DOI: 10.7860/JCDR/2024/69812.19467

Case Report

Surgery Section

Spontaneous Perforation of Ascending Colon Presenting as Retroperitoneal Abscess: A Case Report

DAVINDER KUMAR[1], RITESH KUMAR[2], MONIKA GUPTA[3], PIYUSH GUPTA[4], SANJAY MARWAH[5]

ABSTRACT

Perforation of the colon is frequently encountered in surgical emergencies and requires urgent intervention. Free colonic perforations are diagnosed early due to the development of signs of peritoneal irritation. However, perforation of the posterior wall of the colon into the retro-peritoneal space poses a diagnostic challenge because of the absence of signs of peritoneal irritation and its atypical clinical presentation. The authors reported an unusual case of 42 years old female patient with idiopathic perforation of the posterior wall of the ascending colon that presented as a large retroperitoneal abscess. The abscess was diagnosed based on clinical and Computed Tomography (CT) findings, and the patient underwent incision and drainage of the abscess through a flank incision. There was initial improvement in the patient's general condition, but on the fourth day, there was faecal discharge through the wound, indicating colonic perforation. The patient was immediately taken for an emergency laparotomy. Intraoperatively, the peritoneal cavity was found to be clean; however, upon mobilisation of the ascending colon, two large perforations on its posterior wall were found with faecal soiling of the retroperitoneal tissues. Right hemicolectomy with end ileostomy and closure of the transverse colonic end were performed. Histopathology revealed the absence of any definite pathology, and a diagnosis of spontaneous perforation was made. This unusual case highlights that this rare possibility should be considered as a differential diagnosis of a retroperitoneal abscess to enable early intervention, which is likely to save the patient.

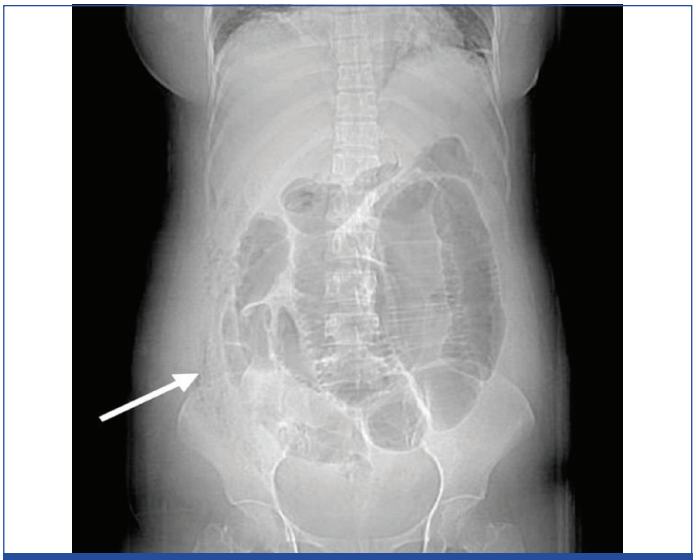
Keywords: Hemicolectomy, Faecal soiling, Idiopathic, Ileostomy, Intestinal perforation

CASE REPORT

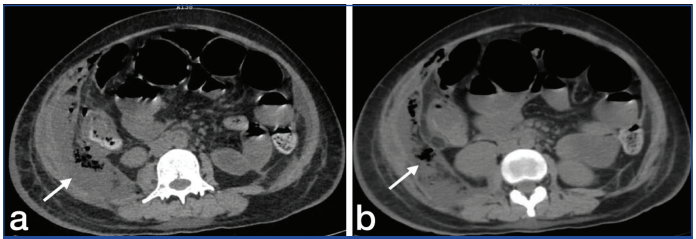
A 42-year-old female patient presented in the emergency room complaining of diffuse abdominal pain, fever, and obstipation for the last four days. She had no history of any bowel complaints, co-morbid factors such as diabetes mellitus, hypertension, or coronary artery disease, or tuberculosis or contact with tuberculosis. Upon general physical examination, the patient appeared toxic and dehydrated with a pulse rate of 110 beats per minute, blood pressure of 138/84 mm Hg, temperature of 101°F, and respiratory rate of 24 per minute. There was no lymphadenopathy, and the chest examination was essentially normal.

Abdominal examination revealed generalised abdominal distension and mild tenderness. There was no palpable lump in the abdomen. On examination of the back, erythema and oedema extended from the right flank down to the right thigh, which was tender on palpation with crepitus suggestive of subcutaneous air. Bowel sounds were absent on auscultation. During digital rectal examination, there was no pelvic tenderness, and the rectum was collapsed.

