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Case Report

A rare case of acute colonic pseudo-obstruction leading to colonic perforation in a ventilated patient with cerebrovascular accident

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ABSTRACT

Acute pseudo-colonic obstruction in a patient with a functioning ileocecal valve can be risky, resulting in closed-loop obstruction, significant distention of the colon, and increased chances of colon perforation and ischemia if diagnosis and timely non-operative treatments are delayed. We report a case of acute pseudo-colonic obstruction with closed-loop obstruction, resulting in colon perforation in a ventilated patient with a cerebrovascular incident. The situation was promptly identified during the first assessment with a surgical consultation and imaging study, resulting in timely surgical intervention which included removing the diseased section of the right colon, creating an end ileostomy, and colostomy. The postoperative contrast study of the remaining colon and colonoscopy confirmed the pseudo-obstruction without finding any blockages in the distal colon and rectum. After the operation, the patient recovered well and was sent home. In conclusion, early clinical suspicion, diagnosis, and prompt management of a complicated ACPO result in a good patient outcome.

Keywords: Pseudo-colonic obstruction, Colon perforation, Ventilated patient, Cerebrovascular accident, Ogilvie's syndrome, Right hemicolectomy and ileostomy

INTRODUCTION

Acute pseudo-colonic obstruction resulting in colon perforation is a rare medical condition. Early clinical suspicion of pseudo-colonic obstruction can provide an opportunity for medical management and prevent serious complications of colon perforation and ischemia.[2,5]

We describe a case of an acute pseudo-colonic closed-loop obstruction resulting in a perforation of the ascending colon, which presented clinically as acute abdominal distention in a patient on ventilator, and a contrast-enhanced CT abdomen revealed pneumoperitoneum and severe colonic distention. The case was effectively managed through appropriate timely emergency surgery.

CASE REPORT

A 52-year-old obese man with diabetes, hypertension, dyslipidemia, and no prior surgery was hospitalized in the ICU for a month with a tracheostomy and mechanical ventilation following a diagnosis of cerebrovascular accident caused by a left intracerebral hemorrhage (Figure 1 A and B). Attending intensivist requested a surgical consultation after the patient experienced worsening abdominal distention for 2 days along with symptoms of sepsis, low blood pressure, tachycardia, and was placed on inotropic support. Lab tests showed an elevated white blood cell counts of 12000, increased C-reactive protein levels of 146, and elevated serum creatinine of 142 micromoles/liter, with normal sodium levels and a low potassium level of 2.7 millimoles/liter. The patient had been receiving nasogastric feeds and had

a bowel movement two days before experiencing abdominal distention. During the clinical examination, the abdomen was tense and greatly distended, with normal hernia openings and rectal examination showed an empty rectum with no abnormalities or narrowing. A CT scan of the abdomen with intravenous contrast was performed. There was a significant distension of the entire colon (Figure 3A and B) and rectum (Figure 3C) with dilated colon diameter reaching up to 11 centimeters (Figure 3A), a collapsed small bowel indicating a closed loop colon obstruction, and noticeable pneumoperitoneum (Figure 2A and B).

A decision was made to perform an immediate exploratory laparotomy after obtaining high-risk informed consent and initiating empirical intravenous meropenem. The laparotomy revealed a significantly distended and viable entire length of the colon and rectum (Figure 4 A and B), sero-muscular breaking and maceration of the entire right side of the colon up to the splenic flexure (Figure 4 B), with an early 1.5-centimeter wide perforation on the ascending colon (Figure 4 C) covered with omentum. There was a moderate amount of serous-feculent fluid in the peritoneal cavity. An extended right hemicolectomy was performed, including all macerated right colon (Figure 4 D), with an end ileostomy (Figure 6) and distal left colostomy (as a mucous fistula). The laparotomy wound was closed primarily with mass closure technique and interrupted skin sutures, and a closed negative pressure wound device was applied to prevent surgical site infection. Postoperatively, the patient recovered gradually, was weaned off inotropes and ventilatory support, started on nasogastric feeds and the ileostomy began working on the 2nd postoperative day. The patient was transferred from the ICU to the ward on the 7th postoperative day. Inflammatory markers, serum electrolytes and creatinine levels normalized by the 5th postoperative day. The abdominal pus culture grew Pseudomonas, which was sensitive to meropenem, so meropenem was continued for 7 days. The patient was treated by a multidisciplinary team including internal medicine, surgery, neurology, ENT physicians, nutritional and physiotherapy services. The initial ileostomy output exceeded 1.5 liters and gradually reduced to less than 1 liter by the 10th postoperative day. The patient began tolerating oral feedings on the 14th postoperative day, with improvement in the Glasgow coma scale. The laparotomy wound was healing well. The histopathology report of the resected colon showed nonspecific colitis without ischemic changes.

