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First Irish and tenth case of small bowel obstruction secondary to suprapubic catheterisation in the world. Case report and case review of a rare complication of suprapubic catheterisation

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ABSTRACT

INTRODUCTION: Percutaneous Suprapubic urinary bladder catheterisation (SPC) is a common procedure performed in cases of urinary retention where attempt to pass urethral catheter has failed. However, the procedure requires meticulous precision, vigilance and sound knowledge of anatomy, to avoid grave complications. We are reporting a very rare complication of Suprapubic catheterisation that is small bowel obstruction. Our case is first Irish and 10th global case of small bowel obstruction secondary to SPC.

CASE PRESENTATION: Aim of this study was to report this rare complication of the SPC in our patient who was 88 years old retired farmer presenting to emergency department with small bowel obstruction. In our case after clinical examination diagnosis was made with CT scan. Laparoscopy done and found that SPC passed through mesentery before entering bladder and was released laparoscopically.

We also searched the literature to find similar reported cases to extract useful information from these cases and use this information to draw conclusions and make recommendations to avoid injuries in the future. Database search conducted in March 2017 on the bibliographic databases Ovid MEDLINE (1946 to November 2016) and EMBASE (1980 to November 2016) along with additional reference searching revealed only 9 reported cases of small bowel obstruction secondary to SPC.

CONCLUSIONS: From the extensive literature search we found that there are only nine cases reported so far globally, and our case is first Irish and tenth international case of bowel obstruction secondary to SPC. Significantly distended bladder, use of ultrasound and extra precaution in elderly patients can reduce the risk of damage to bowel.

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1. Introduction

Percutaneous Suprapubic urinary bladder catheterisation (SPC) is a common procedure performed in cases of urinary retention where attempt to pass urethral catheter has failed. Most commonly this procedure is performed in emergency department under local anaesthesia. However, the procedure requires meticulous precision, vigilance and sound knowledge of anatomy, to avoid grave complications. Fig. 1 shows the important anatomical features and location of bladder in pelvis and it also points to an area of peritoneal cavity that might contain loop of bowel and lead to injury if bladder is not adequately distended. As can be seen in Fig. 2, when bladder is distended it pushes peritoneum away and makes it relatively safe to put SPC.

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Bowel obstruction, though uncommon, but is a possible complication of SPC. If a patient presents with bowel obstruction and has SPC in situ, SPC should be considered a possible aetiology. Early diagnosis and management can reduce the post-op morbidity of the patient. In our case report, we discuss the management of first Irish patient presented with small bowel obstruction secondary to SPC. This case report provides the second ever case [1] managed laparoscopically, thus potentiating that minimal invasive surgery provides promising results that will deliver better outcomes. The work has been reported in line with the SCARE criteria [2].

2. Case presentation

An 88-year-old Irish gentleman with normal BMI who was a retired farmer, presented to Emergency department (ED) in Secondary care hospital in Ireland. He was brought to ED by family with one-day history of complaints of vague abdominal pain and vomiting. He had SPC inserted 8 years ago, due to urinary retention secondary to benign prostate enlargement (BPH). He underwent

