

## Internal Small Bowel Herniation and Obstruction Following Robotic Cystectomy - A Case Report and Review of the Literature

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### Abstract

Small bowel obstruction (SBO) secondary to internal herniation is a rare complication following radical cystectomy. We review a case of a 58-year-old man representing as an emergency 2 years following robotic cystectomy with acute abdominal pain, left flank pain and vomiting. Laparotomy revealed an internal hernia causing small bowel and left ureteric obstruction. Traditional surgical technique sets a precedent for closing potential hernia sites, however recent advances in robotic cystectomy may mean these defects are often left open.

### Case report

A 58-year-old man presented to the emergency department of a district general complaining of a 24-hour history of diffuse abdominal pain, bilious vomiting and left loin pain. He had previously undergone a robot-assisted radical cystectomy (RARC) and intracorporeal ileal conduit diversion 2 years ago for a G3pT1 + CIS bladder carcinoma. His recovery had been uneventful until the day of presentation. Interim staging CT images of the chest, abdomen and pelvis showed no evidence of tumour recurrence.

Past medical history was uneventful and he enjoyed a performance status of 0. He had no regular medications and no known drug allergies.

Initial observations were within normal limits. Abdominal examination revealed a distended, tympanic but soft abdomen with tenderness in the left renal angle. Digital rectal examination revealed an empty rectum.

Initial management included naso-gastric (NG) tube insertion which drained 1000mLs of bilious fluid, intravenous (IV) fluid resuscitation and IV antibiotics.

Initial blood tests showed haemoglobin 153g/dL, white cell count  $12.2 \times 10^9/L$ , C-reactive protein 8mg/L, Urea 8.5mmol/L, Creatinine 141 $\mu$ mol/L and lactate 4.8mmol/L.

CT scan of the abdomen and pelvis revealed distended loops of small bowel with a transition point close to the ileal conduit. There was also left ureterohydronephrosis with associated left perinephric stranding (Figure 1).

Due to acute kidney injury and left ureterohydronephrosis, a left nephrostomy was placed 24h later under local anaesthetic.

Conservative measures (NG tube, IV fluids and gastrograffin) failed to resolve symptoms, therefore the patient was taken for laparotomy 48h later. Approximately 30cm of bowel had herniated through the mesenteric defect at the ileo-ileal anastomosis. The herniated bowel was gently manipulated and returned to its correct position. This showed the left ureter to have been involved in the hernia, appearing swollen and thrombosed. The left ureter was left intact in the knowledge that there was a covering nephrostomy. The small bowel appeared injected but viable throughout. The mesenteric defect was closed with interrupted 2-0 Vicryl to prevent recurrence.

The patient subsequently made an uneventful recovery and was discharged 9 days following laparotomy with a covering nephrostomy in situ. Nephrostogram 3 weeks post-operatively showed a stricture at the uretero-ileal anastomosis which was successfully managed with an antegrade stent.

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Figure 1: Ureterohydronephrosis with associated left perinephric stranding

## Discussion & review of the literature

Ileal conduit diversion was popularised in 1950 by Bricker and is a popular technique, traditionally performed with closure of all mesenteric and peritoneal defects to minimise internal herniation [1,2].

Bricker's original technique involved having the distal ureters emerge from the peritoneum of the posterior abdominal wall adjacent to the proximal bowel conduit and suturing the intra-abdominal ureter to the conduit. Potential internal hernia sites such as mesenteric defects are closed. Bricker's technique also involved obliterating the peritoneal defect in the right lumbar gutter and suturing the ileal conduit to the posterior peritoneum [2]. Further modifications included sewing the cut peritoneal edge to the conduit or pulling the medial peritoneal flap over the ileal stump and ureters to retroperitonealise the conduit [3,4].

Small bowel obstruction (SBO) following radical cystectomy (RC) has been described in detail by Varkarakis et al [5]. They noted a SBO incidence of 3.2% and 7.3% in the early and late post-operative periods respectively. The authors identified that small bowel obstruction secondary to internal herniation following cystectomy is rare, carrying an incidence of 0.2%.

The most common reasons for SBO following cystectomy are adhesions and local recurrence [1]. Varkarakis were only able to identify tumour stage >T3a as a risk factor for small bowel obstruction following RC. Anastomotic failure and recurrence were the most common reason for small bowel obstruction in the early and late period respectively.

No surgical techniques were found to be statistically significant as predictor of small bowel obstruction. However, when retroperitonealisation of the uretero-ileal anastomosis was not performed, both early and late SBO occurred more often ( $P = 0.06$ ). In addition, SBO due to anastomotic malfunction in the late period occurred more often ( $P = 0.06$ ) when the ileo-ileal

anastomosis was hand-sutured end-to-end [5].

A study in the 1980's by Sullivan et al. found higher incidences of severe intestinal obstruction of 3% and 8.5% at 6 and 60 months respectively. The literature review in this study showed a high variability of incidence of 1.8% to 15% postoperative intestinal obstruction [6].

A review of 13-year experience with Bricker's group showed that, like Varkarakis, most obstructions were due to adhesions or metastatic disease. 10% were related to internal hernias and predominantly involved the right lumbar gutter. In this series, intestinal obstruction carried a mortality of 21% [7].

Historical review sets a precedent for closure of potential internal hernia sites, such as the mesenteric defect. Recent advances in laparoscopic and robotic techniques often leave these defects open [8,9]. However, there is little in the literature regarding the consequences of leaving mesenteric defects open. This is somewhat surprising as SBO is a significant complication with the need for reoperation and carries high patient mortality [10].

We report the first case of internal hernia following robotic cystectomy with obstruction of the small bowel and left ureter. The appearance of both small bowel obstruction and left ureterohydronephrosis made our team concerned for local tumour recurrence, especially considering recent reports of atypical patterns of local recurrence following RARC [11]. Placement of the covering nephrostomy pre-operatively avoided the need for difficult stent insertion through the ileal conduit or a nephrostomy insertion in a non-hydronephrotic renal pelvis after reduction of the internal hernia.

This unusual case highlights the possibility of internal herniation following RARC. Both urologists and general surgeons should be alert to the possibility of an internal hernia following RARC. We also emphasise the need for mesenteric defects to be closed in robotic surgery, as they are in open cases. This has led to a change in surgical technique in our unit to now routinely close mesenteric defects between the ileo-ileal anastomosis.

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