A gastrografin study (Figure 5A and B) of the remnant colon on the 21st postoperative day revealed no mechanical obstructing lesion. A colonoscopy on the 23rd postoperative day confirmed the absence of any obstructing lesions in the distal colon and rectum. The patient was reviewed by an ENT surgeon and the tracheostomy was removed on the 26th postoperative day. The patient was discharged home on the 30th postoperative day in good general condition, conscious, oriented, taking normal feeds with the ileostomy (Figure 6) producing semi-solid stools of 500 ml/day and colostomy with minimal mucous output. The laparotomy wound had healed well. The patient was reviewed in the outpatient clinic 1 month after discharge, was doing well with the Ileostomy working well and the colostomy bringing minimal mucous discharge.

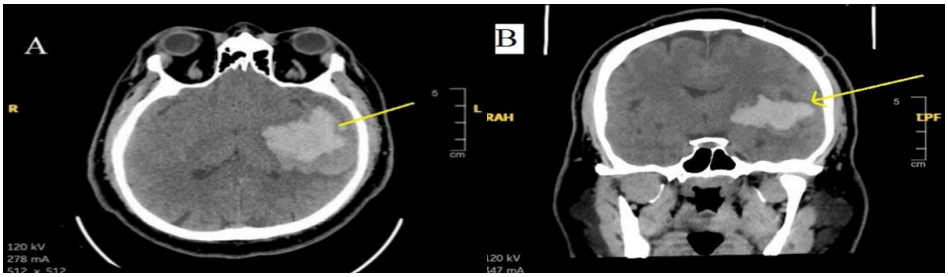

Figure 1 (A and B): Brain CT scan: Intracerebral hemorrhage-axial view and intracerebral hemorrhage-coronal view.

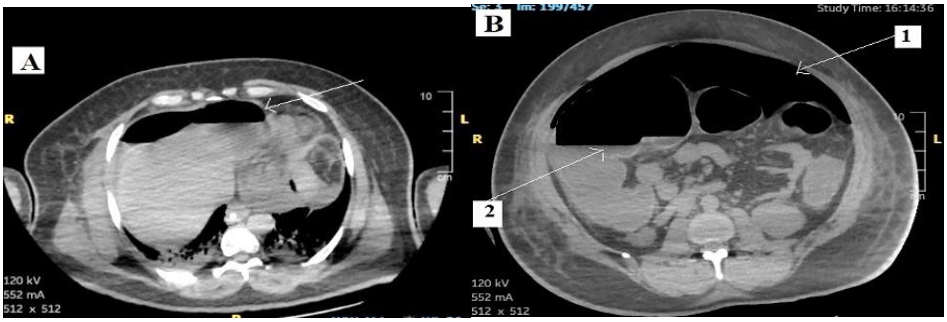

Figure 2 (A and B): CT scan of the abdomen. Pneumoperitoneum (1) with distended colon (2).

