CASE REPORT

Spontaneous perforation of the caecum case reports and a review of the literature

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PERFORATION of the healthy caecum is an uncommon condition. It may occur as a result of distal large bowel obstruction, unrelieved volvulus of the caecum, trauma to the right side of the abdomen, or ingested foreign bodies, e.g. a fish-bone or tooth-pick. Spontaneous perforation of the caecum in the absence of any of the above factors is exceedingly rare. In an extensive search of the English literature, only four such cases could be found (see Table 1). Low & Fairley (1934) described a case of perforation occurring in a patient suffering from tropical sprue. Two other cases occurred in the post-partum period, one following natural childbirth, and the other after Caesarean section (Robertson, Eddy & Vosseler, 1958; Hirsch, 1961). Another case arose in an elderly woman who had had a fall and sustained injuries of her left shoulder and chest wall (Eckman, Wenske & Abramson, 1958). Two further cases are reported here, where perforation of the caecum occurred following left inguinal herniorrhaphy and left nephrectomy respectively.

Case No. 1

A 73-year-old man was admitted to hospital on 28 December 1964 for a routine left inguinal herniorrhaphy. At the operation the following day, he was found to have a sliding hernia of his sigmoid colon. This was reduced and a Bassini repair performed. Two days postoperatively, the patient had a normal bowel action, but developed a pyrexia and abdominal distension. Bowel sounds were present. A chest X-ray showed some free gas under the diaphragm but this was thought to be due to air having entered the peritoneal cavity when the hernial sac was opened. An abdominal film showed gross gaseous dilatation of the whole colon and terminal ileum, the transverse diameter of the caecum measuring 14 cm (Fig. 1). A flatus tube was passed with some escape of gas. On the 4th postoperative day, sigmoidoscopy showed the colon to be normal to 14 cm, but no gas was released. Over the next 2 days, his abdominal distension continued to increase despite occasional passage of flatus. Bowel sounds were present throughout. However, on the 8th postoperative day, he developed severe colicky abdominal pain. His abdomen became further distended, and the bowel sounds were diminished. A laparotomy was therefore performed.

Operation. He was found to have a tension pneumoperitoneum with free pus in the peritoneal cavity. The large bowel and terminal ileum were grossly distended. There were a few small patches of gangrene in the caecum, the actual perforation having sealed itself off. No lesion was detected in the large bowel, which was distended down to the pelvic peritoneal reflection. No kinking or obstruction of the sigmoid colon was found in the region of the internal inguinal ring. The distended bowel was

FIG. 1

decompressed, the peritoneal cavity sucked out, and a caecostomy tube inserted. The abdomen was closed with drainage. His initial postoperative recovery was uneventful apart from a chest infection, but following removal of the caecostomy tube, faeces continued to discharge from the opening. A barium enema was performed, and this showed no lesion in the colon. He remained constipated and only with laxatives and repeated enemas did his bowels act, and the caecostomy eventually closed down. He was discharged from hospital on 5 April 1965, but became constipated and developed a wound abscess in the region of his old caecostomy, and so required re-admission. A faecal fistula developed, and did not heal despite regular laxatives and repeated enemas. Formal operative closure was performed on 8 June 1965 with subsequent healing of the wound.

Case No. 2

A 64-year-old man was admitted to hospital on 24 July 1966 for a routine left nephrectomy for hydro-nephrosis. Two days later, through a left lumbar

incision, a large hydronephrotic kidney was removed. The peritoneal cavity was not opened. Postoperatively, he developed some oozing from the wound and required blood transfusion. Over the next few days, his abdomen slowly became distended. Bowel sounds were present. Naso-gastric suction and intravenous infusion were begun but there was very little gastric aspirate obtained. A flatus tube was passed on several occasions and small enemas given with little result. He complained of some abdominal pain on the 8th postoperative day and chest and abdominal X-rays performed showed a large pneumoperitoneum and a grossly distended caecum. A laparotomy was performed.

Operation. He was found to have a tension pneumoperitoneum. The caecum was distended and there was a seromuscular tear in its wall. At one point, there was a minute hole through which gas escaped. There was a small haematoma in the region of the bed of the left kidney, but no obstructing lesion could be found in the distal large bowel. A caecostomy was performed through the site of perforation and the abdomen closed with drainage. Postoperatively, he developed a chest infection which responded to antibiotics and a haematoma discharged from his nephrectomy wound. The caecostomy tube was removed on the 7th postoperative day. Daily suppositories encouraged a regular bowel action and the caecostomy was healed within a week. A barium enema performed showed no colonic abnormality. His discharge from hospital has only been delayed by an indolent bed-sore.

