

Perforated Colorectal Cancer: An Important Differential Diagnosis in All Presumed Diverticular Abscesses

Dear Editor,

Colorectal cancer (CRC) is the most common cancer in Singapore¹ and is also on an increasing trend.² Common presenting symptoms of CRC include abdominal pain, change in bowel habits, per rectal bleeding, anaemia and weight loss.³ A less frequent presentation is perforation and abscess formation, which is usually intraperitoneal but may occasionally be located in extraperitoneal spaces. With contained perforation and abscess formation, the clinical picture can closely resemble complicated diverticulitis, whether on clinical examination or on radiological imaging such as Computed Tomography (CT) scans. Patients typically present with fever, abdominal pain and leukocytosis, and CT scans show a pericolic or intra-abdominal abscess. It is thus important to consider the diagnosis of colonic carcinoma in patients who present with such a clinical picture. We present 3 cases of carcinoma of the colon presenting as a pericolic abscess over a period of 2 months—initially diagnosed as a diverticular abscess—for which diagnosis of carcinoma was made intraoperatively.

Case Presentations

Case 1

A 52-year-old Chinese male presented with left sided abdominal pain and recurring low grade fever for 1 months duration. On presentation, he had a temperature of 37.8°C, but was not toxic looking. Abdominal examination revealed fullness in the left iliac fossa which was tender to deep palpation. There was no evidence of peritonism.

Full blood count revealed a normal white blood cell and differential counts. A CT of the abdomen and pelvis was performed which showed features suggestive of sigmoid diverticulitis such as inflammatory effacement of fat in the sigmoid mesocolon with surrounding inflammatory fluid (Fig. 1). The radiological diagnosis was that of sigmoid colon diverticulitis. He was then admitted for IV antibiotics, after which the pain resolved. He was discharged and planned for an outpatient colonoscopy in 3 weeks.

However, he was readmitted 2 weeks after discharge for worsening central abdominal pain with fever for 3 days. He was febrile and toxic looking. Abdominal examination revealed a slightly distended abdomen with suprapubic fullness and tenderness but no generalized peritonism. His white cell count was mildly elevated at $10.01 \times 10^9/L$. A



Fig. 1. Sigmoid diverticulitis (Case 1).

repeat CT abdomen and pelvis was reported as diverticulitis in a focal segment of sigmoid with a paracolic abscess and prominent regional lymph nodes (Fig. 2).

In view of recurrent diverticulitis and worsening symptoms, a laparotomy was performed. Intraoperatively a sigmoid carcinoma was found, with a sealed perforation and walled off abscess cavity. A high anterior resection was performed, and the patient recovered uneventfully. Histology of the resected specimen showed moderately differentiated adenocarcinoma of the sigmoid, pT3N2.



Fig. 2. Sigmoid diverticulitis with paracolic abscess (Case 1).



Fig. 3. Sigmoid thickening on CT scan (Case 2).

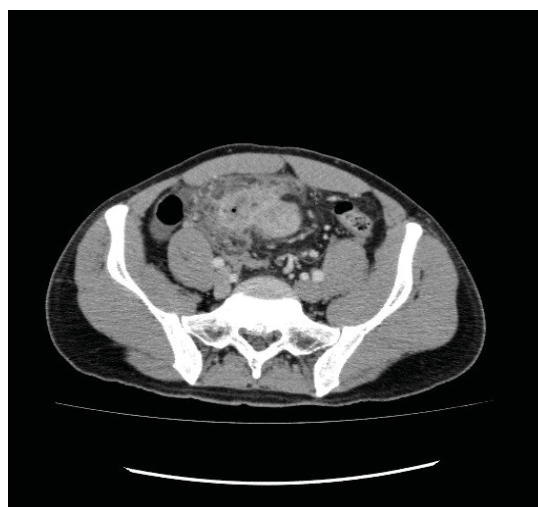


Fig. 4. Sigmoid diverticulitis (Case 3).

Case 2

A 63-year-old Chinese female presented with suprapubic abdominal pain and fever for 5 days duration, as well as a recent loss of weight over the past few months. On examination she was febrile and septic looking. Abdominal examination revealed tenderness at the suprapubic region. There were no signs of peritonism. A full blood count revealed a raised total white cell count of $22.05 \times 10^9/L$ with an elevated neutrophil differential count of 93%. A CT scan of the abdomen and pelvis showed a 6.4 cm segment of sigmoid thickening and multiple diverticula with a sealed perforation (Fig. 3).

An exploratory laparotomy was performed, and intraoperatively an ulcerative sigmoid carcinoma was found with a pinpoint perforation and purulent peritonitis. A high anterior resection with on table washout and primary anastomosis was performed. Postoperatively, her stay was complicated by superficial wound infection which was treated by dressings and intravenous antibiotics. She recovered and was discharged well on the 18th postoperative day.

