Diverticulitis of the transverse colon manifesting as colocutaneous fistula

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ABSTRACT

The transverse colon is a particularly rare site for a diverticulum to develop, with only few reports of solitary diverticula described in the literature. Among the reported complications, colocutaneous fistulas appear relatively infrequently. We describe the case of an 80-year-old woman with a solitary diverticulum of the transverse colon presenting as acute diverticulitis with abscess formation in the epigastric region. A fistulous tract was found between the inflamed colon and the skin. A wedge resection of the inflamed colon together with the fistula and the solitary diverticulum was performed followed by primary suturing of the healthy colonic tissue. Despite the sufficient treatment and thorough clearance of the area, the patient died ten days later from ventilator associated pneumonia.

Although rare, in patients presenting with a subcutaneous abscess in the abdominal region, there should be a high level of suspicion for active intraperitoneal inflammation derived from complicated diverticular disease given the continuously elevated prevalence of the condition in Western societies. The decision regarding proper management of this clinical state should be based on thorough clinical examination and imaging.

KEYWORDS

Diverticulitis – Fistula – Solitary – Transverse colon

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Colonic diverticula are routinely detected in a large portion of the population as asymptomatic findings on endoscopic examination. Their prevalence is increasing as a result of the Western lifestyle and the aging of the population.^{1,2} A diverticulum in the transverse colon is a particularly rare finding, accounting for less than 6% of all gastrointestinal tract diverticula.³ Secondary to diverticulosis, a large variety of complications may appear, including the formation of fistulas, which is favoured by the inflammatory outburst of a diverticular abscess or a phlegmon. The colocutaneous fistula is a rare case of fistulous connection representing only 1% of the cases detected.⁴ Surgical intervention remains the mainstay of treatment in patients with fistulas refractory to medical therapy.⁵ We describe an extremely rare case of a colocutaneous fistula of the epigastric region originating from an inflamed transverse colon solitary diverticulum.

Case history

An 80-year-old woman was admitted to our department for evaluation of a faecal fistula in the epigastric region. Her past medical history included hypertension, hyperlipidaemia, diabetes mellitus, atrial fibrillation and an episode of acute renal failure induced by vancomycin use. Her past surgical history included an open cholecystectomy combined with ventral hernia repair. Computed tomography (CT) colonography five years earlier had revealed the presence of a solitary diverticulum in the transverse colon (Fig 1).

Prior to her admission to our department, the patient reported an episode of pain, redness and swelling in the epigastric region that was treated as an abdominal wall abscess in another hospital. After drainage, her clinical condition improved temporarily. Three days later, passage of gas and

Figure 1 Three-dimensional (3D) reconstruction image (A), endoluminal 3D image (B) and axial image (C) of a solitary diverticulum of the transverse colon appearing in computed tomography colonography

faecal material was noted at the skin above the area by the abscess, indicating the presence of a colocutaneous fistula. She was referred to our hospital, where physical examination confirmed the presence of the fistulous tract. Laboratory findings at the time of admission revealed marked leucocytosis (white cell count $15.57 \times 10^9/l$) while contrast enhanced abdominal CT indicated a communication between the inflamed diverticulum of the transverse colon and the skin in the epigastric region (Fig 2).

The patient underwent an exploratory laparotomy. A wedge resection of the inflamed colon together with the fistula and the solitary diverticulum was performed followed by primary suturing of the healthy colonic tissue (Fig 3). The remaining colon was healthy with no evidence of further inflammation or other diverticula being present. Pathological examination revealed an inflamed colonic diverticulum producing a fistula to the abdominal wall. Five days after the intervention, abdominal CT showed no signs of leakage or recurrence of inflammation in the local tissues. However, the patient developed pulmonary oedema

and was therefore intubated and placed on a mechanical ventilator. Although the abdominal CT did not reveal any pathology, the patient died ten days following the surgery from ventilator associated pneumonia.

Discussion

Colonic diverticulosis is a disease of the West characterised by the formation of mucosal pockets protruding from the muscle wall. The pathogenesis of the disease is multifactorial, involving the combination of diminished muscle wall resistance, significantly low dietary fibre intake and also a change in colonic motility.^{1,6} Diverticular disease is the most common condition found in the colon and is strongly associated with increasing age. Diverticula are mainly detected in the distal colon whereas only 6% of diverticula in a US population occurred in the transverse colon.⁵

Although a significant proportion of patients may remain asymptomatic, complications associated with diverticular disease include diverticulitis and bleeding.¹ Current analysis using data extrapolated from population-based studies of patients undergoing colonoscopy suggests that the risk of developing diverticulitis lies at around only 4%.^{1,7}

Complicated cases of diverticulitis involve the formation of microperforations, which leads to a local inflammatory cascade affecting both the colon and the rest of the nearby structures. Development of a localised abscess may be followed by free perforation in the peritoneal cavity or even a fistulous channel connecting the inflamed colon and a neighbouring organ, mainly at the urinary tract and vagina.⁴ Recent studies have noted a relatively low proportion of patients presenting with colocutaneous fistulas secondary to complicated diverticulitis.⁵