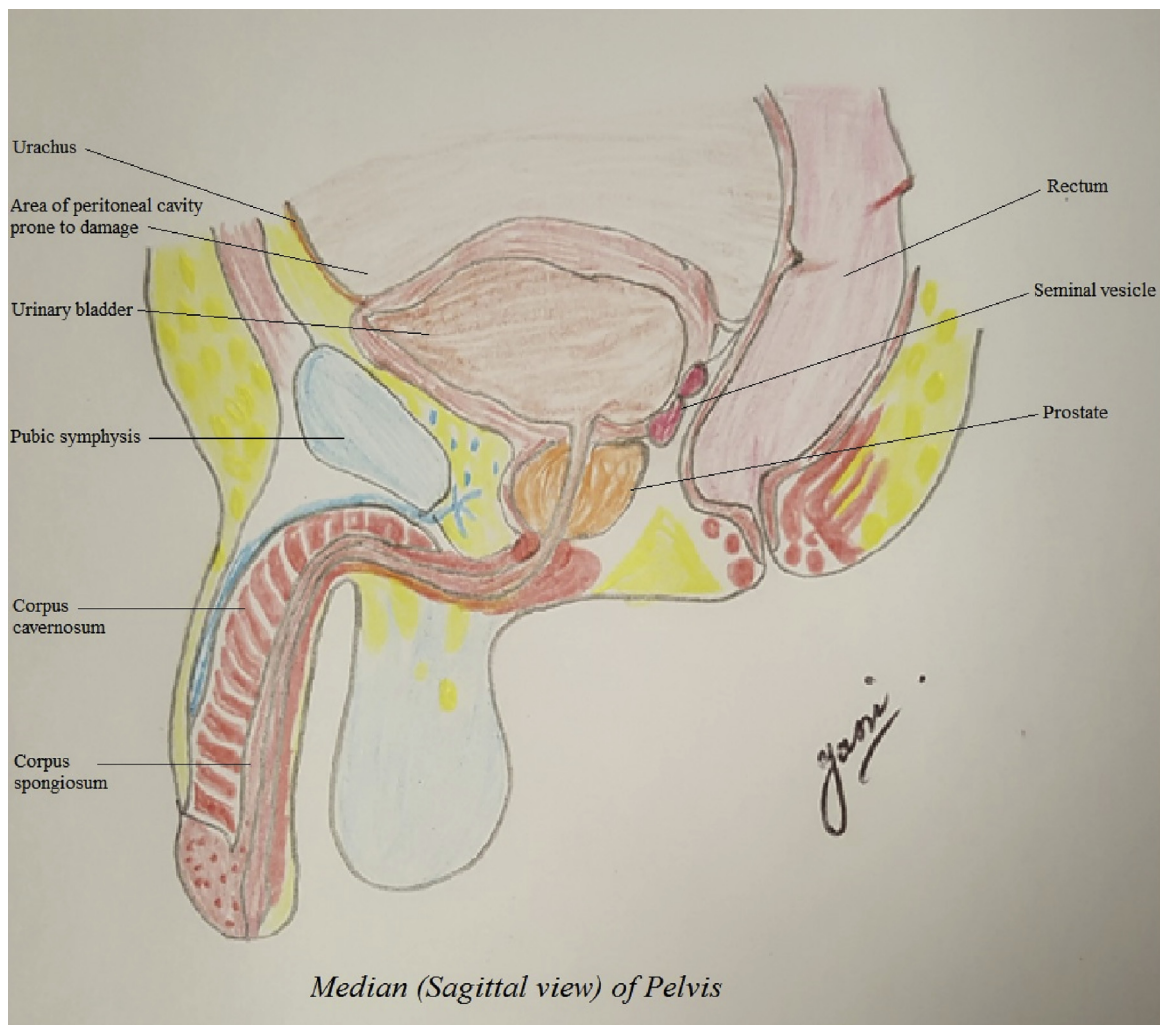


Fig. 1. Salient anatomical features of pelvis on sagittal view can be seen especially the area of peritoneal cavity where bowel can be injured can be seen if bladder is not distended.

transurethral resection of prostate (TURP) and had no further problem until 2 weeks ago, when he again had an episode of urinary retention. Urethral catheterisation was attempted multiple times but weren't successful. SPC was inserted and postoperatively once clear urine started collecting in the urinary bag, patient was discharged home same day. Patient was fine and clear urine was draining from SPC as per the available notes from the other hospital (Fig. 3).

Past medical history included bilateral inguinal hernias, TURP, colonic diverticular disease, gastritis, hypertension, peripheral vascular disease, asthma, recurrent urinary tract infections and depression. Patient was a non-smoker, living with his family, he walks with an aid of a stick and his baseline mobility was reasonable for his age.

On admission patient appeared dehydrated but was conscious, alert, oriented in time, place and person. He was neither anaemic nor jaundiced. Vital signs were within normal limits. Pulse rate 78/min, blood pressure 125/65 mmHg, temperature 36 °C, SPO2 96% at room air. Abdomen was soft but slightly distended with mild periumbilical tenderness. There was a moderate size, reducible indirect left inguinal hernia and had a functioning suprapubic urinary catheter in situ (Fig. 4).

Biochemical and haematological investigations revealed white cell count (WBC) 24.4 with neutrophilia of 20.1. Hb 15.1 g/dl, CRP

was 42, Urea and Creatinine were 11.9 and 143 respectively. Patient had moderate renal impairment and eGFR was 40.

