

## Case report

### A recurrent, ischaemic ileocolonic anastomosis ulcer refractory to surgery treated with hyperbaric oxygen

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#### Key words

Gastrointestinal tract; Chronic wounds; Case reports

#### Abstract

(Pateria P, Chong A. A recurrent, ischaemic ileocolonic anastomosis ulcer refractory to surgery treated with hyperbaric oxygen. *Diving and Hyperbaric Medicine*. 2018 September;48(3):194–196. doi: 10.28920/dhm48.3.194-196. PMID: 30199892.) A 54-year-old male had undergone right hemicolectomy and ileo-colonic anastomosis for carcinoma-in-situ found at colonoscopy. Eighteen months later, he presented with a lower gastrointestinal bleed from an anastomotic ulcer, treated with resection of the anastomotic site and ileo-sigmoid anastomosis. In the ensuing 12 months, he had three episodes of haematochezia. Colonoscopy revealed a 12 mm anastomotic ulcer necessitating a further colonic resection and re-anastomosis. Two-years later, he presented with iron deficiency anaemia. He preferred expectant management and received ten iron-infusions over the subsequent four years. Thereafter, he developed painless haematochezia. Colonoscopy showed a 15 mm linear ulcer with mild ooze at the anastomosis. Histology was consistent with an ischaemic ulcer; there was no evidence of recurrence of carcinoma-in-situ. The ulcer remained refractory to endoscopic and medical treatment, as seen at three follow-up colonoscopies. Hyperbaric oxygen treatment (HBOT) was offered and he received 30 sessions over six weeks. Colonoscopy at HBOT completion revealed healing of the ulcer. The patient had no further overt bleeding and serum ferritin has continued to rise spontaneously over 12 months follow-up.

#### Introduction

Ulceration at ileo-colonic and colo-colonic anastomoses is a known complication of large bowel resection, described with variable frequencies ranging from 0.8 to 2.5%.<sup>1-3</sup> While the precise aetiology of such ulceration remains unknown, use of non-steroidal anti-inflammatory drugs (NSAIDs), development or recurrence of Crohn's disease and malignancy have been found in some cases. The incidence of anastomotic ulceration is more common in the paediatric population than in adults.<sup>4,5</sup> Anastomotic ulcers commonly present with iron deficiency and gastrointestinal bleeding.<sup>1,2</sup>

Many therapies, including sulfasalazine, sucralfate, 5-aminosalicylic acid (5-ASA), antacid therapy such as ranitidine and protein pump inhibitors have been described for management of anastomotic ulcers with variable success.<sup>1-5</sup> We report a case of recurrent anastomotic ulceration resistant to all medical and surgical intervention over several years but which healed with hyperbaric oxygen treatment (HBOT).

#### Case report

A 54-year-old male presented with abdominal pain and underwent colonoscopy which revealed a polyp and biopsies were consistent with carcinoma-in-situ. He was managed with right hemicolectomy and ileo-colonic anastomosis, from which he recovered well. Past medical history included basal cell carcinoma resection and solar keratosis. He was not on any regular medications. He denied intake of NSAIDs. He had adequate dietary intake of iron, was a non-smoker and drank 1–2 standard drinks of alcohol per day. There was no significant family history of gastrointestinal malignancy.

Eighteen months later, he presented with an acute lower gastrointestinal bleed. Colonoscopy showed bleeding from an anastomotic ulcer. A resection of the anastomotic site, transverse and left hemicolectomy and ileo-sigmoid anastomosis was performed. In the ensuing twelve months, he had three episodes of lower gastrointestinal bleeds and remained iron deficient requiring three iron infusions and one blood transfusion. He was investigated with capsule endoscopy, double balloon enteroscopy and colonoscopy. The investigations revealed a 12 mm ulcer at the anastomosis

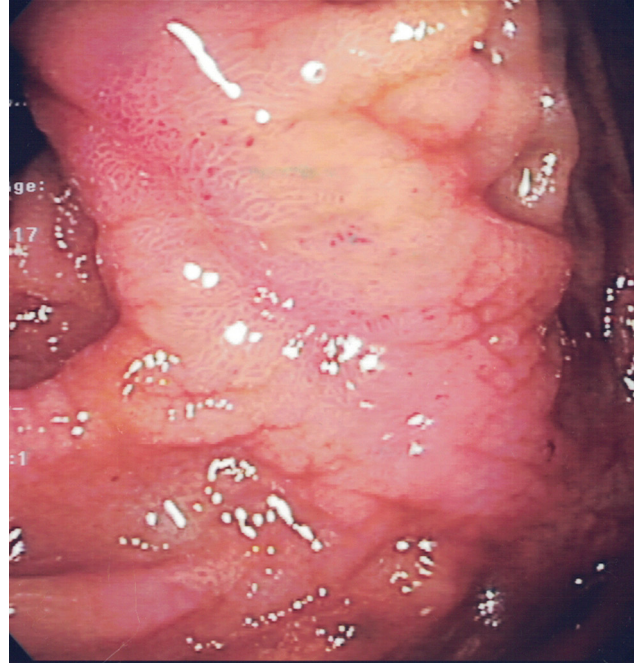
**Figure 1**

15 mm, ischaemic, linear ulcer (white) at the ileo-colonic anastomosis with mild ooze



