STAB SUPRAPUBIC CATHETER INSERTION: INDICATIONS AND PERI-OPERATIVE COMPLICATIONS, A FOUR AND HALF YEAR REVIEW AT THE KORLE BU TEACHING HOSPITAL, ACCRA

Asante EKA[1], Mensah JE[1], Klufio GO[1], Kyei MY[1], Ampadu K N[1]

[1]Urology Unit, Department of Surgery, School of Medicine and Dentistry, College of Health Sciences, University of Ghana

ABSTRACT

Background: Suprapubic catheter insertion is a common urological procedure, which is often considered to be simple and safe even in inexperienced hands. The objective of our study was to determine the peri-operative morbidity associated with Stab Suprapubic Catheter Insertion (SSPCI) (i.e. stab suprapubic cystostomy)

***Patients and Methods*:** A total of 429 patients who had suprapubic catheter insertion using the stab method (with trocar and sheath) at the Korle-Bu Teaching Hospital, Accra, between January 2010 and June 2014 were identified and their case notes reviewed to determine the peri-operative complication rate in relation to the categories of doctors who undertook the procedure.

Results: The commonest indication for a stab suprapubic catheter insertion was acute/chronic retention of urine secondary to benign prostatic hyperplasia (BPH). The overall complication rate was 3.5% with bowel perforation constituting 0.7% of the complications.

Conclusion:Stab suprapubic catheter insertion is a safe and effective bedside procedure for bladder drainage when urethral catheterization fails or is undesirable, and can be performed by all grades of surgeons/medical doctors, in selected patients. Complications associated with the procedure can be reduced to a minimum by strict attention to some technical details.

Key Words: *Urinary retention, Stab suprapubic catheter insertion, Complications, Reusable trocar and sheath, Surgeon grade*

Introduction

In the setting where a patient has urinary retention and yet urethral catheterization is either impossible or undesirable for the relief of the retention, suprapubic catheter insertion offers an effective alternative. Suprapubic catheter can be placed percutaneously either by means of a trocar and sheath after localization of the bladder[1,2] or by using the Seldinger technique using peel away sheath[3]. Relatively safer techniques may be by image guidance using ultrasonography (USG)[4] fluoroscopy[5] or cystoscopy guided percutaneous suprapubic catheterization[6].Suprapubic catheter insertion may also be achieved through a formal (open) cystostomy[7]. Although the stab percutaneous cystostomy is a safe procedure, it is not devoid of complications such as site bleeding, catheter blockade, malposition, dislodgment, or bowel injur[8,9].

We conducted an audit of all suprapubic catheter insertions performed at our unit using a reusable trocar and sheath. Our aim was to determine the safety of stab suprapubic catheter insertion in a relatively resource-poor environment where equipment for safer closed suprapubic catheter insertion is hardly available or affordable.

Corresponding Author: **Dr. Emmanuel KwekuAttua AsanteBSc, MBChB, MGCS, FWACS**
Urology Unit, Department of Surgery, School of Medicine and Dentistry, College of Health Sciences, University of Ghana
Email Address: Kasati2@yahoo.com
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Patients and Methods

A total of 429 patients who had SSPCI at the Urology Unit of the Korle-Bu Teaching Hospital, Accra, between January 2010 and June 2014 were identified and their case notes reviewed. All patients had a clinically distended bladder at the time of suprapubic catheter insertion. Ultra-sonography guidance was not used in any case. The following data was collected: patient's demographics, indication for the suprapubic catheter insertion, intra-operative difficulties or complications and the grade of the doctor/surgeon who performed the procedure.

The process and technique of SSPCI practiced at our unit is as follows: A written informed consent is obtained from each patient prior to undertaking the procedure. A commercially available, reusable cystostomy trocar and sheath made of stainless steel (Bard Medical 0488 26Fr) is used. The catheter to be inserted (which must be of a size that can pass through the sheath easily) is checked for patency and balloon function before use. Prophylactic antibiotic cover, usually with a single dose of gentamycin 160mg IV/IM is given if not contraindicated.