A chest radiograph was normal but plain abdominal film showed dilated bowel loops, which were predominantly small bowel loops. An urgent CT scan abdomen showed that SPC was passing through the intraperitoneal space and there was a loop of small bowel twisted close to SPC. There were dilated bowel loops proximal and collapsed loops distal to this area. An artefact due to bilateral hip replacement resulted in poor quality CT scan, but upon consultation of an experienced radiologist bowel obstruction secondary to SPC was confirmed (Fig. 5).

Patient was managed as bowel obstruction keeping him nil per mouth, intravenous fluids and VTE prophylaxis given. Laparoscopy of the patient was performed by consultant general surgeon with vast experience in laparoscopic surgery. Intra-operative findings revealed while travelling from skin to bladder, SPC had passed through full thickness of small bowel mesentery. Surprisingly, no blood vessels or any other integral structures were damaged. There were dilated loops of bowel proximal to that area but there was no blood in the pelvis. Attempt was made to distend the bladder using SPC, removing SPC and placing another under direct vision using laparoscopy, as explained by Goldblum et al. [1]. But bladder was not distending enough to push peritoneum away. So, the area of the mesentery hooked by SPC was divided and bladder was anchored to anterior abdominal wall using intracorporeal sutures. Bowel was

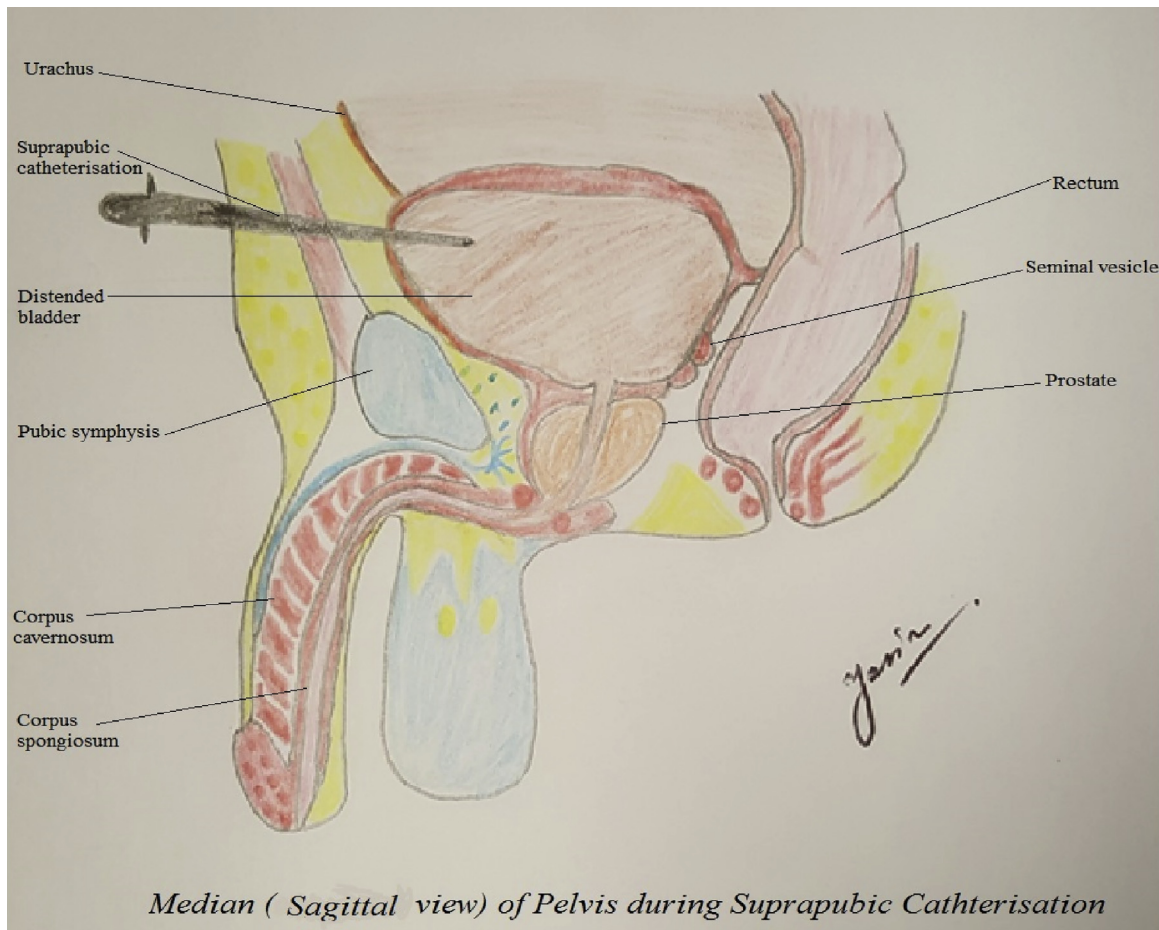


Fig. 2. Suprapubic catheterisation in sagittal view with distended bladder can be seen.

extensively examined for vascularity and after satisfaction 10 mm umbilical port closed using PDS suture. Patient was transferred to general surgical ward after recovery. Patient could eat and drink same day and was sent home following day. He was really satisfied when seen in the clinic 6 weeks, as he had a quick and uneventful recovery (Fig. 6).

3. Discussion and case review

Most commonly reported complications after suprapubic catheterisation are urinary tract infections, bleeding, bowel injury and incisional hernia. There were two large studies on complications post SPC insertion, they reported incidence of 2.7% and 2.4% of bowel perforation respectively [3,4]. Both studies were carried out in UK in 2006 and 1998 and there were 5 cases of bowel perforation in each of above mentioned studies. Ahluwalia et al. reported mortality rate of 1.8% in their study [3] while mortality rate of 0.8% was reported by Sheriff et al. [4].

