International Journal of Research in Orthopaedics
Malhotra V et al. Int J Res Orthop. 2026 Jul;12(4):1190-1193
https://www.ijoro.org

DOI: https://dx.doi.org/10.18203/issn.2455-4510.IntJResOrthop20262066

Case Report

Spontaneous pneumoperitoneum in a case of multiple intestinal diverticulosis in an elderly female admitted for intertrochanteric fracture

Vishakha Malhotra[1]*, Mukesh Soni[2], Saakshi Sharma[2], Arpita Singh[3]

[1]Department of Trauma Surgery, MGM Medical College, Navi Mumbai, Maharashtra, India
[2]Department of General Surgery, MGM, Medical College, Navi Mumbai, Maharashtra, India
[3]Department of Pathology, MGM Medical College, Navi Mumbai, Maharashtra, India

Received: 24 March 2026
Revised: 05 May 2026
Accepted: 06 June 2026

***Correspondence:**
Dr. Vishakha Malhotra,
E-mail: vishakhamalhotra17@gmail.com

ABSTRACT

Spontaneous pneumoperitoneum refers to the presence of free intraperitoneal air without perforation of a hollow viscus and accounts for less than 10% of all cases of pneumoperitoneum. It is a rare clinical entity and often poses a diagnostic challenge, especially in elderly patients presenting with signs suggestive of perforation peritonitis. It even more rare to encounter this case on regular rounds in the orthopaedic ward. We report the case of an 85-year-old female admitted for left intertrochanteric femur fracture following a fall, who developed abdominal distension and generalized abdominal pain on the fourth day of trauma. Clinical examination revealed abdominal distension, tenderness and guarding, raising suspicion of perforation. Contrast-enhanced computed tomography demonstrated pneumoperitoneum with multiple diverticula involving the ileum, ascending colon and transverse colon. Emergency exploratory laparotomy was performed due to clinical signs of peritonitis and pneumoperitoneum on CT. Intraoperatively, multiple diverticula were identified in the duodenum, proximal ileum, ascending colon and transverse colon, with inflammatory changes in the omentum and multiple adhesions, but no gastrointestinal perforation was found. This case highlights the importance of considering spontaneous pneumoperitoneum in elderly patients with diverticulosis and emphasizes that surgical exploration may still be necessary when clinical findings strongly suggest perforation despite the absence of an actual bowel perforation.

Keywords: Intertrochanteric fracture, Spontaneous pneumoperitoneum, Small bowel diverticulosis, Multiple intestinal diverticula, Acute abdomen, Geriatric patient

INTRODUCTION

Spontaneous pneumoperitoneum is a term given to the occurrence of free air in the abdomen in the absence of any perforation of the abdominal viscera.[1] It is a rare finding (<10% of all cases of pneumoperitoneum) and is also known as non-surgical pneumoperitoneum.[2] We would like to discuss a case of spontaneous pneumoperitoneum in an 85 years old female who presented with complaints of abdominal distension and was intra operatively found to have multiple diverticula in the duodenum, the proximal ileum, ascending colon and transverse colon. Diverticula are most frequently observed in the large bowel with only 0.1-1.5% incidence in the small bowel.[3]

CASE REPORT

An 85 years old female was admitted under the orthopaedics department with history of slip and fall sustaining injury to the left hip with a diagnosis of left intertrochanteric femur fracture and was planned for

closed reduction with internal fixation, no other injuries or complaints were noted at the time of admission. On day 3 of admission (day 4 of trauma), patient relatives noticed abdominal distension and surgery opinion was requested in view of the same. Patient only complained of distension of abdomen with generalized pain and had no nausea, vomiting, breathlessness, stool had been passed once in the past 24 hours and she was continuing to pass flatus. No significant previous medical/surgical history was stated.

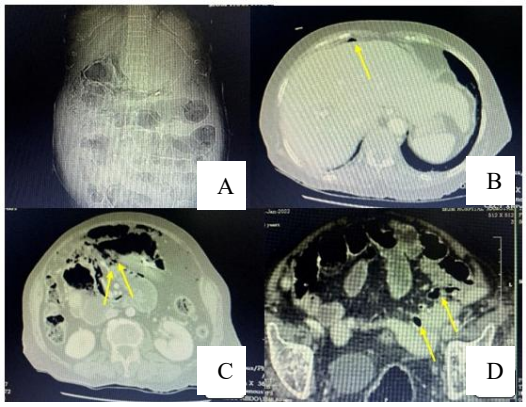

Figure 1: Radiological images: (A) radiograph suggestive of pneumoperitoneum with distended bowel loops, (B) CT abdomen (axial section) demonstrating significant free intraperitoneal air (arrow), (C) diverticula involving ileum (arrow) and (D) diverticula involving ileum (arrow).