Discussion

Acute gastric dilatation and small bowel ileus are known complications following abdominal operations and other procedures, e.g. the reduction of a fractured femur and retroperitoneal operations, but colonic dilatation only rarely occurs. The present cases are examples of the latter, and this led to caecal perforation. There appeared to be some intrinsic abnormality in the first patient's large bowel despite the lack of any previous history of constipation, for the caecostomy failed to close spontaneously even with the regular administration of aperients.

The part played by the ileocaecal valve in caecal perforation is uncertain. Some authors (Saeltzer &

Rhoads, 1935; Wangensteen, 1955) believe that a competent ileocaecal valve is an important factor. It is interesting to note that in the first case and the ones of Robertson *et al.* (1958) and Eckman *et al.* (1958), the terminal ileum as well as the caecum was distended. This does not necessarily mean that the ileocaecal valve was incompetent, but that the small bowel was unable to propel its contents into the grossly distended large bowel.

The mortality of perforated caecum is high, varying from 35% to 72% (Albers, Smith & Carter, 1956; Wangensteen, 1955; Lowman & Davis, 1956). One important factor is the delay in diagnosis, as the clinical picture may not be correctly interpreted. Gross abdominal distension with slight pain and tenderness may be the only positive findings. Bowel sounds are usually present, and there may be no vomiting or abdominal rigidity (Robertson *et al.*, 1958, and present cases). Straight X-ray of the abdomen will reveal a distended caecum with free gas under the diaphragm. Lowman & Davis (1956) found that a caecum with a transverse diameter of 9 cm or over was indicative of impending caecal perforation. The caecum usually remains distended even after perforation (Rack, 1952, and present cases) probably because the tear becomes sealed off. Measurement of the size of the caecum is therefore helpful in anticipating and diagnosing caecal perforation.

The treatment of perforated caecum is by immediate laparotomy. At operation, after exclusion of a distal colonic lesion, the dilated bowel is decompressed and caecostomy is performed through the site of perforation, if possible. The abdomen is closed with drainage. If no operative treatment is given, death usually ensues. Albers *et al.* (1956) reported 14 deaths out of 15 when no operation was performed, whereas in the operated group the mortality was 30%. In the postoperative period, barium enema studies are performed to exclude a colonic lesion that may have been missed at operation. The caecostomy tube is removed at the end of the first week and the caecostomy should close spontaneously, as in the case reported by Robertson *et al.* (1958), and in Case 2. In Case 1, however, formal operative closure had to be performed.

TABLE 1
Reported cases of spontaneous perforation of the caecum

Case report	Age	Sex	Preceding event	Treatment	Outcome
Low & Fairley (1943)	58	F	Tropical sprue	Laparotomy	Death
Robertson, Eddy & Vosseler (1958)	25	F	Caesarean section	Laparotomy; caecostomy	Recovery
Eckman, Wenske & Abramson (1958)	75	F	Injury to left shoulder and chest	No operation	Death
Hirsch (1961)	41	F	Childbirth	Laparotomy; suture of caecal tear	Recovery
Present cases 1.	73	M	Left inguinal herniorrhaphy	Laparotomy, caecostomy; closure of caecostomy	Recovery
2.	64	M	Left nephrectomy	Laparotomy; caecostomy	Recovery

Summary

Two cases of spontaneous perforation of the caecum following left inguinal herniorrhaphy and left nephrectomy respectively are described. Four other cases published in the literature are reviewed. Aetiological factors, diagnosis and treatment of the condition are discussed.

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References

- ALBERS, J.M., SMITH, L.L. & CARTER, R. (1956) Perforation of the cecum. *Ann. Surg.* **143**, 251.
- ECKMAN, W.G., WENSKE, F. & ABRAMSON, W. (1958) Perforation of the cecum complicating adynamic ileus. *Amer. J. Surg.* **96**, 718.
- HIRSH, M.I. (1961) Spontaneous rupture of the caecum. Report of a case. *Cent. Afr. J. Med.* **7**, 49.
- LOW, G.C. & FAIRLEY, N.H. (1943) Fatal perforation of caecum in case of sprue. *Brit. med. J.* **ii**, 678.
- LOWMAN, R.M. & DAVIS, L. (1956) An evaluation of cecal size and impending perforation of the cecum. *Surg. Gynec. Obstet.* **103**, 711.
- RACK, F.J. (1952) Obstructive perforation of the cecum; Report of eight cases. *Amer. J. Surg.* **84**, 527.
- ROBERTSON, J.A., EDDY, W.A. & VOSSELER, A.J. (1958) Spontaneous perforation of the cecum without mechanical obstruction. *Amer. J. Surg.* **96**, 448.
- SAELTZER, D.V. & RHOADS, G.K. (1935) Diastasic perforation of the normal cecum resulting from obstruction of the colon. *Ann. Surg.* **101**, 1257.
- WANGENSTEEN, O.H. (1955) *Intestinal Obstructions*, 3rd edn, p. 39. Charles C. Thomas, Springfield.