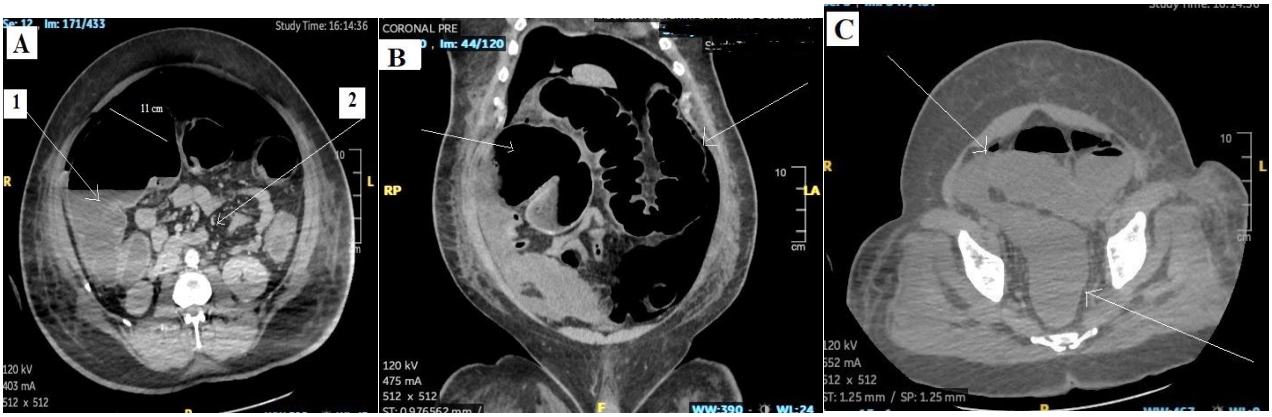

Figure 3 (A-C): Abdomen CT scan showing entire colon distension. Distended colon (1) with ascending colon diameter of 11 cm and collapsed small bowel (2). Coronal view showing distended colon (both arrows) and distended sigmoid colon and entire rectum (both arrows).