Histology returned as a pT3N0 moderately differentiated adenocarcinoma of the sigmoid colon.

Case 3

A 45-year-old Chinese male with no past history of note presented to another local hospital for abdominal pain. A CT scan showed uncomplicated sigmoid diverticulitis, and his pain resolved on IV antibiotics. He was discharged with a plan for early colonoscopy. However, he was admitted again, this time to our institution with worsening lower abdominal pain, associated with watery stool. There was

no fever or per rectal bleeding.

On examination he was afebrile and non toxic. Abdominal examination revealed tenderness in the left iliac fossa on deep palpation but no peritonitis. No masses were felt and per rectal examination was normal. His full blood count revealed a raised total white cell count of $14.5 \times 10^9/L$ with a neutrophil differential count of 80.7%. A repeat CT showed irregular mural thickening involving the sigmoid colon, complicated by perforation forming a pericolic abscess (Fig. 4).

In view of the CT scan findings he underwent a laparotomy. Intraoperatively a large ulcerating sigmoid carcinoma was found with localised perforation and a contained abscess. A high anterior resection was performed and he was discharged well with no complications on the 5th postoperative day. Histology returned as pT3N0 moderately differentiated adenocarcinoma of the sigmoid colon.

Discussion

Colorectal cancer is on the rise worldwide, and the recent health statistics show that it is the overall leading cancer in Singapore, being the most common cancer in males (age standardised rate of 39.9) and second most common in females (age standardised rate of 29.2).¹ The rates of incidence of CRC have also been increasing at an annual rate of 2.6% and 2.35% for men and women respectively.²

Perforation in association with a colonic tumour is uncommon as a primary presentation, with incidences ranging from 2.6%⁴ to 10%.⁵ Perforated tumours can present as a colitis or an abscess. Abscess formation occurs in 0.3% to 0.4% of colonic carcinomas and is the second most common complication of perforated lesions.⁶ These

abscesses commonly remain localised in the paracolic region or may develop into a pelvic abscess, but they can also track along various tissue planes and have been reported to present as a flank abscess, psoas abscess,⁷ or even a subcutaneous abscess on the trunk.⁸

The location of perforation associated with colonic cancers is most commonly at the tumour site and is due to locally invasive disease causing a breach of integrity of the colonic wall.⁴ Perforations can also occur proximally to an obstructing primary lesion, for example, a perforated caecum secondary to a closed loop obstruction with a competent ileocecal valve in an obstructed carcinoma of the sigmoid or descending colon. Less commonly, perforation occurs into a nearby hollow viscus or into the skin resulting in formation of a fistula.⁹ The location of the tumour is also a factor in the likelihood of perforation and abscess formation. In the right and transverse colon, perforations present twice as commonly as peritonitis compared to abscesses. On the other hand, abscess formation is more common than free perforation in the left colon, and the sigmoid and rectosigmoid are the most frequent locations for perforation with abscess formation.⁹

Intra-abdominal abscesses secondary to tumor perforation commonly present very similarly to complicated diverticular disease. However, as the incidence of such presentations is uncommon, malignancy may be overlooked during the initial presenting history and physical examination as a differential diagnosis. In fact, the diagnosis of perforated carcinoma under emergency conditions is not often entertained, and most are preoperatively diagnosed as intraabdominal abscess secondary to perforated diverticulitis.^{6,10}

The usual management of diverticulitis is based on patients symptomatology as well as CT scan results. Simple diverticulitis can be treated with bowel rest and intravenous antibiotics. Complicated diverticulitis is classified using the Hinchey classification,¹¹ and management strategies depend on the classification. Hinchey III and IV diverticulitis are indications for laparotomy, washout and resection of the affected colon.

However, most patients present with simple or Hinchey I diverticulitis. These patients are managed conservatively with bowel rest and intravenous antibiotics, and offered a colonoscopy at a much later date, the rationale being that an endoscopic evaluation early on with active inflammation of the colon carries a higher risk of perforation. In fact, if patients are young, some physicians may not even do a colonoscopic evaluation. Sometimes the patients themselves may not be keen for colonoscopy after the acute episode settles. In such cases, if the presumed diverticulitis is truly caused by a malignant process, then this would result in a delayed or missed diagnosis. Patients with Hinchey II diverticulitis are commonly treated with CT guided

percutaneous drainage, which—in case of a perforated colonic tumour—may result in seeding of tumour cells along the drainage tract to the skin, turning a potentially resectable tumour into a metastatic carcinoma.