On examination patient was conscious, oriented and vitally within normal limits with abdominal findings of distension, everted umbilicus, diffuse tenderness and guarding which was more prominent in the epigastric and right hypochondrium regions. On digital rectal examination, hard stools were present with normal sphincter tone. Patient's orthopaedic surgical procedure was deferred and planned for conservative management of the fracture after due discussion with the orthopaedic team and she was observed in the ICU. Haematological findings showed normal values along with normal serum parameters. Patient was subjected to decubitus radiograph and abdominal sonography which showed distended bowel loops along with sluggish peristalsis of bowel loop suggested CT correlation to rule out obstruction. Contrast CT of the abdomen and pelvis reported pneumoperitoneum with multiple diverticula involving ascending colon, transverse colon and ileum (Figure 1) along with a comminuted left femur intertrochanteric fracture and cholelithiasis.

She was taken up for emergency laparotomy and intraoperatively multiple adhesions were noted involving omentum, anterior abdominal wall, gall bladder, liver, small and large bowel. Dilated bowel loops were present, no perforation was found after thorough inspection of stomach, small and large bowel. Multiple diverticula (Figure 2) were noted in the duodenum, the proximal ileum, ascending colon and transverse colon. Omentum was found inflamed and hence, a specimen was collected and sent for histopathological examination. All other intraabdominal organs were intact and no other abnormalities were noted. Incision was closed in layers after placement of two intraabdominal drains and patient tolerated procedure well and was extubated post operatively, then shifted back to surgical ICU for post operative care.

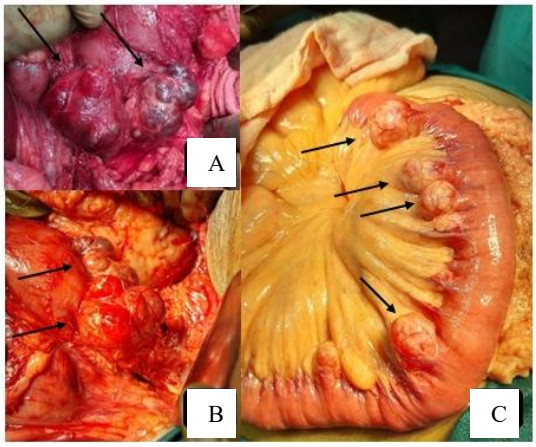

Figure 2: Intraoperative images: (A) diverticula involving ascending colon, (B) diverticula involving transverse colon and (C) multiple diverticula involving proximal ileum.

Post operatively, patient continued to remain vitally stable, distension persisted but gradually resolved by post operative day 5. Patient passed flatus on post operative day 3 and stool on day 5. Haematological findings on post op day 1 showed rise of total white cell count from 9450/cumm to 20700/cumm which showed gradual fall with IV antibiotics to 8020/cumm on post operative day 6. All other serum parameters continued to stay in normal limits.

Drains continued to show minimal serous output were removed on POD.[3] She was discharged on post operative day 7 after discussions with orthopaedic team to continue follow up in both surgery and orthopaedics outpatient departments. Patient returned for follow up on post operative day 10 and 14. Suture line was healthy and abdomen was soft on both occasions with vitals within normal limits and no fresh complaints.

DISCUSSION

Pneumoperitoneum without the presence of perforation of abdominal viscera is rare, over 90% cases present with perforation of gastrointestinal tract. Spontaneous pneumoperitoneum is known to be caused by various etiologies involving intrathoracic, intraabdominal or pelvic pathologies. It may even be iatrogenic or idiopathic.[4] Not all cases of nonsurgical pneumoperitoneum present with symptoms and amongst symptomatic cases, most common symptom is abdominal discomfort with distension. Other clinical features include

abdominal pain with or without signs of peritonitis like tenderness, guarding or rigidity on examination.[5]

Nonsurgical pneumoperitoneum is observed in approximately 5-15% cases of pneumoperitoneum amongst which pneumoperitoneum secondary to small bowel diverticulosis as found in our patient is even more rare.[1] Diverticula are rare in the small bowel and characterized by outpouchings composed of mucosa and sub mucosa. In the small bowel they are commonly present in the duodenum followed by jejunum then ileum.[6]

Etiopathogenesis of small bowel diverticula with spontaneous pneumoperitoneum is unclear and in approximately 70% patients it an incidental finding and most clinical features arise as a result of complications of diverticulosis such as diverticulitis, perforation, peritonitis, adhesions, obstructions, etc.[7] Our patient had complaints of abdominal pain, discomfort and distension along with clinical signs of peritonitis such as tenderness, guarding and rigidity.

