Clinical Reference Synopsis:
Percutaneous Suprapubic Catheterization
Incidences of Bowel Perforation
Misplaced Suprapubic Catheters
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PERCUTANEOUS SUPRAPUBIC CATHETERIZATION: INCIDENCES OF BOWEL PERFORATION

Introduction

Percutaneous “trocar punch” cystostomy carries high rates of morbidity and mortality, mostly due to inadvertent perforation of the peritoneal cavity and ensuing bowel damage. The following table compiles data from three primary sources in the literature where sufficiently large patient populations were analyzed by the authors to yield statistically-significant findings regarding rates of morbidity and mortality associated with the procedure. These and other references are provided later in this section.

Complication Rates: Percutaneous Trocar Punch

<table>
<thead>
<tr>
<th></th>
<th>Ahluwalia 2006¹</th>
<th>Sheriff 1998¹⁸</th>
<th>NPSA 2009¹⁹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases</td>
<td>219</td>
<td>157</td>
<td>259</td>
</tr>
<tr>
<td>Malpositioning/Expulsion</td>
<td>2.7%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Exit Site Bleeding</td>
<td>1.8%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Catheter Blockage</td>
<td>2.2%</td>
<td>18%</td>
<td>-</td>
</tr>
<tr>
<td>Bowel Injury</td>
<td>2.2%</td>
<td>2.7%</td>
<td>3.5%</td>
</tr>
<tr>
<td>Mortality</td>
<td>1.8%</td>
<td>0.8%</td>
<td>1.15%</td>
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Abstract: Suprapubic catheter (SPC) insertion is a common urological procedure, which is often referred to as safe and simple even in inexperienced hands. There is, however, very little published evidence on the safety of this procedure. Our study aimed to provide evidence on the associated morbidity and mortality and provide guidance for practising clinicians. A total of 219 patients who underwent SPC insertion under cystoscopic guidance at two urology institutions between 1994 and 2002 were identified and their case notes reviewed. The intra-operative complication rate was 10% and the 30-day complications rate was 19%. **Mortality rate was 1.8%**. Long-term complications included recurrent UTIs (21%), catheter blockage (25%) resulting in multiple accident and emergency attendance (43%). Despite this, the satisfaction rate was high (72%) and most patients (89%) prefer the SPC over the urethral catheter. SPC bladder drainage results in a high patient satisfaction rate. Patients and clinicians should be aware of the potential complications associated with SPC insertion.

Abstract: Background: Complications of suprapubic catheter insertion are rare but can be significant. We describe an unusual complication of a delayed bowel perforation following suprapubic catheter insertion. Case Presentation: A gentleman presented with features of peritonitis and feculent discharge along a suprapubic catheter two months after insertion of the catheter. Conclusion: Bowel perforation is the most feared complication of suprapublic catheter insertion especially in patients with lower abdominal scar. The risk may be reduced with the use of ultrasound scan guidance.


Abstract: A patient who had a small bowel mesentery perforation following insertion of a suprapubic catheter (SPC) is described. He had no bowel complaints immediately following the procedure, but presented 10 weeks later with insidious onset bowel obstruction due to the kink caused by the catheter. This complication occurred despite cystoscopy control and adequate bladder distension prior to the procedure. This isolated case illustrates the fact that regardless of the ease and frequency of SPC insertion, complications do occur. An unusual complication of a common surgical procedure. This report describes small bowel obstruction as a complication of supra pubic catheter insertion. Though these complications are rare, it is essential to be aware of these possibilities that will enable us to recognize it early and act upon it.


Abstract: Background: Suprapubic catheterization is a common procedure employed by urologists to manage long standing voiding dysfunction or neuropathic bladders in patients. Bowel injury is a rare but important complication, in light of the consequences to patient morbidity. Case Presentation: An 81 year old Caucasian female presented with a blocked suprapubic catheter 3 weeks after passage under cystoscopic guidance. The Foley catheter was replaced and attempted aspiration brought up a faeculent fluid. There were no signs to suggest peritonitis. Catheter was kept in situ until computed tomography imaging was obtained; this illustrated the catheter in small bowel with balloon inflated, causing partial small bowel obstruction. Patient underwent exploratory laparotomy with bowel resection, with an uneventful post-operative recovery. Conclusion: We speculate that the injury occurred at the time of first catheter exchange, with the tip directly piercing the small bowel. To our knowledge this particular mechanism of injury has not previously been reported. This case demonstrates the importance of remaining vigilant to iatrogenic bowel injury after cystostomy, and aids initial management if injury is suspected.