The least common complication of the suprapubic catheterization is bowel obstruction. Keen observation of the patient and high levels of suspicion in case of delayed recovery is the key in diagnosing the problem and reducing morbidity. There are only few reported cases in the world of bowel obstruction secondary to suprapubic catheterisation (Fig. 7).

Database search conducted in March 2017 on the bibliographic databases Ovid MEDLINE (1946 to November 2016) and EMBASE (1980 to November 2016) along with additional reference searching revealed only 9 reported cases of small bowel obstruction secondary to SPC. However, our case is the first to be reported

from Ireland and second reported case that was managed through laparoscopy. The details of the cases reported are summarised in Table 1.

Upon literature review, it is observed that the presentation with bowel obstruction can be from 1 day [8] up to 4 years [11]. So, high degree of suspicion is important in early diagnosis of these cases. Average age of patients presenting with bowel obstruction secondary to SPC was 75.88 yrs. Wilson et al. [13] found that bladder dysfunction is extremely common in elderly patients, with only 14 patients out of 70 in their study having no symptoms. Our patient was 88yrs old making him oldest patient to present with small bowel obstruction.

One thing was noticed in most of the cases, that CT scan was accurate in diagnosing bowel obstruction and as was mentioned by other studies that it is very accurate in diagnosis of bowel obstruction preoperatively [14]. In all of these cases patients were vitally stable except as mentioned by Lin et al. [8], their patient became unstable and necessitated transfer to ICU. But that was the only patient that presented acutely after the procedure. All cases were managed with laparotomy, increasing the post-op morbidity of the patient and increasing post-op hospital stay. Only Goldblum et al. [1] managed the small bowel obstruction laparoscopically and patient was discharged home 2 days later. They removed the catheter and after being satisfied with haemostasis, they replaced SPC under laparoscopic control. In our case, patient was managed laparoscopically, could eat and drink the same day and was discharged home next day.

Laparoscopy was considered as a contraindication for bowel obstruction but Strickland et al. [15] in 1999 showed that it can be

