CASE REPORT

Clostridium difficile infection after ileostomy closure mimicking anastomotic leakMuhammad Qutayba Almerie,¹ Adam Culverwell,² Christopher Mahon¹

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SUMMARY

Clostridium difficile infection is linked to antibiotic exposure, with elderly and immunocompromised hospitalised patients being particularly at risk. The symptoms range from mild diarrhoea to life-threatening fulminant colitis. We describe an unusual presentation of *C. difficile* infection after closure of ileostomy in a healthy 60-year-old man with a history of low anterior resection and defunctioning ileostomy for rectal tumour. On the third day postoperatively, the patient developed left lower abdominal pain and profuse diarrhoea. With worsening symptoms and steadily increasing inflammatory markers over the following few days, concerns were raised about an anastomotic leak with pelvic abscess. CT of the abdomen/pelvis on day 7 surprisingly showed colitis in the neorectum/sigmoid colon. A stool test confirmed *C. difficile* infection.

BACKGROUND

Proximal faecal diversion by forming defunctioning ileostomy is widely used to protect distal anastomosis. Patients having low anterior resection for rectal tumour are at higher danger of anastomotic leak with risk reaching 10%.¹ Diverting stomas were found to decrease the clinical anastomotic leak distally and the risk of reoperation in patients undergoing low anterior resection.² The temporary stoma is usually closed a few months later after contrast studies confirm intact distal anastomosis. Elective closure of ileostomy is usually considered a low-risk operation with a mortality rate of 0.4%.³

Clostridium difficile infection is a major cause of hospital-acquired infection that continues to increase in incidence and severity among hospitalised patients.^{4 5} The symptoms can range from mild diarrhoea to a fulminant colitis that could cause severe sepsis, toxic megacolon and multiorgan failure, and is associated with high mortality.^{4 6} The major risk factors for acquiring *C. difficile* infection are antibiotic exposure, severe underlying disease, older age and immune suppression.⁷

In this article, we report an unusual presentation of *C. difficile* infection in a healthy 60-year-old man who had an elective reversal of ileostomy. The initial presentation of *C. difficile* infection was indistinguishable from that expected normally in postileostomy-closure recovery. As the patient's symptoms worsened, they mimicked the far more common causes of postoperative intra-abdominal sepsis (anastomotic leak).

CASE PRESENTATION

A 60-year-old man was admitted to our surgical department for an elective closure of his ileostomy.

Six months earlier, he had undergone a laparoscopic low anterior resection with a diverting ileostomy for a T2N0M0 rectal tumour. The operation was preceded by a short course of neoadjuvant radiotherapy.

A few months following the operation, the patient had a water soluble enema, which confirmed an intact colorectal anastomosis; he was booked for an elective closure of his ileostomy.

The patient was admitted on the day of the operation. He had no medical problems apart from that mentioned above. He received only one dose of antibiotics immediately before the operation (intravenous 500 mg metronidazole and 2 mg/kg gentamycin). The ileostomy closure was completed with no intraoperative complications.

The patient had good recovery until day 3 postoperatively, when he started having severe diarrhoea with over ten bowel motions in a day. This was accompanied by an unusual pain in the left lower quadrant of the abdomen away from the ileostomy site in the right abdomen.

INVESTIGATIONS

A series of daily blood tests were arranged for the patient, which showed a steadily increasing C reactive protein (CRP) level jumping from 17 mg/L on first day postoperative to 209 mg/L on day 5 postoperative (normal 0–10). His white cell count also increased to $11.4 \times 10^9/L$. A sample of the stool was sent for microbiological assessment.

DIFFERENTIAL DIAGNOSIS

Diarrhoea is expected after closure of ileostomy due to atrophy of the excluded colon mucosa. However, the sudden profuse diarrhoea accompanied by lower abdominal pain and raised inflammatory markers in our patient raised concerns about a pelvic abscess secondary to an anastomotic leak. The other differential diagnoses were iatrogenic intraoperative bowel injury or infectious gastroenteritis.

TREATMENT

On day 7, the patient was started empirically on parenteral antibiotics (amoxicillin, gentamycin and metronidazole) with suspicion of intra-abdominal sepsis. CT of the abdomen and pelvis was arranged to look for signs of anastomotic leak. The CT scan showed no signs of anastomotic leak. Instead, it surprisingly showed a notably oedematous mucosa of the neorectum/sigmoid colon with inflammation in the mesocolon, suggestive of colitis (figure 1). Toxin assays in the stool confirmed *C. difficile* infection.

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The patient's parenteral antibiotics were stopped and he was started on oral metronidazole. He recovered well and was discharged home after 2 days (day 9 postoperatively) with oral metronidazole to finish a 10-day course.

OUTCOME AND FOLLOW-UP

The patient was reviewed in outpatient clinic 2 weeks after discharge. He remained asymptomatic.