Abstract: Suprapubic catheters have gained wide acceptance in urology. Although many regard their insertion a simple procedure, morbidity is significant and is probably underreported. We describe a percutaneous technique using intraoperative ultrasonography combined with flexible cystoscopy to ensure safe insertion, minimizing the risk to adjacent viscera.

Abstract: Suprapubic catheter insertion is uncommonly associated with complications. This article reports an 83-year-old man admitted with small bowel obstruction, 4 years after insertion of a suprapubic catheter.


Abstract: Inadvertent bowel injury can occur when utilizing trocar cystotomy technique for the placement of a suprapubic catheter. The authors present a patient who had a suprapubic catheter placed through a stab incision at the time of vaginal pelvic reconstruction for procidentia. Her presentation did not include the typical signs of peritonitis, but was characterized by low urine output and regression of bowel function due to ileus and third-spacing in the peritoneal cavity. The potential risk factors for bowel injury in this patient are enumerated and techniques to minimize the risk of bowel perforation are discussed. The risk of bowel injury is reduced by choosing a catheter introducer that minimizes impedance while piercing tissues, and by using a rigid cystoscope for visualization of the suprapubic trocar during entry into the bladder.


Abstract: Although suprapubic catheterization is a useful technique in managing the postoperative patient who requires prolonged urinary drainage, the potential exists for iatrogenic damage to the abdominal contents. Two cases of perforation of the distal ileum occurring during catheter placement after vaginal procedures are presented. Such complications may be kept at a minimum by adequate bladder distention, careful bladder palpation, placement of the patient in the Trendelenburg position before filling the bladder, and catheter insertion before closure of the surgical incision.


Abstract: Peritonitis following suprapubic catheter placement may result from inadvertent placement of the drain through the large and small bowel and bladder base. The author describes a case of infectious peritonitis which developed after suprapubic catheter removal. The patient, underwent suprapubic catheter placement after Burch Colposuspension for genuine stress incontinence. The catheter was removed with a full bladder after an uneventful postoperative course, but the patient subsequently developed acute infectious peritonitis due to extravasated urine from the cystostomy site. It was concluded that suprapubic catheters should be removed after the bladder is emptied, to prevent this complication. This may be most important in patients who void without residual prior to epithelialization of the cystostomy site.

Abstract: Background: Suprapubic catheterization is a common procedure employed by urologists to manage long standing voiding dysfunction or neuropathic bladders in patients. Bowel injury is a rare but important complication, in light of the consequences to patient morbidity. Case presentation: An 81 year old Caucasian female presented with a blocked suprapubic catheter 3 weeks after passage under cystoscopic guidance. The Foley catheter was replaced and attempted aspiration brought up a faeculent fluid. There were no signs to suggest peritonitis. Catheter was kept in situ until computed tomography imaging was obtained; this illustrated the catheter in small bowel with balloon inflated, causing partial small bowel obstruction. Patient underwent exploratory laparotomy with bowel resection, with an uneventful post-operative recovery. Conclusion: We speculate that the injury occurred at the time of first catheter exchange, with the tip directly piercing the small bowel. To our knowledge this particular mechanism of injury has not previously been reported. This case demonstrates the importance of remaining vigilant to iatrogenic bowel injury after cystostomy, and aids initial management if injury is suspected.


