

## Case Report

# When you hear hoofbeats, think horses before zebras – a case of recurrent small bowel obstructions with a twist

LongHai Jin\*, Krishanth Naidu

Department of General Surgery, The Canberra Hospital, Garran, ACT 2605, Australia

\*Corresponding author. Department of General Surgery, The Canberra Hospital, Yamba Drive, Garran, ACT 2605, Australia. Email: longhaijin@gmail.com

### Abstract

Mechanical small bowel obstructions (SBOs) account for a considerable proportion of hospital admissions for acute abdominal pain. SBOs are most frequently caused by adhesions; and very few SBOs are associated with intraperitoneal devices. An 84-year-old man was admitted to our tertiary institution with recurrent SBOs that were initially believed to be caused by his implantable cardioverter defibrillator which had undergone intraperitoneal migration. However, this was later found to be a misguided ‘zebra’; as the cause was revealed to be a common ‘horse’ — adhesions. This article shares our key learnings from this diagnostic dilemma.

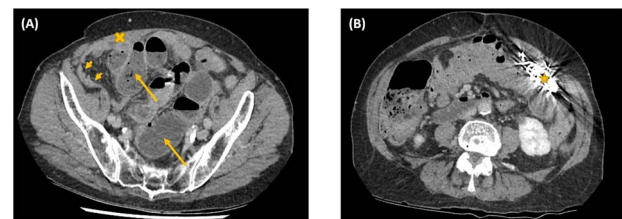
**Keywords:** small bowel obstruction; implantable cardioverter defibrillator; migration; adhesion

### Introduction

Mechanical small bowel obstructions (SBOs) have an array of aetiologies, which can be classified into extrinsic (external compression onto the bowel), intrinsic (compression from within the bowel wall), and intraluminal (obstruction from within the bowel lumen). Adhesions are the most common aetiology; and intraperitoneal devices are very rare. This article presents an elderly man who presented to our hospital with recurrent SBOs caused by adhesions; however, the diagnosis was initially misguided by an unusual migrating intraperitoneal implantable cardioverter defibrillator (ICD).

### Case report

An 84-year-old man was admitted three times to our tertiary institution within six weeks with recurrent SBOs. He presented on each occasion with acute colicky abdominal pain, vomiting and obstipation. His examination revealed abdominal distension and periumbilical tenderness without signs of peritonism. His comorbidities included ischaemic heart disease with previous triple coronary artery bypass grafts, atrial fibrillation, chronic obstructive pulmonary disease and rheumatoid arthritis. Surgically, he had a pyloroplasty as an infant; as well as an open appendectomy and a laparoscopic cholecystectomy several decades ago. Furthermore, he had an ICD (*Medtronic XT VR DVBB2D1*) placed in the left preperitoneal space two years ago for recurrent ventricular fibrillation. His pectoral anatomy had precluded a standard pectoral ICD placement. Interestingly, he has had six episodes of SBOs and all of them had occurred following the ICD placement.



**Figure 1.** Axial computed tomography images showing small bowel obstruction with a transition point in the anterior right iliac fossa (cross). There are distended small bowel loops proximally with air-fluid levels and faecalised contents (arrows); and collapsed small bowel loops distally (arrow heads). The ICD is located intraperitoneally (star).