In the supine position, an incision (about 1cm) is made two finger breadths above the pubic symphysis after infiltrating the skin and underlying fascia with

10mls of 2% lignocaine with adrenaline solution. The needle is then advanced through the skin incision, aiming for the bladder and then urine is aspirated to confirm the position of the bladder. Thereafter the incision is deepened to the rectus sheath. The trocar and sheath is then advanced into the bladder with a gradual rotating motion of the hand, keeping a sustained pressure over it, the direction and depth being the same as determined by the needle, which is usually vertical or slightly towards the pelvis. Once the bladder is entered, the trocar is removed, holding behind the sheath inside the bladder. An assistant, who is ready with the appropriate Foley catheter (with attached urine bag) and a syringe prefilled with sterile water, inserts the catheter rapidly into the bladder through the sheath and inflates the balloon with 10mls of distilled/sterile water.

As soon as the balloon is inflated, the sheath is removed and the catheter pulled back to tuck it against the abdominal wall. Gentle traction is applied to the catheter for about five minutes to ensure complete hemostasis. A small sterile dressing is then placed around the catheter to cover any exposed part of the wound. Post operatively, a 7-day course of oral ciprofloxacin is prescribed for the patient. The patient is admitted for 24hours and monitored for bleeding, post obstructive diuresis and signs of peritonitis.

Results

Of the 429 cases studied there were 427 males (99.5%) and 2 females. Their average age was 56.4 years (range 11 to 105 years). The indications for the SSPCI are shown in Table 1. The commonest indication was bladder outlet obstruction secondary to BPH. Of the two women in the series one had urethral obstruction by infiltrating carcinoma of the cervix and the other a neurogenic bladder.

Overall, 15(3.5%) of the patients developed perioperative complications (Table 2). The commonest complication was urinary peritonitis with no associated bowel injury. Two patients sustained an additional perforation in the bladder in addition to the stab perforation, one in the dome of the bladder and the other in the posterior wall with no associated rectal injury. Small bowel perforation was the most serious complication found.

There were 2 misplaced catheters which resulted from the fact that although the tip of the catheter was in the bladder the balloon was found blown between the bladder and anterior abdominal wall

Table 3 shows the categories of doctors who undertook the procedure and the number of cases each group performed. Of the cases performed by junior residents, 24% (51 out of 212) had a consultant or senior resident supervision, as did all the cases performed by house officers. Overall, only 5.8% (25 out of 429) of cases were performed either by or under the supervision of consultant urologist.

Table 1. Indications for SSPCI

Indications	No. (%)
Bladder Outlet Obstruction – BPH	202 (47.08)
Urethral Stricture	141 (32.88)
Urethral injury	33 (7.69)
Bladder Outlet Obstruction – Prostate cancer	27 (6.29)
Neurogenic Bladder	8 (1.86)
Clot Retention	7 (1.63)
Bladder neck stenosis-post prostatectomy	4 (0.93)
Meatal Stenosis	4 (0.93)
Recurrent UTI/ Severe Urethritis	2 (0.47)
Carcinoma of the cervix	1 (0.23)

Table 2. Complications associated with SSPCI (No. Of procedures = 429)

Complications	Number (%)
Urinary Peritonitis	8 (1.86)
Perforation Dome of Bladder	1 (0.23)
Perforation Posterior wall of Bladder	1 (0.23)
Small Bowel Perforation	3 (0.70)
Misplaced Catheter	2 (0.47)
TOTAL	15 (3.49)

Table 3. Categories of doctors who undertook SSPCI and associated number of complications

Doctor/Surgeon Grade	No. of SSPCIs (%)	No. of Complications (%)
House Officer	71 (16.6)	4 (5.6)
Junior Resident	212 (49.4)	7 (3.3)
Senior Resident	125 (29.1)	3 (2.4)
Consultant	21 (4.9)	1 (4.7)
Total	429 (100)	15