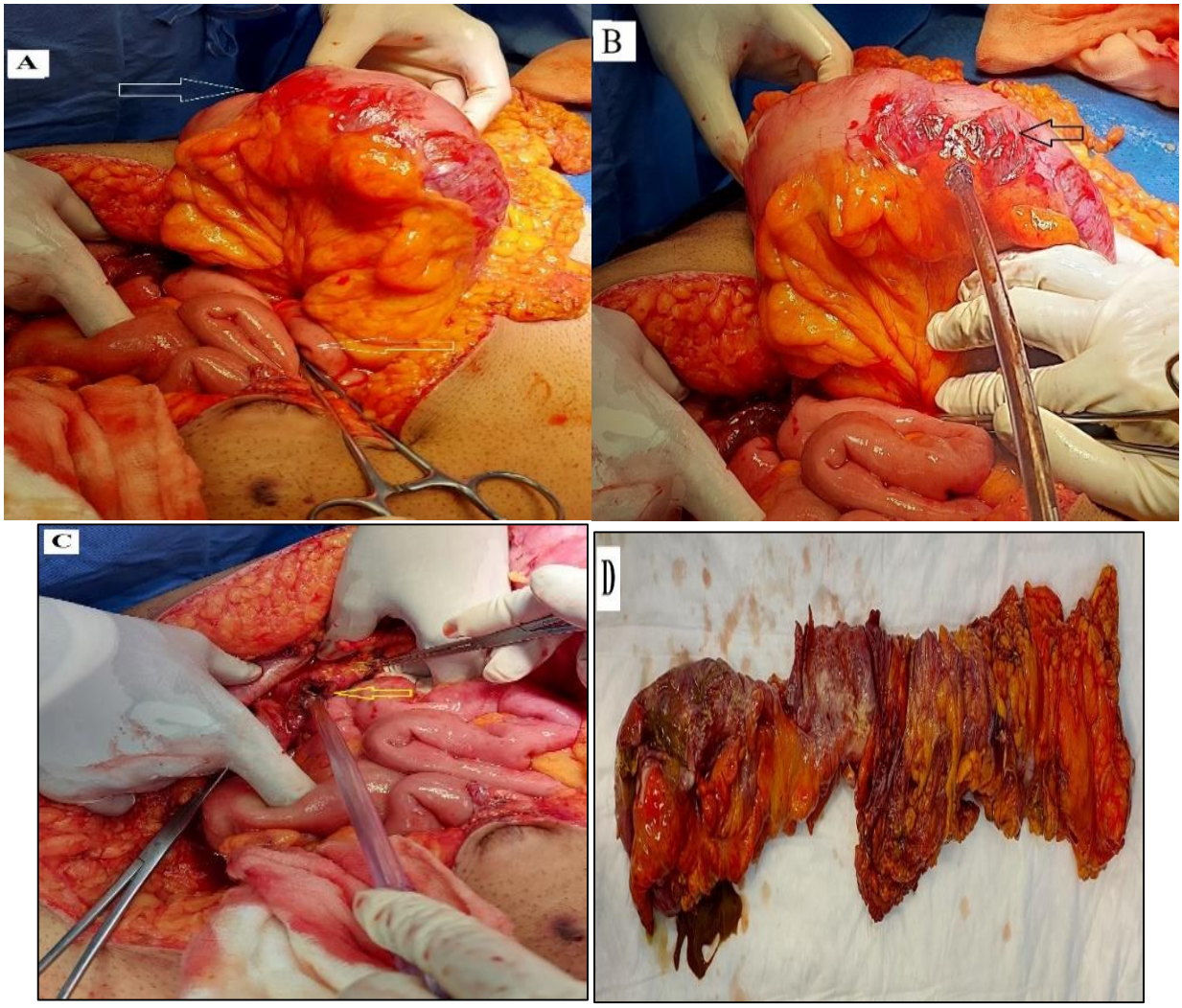

Figure 4 (A-D): Intraoperative pictures. Distended colon and collapsed small bowel. Seromuscular tearing and maceration of over-distended transverse colon. Perforation in ascending colon. Resected colon specimen shows stretching-associated necrosis.

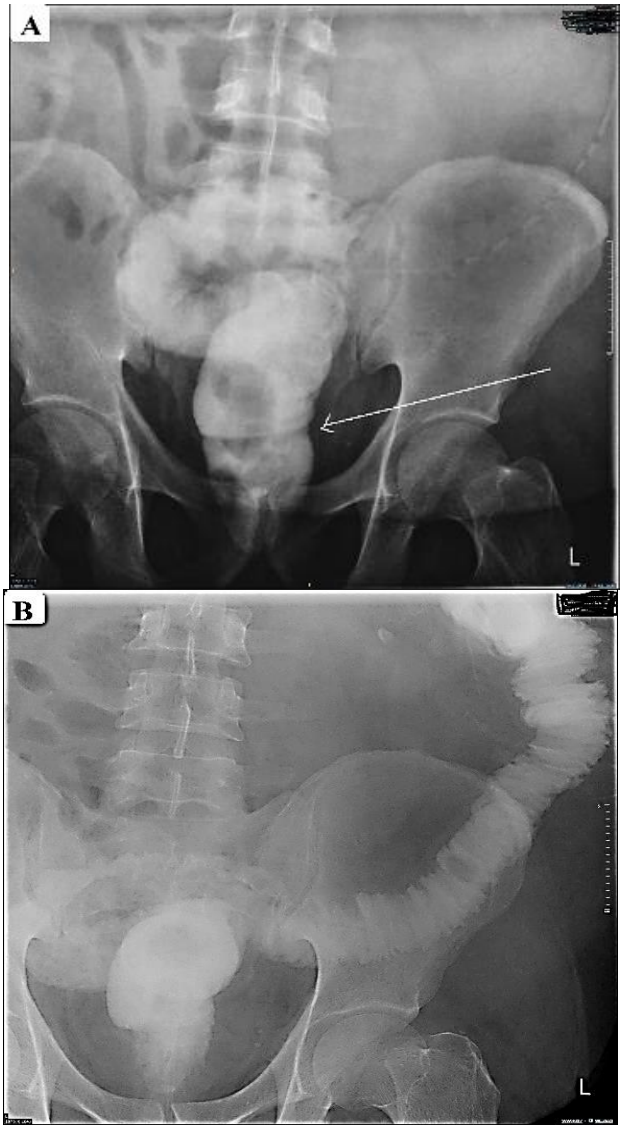

Figure 5 (A and B): Post-operative Gastrografin enema study shows contrast filling of the rectum and sigmoid colon without mechanical obstruction and contrast opacification of the remnant left side of the colon.

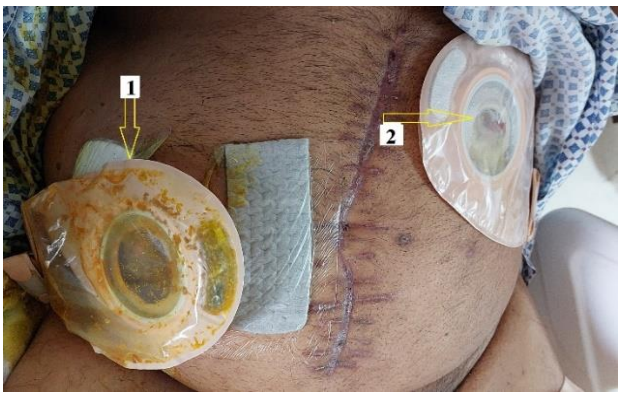

Figure 6: Post-operative picture at the time of discharge showing functioning ileostomy (1) on right side and colostomy (2) as mucous fistula on left side.

