CASE REPORT

Ileal conduit volvulus: rare complication of urinary diversion

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Accepted 1 January 2019

SUMMARY

Ileal conduit volvulus is a rare complication of urinary diversion. It has been suggested that various factors including prolonged length of the ileal segment, lack of fixation of the conduit to the peritoneum and failure to close the incised mesentery predispose patients to this complication. We present the case of a 76-year-old man who presented to hospital with severe abdominal pain and oliguria secondary to a volvulus of his ileal conduit. Investigations revealed early acute kidney injury as a result of urinary obstruction which was evident on abdominal CT. The patient subsequently underwent operative repair of the volvulus. Symptoms resolved following the procedure, kidney function improved and the patient was discharged without complication.

BACKGROUND

Volvulus of an ileal conduit is characterised by abdominal pain, reduced urine output and elevated creatinine. Although a rare complication of urinary diversion, it has the potential to carry significant morbidity if not recognised early and managed appropriately. To date, less than 10 cases have been reported in the surgical literature. Due to its rarity, there is no consensus regarding the workup and management of this complication. With this case report, we hope to provide medical practitioners with further insight into ileal conduit volvulus and present a framework in order to approach and manage the condition.

CASE PRESENTATION

A 76-year-old man presented to the emergency department with progressively worsening lower abdominal pain, nausea and vomiting. He had undergone a pelvic exenteration for T4N2M1 rectal cancer approximately 1 year prior. As part of this procedure, a radical cystoprostatectomy was performed with subsequent formation of an ileal conduit. The patient had noted minimal output from his urostomy in the past 6 hours. On examination, he was tender in the right lower quadrant with associated guarding. He was hypertensive but otherwise haemodynamically stable and afebrile.

On investigation, laboratory tests revealed a white cell count of $5.59 \times 10^9/L$, C reactive protein 8 mg/L and lactate of 1.5 mmol/L. The estimated glomerular filtration rate (eGFR) was 74 mL/min/1.73 m² with a creatinine of 91 µmol/L. A CT scan was performed which demonstrated obstruction of the ileal conduit at the level of the right-sided

abdominal stoma (figure 1) with concurrent hydro-nephrosis of both kidneys and bilateral perinephric stranding (figure 2).

Due to irretractable abdominal pain despite significant amounts of opioid analgesia and a sinister abdominal examination, the patient was taken to the operating theatre. Local exploration of the urostomy site confirmed a complete obstruction of the ileal conduit secondary to a volvulus in the axial plane. Overt ischaemia was already apparent proximal to the site of the volvulus (figure 3). The obstruction was relieved and the non-viable segment of the stoma resected. The remaining proximal viable part of the ileal conduit was refashioned to create a new stoma. The procedure was without complication and the following day the patient was pain free with an active urostomy. Histopathology later revealed variable ischaemic change of the resected bowel consistent with haemorrhagic infarction.

DIFFERENTIAL DIAGNOSIS

Conduit related

- ▶ Stenosis.
- ▶ Mucus plug.
- ▶ Parastomal hernia.
- ▶ Pseudo-obstruction.
- ▶ Thrombosis of ileal conduit veins.

Genitourinary

- ▶ Ureterolithiasis.
- ▶ Pyelonephritis.
- ▶ Stricture (anastomotic or ureteral).
- ▶ Extrinsic compression of ureter (secondary to crossing vessel or recurrent tumour).

Gastrointestinal

- ▶ Small bowel obstruction.
- ▶ Diverticulitis.
- ▶ Appendicitis.
- ▶ Inflammatory bowel disease.

OUTCOME AND FOLLOW-UP

The patient was discharged from hospital 3 days after his operation pain free with an active urostomy. He was to follow-up with his urologist and oncologist for ongoing care. To date, the patient has had no further complications relating to his ileal conduit.

DISCUSSION

Construction of an ileal conduit was first described by Seiffer in 1935¹ with the procedure being refined and popularised by Bricker in 1950.² The

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To cite: Shamavonian R, Andrawis N. *BMJ Case Rep* 2019;**12**:e227924. doi:10.1136/bcr-2018-227924

Figure 1 Axial image of the abdominal CT demonstrating the obstructed ileal conduit (arrow).

procedure is conducted following cystectomy and involves resecting the ureters from the bladder, reimplanting them into a segment of the ileum and exteriorising the isolated segment of ileum through the abdominal wall as a stoma. A number of complications are associated with the procedure, the most common being nutritional and metabolic abnormalities, infection, renal insufficiency and stomal problems (particularly parastomal hernias).³ The frequency of these complications and their occurrence varies in relation to the timing of the surgery.

Volvulus of an ileal conduit is an extremely rare complication of urinary diversion and only a handful of cases have been reported in the literature. A number of factors have been described that may predispose an ileal conduit to twist on itself. When constructing an ileal conduit, the length of bowel is of particular importance in avoiding future complications. An ileal segment lacking in length can create unnecessary tension on the cutaneous stoma. Allowing too much length will create a redundant piece of small bowel with the subsequent mobility predisposing it to twist on itself.⁴ During the procedure, the mesentery is incised in order to create the conduit and at the conclusion of the case, closing the mesenteric window will avoid the possibility

Figure 2 Coronal image of abdominal CT demonstrating bilateral hydronephrosis and hydroureter (star) with bilateral perinephric stranding (arrow).

