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Research Article

Pneumatosis Cystoides Intestinalis Coli Presenting As Acute Large Bowel Obstruction: A Rare Case Report

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ABSTRACT
Background: Pneumatosis intestinalis is a rare condition characterized by the presence of gas-filled cysts within the bowel wall. Colonic involvement, termed pneumatosis cystoides intestinalis coli, is uncommon and is usually asymptomatic or associated with nonspecific gastrointestinal complaints. Presentation as sigmoid volvulus causing acute large bowel obstruction is extremely rare and may mimic malignant obstruction on imaging.
Case Presentation: A 65-year-old female presented with abdominal pain and distension for two days, obstipation for four days, and vomiting with fever for one day. Examination revealed a distended abdomen with diffuse tenderness and absent bowel sounds. Laboratory parameters were within normal limits. Contrast-enhanced CT abdomen showed multiple dilated large bowel loops with irregular wall thickening in the sigmoid colon causing luminal narrowing, raising suspicion of malignant large bowel obstruction. The patient underwent emergency exploratory laparotomy. Intraoperatively, a redundant sigmoid colon with 180-degree twist was noted. After derotation and decompression, multiple grape-like cysts were seen throughout the sigmoid colon. Sigmoidectomy with end colostomy (Hartmann's procedure) was performed. The postoperative period was uneventful. Histopathological examination confirmed pneumatosis cystoides intestinalis. Stoma reversal with colorectal anastomosis was performed two months later.
Conclusion: Pneumatosis cystoides intestinalis coli presenting as sigmoid volvulus is exceedingly rare and can mimic malignant obstruction on imaging. Definitive diagnosis is often intraoperative or histopathological. Surgical resection is indicated in complicated cases presenting with volvulus and obstruction. Awareness of this rare presentation is important for appropriate management.

Keywords: Pneumatosis Intestinalis, Pneumatosis Cystoides Intestinalis Coli, Sigmoid Volvulus, Large Bowel Obstruction, Hartmann's Procedure, Colonic Pneumatosis, Acute Intestinal Obstruction, Exploratory Laparotomy, Colorectal Surgery.

INTRODUCTION

Pneumatosis intestinalis is an uncommon entity characterized by the presence of multiple gas-filled cysts within the wall of the gastrointestinal tract. These cysts are most commonly located in the submucosal and subserosal layers, although occasional involvement of the muscularis propria has been described. The size of the cysts varies widely, ranging from minute microscopic collections to large lesions measuring several centimetres. Pneumatosis intestinalis can affect any segment of the gastrointestinal tract from the oesophagus to the rectum, but it is most frequently encountered in the small intestine, particularly the jejunum, followed by the ileocecal region and colon. In some cases, gas collections may also extend to extraintestinal sites such as the mesentery, peritoneum, omentum, and falciform ligament.

Pneumatosis cystoides intestinalis coli is when it involves the colon and is particularly rare and is usually asymptomatic or presents with nonspecific gastrointestinal symptoms. Presentation as sigmoid volvulus is extremely uncommon. We report a rare case of pneumatosis cystoides intestinalis coli presenting as sigmoid volvulus and acute obstruction requiring emergency laparotomy and sigmoidectomy with Hartmann's procedure.

The condition occurs across a wide age range but is most commonly reported in adults between the fourth and seventh decades of life, with no clear gender predilection.

Case summary:

A 65 year old female presented to the emergency department with complaints of abdominal pain and abdominal distension for 2 days, with history of obstipation for 4 days. She also had history of vomiting and fever for 1 day. No complaints of weight loss, chills with rigor, high coloured urine. No known co-morbidities. Patient was a non-smoker and non-alcoholic. Clinical examination of the abdomen revealed distended abdomen and diffuse tenderness, no guarding or rigidity. Bowel sounds were absent. Vitals showed tachycardia. CBC, LFT, RFT, Coagulation factors were within normal limits.

Case evaluation and management:

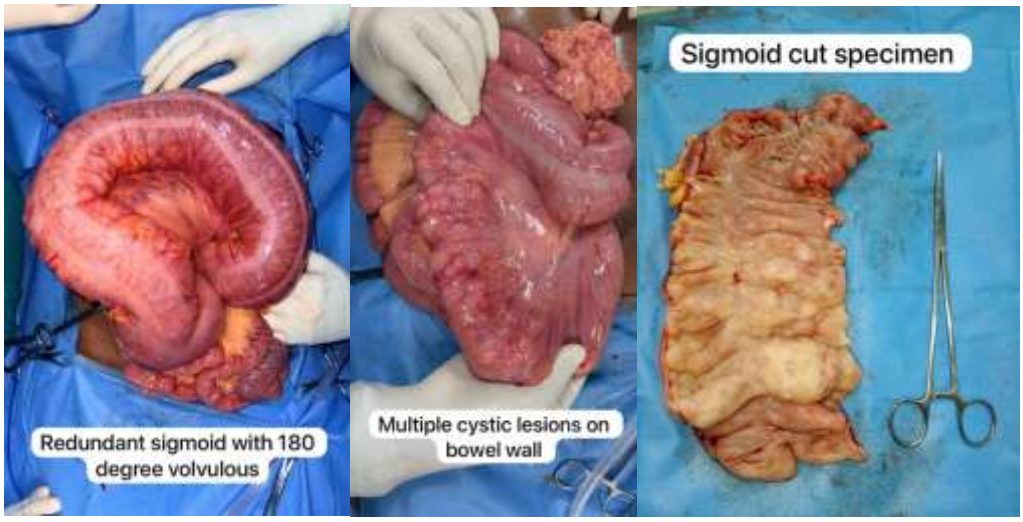
Computed tomography (CT) abdomen reported-