On haematological investigations, her haemoglobin was 6.7 g/dL, total white cell count was 25,000 per cubic millimeter with 80% polymorphs, blood urea was 127 mmol/L, serum creatinine was 1.7 mmol/L, C-reactive protein was 25.46 mg/dL, serum sodium was 130 mmol/L, and serum potassium was 2.5 mmol/L. The chest X-ray was normal, and there was no free air under the diaphragm. The plain X-ray of the abdomen (erect) revealed dilated bowel loops and subcutaneous air in the right-side of the abdominal wall [Table/Fig-1]. Ultrasound of the abdomen showed dilated bowel loops and a large retroperitoneal collection on the right-side. An abdominal Non-Contrast Computed Tomography (NCCT) scan was performed due to deranged renal functions, revealing a large retroperitoneal collection on the right-side containing multiple air pockets with extension into the abdominal wall, suggestive of an abscess. There was no evidence of pneumo-peritoneum or free fluid in the peritoneal cavity [Table/Fig-2a,b].



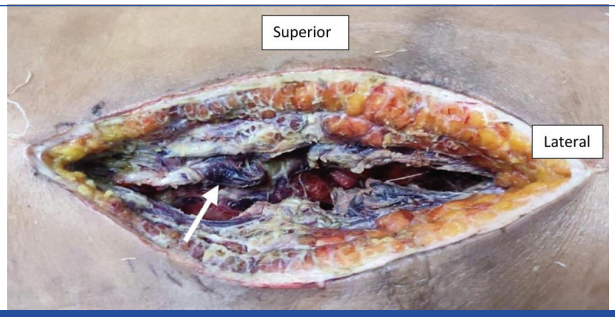
[Table/Fig-1]: X-ray abdomen showing dilated small bowel loops and surgical emphysema right-side of the abdominal wall (arrow).



[Table/Fig-2]: a,b) Non-Contrast Computed Tomography(NCCT) abdomen showing dilated bowel loops and multiple air foci with collection in retro-peritoneal space on right-side (arrow).

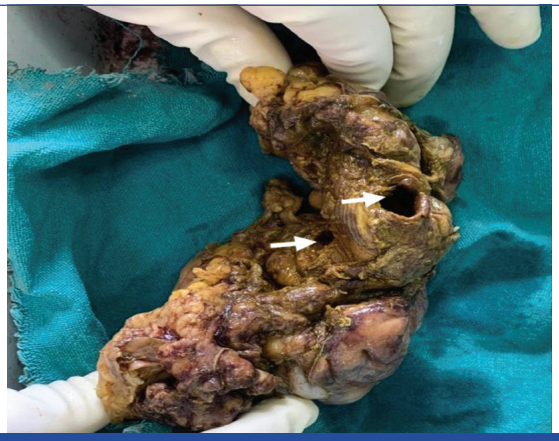
The diagnosis of an abdominal wall abscess due to anaerobic infection was considered because of the lack of signs of peritonitis, and the CT abdomen showed no evidence of pneumo-peritoneum and the absence of intra-abdominal collection. Antibiotics (Ceftriaxone

and Metronidazole) were initiated, and after adequate resuscitation, extraperitoneal drainage of the retroperitoneal abscess was performed under general anaesthesia through the flank incision. The abscess cavity involved subcutaneous tissue with extension into the underlying muscles. Approximately, 2500cc of foul-smelling purulent fluid was drained, loculi were broken, warm saline lavage was performed, hemostasis was achieved, and the wound was packed with saline-soaked gauze, left to heal with secondary intention. The drained pus was sent for culture and sensitivity. The patient had a good recovery in the post-operative period. Her pulse rate decreased to 90 beats per minute, and there were no episodes of fever. In laboratory parameters, her haemoglobin was 6.0 g%, the leukocyte count decreased to 17,000 per cubic millimeter, and C-reactive protein decreased to 15.5 mg/dL. Two units of whole blood were transfused due to low haemoglobin levels. After 48 hours, the pack was removed, and the wound was irrigated with warm saline solution. However, there was necrosis of the underlying abdominal wall muscles [Table/Fig-3].