Figure 3 Intraoperative photograph of ileal conduit demonstrating (A) signs of patchy focal ischaemia (black arrows) and (B) dusky bowel with focal point of ischaemia (red arrow).

of internal herniation. Surgeons may choose to fixate the ileal conduit to the abdominal wall or peritoneum in order to create stability and thus reduce the risk of volvulus. It was interesting to note in our case that no fixation of the ileal conduit was identified. Finally, it has been suggested that slender people may be at increased risk of small bowel volvulus because the absence of excess fat padding of the mesentery and retroperitoneum predispose the segment of bowel to excessive mobility.⁵

Symptoms of ileal conduit volvulus in reported cases consist of abdominal pain, nausea, vomiting, oliguria or anuria.⁶ In most cases, patients had generalised abdominal tenderness on examination. Traditionally, intravenous urography and fluoroscopic retrograde urography were used to evaluate the integrity of an ileal conduit. However, with increasing accessibility to multi-detector CT and its speed in providing images, it has emerged as the gold standard for identifying complications of an ileal conduit. Furthermore, its ability to simultaneously assess extra-urinary structures and not be impeded by body habitus or the presence of stool or intestinal gas, which can hinder evaluation with intravenous urography, makes it an advantageous imaging modality.⁷

We would suggest surgical exploration as the definitive management choice for ileal conduit volvulus. This allows the operator to relieve the obstruction and simultaneously assess the bowel for signs of ischaemia. If required, resection of the non-viable segment of ileum can ensue. Alternatively, percutaneous nephrostomy can be used as a temporising measure to relieve the obstruction with the view of undertaking surgery in the near future. As a stand-alone management, although described in some case reports with limited success,⁸ we could not recommend percutaneous nephrostomy as a definitive treatment choice for volvulus of an ileal conduit. Another non-operative intervention to manage ileal conduit volvulus is decompression with the use of a Foley catheter. Gentle navigation of the conduit through the external opening of the stoma may cause the volvulus to untwist. Although not described in the literature, this was attempted in the current case both with the practitioner's finger and a Foley catheter without success. If clinicians are to attempt this method, they should have a low threshold to abandon if met with resistance due to the high risk of perforation. Even with successful decompression, the inability to assess the bowel and high risk of retorsion would warrant close observation in hospital and arguably elective surgical exploration and repair in the near future.

Although rare, clinicians should consider ileal conduit volvulus as a potential cause of obstruction in patients who have undergone urinary diversion that present with abdominal pain and

oliguria. Rapid assessment with multidetector CT followed by surgical exploration should be conducted in all patients.

Learning points

- ▶ Medical practitioners should consider volvulus as a potential complication of urinary diversion in patients that present with abdominal pain and reduced urine output.
- ▶ Abdominal CT should be the imaging of choice to help confirm diagnosis.
- ▶ Surgical exploration and management are recommended for all patients that present with ileal conduit volvulus.

Contributors RS initially saw the patient on his presentation, was part of the surgery and looked after him until discharge. He gained consent from the patient to write up the case report. He also undertook the literature research and was the primary person who wrote up the case report. NA was the case consultant. He captured the operative images during the procedure. He was involved with the planning of the case report and provided guidance on how to approach it. He also helped undertake the literature review. He was the main editor of the case report and made changes that he felt appropriate following RS first draft.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Seiffer L. Die Darm-Siphonblase. *Arch fur Klinische Chirurgie* 1935;183:569. in German.
- 2 Bricker EM. Bladder substitution after pelvic evisceration. *Surg Clin North Am* 1950;30:1511–21.
- 3 Madersbacher S, Schmidt J, Eberle JM, *et al.* Long-term outcome of ileal conduit diversion. *J Urol* 2003;169:985–90.
- 4 Colombo R, Naspro R. Ileal Conduit as the Standard for Urinary Diversion After Radical Cystectomy for Bladder Cancer. *Eur Urol Suppl* 2010;9:736–44.
- 5 Vaez-Zadeh K, Dutz W, Nowrooz-Zadeh M. Volvulus of the small intestine in adults: a study of predisposing factors. *Ann Surg* 1969;169:265–71.
- 6 Ahmed K, Godbole HC, Dasgupta P, *et al.* Volvulus--a rare complication of ileal conduit. *Int J Clin Pract* 2005;59:858–60.
- 7 Kawamoto S, Fishman EK. Role of CT in postoperative evaluation of patients undergoing urinary diversion. *AJR Am J Roentgenol* 2010;194:690–6.
- 8 Flanagan FL, Fenlon HM, Breatnach E. Ileal loop conduit volvulus: a rare but reversible cause of bilateral ureteric obstruction. *Clin Radiol* 1995;50:177–9.

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