- Multiple dilated large bowel loops
- Short segment irregular wall thickening noted in sigmoid colon for a length of 8.1 cm causing severe luminal narrowing
- No bowel wall air/ portal venous gas
- Mild free fluid in abdomen, few sub centimetric peri colic lymph nodes

Possibility of malignant growth involving sigmoid colon causing partial large bowel obstruction Distended abdomen on presentation multiple dilated bowel loops

Taking into account the imaging and clinical examination findings, patient was taken up for exploratory laparotomy

Intraoperative findings revealed a redundant sigmoid with 180 degree twist, upon derotation and decompression multiple grape like cysts seen throughout the length of sigmoid colon. With adequate margin proximally and distally sigmoidectomy with end colostomy and Hartmann's procedure done. Post operative period was uneventful. Patient was discharged on POD-8.



Histopathology was followed which revealed PNEUMATOSIS CYSTOIDES INTESTINALIS

GROSS DESCRIPTION:
A) Received portion of large bowel measuring 31 cm in length. External surface – congested, cut surface- edematous, mucosal nodularity measuring 10 cm in length, which is 14 cm from proximal resected margin and 7 cm from distal resected margin. Cut surface of nodularity shows multiple cysts of size 0.5 to 1 cm in diameter with no content.

B) Received omentum measuring 2.5x1.5x 1 cm .Grossly no nodes made out.

BIT DETAILS:
A1- proximal resected margin
A2- Distal resected margin
A3- Edematous mucosa
A4-Random colon
B- omentum
AR1-AR4- Mucosa with cystic spaces
AR5-AR7- Edematous mucosa

MICROSCOPIC DESCRIPTION

A1,A2) Section studied from both resected ends show colonic mucosa with submucosal edema and congestion.

A3,AR1-AR4) Section from mucosal nodularity shows intact colonic epithelium with submucosa showing multiple dilated cystic spaces lined by histiocytes, multinucleated giant cells , with intervening muscle bundles extending from underlying muscularis propria. Serosa shows congestion.

A4) Section from adjacent random colon show submucosal edema and congestion.

AR5- AR7) Section studied shows edematous Colonic mucosa with Serosa showing collection of eosinophilic fluid material.One node shows reactive hyperplasia.

B) Section from omentum shows fibrofatty tissue with congestion.

IMPRESSION : FEATURES ARE IN FAVOR OF PNEUMATOSIS CYSTOIDES INTESTINALIS

Patient was proceeded with reversal of stoma and colorectal anastomosis after 2 months

DISCUSSION:

Management of pneumatosis intestinalis depends on the clinical presentation and underlying aetiology. Asymptomatic or benign cases can be managed conservatively with bowel rest, oxygen therapy, antibiotics, and treatment of underlying cause. However, surgical intervention is indicated in the presence of complications such as obstruction, volvulus, ischemia, perforation, or when malignancy cannot be excluded. In our case, the patient presented with acute large bowel obstruction with clinical deterioration, necessitating emergency laparotomy. Intraoperatively, a redundant sigmoid colon with volvulus and multiple cysts along the sigmoid colon were identified. Sigmoidectomy with end colostomy (Hartmann's procedure) was performed considering the acute setting and distended bowel. Histopathological examination confirmed pneumatosis cystoides intestinalis.

This case highlights the rare presentation of pneumatosis cystoides intestinalis coli as sigmoid volvulus mimicking malignant obstruction. Preoperative diagnosis can be difficult, and definitive diagnosis is often made intraoperatively or on histopathology. Surgical resection remains the treatment of choice in complicated cases. Awareness of this rare entity is important to avoid misdiagnosis and to guide appropriate management. Being a benign condition, uncomplicated cases can be managed conservatively. Spontaneous rupture of these cysts may give rise to benign pneumoperitoneum, which is non-surgical pneumoperitoneum

The exact pathogenesis of pneumatosis intestinalis remains uncertain. Several mechanisms have been proposed, including the mechanical theory, which suggests increased intraluminal pressure leading to dissection of gas into the bowel wall; the bacterial theory, which implicates gas-producing organisms entering the submucosa through mucosal defects; the mucosal injury theory, in which disruption of mucosal integrity allows intraluminal gas to track into the intestinal wall; and the pulmonary theory, where alveolar rupture permits gas to travel along vascular sheaths into the mesentery and bowel wall.

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