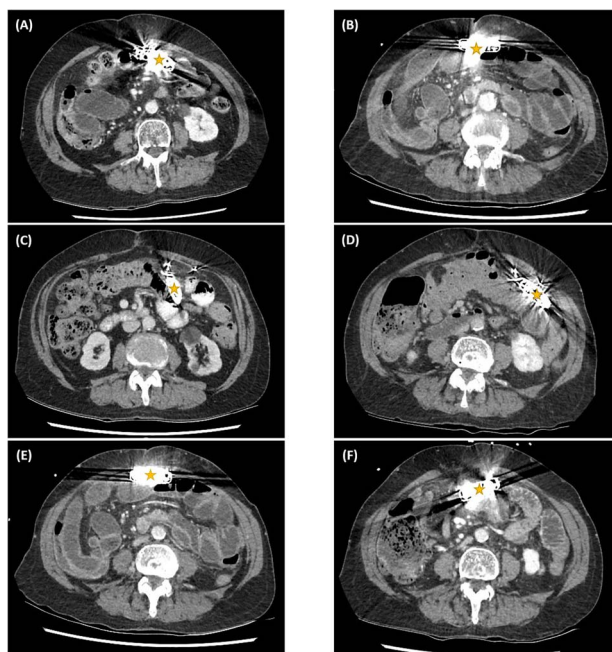
The abdominal computed tomography (CT) studies on all three recent admissions were consistent with SBO. The transition point was consistently seen in the right iliac fossa; with small bowel loops distended proximally with air-fluid levels and faecalised contents; and small bowel loops collapsed distally to the ileocaecal valve (Fig. 1A). There were no signs of bowel ischaemia or perforation. However, the preperitoneal ICD appeared to have migrated into the peritoneal cavity (Fig. 1B). On review of the serial abdominal CT studies over the past two years, the ICD was in a different intraperitoneal location each time (Fig. 2). The recurrent episodes of SBOs were thus believed to be related to the ICD, due to either intraperitoneal migration of the device or formation of adhesions from its placement, given the coinciding timeline.

For the first and second hospital admissions, he was managed non-operatively with nil-per-oral, nasogastric tube decompression, intravenous fluids and electrolytes. He successfully passed

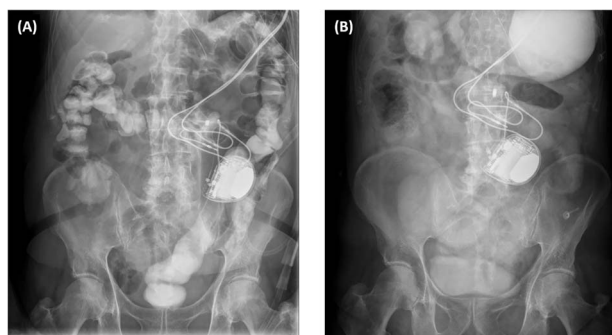
Received: August 24, 2023. Accepted: September 21, 2023

Published by Oxford University Press and JSCR Publishing Ltd. © The Author(s) 2023.

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<https://creativecommons.org/licenses/by-nc/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited. For commercial re-use, please contact [journals.permissions@oup.com](mailto:journals.permissions@oup.com)



**Figure 2.** Serial computed tomography studies from the six episodes of SBOs showing the abdominal ICD device (star) in a different intraperitoneal location each time — in March (A), April (B), and November (C) of 2019; November (D) and December (E) of 2020; and January (F) of 2021.



**Figure 3.** X-ray plain films of the abdomen showing passage of *Gastrografin* into the colon and rectum during the first admission (A); and the non-progression of *Gastrografin* in the stomach during the third admission (B).

*Gastrografin* follow-through into the colon (Fig. 3A). His diet was then progressed and he was discharged home. For the third admission, he did not pass *Gastrografin* follow-through (Fig. 3B). His treatment was escalated for several indications, including the frequency of SBO recurrences, suspected intraperitoneal migration of the ICD, non-progression of *Gastrografin* follow-through and non-resolution of obstructive symptoms. He underwent a laparotomy to surgically relieve the mechanical obstruction. Intraoperatively, dense matted adhesions were found between loops of small bowel in the right iliac fossa. Although the ICD was freely floating within the peritoneal cavity, but it did not cross to the right side to have direct involvement with the mechanical transition point. Extensive adhesiolysis was performed to release the mechanical transition point of the small bowel. The ICD was then resecured in a new retrorectus pocket on the left abdominal wall. His post-operative recovery was uneventful and he was discharged home a week later.

SBOs account for 15% of emergency presentations for acute abdominal pain as well as 15% of gastrointestinal surgical

admissions to hospital [1]. Adhesions are responsible for 65% to 74% of SBOs [1, 2]. Other mechanical causes of SBO are hernias, tumours, volvulus, intussusception and Crohn's disease. In the absence of bowel ischaemia, perforation and peritonitis, 73 to 90% of SBOs resolve non-operatively with supportive treatment, especially with judicious use of water-soluble contrast agents like *Gastrografin* [3, 4]. However, SBOs can still have profound impacts on the quality of life of patients due to symptoms of pain and obstruction, as well as from discomfort associated with interventions and operations.