DISCUSSION

Early symptoms of *C. difficile* colitis such as diarrhoea and increased CRP might be normal findings in the postileostomy-closure patients. More advanced clinical manifestations are indistinguishable from other causes of intra-abdominal sepsis (eg, anastomotic leak, pelvic abscess or iatrogenic bowel injury). This could cause delay in the diagnosis of *C. difficile*, which could be fatal.⁸

In the literature, we could only find one case that reported *C. difficile* infection after closure of ileostomy.⁸ Similar to our patient, the patient had defunctioning ileostomy with low anterior resection for rectal cancer. Again, the presentation of *C. difficile* was confusing and the diagnosis was delayed, but the

disease was much more severe (fulminant colitis), and the patient deteriorated quickly and died following an emergency total colectomy.

Three studies looked into the incidence of *C. difficile* infection postclosure of ileostomy.^{9–11} Hussain *et al* looked prospectively into 20 patients who were experiencing reversal of ileostomy, and took two stool samples before and two after the procedure, and sent them to be cultured for *C. difficile*, and analysed for toxins A and B by a Premier enzyme immunoassay test. None of the patients had positive tests preoperatively. Two of the 20 patients had asymptomatic postoperative *C. difficile* colonisation (10%), while one patient developed clinical pseudomembranous colitis with positive toxins (5%).⁹

Randall *et al*¹⁰ looked retrospectively into patients who were coded to have had closure of ileostomy and subsequent *C. difficile* infection. Six of the 143 patients who had reversal of ileostomy developed *C. difficile* infection (4.2%).

However, the biggest of these studies was a retrospective large population-based analysis (2004–2008) in the USA. The authors searched the hospital databases using the codes for reversal ileostomy and *C. difficile* to identify, retrospectively, those patients who had infection after closure of ileostomy. The incidence of

Figure 1 Contrast-enhanced CT study performed at day 7 showing features of an active colitis. (A and B) Coronal images (reformatted) showing long segment of thickened and inflamed descending and sigmoid colon. The bowel wall showing mucosal enhancement, submucosal oedema and haustral thickening (white arrow). Note normal appearances of the colon proximal to the splenic flexure (yellow arrow). Hyperaemia in the mesocolon (red arrow). (C) Axial image showing oedematous, inflamed sigmoid colon. 'Layering' of the bowel wall reflecting mucosal enhancement and submucosal oedema (white arrow). The other feature indicating an active colitis is the minor stranding in the pericolic mesentery, signifying inflammatory infiltrates (arrow head), in addition to thickening of the peritoneum (blue arrow). Good perfusion of the bowel wall argues against ischaemic colitis.

C. difficile colitis after ileostomy closure was estimated at 1.6% (217/13 245).¹¹

The above reports show a higher risk of developing *C. difficile* infection postoperatively in patients undergoing closure of ileostomy than the risk reported in the general hospital population (0.08%)¹² and that reported in the inpatients following general surgical procedures (0.52%).¹³

The downside of these studies, however, is that the details of patients' characteristics, presentation, preoperative comorbidities and use of antibiotics, are not clear. This makes the studies less informative to doctors in the hospital who are challenged by the confusing presentation of the disease who need guidance on how to spot the early signs of the disease, and to request the appropriate investigations to allow early diagnosis and prompt treatment of a potentially fatal disease.

There is no clear explanation yet for encountering *C. difficile* infection after closure of ileostomy. *C. difficile* could colonise the small bowels, with many studies reporting enteritis with *C. difficile*.¹⁴ Animal studies have shown that excluded colons undergo mucosal and muscular atrophy with derangement in the intestinal immune system.¹⁵ Another potential cause might be due to the reduced nutrition in excluded colons. This could change the unique microbial ecosystem in the large bowel in favour of the more fastidious bacteria such as *C. difficile* causing

colonisation of the colon.¹¹ When the stoma is closed, the spores could get reactivated and enter a growth phase leading to clinical infection.

We believe that the antibiotics administered at induction might have been the trigger of the infection in our presented cases, as previous reports have shown that even one dose of antibiotics increases the risk of *C. difficile* infection.¹⁶

Contributors MQA conceptualised the case and wrote the draft of the case report. AC provided the images and the caption, and reviewed and edited the final draft. CM conceptualised the case, and reviewed and edited the final draft.

Competing interests None declared.

Patient consent Obtained.

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Learning points

- Early symptoms of *Clostridium difficile*, such as diarrhoea and increased inflammatory markers, could be indistinguishable from the normal spectrum of expected symptoms after ileostomy closure.
- *C. difficile* should be considered in patients reporting profuse diarrhoea with non-settlement after closure of ileostomy.
- Surgical complications are usually the first thought of causes of problematic recovery in postoperative patients. However, less common causes such as *C. difficile* should always be suspected and thoroughly investigated.
- *C. difficile* infection after ileostomy closure shares common clinical features with other possible causes of postoperative intra-abdominal sepsis (eg, anastomotic leak, abscess, iatrogenic bowel injury). Careful assessment is warranted to avoid delayed diagnosis, which increases morbidity and mortality.

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