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Perforated diverticulitis following extra-abdominal surgery

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Summary

The peritonitis of perforated diverticular disease is a life-threatening condition. We report three cases where it occurred following unrelated extra-abdominal surgery and where surgical intervention proved to be the correct course of management. All cases were treated with a Hartmann's procedure; this is probably the safest option for purulent peritonitis in patients who are a high operative risk and have recently undergone major surgery.

Keywords: perforation; diverticulitis

Diverticular disease has an increasing incidence in Western countries which can be explained by an increasing elderly population and also the relatively low-fibre diet of western culture. Fifty per cent of the population over 50 years of age have diverticulosis, and it is estimated that acute diverticulitis will develop in 15-20% of these cases.¹ Spontaneous perforated sigmoid diverticulitis is an unusual complication following unrelated extra-abdominal surgery. Three cases are reported here, and the pathogenesis is discussed.

Case reports

Case 1

A 76-year-old man was admitted through Accident and Emergency with a 24-hour history of worsening abdominal pain two weeks after triple coronary artery bypass grafting. He was pyrexial, tachycardic and hypotensive. Abdominal examination revealed generalised peritonitis. After resuscitation, a laparotomy revealed a purulent peritonitis secondary to a perforated sigmoid diverticular abscess. A Hartmann's procedure was performed with end colostomy and closure of rectal stump. Postoperatively he spent a period in intensive care and required a blood transfusion for acute gastric erosions. He was discharged home after four weeks. He has since had a successful reversal of his Hartmann's procedure, and is well.

Case 2

A 61-year-old man presented to Accident and Emergency with severe abdominal pain three weeks after the excision of a malignant glioblastoma from his right temporoparietal region. His medication included nonsteroidal anti-inflammatory drugs, dexamethasone and atenolol. On examination he was pale, with a pulse rate of 80 beats/min. His abdomen was distended and generally tender with guarding. Bowel sounds were absent. An abdominal X-ray showed dilated loops of small bowel. He underwent an emergency laparotomy which revealed a perforated sigmoid diverticulum. A Hartmann's procedure was performed. Postoperatively he made a good recovery.

Case 3

A 73-year-old asthmatic woman was admitted for an elective left total hip replacement. Seven days postoperatively she started vomiting, and experienced pain over the lower abdomen. Her symptoms worsened over the following 48 hours. Her abdomen became distended and bowel sounds were absent. A chest X-ray revealed gas under both diaphragms. At laparotomy a perforated sigmoid diverticulum was found. A Hartmann's procedure was performed. Postoperatively her asthma worsened, she developed a right pneumothorax, a right basal pneumonia and became septicaemic. She was ventilated and later underwent tracheostomy. She remained in intensive care for 38 days, after which her clinical condition continued to improve. She was recently discharged from hospital.

Discussion

Acute postoperative perforated diverticulitis has been associated with cardiac surgery or renal transplant surgery.² General surgical complications following cardiac surgery include gastroduodenal ulcer, acute cholecystitis, small bowel ischaemia or pancreatitis; colonic complications are relatively rare.³⁻⁵ Patients with extensive diverticular disease are recommended for colon resection before renal transplantation, as the occurrence of colonic

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Postoperative perforated diverticulitis: possible causes

- age
- opiate analgesia
- long-term steroids
- diet/long standing constipation
- raised intraluminal pressures
- intestinal mucosal ischaemia
- increased collagenase activity

Box 1

complications following renal transplantation are well recognised² with an incidence of colonic perforation of 2–4%.⁶

The pathogenesis of postoperative diverticulitis is multifactorial in nature (box 1). Its high incidence in association with cardiac surgery may be related to the older age of this population. It has been suggested that postoperative morphine analgesia following heart surgery may be responsible. In other surgical specialties, patient-controlled morphine analgesia is increasingly used. Painter *et al*⁷ demonstrated that morphine increases intraluminal pressure in the sigmoid colon and causes marked distension of the diverticula, thereby increasing the risk of perforation.

Several authors have reported an increase in diverticular perforation in patients receiving steroids or long-term immunosuppressive therapy.⁸ One of our cases was taking long-term dexamethasone.

Summary points

- clinicians should be aware of an acute abdomen as a complication of extra-abdominal surgery in order to ensure prompt referral to the appropriate specialist
- Hartmann's procedure is probably the safest surgical option for postoperative perforated diverticulitis

Box 2

Western low-fibre diets may also have a role in the pathogenesis of perforated diverticulitis, as they can lead to diverticulosis and chronic constipation. In the postoperative period there may be worsening constipation due to bed rest, opiate analgesics, anaesthetics and the surgery itself. Postoperative constipation may lead to the generation of high pressures in the lumen of the colon, which would increase the chance of perforation.

Another theory in the pathogenesis of diverticular perforation suggests that it is due to intestinal mucosal ischaemia induced by hypotension, low-flow states, the use of vasoconstricting drugs, and microthrombi or emboli.⁴ Increasing numbers of patients now receive postoperative prophylactic heparin to prevent thrombus formation. Increased collagenase activity after surgery, with resulting collagen breakdown in thin-walled diverticula, is suggested to be a contributing factor to postoperative perforation.⁹

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