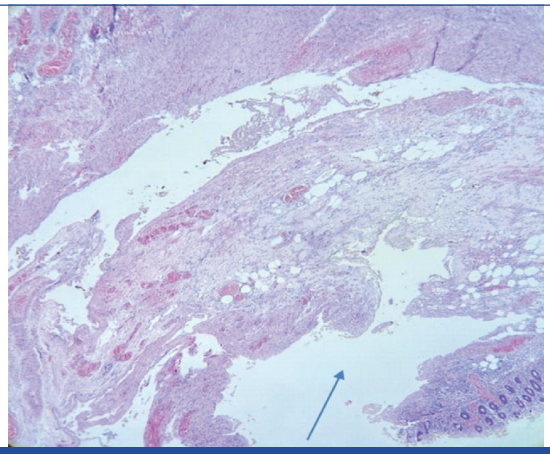
[Table/Fig-3]: Right flank incision made for abscess drainage showing necrosis of abdominal wall muscles (arrow).

The wound was managed with regular antiseptic dressings. The general condition of the patient improved, her abdominal distension decreased, and bowel sounds appeared. She was allowed oral liquids on the third post-operative day. However, on the fourth post-operative day, the patient developed high-grade fever with foul-smelling faecal discharge from the flank wound indicating a colonic leak. Upon retrospective inquiry, there was no history of per rectal insertion of foreign body/trauma. The patient was immediately taken for exploratory laparotomy through a midline incision. Intraoperatively, the peritoneal cavity was clean. However, on mobilisation of the ascending colon, two large perforations were found on its posterior wall with faecal soiling of the retroperitoneal tissues [Table/Fig-4].



[Table/Fig-4]: Showing two perforations in the posterior wall of ascending colon (arrow).

The patient underwent a right hemi-colectomy with end ileostomy and closure of the transverse colonic end. The patient was transferred to the Intensive Care Unit (ICU). The patient experienced tachycardia, persistent hypotension requiring inotropic support, oliguria, and lactic acidosis in the post-operative period. The pus culture report showed heavy growth of *Escherichia coli* sensitive to Colistin only, and Injection Colistin was initiated at a low dose of one million units twice a day due to impaired renal function. Laboratory parameters on the first post-operative day were TLC 15,000 per cubic mm, blood urea was 135 mmol/L, serum creatinine was 3.1 mmol/L, and C-reactive protein was 26.8 mg/dL. On arterial blood gas analysis, pH was 7.15, base deficit was 11, and lactate level was 11.5. The patient was aggressively managed in the Intensive Care Unit (ICU) but unfortunately died after 2 days due to multi-organ failure. Histopathology of the resected specimen showed focal ulceration of the mucosa with necrosis and chronic non-specific transmural inflammation [Table/Fig-5].



[Table/Fig-5]: Histopathology showing ulceration of mucosa (arrow) and chronic transmural inflammation.

DISCUSSION

A retroperitoneal abscess may develop secondary to infections of the genitourinary or gastrointestinal tract. Gastrointestinal causes include various pathologies involving the duodenum, pancreas, ileocecal region, appendix, ascending and descending colon. Among the colonic causes, diverticular perforation into the retro-peritoneum leading to the formation of a retroperitoneal abscess has been reported by some studies [1,2]. Similarly, locally advanced colon carcinoma or retrocecal appendicitis may perforate into the retroperitoneum, resulting in abscess formation [3-5]. Due to the atypical presentation of a retroperitoneal abscess and its mimicry of clinical features with other clinical entities like psoas abscess, perinephric abscess, and necrotising fasciitis, the diagnosis is often delayed, leading to poor outcomes [2]. If there is no identifiable cause, it is labeled as idiopathic or Spontaneous Colonic Perforation (SCP) [4].

According to the literature, idiopathic or SCP is a very rare clinical entity [6]. Historically, the spontaneous perforation of a normal colon was first reported in 1827 in a female patient [4]. Since then, there have been occasional case reports of SCP, and as per a review conducted in 2014, less than 100 such cases have been reported in the literature [7]. Idiopathic perforation does not have a definite patho-physiological basis. Various proposed hypotheses considered to be responsible for idiopathic perforation include raised intra-abdominal or intraluminal pressure, colonic implosion, colonic wall attenuation, and ischemic ulceration due to hard fecoliths [8,9]. However, none of these factors have proven evidence. The histopathological features described to diagnose idiopathic perforation are: i) absence of feculent ulcer; ii) clear mucosal edge not extending up to the serosa; iii) neatly defined broken ends of the muscular layer; iv) absence of any definite colonic pathology that can cause perforation [10,11].

In the present case, the operative findings and microscopic features matched those of idiopathic perforation. Recently, Chongxi R et al., coined a new term named SCP in Adults (SCPA) and evaluated a pooled case series. SCPA was defined as an abrupt perforation of the normal colon without underlying definite pathology that was difficult to diagnose before surgery and carried a high mortality rate. The study compiled 228 cases (7 cases from their own hospital and 221 cases from research databases in the literature). On investigations, most patients had positive findings on imaging, but a preoperative diagnosis could be made in only 20.6% of cases.

