Reminder of important clinical lesson

Clostridium difficile infection in the absence of a colonMohid S Khan,¹ D Levy,² S Mann¹¹ Department of Gastroenterology, Gastroenterology, Neuroendocrine tumour unit, Royal Free Hospital, London, UK² Department of Elderly Care Medicine, Barnet Hospital, Barnet, London, UK

Correspondence to Dr Mohid S Khan, mohidkhan@doctors.org.uk

Summary

Clostridium difficile (CD) infection is almost always confined to the colon causing a spectrum of illness ranging from diarrhoea to fulminant colitis. CD infection of the small intestine has been described but the identification of CD toxin in the stoma effluent of a patient with an end ileostomy is rare. We describe a 91-year-old woman, with a history of proctocolectomy for ulcerative colitis, presenting with profuse ileostomy diarrhoea after a course of antibiotics. Ileostomy effluent was positive for CD toxin but the patient died despite appropriate treatment. This suggests that the small intestine is susceptible to CD infection in antibiotic-treated patients many years after a colectomy. CD enteritis should be considered in all patients with increased ileostomy diarrhoea despite the absence of a colon.

BACKGROUND

Clostridium difficile (CD) infection is a major cause of hospital acquired infection. It causes a toxin-mediated mucosal inflammatory process and is associated with increased morbidity and mortality, especially in elderly hospitalised patients. CD infection is typically a colonic infection and has been only rarely described affecting the small intestine.¹

We describe a patient who had diarrhoeal symptoms due to hospital-acquired CD infection in her ileostomy effluent many years after colectomy.

CASE PRESENTATION

A 91-year-old woman was admitted to hospital from a residential home in November 2007 with a 3-day history of profuse ileostomy diarrhoea associated with anorexia, nausea, lethargy and reduced mobility. The patient reported that she had been changing her ileostomy bag with an increased frequency and had been experiencing leakage of green and watery effluent. Apart from two transient episodes of subacute bowel obstruction, she had no prior history of similar bowel disturbances since having an ileostomy. Nobody else in the home or hospital had suffered with a diarrhoeal illness.

Two weeks before admission she had been discharged following a 3-week inpatient stay with a pubic ramus fracture complicated by *Staphylococcus aureus* bacteraemia requiring a 10-day course of intravenous meropenem. This antibiotic was selected as the patient had a documented penicillin allergy and empirical antibiotics were required pending blood cultures. No other antibiotics had been administered.

Her past medical history included a subtotal colectomy and end-ileostomy for ulcerative colitis in 1971, transitional cell carcinoma of the bladder, acute pancreatitis in 1991 and pulmonary embolism in 1995.

On admission, she was febrile (37.5°C) but normotensive. Systemic examination was otherwise unremarkable. Abdominal examination revealed an old vertical midline scar and ileostomy in the right iliac fossa.

INVESTIGATIONS

Laboratory investigations revealed a neutrophil leucocytosis ($10.3 \times 10^9/l$), renal impairment (urea 26.3 mmol/l, creatinine 128 µmol/l) and an elevated C reactive protein (280 mg/l). Initial stool cultures for salmonella, shigella, *Escherichia coli* 0157, campylobacter and CD toxins from the ileal effluent were negative. Stool viral assays were not determined.

DIFFERENTIAL DIAGNOSIS

The sudden onset of profuse diarrhoea and systemic inflammatory response supported an infectious aetiology, although the differential includes a recurrence of inflammatory bowel disease. A viral aetiology was thought to be less likely as was other small bowel pathology such as coeliac disease, malabsorption, short bowel syndrome and drug side effects.

TREATMENT

She was managed empirically with intravenous meropenem in case of a recurrence of her staphylococcal sepsis, which had previously responded to meropenem. During the admission she developed vasculitic lesions on the finger tips and a trans-thoracic echocardiogram raised the possibility of vegetations on the mitral valve leaflets. Therefore, antibiotics were rationalised to teicoplanin and gentamicin to cover possible *Staphylococcal* endocarditis.

OUTCOME AND FOLLOW-UP

The diarrhoea persisted and a per-stoma ileoscopy revealed a normal ileal mucosa. Repeat culture from the ileostomy effluent was subsequently reported to be positive for CD toxins (day 15) and she was started on oral metronidazole. However, in spite of a reduction in volume of effluent and improved consistency, her general condition deteriorated and she died in week 6 of a hospital-acquired pneumonia after several weeks of debility and frailty.

