

THE UTILITY OF LOWER ABDOMINAL ULTRASOUND DURING PERCUTANEOUS SUPRAPUBIC CATHETER PLACEMENT

Hypothesis / aims of study

Open or percutaneous suprapubic catheter (SPC) placement is a common urologic procedure used in the management of neurogenic bladder, bladder outlet obstruction, urethral injuries and incontinence. Percutaneous SPC placement is generally considered safe although complications such as bleeding and bowel injury can occur. Ultrasound has been proposed as an acceptable method for identifying bowel, blood vessels or other structures located between the bladder and the anterior abdominal wall during percutaneous SPC placement. Recent guidelines from the British Association of Urological Surgeons (BAUS) promote the use of US guidance during percutaneous SPC placement in patients with prior abdominal surgeries or small bladder capacity/incomplete bladder distension (1). However, a current lack of evidence regarding the safety of SPC placement, especially regarding the role of US guidance, was noted. The purpose herein is to report our results with percutaneous SPC placement with special attention to the utility of ultrasound guidance.

Study design, materials and methods

The charts of patients undergoing percutaneous SPC placement at our institution between 2002-2011 were reviewed retrospectively. Patient characteristics including age, gender, body mass index (BMI) and history of lower abdominal surgery were noted. Operative reports were reviewed to determine the use of lower abdominal US guidance and concomitant cystoscopy. Simultaneous US findings, and in particular, the need to modify the approach based on US findings, were noted. Procedures were typically done in the cystoscopy suite under anesthesia. The decision to use cystoscopy, US or introducer needle was based on surgeon discretion. Follow-up from the time of SPC insertion to catheter exchange or removal was reviewed for any adverse events. The primary complications of interest were bleeding and/or bowel injury. Patients were divided into groups based on the use of ultrasound and/or cystoscopy. Demographic data and outcomes were compared. Where appropriate, chi-squared test was used to compare categorical data and student's t-test was used to compare numerical data between groups.

Results

307 percutaneous SPCs were placed. The main indication (49% of cases) was SPC used as a component of a planned procedure (e.g. urethroplasty, fistula repair). Lower abdominal/pelvic US was performed in 92/307 (30%) of cases. Of the 92 cases in which US was used, cystoscopy was also performed in 86/92 (90%). Twenty-five of 307 (8%) cases were performed blindly (without US or cystoscopy). Patient characteristics and results, stratified by the use of US, are outlined in Table 1. The patients with US guidance tended to be older ($p < 0.01$), more likely to have a history of lower abdominal surgery ($p < 0.01$) and more often male ($p < 0.01$). There was no significant difference between groups in regard to BMI.

Major complications occurred in 2 of 307 (1%) cases. Both complications involved bleeding (one perivesically in the space of Retzius, the other intravesically) that required an additional procedure and/or readmission to the hospital. US and cystoscopy were used during SPC placement in one of these cases, whereas neither was used in the other. No bowel injuries were reported. Intervening bowel was noted in 5 of 92 (5%) cases in the US group. Three of these procedures were abandoned while two were able to be safely completed percutaneously utilizing an approach modified based on US imaging. All 5 cases had a prior history of lower abdominal surgery.

Table 1. Patient characteristics and results stratified by the use of ultrasound.

	Ultrasound Used (N=92)	No Ultrasound Used (N=215)
Age (average \pm SD)	61.7 \pm 16.2	53.7 \pm 17.5
Male	68 (73.9%)	187 (87.0%)
BMI (average \pm SD)	29.0 \pm 7.3	29.2 \pm (8.37)
Prior lower abdominal surgery	41 (44.6%)	32 (14.9%)
Use of Cystoscopy	86 (93%)	190 (88%)
No Use of Cystoscopy	6 (7%)	25 (12%)
Bowel Injury	0	0

Bleeding	1 (1%)	1 (0.5%)
Follow-up (average days \pm SD)	32 \pm 21.6	27.1 \pm 15.2

Interpretation of results

Our data show a low complication rate (1/215, 0.5%) and no incidence of bowel injury in those patients undergoing percutaneous SPC placement without the use of ultrasound. The vast majority of these patients, 85.1%, had no prior history of lower abdominal surgery. Our patients who underwent SPC placement with the use of ultrasound had a higher likelihood of previous lower abdominal surgery compared to those in which ultrasound was not used (44.6% vs 14.9%). However, the majority of patients in whom ultrasound was used, 55.4%, actually did not have a prior history of lower abdominal surgery. That no modification of approach was required in these patients and that no instance of bowel injury was encountered could argue for the safety of placing a percutaneous SPC in patients without the addition of US if there is no history of lower abdominal surgery, provided there is adequate distension of the bladder (which was achieved by cystoscopy in the majority of our patients). The main advantage of US during SPC placement in our experience was noted in the 5 patients in whom we either modified the approach of the SPC catheter (2 cases) or abandoned SPC placement (3 cases) due to the presence of intervening bowel. All of these patients underwent simultaneous cystoscopy and had a history of lower abdominal surgery. If US had not been used, there could have been a higher risk of bowel injury.

Concluding message

While our study does not suggest that US is needed for all patients undergoing percutaneous SPC placement, particularly if cystoscopy is used, it does confirm the added advantage of using US to help identify the presence/absence of bowel that could be at risk for inadvertent injury. This is particularly true in patients with a history of lower abdominal surgery.

References

1. Harrison SC, Lawrence WT, Morley R, Pearce I, Taylor J. British Association of Urological Surgeons' suprapubic catheter practice guidelines. *BJU Int.* 2011; 107: 77-85

Disclosures

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