This led to delayed intervention and high post-operative mortality (31.1%) in such cases [12].

A Computed Tomography (CT) scan provides useful information such as pneumo-peritoneum, bowel wall thickening around the site of perforation, extraluminal fluid collection, fecaloma, and pericolic fat stranding. Therefore, a CT scan is the investigation of choice since it aids in early diagnosis and decision-making regarding surgical intervention [13-15]. In the present case, a CT scan revealed dilated bowel loops with a retroperitoneal collection containing air foci. However, the diagnosis of colonic perforation could not be made as there was no pneumoperitoneum.

The most common site of idiopathic perforation is the anti-mesenteric border of the colon, and all patients reported in the literature have presented with localised or generalised peritonitis [12]. However, in the present case, two idiopathic perforations occurred in the posterior wall of the ascending colon, making it the first case report of its kind. These perforations may have initially been small in size and presented with retroperitoneal abscesses. After drainage of the abscess, there was a significant improvement in the patient's general condition with no abdominal signs. However, following decompression of the abscess cavity, faecal matter drained freely into the retroperitoneum through the perforations, leading to systemic sepsis. The diagnosis of colonic perforation could only be made once faecal discharge appeared in the retroperitoneal wound on the fourth post-operative day. Despite immediate laparotomy and aggressive surgical intervention, the patient could not be saved due to severe sepsis and multiorgan failure. The diagnosis of idiopathic colonic perforation was made since no aetiology could be established even after investigations, laparotomy, and histopathology report.

In the present case, the extension of infection into the muscular plane due to the retroperitoneal abscess might have led to necrosis of muscles and oedema of the skin and subcutaneous tissue. Necrotising fasciitis of the abdominal wall (Meleney's gangrene) was one of the clinical possibilities. It is a necrotising infection of the skin and subcutaneous tissue of the abdominal wall leading to rapidly progressing tissue destruction that can spread to the underlying muscles. It typically appears in the second week of surgery or following abdominal wall trauma. It mostly affects immuno-compromised patients with conditions such as diabetes, uremia, and Human Immuno-deficiency Virus (HIV) infection and has an approximate 40% mortality rate [16]. In present case, this possibility was ruled out as there was no involvement of the overlying skin. However, sepsis due to a large retroperitoneal abscess and the time lag in reaching a definitive diagnosis might have resulted in the development of multi-organ dysfunction.

Initially, the patient was managed with incision and drainage of the retroperitoneal abscess; however, caution should be exercised due to the close proximity of retroperitoneal structures in the vicinity, such as the colon, kidney, and ureter, to avoid iatrogenic injury to these organs [17].

The key to the management of such cases is early diagnosis and adequate resuscitation followed by quick surgical intervention. Due to the poor condition of the patient, the majority of cases require colonic resection with end ileostomy/colostomy and closure of the distal stump. However, the literature has described Hartman's procedure, primary closure, resection, and anastomosis with or without covering colostomy in such cases [6].

CONCLUSION(S)

In conclusion, idiopathic perforation of the ascending colon presenting as a retro-peritoneal abscess is an infrequent and life-threatening disease with poor outcomes. Awareness of this rare clinical entity might help clinicians make decisions about early intervention and is likely to improve the prognosis.