Discussion

Suprapubic cystostomy, performed through a stab with a trocar and sheath, after localization of the bladder by palpation, is a well-established procedure for urinary drainage when urethral catheterization is not possible or is undesirable[1,2].It is usually a safe procedure when done in a well distended bladder. It is contraindicated in a non-distended bladder, a history that suggests bladder cancer, previous lower abdominal or pelvic surgery, pelvic cancer, with or without a history of irradiation and when there is placement of an orthopedic hardware for pelvic fracture repair.[9] When the procedure is performed
in a bladder that is not fully distended there is a risk of entry into the peritoneal cavity as the latter with its

contents may lie between the anterior abdominal wall and the bladder. To prevent this complication, we confirm that the bladder is fully distended by palpation and aspiration of urine percutaneously with a syringe and needle before the stab procedure. In our practice patients with any of the above contraindications were managed with an open suprapubic cystostomy.

The commonest indication for a stab cystostomy in our series was bladder outlet obstruction secondary to BPH, after failure of urethral catheterization. Subsequent urethral evaluation (using retrograde urethrogram or urethroscopy) showed no evidence of urethral obstruction in these patients. The high percentage of failure of catheterization in patients with BPH in our series may be due to inadequate lubrication for the catheterization process, poor technique, non-application of a catheter introducer when necessary or non-availability of coude tip urethral catheters. In the series by Ahluwalia *et al* the commonest indication for a suprapubic cystostomy was neuropathic bladder whereas the commonest indication for a stab cystostomy in the bladder outflow obstruction group was urethral stricture[8].

Clot retention was one of the indications for stab suprapubic cystostomy in this series. However, Hilton *et al* listed this as a contraindication for the procedure.[9] They argued that catheters used for stab cystostomy are generally of a fine caliber and should not be used when a risk of occlusion exists and instead a 22Fr catheter should be used by the open method. In our setting, it was much easier and quicker to do a stab cystostomy to evacuate the clot when this could not be achieved by urethral catheterization, especially because we could easily pass a 22Fr catheter through the sheath of our reusable stab set.

The complication rate of closed suprapubic catheter insertion is reportedly low (1.6%)[10]. Our overall complication rate of 3.5% was lower than the 10% intraoperative complication rate reported by Ahluwalia *et al*. Our small bowel perforation rate of 0.6% compares favorably to the 2.7% reported by Sheriff *et al*[11] and 2.4% reported by Ahluwalia et *al*[8] Ahluwalia *et al* reported a Suprapubic catheter malposition/expulsion rate of 3% in a large retrospective series of 219 patients[8]. In our series the malposition rate was 0.5%. The reason for the track loss is that once the trocar is removed during the procedure, urine leaks rapidly through the sheath, causing sudden bladder decompression, which in turn leads to catheter displacement out of the bladder. To avoid this problem, Goyal *et al* suggest advancing the sheath a little further inside the bladder while withdrawing the trocar, after the bladder has been entered during the stab cystostomy procedure[12]. Additionally we realized that it was important to check that the catheter size we selected for use was one that will easily slip through the sheath after removal of the trocar and that the balloon of the catheter was functioning properly prior to the start of the procedure.

We did not encounter any complication of rectal injury, unlike the cases reported by Rajmohan*et al*[13] and Ahmed *et al*[14]. This complication may arise if the procedure is performed in a restless patient, or the patient moves during the procedure or the surgeon applies too much force during the procedure. To avoid this problem, as soon as one has felt a give during the rotating downward pressure on the stab set, it is important to release the pressure and then advance the sheath a little further inside the bladder while withdrawing the trocar[12].

Even though the most severe complication i.e. bowel perforations in our study occurred when the procedure was done by either a house officer or junior resident, there was no statistically significant difference between the different categories of doctors/surgeons, with respect to their complications rates (P = 0.686). This was also the experience of Ahluwalia et al who found that the postoperative complication rates were comparable for cases by consultants and middle grade doctors[8, 1].

Conclusion

Stab suprapubic catheter insertion is a safe and effective bedside procedure for bladder drainage when urethral catheterization fails or is undesirable, and it can be safely performed by all grades of surgeons in selected patients. Complications can be minimized if the technical details mentioned in the discussion above are observed.

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