Placement of cardiac devices on the abdominal wall is uncommon compared to the usual pectoral placement. Migration of abdominal devices is therefore even rarer as a complication. Li et al.[5] reported on a case of intraperitoneal migration of a retrorectus cardiac pacemaker ten months following its placement in a 60-year-old woman. SBOs caused by intraperitoneal devices are also rare. A few isolated cases of SBOs have been caused by Tenckhoff peritoneal dialysis catheter, migrated hernioplasty mesh and V-Loc sutures, as well as left ventricular assist device driveline [6–10].

In medicine, there is an old saying 'when you hear hoofbeats, think of horses before zebras'. It highlights that we should not be distracted by more exotic diagnoses (the zebras) when simple and common diagnoses (the horses) are plausible. In this case, the apparent device migration and the onset of SBOs after ICD placement clouded the diagnosis for the mechanical cause of the SBOs. In retrospect, the serial CT studies consistently showed the transition point in the right iliac fossa despite the ICD migrating around the left-to-mid peritoneal cavity. It was recognised intraoperatively that the extensive adhesions in the right iliac fossa were probably developed several decades earlier from the acute appendicitis and open appendectomy and had remained dormant until the recent ICD placement. It is thus imperative to meticulously evaluate the previous medical and surgical histories — as they may allow an otherwise seemingly occult aetiology to be identified that would redirect the subsequent treatment.

## Conflict of interest statement

None declared.

## Funding

None declared.

## Data availability

Data is available upon request by contacting the corresponding author.

## Patient consent

Consent provided by the patient.

## References

1. Rami Reddy SR, Cappell MS. A systematic review of the clinical presentation, diagnosis, and treatment of small bowel obstruction. *Curr Gastroenterol Rep* 2017;**19**:28.
2. Scott FI, Osterman MT, Mahmoud NN, Lewis JD. Secular trends in small-bowel obstruction and adhesiolysis in the United States: 1988-2007. *Am J Surg* 2012;**204**:315–20.

3. Seror D, Feigin E, Szold A, Allweis TM, Carmon M, Nissan S, et al. How conservatively can postoperative small bowel obstruction be treated? *Am J Surg* 1993;**165**:1215; discussion 125-6-6.
4. Ceresoli M, Coccolini F, Catena F, Montori G, Di Saverio S, Sartelli M, et al. Water-soluble contrast agent in adhesive small bowel obstruction: a systematic review and meta-analysis of diagnostic and therapeutic value. *Am J Surg* 2016;**211**:1114-25.
5. Li KS, Khwaja HA, Hayat TT, Asghar A, Alsarakbi W, Kelley C, et al. A rare cause of abdominal pain. *Ann R Coll Surg Engl* 2007;**89**:W14-6.
6. Huraib SO. Intestinal obstruction as a complication of continuous ambulatory peritoneal dialysis: a case report. *Saudi J Kidney Dis Transpl* 1995;**6**:304-7.
7. Tiwari SK, Lal P. A rare case of acute intestinal obstruction due to bowel entrapment in migrated onlay polypropylene mesh. *Ann R Coll Surg Engl* 2014;**96**:e4-5.
8. Picchio M, Muggianu A, Mancini F, Tintisona O, Spaziani E. Complete mesh migration into the small bowel after incisional hernia repair: a case report and literature review. *Acta Chir Belg* 2017;**117**:118-21.
9. Tagliaferri EM, Wong Tavera SL, Abad de Jesus JL, Bergmann H, Hammans S, Seidlmayer CM. Small bowel obstruction SBO after TAPP repair caused by a self-anchoring barbed suture device for peritoneal closure: case report. *J Surg Case Rep* 2018;**7**:rjy165.
10. Miklin D, Lewis I, Lieberman H. Bowel obstruction due to retained intraperitoneal left ventricular assist device (LVAD) driveline. *J Cardiothorac Surg* 2018;**13**:46.