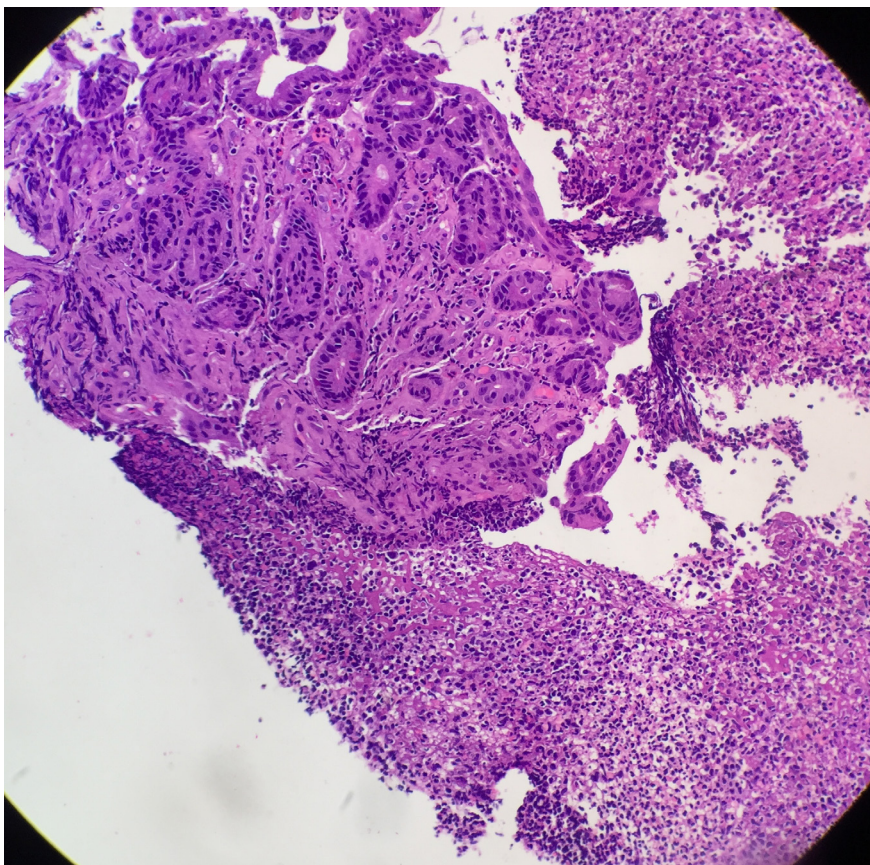
**Figure 3**

Healed ulcer, post 30 HBOT 90-minute sessions at 243 kPa, showing a healthy anastomosis with good vascular markings



**Figure 2**

Ulcer biopsy with haematoxylin and eosin stain at 400 x magnification showing ulcerated mucosa and free-lying inflammatory slough with small crypts and partly fibrotic stroma suggestive of ischaemic ulcer prior to hyperbaric oxygen treatment



and no other source of bleeding was found. Subsequently he underwent his third colonic resection and ileo-colonic anastomosis.

He remained stable for the next two years before presenting with iron deficiency without overt bleeding. He did not have any episodes of epistaxis, melaena or haematuria. He was investigated with gastroscopy and duodenal biopsies to rule out other causes of iron deficiency. Gastroscopy was normal and biopsies did not show evidence of coeliac disease or *Helicobacter pylori* infection. He preferred expectant management and was managed with regular blood tests and iron infusions as required. He remained iron deficient and received 10 iron infusions over the subsequent four years.

Thereafter, he developed painless haematochezia prompting a colonoscopy. Repeat colonoscopy showed a 15 mm linear ulcer (Figure 1) with mild ooze at the anastomosis. The ulcer was treated endoscopically with argon plasma coagulation (APC). The anastomotic ulcer biopsies were consistent with an ischaemic ulcer (Figure 2). The ulcer remained refractory to endoscopic treatment with APC and medical treatment with ranitidine, pantoprazole and 5-ASA. The ulcer was non-healing, with persistent ooze, as seen at three follow-up colonoscopies.

This man presented a serious management dilemma. He had had multiple episodes of lower gastrointestinal bleeding secondary to his anastomotic ulcer, three major surgical procedures and endoscopic and medical management over a period of nine years. Despite all this, he continued to have a non-healing ulcer at the anastomosis. The options of continued conservative management with iron and blood transfusions, repeat surgery and hyperbaric oxygen treatment (HBOT) were discussed with him. Following review at a multidisciplinary team meeting and with due consideration of all of the treatment options, he opted for HBOT. He was treated with 30 x 90-minute HBOT sessions at 243 kPa over six weeks in a multiplace chamber, without any complications. Repeat colonoscopy at the completion of HBOT revealed healing of the ulcer, with no further ooze (Figure 3). The patient has not had any overt bleeding and serum ferritin has continued to rise spontaneously over 12 months follow-up.

## Discussion

Large bowel anastomotic ulcers commonly present with iron deficiency and gastrointestinal bleeding as in this case.<sup>1,2</sup> Whilst such ulcers may be associated with the use of NSAIDs, development or recurrence of Crohn's disease and malignancy, none of these risk factors were present in this man. Many therapies, including sulfasalazine, sucralfate, 5-ASA, antacid therapy such as ranitidine and proton pump inhibitors have been described for management of anastomotic ulcers with variable success and had all been trialled before he underwent HBOT.<sup>1-5</sup>

HBOT has been shown to improve colorectal ischaemic anastomosis healing in animal models.<sup>6</sup> However, it does not appear to have been reported in the management of ileocolonic anastomotic ulcers in humans. This case demonstrates successful healing of an ileocolonic anastomotic ischaemic ulcer with HBOT after many years of failure of conventional surgical, endoscopic and medical treatment. As far as we are aware this is the first such case reported in the literature. Further studies are needed to assess the efficacy of HBOT for such ulcers.

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