DISCUSSION

CD colonisation of the colon is common in patients following treatment with broad-spectrum antibiotics. Pseudomembranous colitis is generally confined to the colon with a demarcation at the ileocaecal valve.² Although CD has been described in jejunal aspirates,³ small bowel involvement occurring in patients with an ileostomy remote from the time of the colectomy for inflammatory bowel disease is rare.^{4–7}

A literature search revealed 15 case reports of CD enteritis with prior abdominal surgery in 11 of 15 cases.^{1–7} An additional series described 12 cases of CD enteritis; 6 with an ileostomy, of whom only 1 had underlying inflammatory bowel disease.⁸ This patient developed CD infection within 2 weeks of surgery. There are only six reported cases of ileostomy CD diarrhoea following inflammatory bowel disease, including one patient who developed a postoperative CD infection.^{4–9} Risk factors for CD enteritis include old age, recent admission to hospital and recent antibiotics. Our case is only the fifth patient described with CD enteritis occurring at least 1 year after the creation of the stoma in inflammatory bowel disease.

Susceptibility to CD infection in the small bowel may be due to morphological changes such as colonic-type metaplasia and partial villous atrophy,¹⁰ or an altered bacterial flora that resembles faecal flora following an ileostomy.¹¹ The long time interval between the original operation and CD infection supports this. The trigger in this case was likely to have been the broad-spectrum antibiotics used prior to the onset of diarrhoea leading to hospital-acquired CD infection. The rate of nosocomial CD infection in this institution is 0.13% of admissions. Symptoms include fever, diarrhoea, nausea, vomiting and abdominal pain. Diagnosis is confirmed by toxin assays. The absence of CD toxin at presentation may be due to a false-negative result but highlights the need of repeat testing if the index of suspicion is high. Clinical management is similar to that of CD infection with an intact colon. CD infection is associated with increased mortality, particularly in patients with advanced age and co-morbidities. We suspect that the CD enteritis was a manifestation of her poor overall health and was, therefore, a contributory factor rather than a cause of her death.

The clinical entity of CD infection in an ileostomy is rare and not well-known even among gastroenterologists. This may be a rarity but the high profile of CD within the community warrants all clinicians to consider this even in patients who do not have a colon.

Learning points

- CD can cause infection of the small bowel.
- CD enteritis can occur many years after a colectomy.
- CD toxin should be requested and repeated if there is an unexplained increase in ileostomy effluent.
- CD enteritis can be fatal.

Competing interests None.

Patient consent Obtained.

REFERENCES

1. **Lundeen SJ**, Otterson MF, Binion DG, *et al.* *Clostridium difficile* enteritis: an early postoperative complication in inflammatory bowel disease patients after colectomy. *J Gastrointest Surg* 2007;**11**:138–42.
2. **Tedesco FJ**. Pseudomembranous colitis: pathogenesis and therapy. *Med Clin North Am* 1982;**66**:655–64.
3. **Taylor RH**, Borriello SP, Taylor AJ. Isolation of *Clostridium difficile* from the small bowel. *Br Med J (Clin Res Ed)* 1981;**283**:412.
4. **LaMont JT**, Trnka YM. Therapeutic implications of *Clostridium difficile* toxin during relapse of chronic inflammatory bowel disease. *Lancet* 1980;**1**:381–3.
5. **Vesoulis Z**, Williams G, Matthews B. Pseudomembranous enteritis after proctocolectomy: report of a case. *Dis Colon Rectum* 2000;**43**:551–4.
6. **Freiler JF**, Durning SJ, Ender PT. *Clostridium difficile* small bowel enteritis occurring after total colectomy. *Clin Infect Dis* 2001;**33**:1429–31; discussion 1432.
7. **Kim KA**, Wry P, Hughes E Jr, *et al.* *Clostridium difficile* small-bowel enteritis after total proctocolectomy: a rare but fatal, easily missed diagnosis. Report of a case. *Dis Colon Rectum* 2007;**50**:920–3.
8. **Lavallée C**, Laufer B, Pépin J, *et al.* Fatal *Clostridium difficile* enteritis caused by the BI/NAP1/027 strain: a case series of ileal *C. difficile* infections. *Clin Microbiol Infect* 2009;**15**:1093–9.
9. **Kuntz DP**, Shortsleeve MJ, Kantrowitz PA, *et al.* *Clostridium difficile* enteritis. A cause of intramural gas. *Dig Dis Sci* 1993;**38**:1942–4.
10. **Apel R**, Cohen Z, Andrews CW Jr, *et al.* Prospective evaluation of early morphological changes in pelvic ileal pouches. *Gastroenterology* 1994;**107**:435–43.
11. **Vince A**, O'Grady F, Dawson AM. The development of ileostomy flora. *J Infect Dis* 1973;**128**:638–41.

This pdf has been created automatically from the final edited text and images.

Copyright 2010 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Please cite this article as follows (you will need to access the article online to obtain the date of publication).

Khan MS, Levy D, Mann S. *Clostridium difficile* infection in the absence of a colon. *BMJ Case Reports* 2010;10.1136/bcr.02.2010.2728, date of publication

Become a Fellow of BMJ Case Reports today and you can:

- Submit as many cases as you like
- Enjoy fast sympathetic peer review and rapid publication of accepted articles
- Access all the published articles
- Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow