

ANZASM Case of the Month **May 2024 Edition**

(case selected by the ANZASM Committee for your information)

Sepsis and delay in recognising anastomotic leak

General Surgery

Case summary

A 67-year-old patient presented to a metropolitan emergency department with acute large bowel obstruction (LBO) and was appropriately transferred to a higher-level care facility. Medical history included type 2 diabetes mellitus (on metformin), hypertension and iron deficiency anaemia. A computed tomography (CT) scan suggested partial obstruction with a transition point in the proximal sigmoid. The ileocaecal valve was competent.

A restorative procedure was planned, rather than a Hartmann's operation (colostomy). The patient underwent emergency open anterior resection with primary anastomosis by the colorectal consultant and senior colorectal fellow. No covering loop ileostomy was utilised. Frank peritoneal contamination was noted but no signs of malignancy. On-table lavage was conducted. Histopathology revealed diverticular disease with active chronic colitis and patchy ulceration.

The patient remained intubated and ventilated postoperatively due to concerns about difficult airway. Nasogastric tube insertion was unable to be completed after multiple attempts by the intensive care unit (ICU) and anaesthetics teams. The patient required inotropic support with noradrenaline at 5 ml/hr initially, increasing to 8 ml/hr the next day with a plan to extubate. Total parental nutrition commenced early. Oliguria and fevers up to 38.6 °C occurred on postoperative day 1. The patient's bowels opened on the same day; however, the patient remained septic with tachycardia and ongoing inotropic support required.

Extubation occurred on postoperative day 2; however, inotropic requirement increased to 10ml/hr as the patient progressed into possible vasoplegic/septic shock. C-reactive protein (CRP) was 383 mg/L.

Inotropes were reduced and the patient cleared for transfer to the ward with arterial and central lines removed. However, fevers of 38.4 °C were noted later that evening, with desaturations and metaraminol required for hypotension. ICU senior consultant involvement remained throughout this time. The patient was subsequently intubated to facilitate a CT scan, which noted free fluid and pneumoperitoneum, as well as segmental pulmonary emboli with features of right heart strain. Bilateral pulmonary consolidation was noted.

Urgent transfer to theatre was arranged that night with 4-quadrant feculent peritonitis noted from an anastomotic leak. A Hartmann's procedure was performed. A full wash-out of the abdominal cavity was also undertaken. Histopathology revealed acute ischaemic necrosis at the join with an 18-mm defect.

Intraoperative inotropic requirement increased to quad strength noradrenaline at 50 ml/hr, vasopressin and dobutamine. The patient became acidotic with obstructive shock (secondary to pulmonary embolism) and acute kidney injury. Continuous veno-venous haemodialysis commenced. A purpuric rash was noted, suggestive of Stevens-Johnson syndrome and toxic epidermal necrolysis. The patient was coagulopathic secondary to acute liver failure. Multiorgan failure ensued, with a reduced level of consciousness. The stoma became necrotic. The patient then developed upper intestinal bleeding. Supportive care was provided and family discussions about care limitations occurred. The patient died on day 10 after initial presentation.

Discussion

This patient may not have died if the initial operation had been a Hartmann's procedure. However, it is well established that resection and primary anastomosis is a reasonable approach with LBO, because it avoids 3–6 months with a colostomy, and the morbidity and potential mortality of a second laparotomy to reverse the Hartmann's procedure. The risk of an anastomotic leak is approximately 5% when a resection and primary anastomosis is performed. Unfortunately, this occurred in this case.

The patient was significantly compromised in the perioperative period with sepsis in combination with pre-existing comorbidities. The initial management of primary anastomosis performed by the colorectal team was appropriate. Once the decision was made to operate, the sequence of events was appropriate and timely. The patient's age and clinical condition certainly warranted anastomosis as the preferred choice in experienced hands, as recommended by *American Society of Colon and Rectal Surgeons* guidelines.ⁱ

On postoperative day 4, the patient suffered a leak from the anastomosis and overwhelming sepsis developed. The sepsis initially was thought to be related to a normal postoperative response. In hindsight it is noted that the patient deteriorated early: perhaps extubating early was premature? CRP was noted to be >300 mg/L for 2 consecutive daysⁱⁱ. The ICU team identified that the patient began to experience septic shock post-extubation, and appropriately organised urgent CT imaging and surgical review.

The patient was returned to theatre for an anastomosis resection and end-colostomy. On day 10 after initial presentation the patient died due to overwhelming sepsis associated with the anastomotic leak. It is debatable whether earlier identification of anastomotic leak would have affected the final outcome for this patient. The patient's severe decline into multiorgan failure after the second laparotomy was not unexpected.

Clinical lessons

Good collaboration between the critical care and surgical teams is noteworthy in this case.

Concerns remain in the delay to diagnosis for the cause of sepsis. Suggested changes would be a lower threshold to consider anastomosis leak as a cause for early postoperative deterioration. Possible noradrenaline counter-effects on anastomotic ischaemia cannot be ruled out.

Care deficiency centres on the delayed recognition of an anastomotic leak as the potential cause for high CRP, fevers and inotrope requirement after the initial operation.

Areas of commendable practice include good communication between teams, and that the patient was operated on by experienced surgeons who utilised up-to-date techniques. There was prompt

return to theatre once the established diagnosis of leak was made. Multidisciplinary care involvement was optimal, along with other care once the palliative trajectory was identified.

ⁱ Hall J, Hardiman K, Lee S, Lightner A, Stocchi L, Paquette IM, Steele SR, Feingold DL; Prepared on behalf of the Clinical Practice Guidelines Committee of the American Society of Colon and Rectal Surgeons. The American Society of Colon and Rectal Surgeons Clinical Practice Guidelines for the Treatment of Left-Sided Colonic Diverticulitis. *Dis Colon Rectum*. 2020 Jun;63(6):728-747. doi: 10.1097/DCR.0000000000001679. PMID: 32384404.

ⁱⁱ Stephensen BD, Reid F, Shaikh S, Carroll R, Smith SR, Pockney P; PREDICT Study Group collaborators. C-reactive protein trajectory to predict colorectal anastomotic leak: PREDICT Study. *Br J Surg*. 2020 Dec;107(13):1832-1837. doi: 10.1002/bjs.11812. Epub 2020 Jul 16. PMID: 32671825.