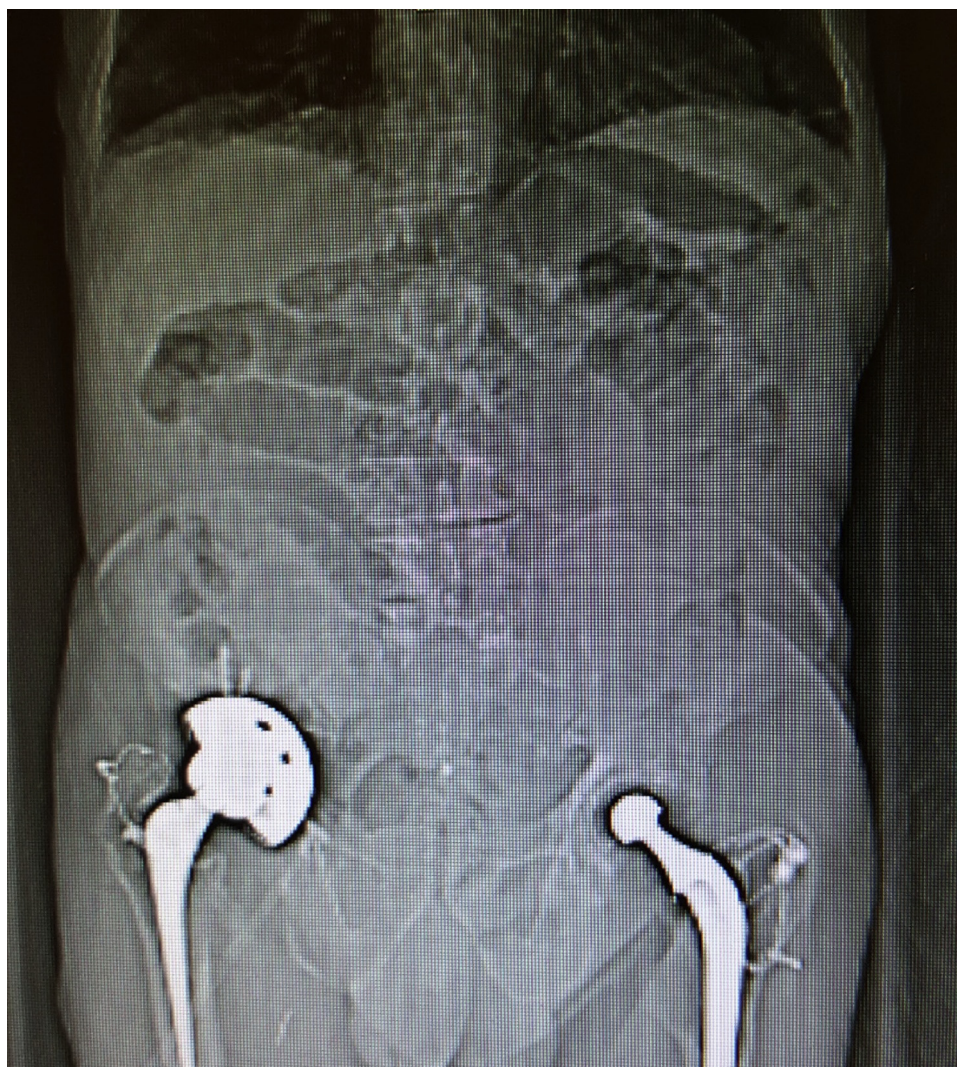


Fig. 3. PFA shows dilated bowel loops in abdomen. Bilateral hip prosthesis can also be seen.

Table 1

Details of the cases reported so far on SBO (small bowel Obstruction) secondary to SPC (suprapubic catheterisation).

Article	Journal and year	Country	Guidance ^b	(time elapsed) ^a	Age	Indication for SPC	Treated with
Moody TE et al. [5]	J urology 1977	USA	None	10 days	63yr	BPH	Laparotomy
Sullivan LP et al. [6]	Surgery 1990	USA	None	14 months	70yr	Neurogenic bladder	Laparotomy
Goldblum et al. [1]	Surg Endoscopy 1999	Switzerland	None	6 days	78yr	BPH ^c	Laparoscopy
Simpson R [7]	The J. of Urology 2001	Australia	None	10 days	76yr	BPH	Laparotomy
Lin A et al. [8]	J of Emer Med 2005	Taiwan	None	1 day	75yr	Neurogenic bladder	Laparotomy
Krishnan A et al. [9]	The Scientific World J. 2006	UK	Cystoscopy	10 weeks	83yr	Prostate CA	Laparotomy
Shetty K et al. [10]	British J. of medical and Surg urology 2012	UK	Cystoscopy	9 months	71yr	Incontinence (neurogenic)	Laparotomy
Delia et al. [11]	British journal of Hosp Medicine 2013	UK	Cystoscopy	4 years	83yr	BPH	Laparotomy
Bonasso P et al. [12]	Urology case reports 2016	USA	None	4 days	84yr	Neurogenic bladder	Laparotomy

^a time elapsed between SPC procedure and symptoms.