Abstract: Iatrogenic bowel injury is a recognized complication of percutaneous suprapubic cystostomy. In the present report, we describe a case of misplacement of suprapubic catheter into cecum, in which laparoscopic technique was used successfully to identify and treat this condition. A 72-year-old woman with severe multiple sclerosis underwent her fourth change of suprapubic catheter 3 months after initial insertion. At the time of catheter change, the urologist performed a cystoscopy via the suprapubic tract and found feculent material in the presumed bladder. A diagnosis of colovesical fistula was made, and patient was referred to the acute surgical service. Cystogram via suprapubic catheter showed passage of contrast straight into colon in the region of cecum with no evidence of a fistula. Computed tomography of abdomen and pelvis confirmed the position of the catheter in the cecum. At laparoscopy, the cecum was seen to move when tension was applied to the suprapubic catheter, confirming the catheter tip and balloon in the lower pole of cecum. Laparoscopic transection of the cecum above the point of entry of the catheter was performed using an Endo GIA linear stapler. Under laparoscopic visualization, a new suprapubic catheter was inserted into the bladder. Intraoperative bleeding was minimal and the postoperative course was uneventful.


Abstract: Suprapubic tube placement is a common urological procedure with a low incidence of complications, including hematuria, catheter blockage, recurrent urinary tract infections, and rarely, injury to adjacent organs. Fortunately, most serious complications are discovered shortly after initial suprapubic tube placement and are readily corrected. Very few cases of delayed complications or injuries have been reported. We report a case of Foley perforation into the ileum during suprapubic tube exchange discovered more than 8 months after initial placement, and preceding numerous monthly changes that occurred without incident. While a rare complication, physicians should be conscious of the potential for delayed injury in patients managed with long term suprapubic tube placement.

Abstract: The percutaneous suprapubic bladder catheter has become an important tool for the urologist because of its efficacy, simplicity and wide range of applications. A case of **intestinal obstruction secondary to percutaneous cystotomy** with the Bonanno suprapubic bladder drainage catheter is reported.


Abstract: Objectives: A colovesical fistula created after placement of a suprapubic catheter through the transverse colon was managed without reoperation. Case: An underweight postmenopausal patient presented with rectocele and vaginal vault prolapse requiring surgical repair. During routine placement of a suprapubic catheter a piece of transverse colon was punctured and connected to the bladder. The patient was managed conservatively for her enterotomy and colovesical fistula. Discussion: Because the traumatized segment of bowel was healthy and there was no gastrointestinal stricture, it is ideal to conservatively treat patients with a suprapubic catheter injury with the expectation that the fistula will heal. Conclusions: The fact that our patient had no clinical signs or symptoms weighed heavily into our decision to treat this patient conservatively rather than perform an immediate bowel anastamosis after the fistula was identified.


Two patients with **small bowel perforation** that occurred during suprapubic catheter insertion are described. Insertion of the catheter with a trocar and with a transurethral sound, respectively, was responsible for the perforation. These perforations occurred despite preliminary bladder distention. Small bone injury was slight in both patients, and neither patient required resection. In one patient, the ileocutaneous fistula closed spontaneously, and in the other, oversewing the perforation only was necessary; neither patient has known residual complications.


We report on the clinical outcome and satisfaction survey of long-term suprapubic catheterisation in patients with neuropathic bladder dysfunction. Between early 1988 and later 1995, 185 suprapubic catheters were inserted under direct cystoscopic vision. Anti- cholinergic therapy was given to all patients with significant detrusor hyper-reflexia; the catheters clamped daily for two hours and changed every six weeks. Ultrasonography and assessment of the serum creatinine were used to assess the upper renal tracts, and the results of the pre-and post-catheter video-cystometryography was used to evaluate bladder morphology, cystometric capacity, maximum detrusor pressure and the presence of vesico-ureteric reflux. There were equivalent numbers of males and females. The follow-up ranges from 3 ± 68 months. Following catheterisation, there was a 50% reduction in the average maximum detrusor pressure, bladder morphology improved in 85% of the cases; the bladder capacity and upper renal tracts remained unchanged. Vesico-ureteric reflux was abolished in 33% of the cases. Complaints were common consisting of recurrent catheter blockage, persistent urinary leakage and recurrent urinary tract infections. There was a **2.7% incidence of small bowel injury with one fatality.** However, the general level of
satisfaction was high. It is concluded that suprapubic catheterisation is an effective and well tolerated method of management in selected patients with neuropathic bladder dysfunction for whom only major surgery would otherwise provide a solution to incontinence. We are encouraged to find preservation of renal function with maintained bladder volumes and reduced maximum detrusor pressures thus justifying the policy of catheter clamping and anti-cholinergic therapy in the presence of significant detrusor hyper-reflexia. However, even in expert hands this procedure is not without hazards.


