcomes.
- ▶ Visualising the small bowel through routine modalities of endoscopy remains challenging and clinicians should consider the impact that underlying pathology might have on the outcome on such investigations.
- ▶ The use of DBE, employed synergistically with other imaging modalities, is now rapidly improving the ability to visualise, diagnose and treat pathology of the small bowel.

Acknowledgements The authors thank to the Endoscopy department at Southmead Hospital for kindly providing images for this case report.

Contributors VP was involved in writing and editing the overall manuscript. KW was involved in writing the discussion within the manuscript. PM was involved in reviewing the final manuscript. AT was involved in identifying the case to be written up as a case report and reviewing the final manuscript.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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