According to the literature, diverticulitis of the transverse colon is rare. Rao *et al* were the first to publish a case of a perforated diverticulum presenting as a spontaneous transverse colocutaneous fistula.⁸ These uncommon tissue connections occur almost exclusively as a complication of previous resection for diverticulitis or from percutaneous drainage of diverticular abscesses. In our case, the fistula established itself after the perforation of a solitary diverticulum of the transverse colon and its detection was

Figure 2 Computed tomography revealing a colocutaneous fistula between the transverse colon and epigastric region (arrow)

Figure 3 Intraoperative photographs: Colocutaneous fistula (arrow) and numerous hernia defects (A); wedge resection of the inflamed colon, fistulectomy and diverticulectomy (arrow) (B); and primary closure (arrow) (C)

feasible because of the percutaneous drainage of the formed abscess.

The management of an enterocutaneous fistula is described in a specific care protocol termed SNAP, which includes the aspects of sepsis, nutrition, anatomy and procedures for definitive treatment.⁹ The available options for surgical treatment vary depending on the clinical condition of the patient. In the majority of cases, the preferred choice is single stage bowel and fistula resection.⁵ Another strategy was followed by Shperber *et al*, who performed a diverticulectomy and subsequent closure of the perforation.¹⁰ However, the outcome was not favourable: leakage was detected and subsequent reoperation with a right colectomy was mandatory.

In our case, a wedge resection of the inflamed colon together with the fistula and the solitary diverticulum was performed followed by primary suturing of the healthy colonic tissue. A more radical resection was not attempted owing to the absence of further inflammation of the remaining colon or other diverticula, as evidenced by the preoperative diagnostic imaging. However, the patient developed sudden onset pulmonary oedema, requiring emergency intubation and mechanical ventilator support, and she died ten days postoperatively from ventilator associated pneumonia. Interestingly, according to a retrospective study at the Yale School of Medicine, pneumonia is the most frequent complication (25%) recorded in elderly patients undergoing emergency surgical interventions in the colon.¹¹ Regarding fistula formation, a population-based cohort study revealed a 2.6-fold increased mortality rate in patients with a fistula compared with the general population while the mortality in the years following diagnosis remains significantly elevated in this group of patients.^{7,12}

Conclusions

Our report presents an uncommon case of diverticulitis manifesting as a colocutaneous fistula from a solitary

diverticulum of the transverse colon. Although rare, for patients with a subcutaneous abscess in the abdominal region there should be a high level of suspicion for active intraperitoneal inflammation derived from complicated diverticular disease given the continuously elevated prevalence of the condition in Western societies. The decision regarding proper management of this clinical state should be based on thorough clinical examination and imaging.

References

1. Stollman N, Raskin JB. Diverticular disease of the colon. *Lancet* 2004; **363**: 631–639.
2. Onur MR, Akpınar E, Karaosmanoglu AD *et al*. Diverticulitis: a comprehensive review with usual and unusual complications. *Insights Imaging* 2017; **8**: 19–27.
3. Peery AF, Keku TO, Martin CF *et al*. Distribution and characteristics of colonic diverticula in a United States screening population. *Clin Gastroenterol Hepatol* 2016; **14**: 980–985.e1.
4. Bahadursingh AM, Virgo KS, Kaminski DL, Longo WE. Spectrum of disease and outcome of complicated diverticular disease. *Am J Surg* 2003; **186**: 696–701.
5. Tam MS, Abbass M, Tsay AT, Abbas MA. Outcome of colonic fistula surgery in the modern surgical era. *Tech Coloproctol* 2014; **18**: 467–472.
6. Stollman NH, Raskin JB. Diverticular disease of the colon. *J Clin Gastroenterol* 1999; **29**: 241–252.
7. Shahedi K, Fuller G, Bolus R *et al*. Long-term risk of acute diverticulitis among patients with incidental diverticulosis found during colonoscopy. *Clin Gastroenterol Hepatol* 2013; **11**: 1,609–1,613.
8. Rao UP, Venkitachalam PS, Posner GL, Estueta ET. Diverticulitis manifesting as transverse colocutaneous fistula: report of a case and review of literature. *Dis Colon Rectum* 1980; **23**: 44–48.
9. Gribovskaja-Rupp I, Melton GB. Enterocutaneous fistula: proven strategies and updates. *Clin Colon Rectal Surg* 2016; **29**: 130–137.
10. Shperber Y, Halevy A, Oland J, Orda R. Perforated diverticulitis of the transverse colon. *Dis Colon Rectum* 1986; **29**: 466–468.
11. McGillicuddy EA, Schuster KM, Davis KA, Longo WE. Factors predicting morbidity and mortality in emergency colorectal procedures in elderly patients. *Arch Surg* 2009; **144**: 1,157–1,162.
12. Humes DJ, West J. Role of acute diverticulitis in the development of complicated colonic diverticular disease and 1-year mortality after diagnosis in the UK: population-based cohort study. *Gut* 2012; **61**: 95–100.