DISCUSSION

This case study was carried out following SCARE criteria.[1] Situation we described was detected promptly through a surgical consultation and an abdominal CT scan, leading to timely surgical treatment and a successful patient result.

Pseudo-colonic obstruction, also known as Ogilvie's syndrome, can often occur in ventilated patients due to factors like sedative medications, autonomic nervous system dysfunction, and electrolyte imbalances. Some cases have been reported in non-ventilated cerebrovascular accident patients, possibly due to disrupted neuro-enteric pathways in CVA.[2,5,9-11]

Clinically, Ogilvie's syndrome manifests as progressive abdominal distention, pain, vital sign changes, and possibly sepsis if complications arise.[7] Early radiological evaluation, such as a plain X-ray/contrast-enhanced CT scan of abdomen, is recommended for prompt diagnosis.[7]

Jayaram et al systematic review of 125 postpartum ACPO cases and Vanek et al analysis of 400 general cases found a postoperative occurrence rate of up to 10% of colonic pseudo-obstruction cases, with cesarean section being most common procedure.[2,5] It has been reported that there is a potential risk of colon perforation reaching 43%, with a surgery rate of up to 47% and a mortality rate of 1.5%.[2,5] Colonic pseudo-obstruction is generally divided into 2 categories: acute and chronic.[3-4,12] It is also divided into central type attributed to causes related to the central nervous system like cerebral hemorrhage, Parkinson's disease, spinal cord injury, and peripheral type due to diabetes and electrolyte imbalances. Acute Ogilvie's syndrome can appear similar to sigmoid volvulus in clinical presentation, while the chronic form can resemble mechanical obstruction of the distal colon.[3] A marked increase in cecum diameter on radiological imaging is used as a reliable indicator of colon perforation, with risk levels escalating from 9 cm and peaking when the diameter surpasses 12 cm.

Identifying Ogilvie's syndrome in its early stages enables the use of non-invasive treatment methods (outlined in Table 1) like neostigmine through IV, rectal tube decompression, enemas, and endoscopic decompression, resulting in a 50 to 90% success rate for non-surgical approaches (Table 1). Multiple studies (Table 1) in research indicate that in cases where endoscopic decompression fails in patients with a colon diameter exceeding 11 cm on radiological imaging, early surgery should be taken into account to lower the chances of severe complications and fatalities. Ischemia, which is associated with significant rates of Morbidity and death, might eventually require urgent surgical intervention. [5-7,13] Urgent surgical interventions often involve removal of diseased colon and creating an end ileostomy, or performing diversion procedures such as cecostomy or diversion ileostomy with no resections.[9]

Table 1: Literature review of perforation risk and conservative management.

Reference study	Number of cases of ACPO	Percentage of success of conservative treatment (%)	Percentage of colon perforation (%)	Mortality (%)
Ross et al[13]	106,784	91	9	12.3
Vanek et al[5]	400	90	10	15-40
Jayaram et al[2]	125 (postpartum)	50	43	1.5
Jochle el al[8]	71	70	12	21

Table 2: Literature review of operative interventions.

Reference study	N (%)
Vanek et al-179 cases[5,7]	
Ostomy alone	129 (72)
Resection	25 (14)
Other procedures	25 (14)
Jochle et al-25 cases[8]	
Ostomy alone	20 (80)
Resection	5 (20)

No literature review specifically addresses recommendations for reversing an ileostomy and performing an anastomosis of the ileum and colon after recovering from an acute problem in cases of ACPO.[15] Many literature reviews discuss resection and diversion procedures but do not provide additional suggestions for a reversal as a follow-up procedure. Likely reason for not reversing surgery could be concerns about another episode of ACPO from the remaining colon, and patient's health being not suitable for another major operation and its complications.[14,15] In our case, we kept patient under follow-up, unlikely that his general condition will permit another major operation of ileostomy reversal.

CONCLUSION

Acute pseudo-colonic obstruction is a potential life-threatening event, occurring often in ventilated patients in the ICU, and detecting it can be challenging. It is advisable to suspect this condition in a patient having progressive abdominal distention and to request suitable radiological investigation, such as a plain X-ray or a contrast-enhanced CT scan of the abdomen. Early detection of this condition always allows for successful non-operative management. In case of a colon perforation, early surgical intervention with proper resection and diversion procedure may rescue the patient from morbidity and mortality.

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