It is well documented that perforated colonic carcinoma has a lower 5 year survival rate, in comparison to the uncomplicated colonic cancer undergoing elective resection. Factors that contribute to this poor prognosis include a high operative mortality due to sepsis secondary to perforation, higher incidence of locally advanced malignancy in perforated tumours, as well as a higher incidence of distant metastases at presentation.⁴ In fact, the operative mortality from perforating lesions of the colon is up to 4 times greater than in uncomplicated cases.¹² In view of the poorer survival of perforated lesions, the National Comprehensive Cancer Network (NCCN) guidelines recommend consideration of adjuvant chemotherapy in localised perforated tumours regardless of pathological staging of the locoregional disease.¹³ All the patients presented in this article subsequently underwent adjuvant chemotherapy.

Therefore, it is important that the diagnosis of perforated colonic carcinoma is considered as a differential diagnosis whenever a patient presents with an intra-abdominal abscess with the presumptive diagnosis of perforated diverticular disease. As the previously discussed cases have illustrated, regardless of age or presenting history, there is always a possibility of malignancy in such a presentation. Thus, all patients who present with complicated “diverticular disease” and intra-abdominal abscess—especially those that do not respond to conservative treatment—should be offered surgery with resection of the involved colon and removal of the abscess for histological evaluation. Intraoperatively, until malignancy can be definitively ruled out, it is advisable to stick to oncological principles such as a high vascular ligation, en bloc resection of the diseased bowel and its lymphatics, adequate resection margins and minimal manipulation of the lesion during surgery. If the patient declines surgery, he should have an endoscopic evaluation of the colon when the inflammation settles after 4 to 6 weeks to rule out an underlying carcinoma.

Conclusion

Perforation with localised abscess collection is an uncommon presentation of colonic malignancy, and it commonly mimics complicated diverticular disease. As such, it is important to consider perforated carcinoma as a differential diagnosis in the management of such patients regardless of age, especially in those who do not respond to conservative management.

REFERENCES

1. Ministry of Health Singapore Health Statistics 2003 to 2007. Available at: <http://www.moh.gov.sg/mohcorp/statistics.aspx?id=23712>. Accessed April 2011.
2. Wong MTC, Eu KW. Rise of colorectal cancer in Singapore: An epidemiological review. *ANZ J Surg* 2007;77:446-9.
3. Speights VO, Johnson MW, Stoltenberg PH, Rappaport ES, Helbert B, Riggs M. Colorectal cancer: Current trends in initial clinical manifestations. *South Med J* 1991;84:575-8.
4. Crowder VH Jr, Cohn I Jr. Perforation in cancer of the colon and rectum. *Dis Colon Rectum* 1967;10:415-20.
5. Mandava N, Kumar S, Pizzi WF, Aprile JJ. Perforated colorectal carcinomas. *Am J Surg* 1996;172:236-8.
6. Tsai HL, Hsieh JS, Yu FJ, Wu DC, Chen FM, Huang CJ et al. Perforated colonic cancer presenting as intra-abdominal abscess. *Int J Colorectal Dis* 2007 Jan;22:15-9.
7. Kobayashi H, Sakurai Y, Shoji M, Nakamura Y, Suganuma M, Imazu H, et al. Psoas abscess and cellulitis of the right gluteal region resulting from carcinoma of the cecum. *J Gastroenterol* 2001;36:623-8.
8. Shucksmith HS. Subcutaneous abscess as the first evidence of carcinoma of the colon. *Br J Surg* 1963;50:514-5.
9. Welch JP, Donaldson GA. Perforative carcinoma of the colon and rectum. *Ann Surg* 1974;180:734-40.
10. Devitt JE, Roth-Moyo LA, Brown FN. Perforation complicating adenocarcinoma of colon and rectum. *Can J Surg* 1970;13:9-12.
11. Hinchey EJ, Schaal PG, Richards GK. Treatment of perforated diverticular disease of the colon. *Adv Surg* 1978;12:85-109.
12. Kelley WE Jr, Brown PW, Lawrence W Jr, Terz JJ. Penetrating, obstructing and perforating carcinomas of the colon and rectum. *Arch Surg* 1981;116:381-4.
13. National Comprehensive Cancer Network (NCCN) Clinical Practice Guidelines in Oncology: Colon Cancer. Version 1.2010. Available at <http://www.nccn.org>. Accessed 18 April 2011.

Eugene SA Yeo,¹*MRCs*, Kheng Hong Ng,¹*FRCS*,
Kong Weng Eu,¹*FRCS*

¹Department of Colorectal Surgery, Singapore General Hospital

Address for Correspondence: Prof Eu Kong Weng, Department of Colorectal Surgery, Singapore General Hospital, Outram Road, Singapore 168609.
Email: eu.kong.weng@sgh.com.sg