^b guidance either radiological, cystoscopic or none.

^c BPH (benign prostatic hyperplasia).

safely done in patients with acute bowel obstruction. This results in an earlier return of bowel function and a shorter postoperative length of stay reducing morbidity and ultimately total cost of the procedure. Therefore, we recommend that laparoscopic treatment of the patients must be attempted in cases of bowel obstruction,

if they are stable and there is no contraindication to laparoscopy (Fig. 8).

We also recommend using radiological guidance for insertion of SPC in difficult cases to avoid injuries. The guidelines of British association of urology 2011 [16] for suprapubic catheter must be followed, which provide guidelines for safe practise of the tech-

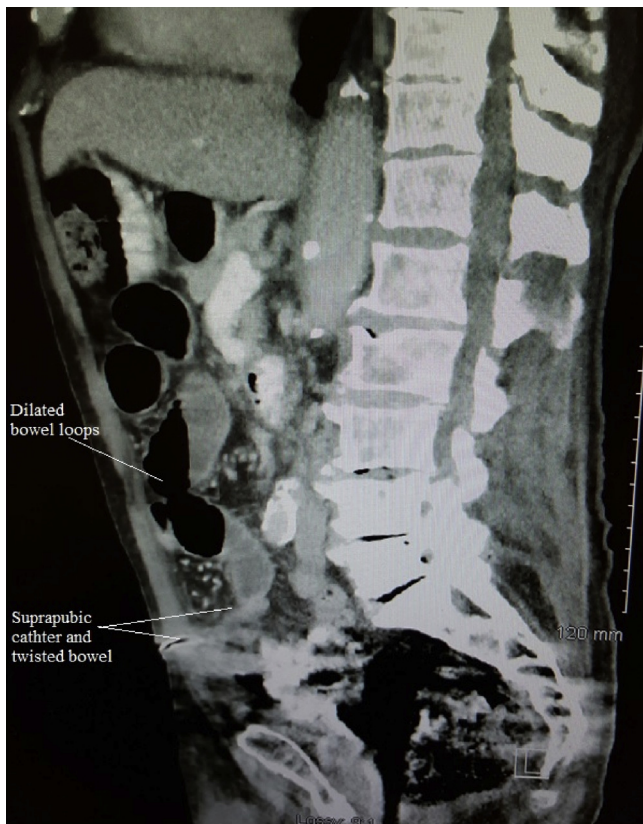


Fig. 4. CT scan (sagittal view) showing dilated bowel loops up to lower abdomen, suprapubic catheter can be seen passing through mesentery along with a twist in bowel.

nique. It recommends that the procedure should be performed by a clinician who has adequate experience of the procedure. In case adequately trained physician is not available, aspiration of bladder should be performed rather than suprapubic catheter insertion. Distended bladder is essential for insertion of SPC and we also recommend Trendelenburg position of position should be maintained during procedure which will move bowel away with gravity. Ultrasound guided insertion of the SPC was also advised by British

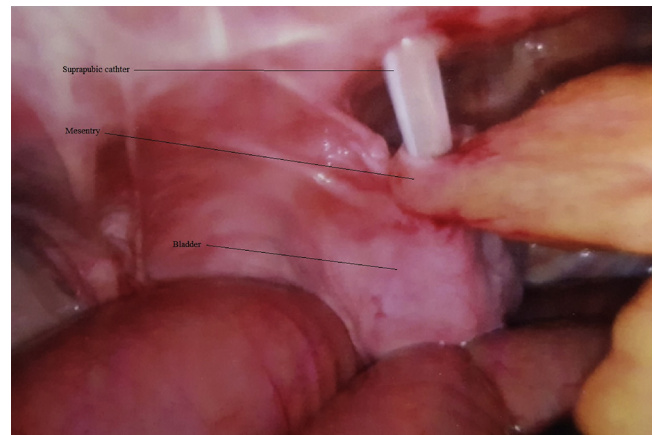


Fig. 6. Intra-op findings showing suprapubic catheter passing through mesentery before entering bladder, dilated bowel loops are also visible.