Excerpts: A suprapubic catheter passes through the tissues of the lower abdominal wall directly into the bladder and should not traverse the peritoneal cavity. Although the benefits are well recognised, complications include peritoneal perforation with or without bowel perforation, infection and haematuria. In September 2008, an incident was identified in the RLS where the bowel had been perforated during the insertion of a suprapubic catheter. This prompted a formal search of the RLS for further incidents relating to the insertion of a suprapubic catheter. In total, 600 incidents relating to suprapubic catheters had been reported. Of these, 259 were related to the insertion and management of these catheters. The search revealed that between September 2005 and June 2009, three incidents causing death and seven causing severe harm resulting from the insertion of a suprapubic catheter had been reported. Nine of these incidents resulted in a bowel perforation.


Abstract: Presentation: a 75-year old man with severe cerebrovascular disease underwent a routine change of suprapubic catheter three months after first insertion. One day after the catheter was changed, he passed faeculent material in the catheter and became unwell with abdominal pain. The catheter tip was visible per rectum. Outcome: a CT scan confirmed that the suprapubic catheter had passed into the sigmoid colon. He underwent laparotomy and repair of a colovesical fistula and sigmoid perforation. He made an uncomplicated recovery. Conclusion: damage to the bowel is a rare but recognized complication of suprapubic catheter insertion. Our patient illustrates that the injury may not become apparent until a change of catheter, and clinicians should bear in mind the possibility of occult bowel damage if patients become unwell after a change of suprapubic catheter.


Abstract: Iatrogenic bowel injury is a recognized complication of percutaneous suprapubic cystostomy. In the present report, we report an unusual case of small bowel perforation caused by a misplacement of suprapubic catheter into terminal ileum. For safe placement of a suprapubic catheter, the patients must have an adequately distended bladder and be placed in Trendelenburg position that allows safe extraperitoneal puncture of the bladder.


Abstract: Suprapubic catheter (SPC) insertion is a commonly performed elective or emergency procedure in urology. SPC change is a simple process that is typically completed in the primary care office in the United Kingdom. Urinary tract infection, hemorrhage, and injury to adjacent intra-abdominal organs are potential complications. The authors present a case of inadvertent bowel injury following elective SPC change. They recommend techniques to prevent this complication.
MISPLACED SUPRAPUBIC CATHETERS


Abstract: Suprapubic cystostomy catheters are an important tool for the management of patients who require urinary drainage. Although complications occur after the procedure, they are usually minor. A case of acute obstruction at the ureterovesical junction caused by a suprapubic cystostomy catheter tip is presented.


Abstract: In patients with a suprapubic catheter, the differential diagnosis of acute lower abdominal pain must include a possible dislocation of this device. We report a case that illustrates such a complication, leading to bowel obstruction in our patient.


Abstract: Objective: To report an unusual presentation of a misplaced suprapubic catheter (SPC) in a spinal cord injury (SCI) patient. Design: A case report of a SCI patient in whom a SPC was ‘partially misplaced’ in an emergency. Setting: London Spinal Injuries Unit, Stanmore, UK. Subject: A 33-year-old man who sustained a C5 SCI in a road traffic accident 6 months ago. He had an indwelling urethral catheter, which blocked off and repeated attempts to reinsert another one per urethra were unsuccessful. Main outcome measure: A SPC was inserted in an emergency at the bedside, as he developed autonomic dysreflexia. The catheter initially drained clear urine but subsequently the flow became intermittent. He also started complaining of lower abdominal discomfort. Results: The abdominal examination was unremarkable without signs of peritonism. An ultrasound scan of the abdomen revealed the eye of the catheter in the bladder but the balloon had been inflated in the subcutaneous tissues. It was reinserted under cystoscopic control in the operating theatre. Conclusion: The insertion of a SPC in a neuropathic patient can be a challenge even for an experienced urologist. As these patients often have small capacity bladders, the SPC should be inserted under cystoscopic control wherever possible. However if they are inserted blindly there should be a high index of suspicion for the potential complication of a misplaced catheter. The patient should undergo regular abdominal examination and an ultrasound scan should be performed as soon as possible for confirmation.


