Intestinal obstruction due to pneumatosis intestinalis

ALED W. JONES  
M.B., Ch.B., D.Path.  
Assistant Lecturer

F. M. COLE  
M.D.  
Lecturer

Department of Pathology, University of Manchester

**PNEUMATOSIS intestinalis** is a condition characterized by the presence of numerous gas-filled cysts, most commonly found in the sub-serosa of the wall of the small intestine. Nearly 300 cases have been described and the literature of the adult cases has been reviewed by Koss (1952), and those occurring in childhood and infancy by MacKenzie (1951). Although the cysts are frequently associated with other intestinal lesions, they themselves are usually symptomless and rarely give rise to complications. Those complications which have been described include pneumo-peritoneum and intestinal obstruction. Cysts can cause obstruction in several ways, one of which is by the formation of fibrous bands and strictures in relation to them. The following report describes such a case.

**Case report**

A retired docker, aged 68, was seen with a 3-week history of abdominal pain. He had had no bowel action for 5 days and had only passed a small quantity of flatus. He gave a 40-year history of dyspepsia for which he had been given antacids.

Four years previously he had a perforated ulcer repaired surgically; no note was made at the time of any other lesion within the abdominal cavity.

Three years prior to admission he had a haematemesis requiring blood transfusion. A barium meal at this time suggested a certain amount of pyloric hold-up which was probably due to pylorospasm caused by the duodenal ulcer; a second barium meal 1 year later showed no delay in gastric emptying.

For 6 months prior to the present admission he had, in addition to his ulcer pain, suffered a second type of abdominal pain. This pain was situated in the lower abdomen; it was intermittent, lasting up to 1 week at a time, colicky in type and unrelieved by antacids. It was getting progressively more severe. For 3 weeks he had been vomiting intermittently but for the few days prior to hospitalization he had vomited everything taken by mouth, but this did not relieve the pain. The vomitus consisted mainly of digested food and contained no blood.

On examination he was dehydrated and hiccupped constantly. The abdomen was distended, tympanitic, and the umbilicus was everted.

![Fig. 1. Small bowel wall showing thin-walled cyst, mainly in sub-serosal position. H & E, × 5-5.](http://pmj.bmj.com/ on January 5, 2018 - Published by group.bmj.com)
Distended coils of small intestine were prominent but no peristalsis was seen. A clinical diagnosis of small bowel intestinal obstruction was made and a laparotomy carried out the same day. The small bowel was grossly distended and the peritoneal cavity contained a small amount of clear straw-coloured fluid. The obstruction was due to a thick fibrous band situated 60 cm proximal to the ileo-caecal junction. The ileum at the point of constriction was kinked at a right angle and showed many sub-serosal gas-filled cysts which involved 7 cm of ileum proximal to the fibrous band. The cysts were thin-walled and measured 0.5–1 cm in diameter (Fig. 1). They contained no fluid and burst like balloons under pressure. No cysts were seen elsewhere. A 17 cm length of ileum was resected and an end-to-end anastomosis performed.

Twenty-three days later he was re-admitted in a shocked state with generalized peritonitis. A laparotomy revealed a perforated gastric ulcer situated high on the greater curvature 8 cm from the cardio-oesophageal junction. It was noted that the pylorus was a little thickened and the lumen narrowed. Because of the latter finding, the presence of a large dilated stomach and the known duodenal ulcer, a gastro-enterostomy was performed as well as repair of the perforation. Despite resuscitative measures the patient remained shocked, developed a left femoral artery thrombosis and died on the second post-operative day.

Microscopy of the surgical specimen
The walls of the cysts consist of dense hyaline fibrous tissue. They are lined by prominent endothelial cells. These cells vary greatly in size and are often multi-nuclear (Fig. 2). In other areas the endothelial lining is absent. The tissue surrounding the cysts shows a mild chronic non-specific inflammation.

Necropsy revealed a large chronic duodenal ulcer. The repaired gastric ulcer and the gastro-enterostomy were intact. Recent thrombosis of the left femoral artery was confirmed. The small intestine anastomosis was intact; no remaining gas cysts were found.

Discussion
Pneumatosis intestinalis is a member of a larger group of conditions characterized by the presence of gas cysts in tissue, called cystic pneumatosis (Colquhoun, 1965). Cystic pneumatosis must be differentiated from interstitial emphysema in which the gas is in a non-cystic form, and gas which is produced by organisms.

Apart from the gut, gas cysts have been described in the mesentery, retroperitoneal tissue, diaphragm (Koss, 1952), in the vagina (Bender & Jeffcoate, 1950; Abell, 1958; Hoffman & Grundfest, 1959), and rarely in the stomach (Baumann-Schenker, 1939; Keyting et al., 1961). In the majority of cases the bowel wall alone has been involved, but in a minority of cases lesions have occurred at other sites also. In the gastro-intestinal tract the locations of the cysts are, in decreasing order of frequency, the jejunum and ileum, colon (pneumatosis coli), caecum, duodenum and stomach.

Many diverse theories concerning the aetiology of intestinal gas cysts have been postulated, but only one—the mechanical theory—has been supported by experimental studies, and most authors have

Fig. 2. Small cyst lined by endothelial cells of varying size, the majority of which are multi-nucleate. H & E, × 72.
Pneumatosis intestinalis is a rare and usually symptomless condition; nevertheless it can on occasion give rise to an acute abdominal emergency. Attention is drawn to the fact that obstruction due to fibrous bands can occur; the signs and symptoms of which might easily be confused with those of other intestinal lesions with which the condition is often associated. This difficulty can in many cases be overcome by an awareness of the condition and careful examination of a routine radiograph of the abdomen.

References


STEINDL, H. (1921) Zur Kenntnis der Gaszystenbildung am menschlichen Darm und ihrer Entstehungsweise. Dschr. Z. Chir. 163, 44.


Intestinal obstruction due to pneumatosis intestinalis.

A. W. Jones and F. M. Cole

doi: 10.1136/pgmj.43.504.680

Updated information and services can be found at:
http://pmj.bmj.com/content/43/504/680.citation

Email alerting service

These include:
Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

Notes

To request permissions go to:
http://group.bmj.com/group/rights-licensing/permissions

To order reprints go to:
http://journals.bmj.com/cgi/reprintform

To subscribe to BMJ go to:
http://group.bmj.com/subscribe/