REFERENCES

[1] Choi PW. Pneumomediastinum caused by colonic diverticulitis perforation. J Korean Surg Soc. 2011;80(1):17-20. Doi: 10.4174/jkss.2011.80.Suppl1.S17.
[2] Ruscelli P, Renzi C, Polistena A, Sanguinetti A, Avenia N, Popivanov G, et al. Clinical signs of retroperitoneal abscess from colonic perforation: Two case reports and literature review. Medicine (Baltimore). 2018;97(45):e13176. Doi: 10.1097/MD.0000000000013176.
[3] Hsieh CH, Wang YC, Yang HR, Chung PK, Jeng LB, Chen RJ. Retroperitoneal abscess resulting from perforated acute appendicitis: Analysis of its management and outcome. Surg Today. 2007;37(9):762-67. Doi: 10.1007/s00595-006-3481-5.
[4] Goligher J, Duthie H, Nixon H. Surgery of anus, rectum and colon. 5th Ed. East Sussex BN21: Bailliere Tindall; 1984.
[5] Tsai HL, Hsieh JS, Yu FJ, Wu DC, Chen FM, Huang CJ, et al. Perforated colonic cancer presenting as intra-abdominal abscess. Int J Colorectal Dis. 2007;22(1):15-19. Doi: 10.1007/s00384-006-0097-6.
[6] Kurane SB, Kurane BT. Idiopathic colonic perforation in adult- A rare case. Indian J Surg. 2011;73(1):63-64. Doi: 10.1007/s12262-010-0127-z. Doi: 10.1007/s12262-010-0127-z.
[7] Makki AM, Hejazi S, Zaidi NH, Johari A, Altaf A. Spontaneous perforation of colon: A case report and review of literature. Case Rep Clin Med. 2014;3(7):392-97. Doi: 10.4236/crcm.2014.37087.
[8] Serpell JW, Nicholls RJ. Stercoral perforation of the colon. Br J Surg. 1990;77(12):1325-29. Doi: 10.1002/bjs.1800771204.
[9] Losanoff J, Kjossev K. Idiopathic perforation of sigmoid colon. Dig Dis Sci. 1995;40(6):1408-09.
[10] Kasahara Y, Matsumoto H, Umemura H, Shirafa S, Kuyama T. Idiopathic perforation of the sigmoid colon in Japan. World J Surg. 1981;5(1):125-30. Doi: 10.1007/BF01657857.
[11] Laskin MD, Tessler K, Kives S. Cecal perforation due to paralytic ileus following primary caesarean section. J Obstet Gynaecol Can. 2009;31(2):167-71. Doi: 10.1016/s1701-2163(16)34102-0.
[12] Chongxi R, Jinggang J, Yan S, Hongqiao W, Yan L, Fengshuo Y. Spontaneous colonic perforation in adults: Evaluation of pooled case series. Science Progress. 2020;103(3):01-15. Doi: 10.1177/0036850420945462.
[13] Chakravartty S, Chang A, Nunoo-Mensah J. A systematic review of stercoral perforation. Colorectal Dis. 2013;15(8):930-35. Doi: 10.1111/codi.12123.
[14] Miki T, Ogata S, Uto M, Nakazono T, Urata M, Ishibe R, et al. Multidetector-row CT findings of colonic perforation: Direct visualization of ruptured colonic wall. Abdom Imaging. 2004;29(6):658-62. Doi: 10.1007/s00261-003-0159-y.
[15] Oguro S, Funabiki T, Hosoda K, Inoue Y, Yamane T, Sato M, et al. 64-slice multidetector computed tomography evaluation of gastrointestinal tract perforation site: Detectability of direct findings in upper and lower GI tract. Eur Radiol. 2010;20(6):1396-403. Doi: 10.1007/s00330-009-1670-5.
[16] Ahmed S, Maharjan N, Hirachan N. Meleney's gangrene managed with a single extensive debridement and resultant defect closure with abdominoplasty technique- A case report. Ann Med Surg (Lond). 2024;86(3):1711-15. Doi: 10.1097/MS9.0000000000001727.
[17] Moon SB. Successful conservative management of a retroperitoneal abscess with sinus too the colon: A case report. Int Surg. 2016;101:133-36. Doi: 10.9738/INTSURG-D-15-00260.1.

PARTICULARS OF CONTRIBUTORS:
1. Senior Resident, Department of Surgey, Pt BD Sharma PGIMS, Rohtak, Haryana, India.
2. Assistant Professor, Department of Surgey, Pt BD Sharma PGIMS, Rohtak, Haryana, India.
3. Professor, Department of Pathology, Pt BD Sharma PGIMS, Rohtak, Haryana, India.
4. Junior Resident, Department of Surgey, Pt BD Sharma PGIMS, Rohtak, Haryana, India.
5. Senior Professor, Department of Surgey, Pt BD Sharma PGIMS, Rohtak, Haryana, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Sanjay Marwah,
Senior Professor, Department of Surgey, Pt BD Sharma PGIMS,
Rohtak, Haryana-124001, India.
E-mail: drsanjay.marwah@gmail.com

PLAGIARISM CHECKING METHODS: [Jain H et al.]
- Plagiarism X-checker: Jan 29, 2024
- Manual Googling: Mar 13, 2024
- iThenticate Software: Mar 25, 2024 (13%)

ETYMOLOGY: Author Origin

EMENDATIONS: 5

AUTHOR DECLARATION:
- Financial or Other Competing Interests: None
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

Date of Submission: **Jan 29, 2024**
Date of Peer Review: **Mar 04, 2024**
Date of Acceptance: **Mar 27, 2024**
Date of Publishing: **Jun 01, 2024**