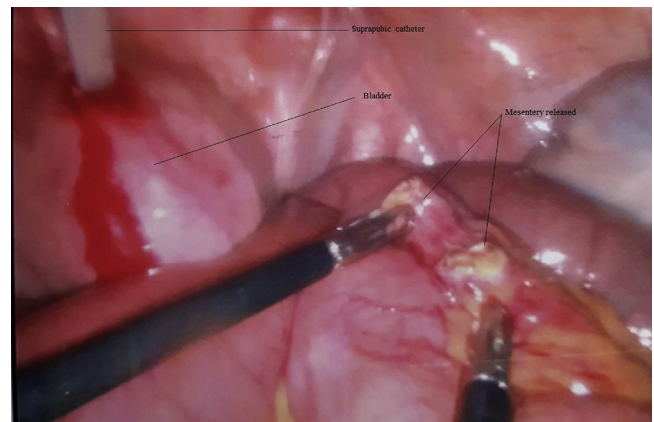


Fig. 7. Part of mesentery trapped in suprapubic catheter is released laparoscopically.

association of urology if there is any doubt about the distention of bladder. Aguilera et al. [17] showed improved safety if SPC is done under ultrasound guidance in emergency. As can be seen from the literature average age of patients presenting with bowel obstruction secondary to SPC was above 75yrs, so extra precautions should



Fig. 5. CT scan (coronal view) showing suprapubic catheter with dilated loops, artefact because of prosthesis can also be seen.

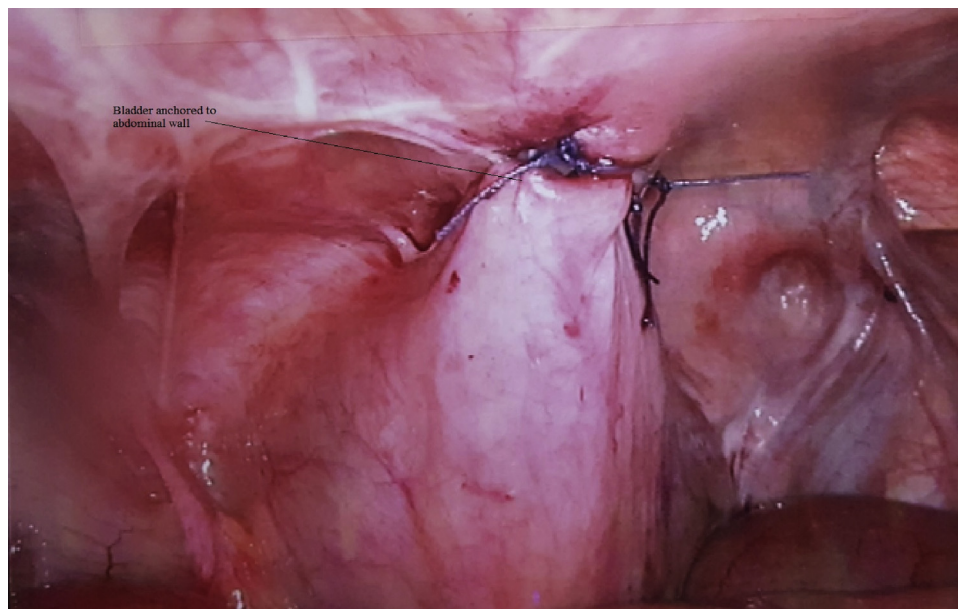


Fig. 8. Bladder anchored to anterior abdominal wall using laparoscopic intracorporeal sutures.

be taken in elderly patients with reduced tone of bladder. Trendelenburg position may also provide additional benefit of moving bowel caudally, thus reducing risk of injury during procedure [5].

4. Conclusion

Small bowel obstruction secondary to SPC is rare complication but high degree of suspicion is required for early diagnosis and management, thus reducing morbidity. Significantly distended bladder, Trendelenburg position, use of ultrasound and extra precaution in elderly patients can reduce the risk of damage to bowel.

Conflict of interest

No conflict of interest.

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Consent

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Author contribution

Y.B: Concept and design, analysis and interpretation of data, administrative and technical support.

Q.U: Critical revision of manuscript, administrative and technical support.

M.J: Data acquisition.

O.A: Concept and design, supervision.

Guarantor

Yasir Bashir

Declaration

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YB was lead author designed study, did literature review and wrote paper, QU helped in paper writing, proof reading and designing, MJ wrote case report and technical support and OA was the overall supervisor and mentor, he provided guidance and approved final transcript.

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