Plain radiograph is sufficient in most cases to diagnose pneumoperitoneum whereas abdominal Contrast-enhanced CT is the gold standard for diagnosing diverticula. Radiological investigations may not be able to detect the diverticula on the mesenteric side and if patient is stable, endoscopy may be employed to diagnose diverticulosis.[7]

Cases of spontaneous pneumoperitoneum can be managed conservatively if clinically stable but the diagnosis is highly dependent on intraoperative findings and it is tough to rule out perforation in a case of pneumoperitoneum preoperatively as even CT can accurately detect alimentary canal perforations in only 85% cases.[4]

Since our elderly patient, who was originally admitted with trauma to left hip leading to left intertrochanteric femur fracture developed spontaneous abdominal distension on day 4 of trauma had clinical signs of peritonitis with contrast CT finding suggestive of pneumoperitoneum with small and large bowel diverticula (involving ascending colon, transverse colon and ileum) we opted for emergency exploratory laparotomy. Intraoperatively multiple adhesions were noted involving omentum, anterior abdominal wall, gall bladder, liver, small and large bowel. Dilated bowel loops were present, no perforation was found after thorough inspection of stomach, small and large bowel. Multiple diverticula were noted in the duodenum, the proximal ileum, ascending colon and transverse colon. Omentum was found inflamed. No cause for pneumoperitoneum could be determined in the patient but marked improvement in clinical status and resolution of all complaints of the patient was observed post operatively and post-operative period continued to remain unremarkable.

Specimen of omentum sent for histopathological examination reported features suggestive of acute inflammation of omentum. Patient was discharged on post operative day 7 and presented with no complaints in follow up and was prepared for eventual surgical repair of femur fracture after complete fitness for surgery.

No conflict of interest exists and consent of patient and relative was obtained before publishing report. Ethical committee approval was obtained.

CONCLUSION

Spontaneous Pneumoperitoneum is a rare entity and can be diagnosed rarely without surgical intervention but with precise history taking, clinical evaluation assisted by radiological investigations. Upon diagnosis of pneumoperitoneum, depending on the clinical status of the patient further plan of management can be derived. Patients with radiological findings of pneumoperitoneum and diverticula who are vitally stable with no clinical features of peritonitis may be managed conservatively and observed for resolution of pneumoperitoneum. However, the diagnosis of spontaneous or nonsurgical pneumoperitoneum is highly dependent on intraoperative findings and it is tough to rule out perforation in a case of pneumoperitoneum preoperatively. Diagnostic laparoscopy can be attempted before exploratory laparotomy but, emergency exploratory laparotomy continues to be the management of choice in most cases of pneumoperitoneum with peritonitis.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Ueda T, Tanaka T, Yokoyama T, Sadamitsu T, Harada S, Yoshimura A. Spontaneous pneumoperitoneum with duodenal diverticulosis in an elderly patient: a case report. Surg Case Rep. 2020;6:3.
2. Grewal JS, Mayer S, Beaty J, Formaro D. A rare case of spontaneous idiopathic pneumoperitoneum presenting as abdominal pain. Cureus. 2021;13(5):e15158.
3. Mantas D, Kykalos S, Patsouras D, Kouraklis G. Small intestine diverticula: is there anything new?. World J Gastrointest Surg. 2011;3(4):49-53.
4. Tanaka R, Kameyama H, Nagahashi M, Yamada T, Kawakami Y, Ueno T. Conservative treatment of idiopathic spontaneous pneumoperitoneum in a bedridden patient: a case report. Surg Case Rep. 2015;1:69.
5. Ferreira-Aparicio FE, Gutiérrez-Vega R, Gálvez-Molina Y, Ontiveros-Nevares P, Athie-Gutiérrez C, Montalvo-Javé EE. Diverticular disease of the small bowel. Case Rep Gastroenterol. 2012;6(3):668-76.
6. Benjamin G, Agnes Thomas A, Koshy M. Small Bowel Diverticulosis Causing Pneumoperitoneum

without Peritonitis: A Case Report. J Gastrointest Abd Radiol. 2018;1(1):69-71.
7. Matli V, Thoguluva Chandrasekar V, Campbell JL, Patel K, Shah R, Desai M. Jejunal diverticulitis: a rare diverticular disease of the bowel. Cureus. 2022;14(1):e21386.

Cite this article as: Malhotra V, Soni M, Sharma S, Singh A. Spontaneous pneumoperitoneum in a case of multiple intestinal diverticulosis in an elderly female admitted for intertrochanteric fracture. Int J Res Orthop 2026;12:1190-3.