Abstract: Suprapubic cystostomy is a commonly performed urological procedure. This case report describes a rare and unique complication which occurred due to a gaping and reflexing ureteric orifice.
CATHETER ASSOCIATED URINARY TRACT INFECTIONS (CAUTI): PREFERENCE FOR SUPRAPUBIC CYSTOSTOMY


Abstract: Ninety-two patients with preoperative sterile urine undergoing colposuspension or vaginal repair operation for stress urinary incontinence and/or genital descensus were randomized to either suprapubic or transurethral postoperative catheter drainage. The prevalence of significant bacteriuria on the fifth postoperative day was statistically significantly lower when using suprapubic catheter (20.8%) than with transurethral catheter drainage (45.5%). This applied especially to colposuspension. The rate of postoperatively impaired bladder emptying also tended to be reduced when using suprapubic catheter. At follow-up after one year, postoperative bacteriuria was closely correlated to increased rates of both clinical cystitis and asymptomatic significant bacteriuria. Thus it is recommended to use suprapubic bladder drainage not only after colposuspension but also after vaginal repair in an effort to avoid an increased risk of urinary infections.


Abstract: Fifty-one patients with clinical and urodynamic diagnoses of stress urinary incontinence were randomly allocated to either suprapubic (N = 24) or transurethral (N = 27) bladder drainage after vaginal surgery for stress incontinence (revised Pereyra procedure). Postoperative use of suprapubic bladder drainage significantly reduced febrile morbidity (calculated as fever index; P less than .01) and length of hospitalization (P less than .05). Postoperative normal bladder functions resumed more quickly when suprapubic drainage was used (P less than .05), so that most patients did not need bladder catheterization upon discharge, as opposed to more than half of those with Foley catheters, who left the hospital with a catheter in place (P less than .05). We conclude that it is both beneficial and cost-effective to use suprapubic bladder drainage after a Pereyra operation for stress urinary incontinence.

3) **Branagan GW, Moran BJ.** Published evidence favors the use of suprapubic catheters in pelvic colorectal surgery. *Dis Colon Rectum.* 2002;45(8):1104-8.

Abstract: Introduction: Bladder catheterization is routine during pelvic colorectal surgery, and transurethral catheterization is the norm. However, in gynecologic surgery suprapubic catheters are commonly used and are reported to be superior to urethral catheters. Methods: A review of published studies comparing urethral and suprapubic catheters in patients undergoing colorectal surgery is presented. Level one evidence from randomized, controlled trials is sparse. Five randomized, controlled trials, most with small numbers, have been published comparing urinary tract infection, urinary retention, duration of catheterization, pain and discomfort, and patient preference. Results: Urinary tract infections were increased in the urethral group in three of the five articles. There were no differences between the two techniques with respect to urinary retention, but all studies commented on the ease with which this complication could be assessed and managed in the suprapubic group. There did not seem to be any difference in duration of catheterization. The suprapubic group experienced less pain and discomfort than the urethral group, and the suprapubic catheter was preferred by those patients who had experienced both. Conclusion: The results reported favor suprapubic over urethral catheterization in that urinary tract infections are reduced, particularly in females, and the ability to attempt normal voiding is facilitated, particularly in males.

Abstract: Purpose: To our knowledge risk factors for urinary tract infection associated with various drainage methods in patients with spinal cord injury have never been evaluated overall in the acute period. We identified the incidence and risk factors associated with urinary tract infection in spinal cord injured patients. Materials and Methods: We prospectively followed 128 patients at our spinal cord injury reference hospital for 38 months and obtained certain data, including demographic characteristics, associated factors, methods of urinary drainage, bladder type, urological complications and predisposing factors of each infection episode. Logistic regression modeling was done to analyze variables and identify risk factors that predicted urinary tract infection. Results: Of 128 patients 100 (78%) were male with a mean age plus or minus standard deviation of 32 6 14.52 years. All patients had a nonfatal condition by McCabe and Jackson guidelines, and 47% presented with associated factors. The incidence of urinary tract infection was expressed as number episodes per 100 patients daily or person-days. The overall incidence of urinary tract infection was 0.68, while for male indwelling, clean intermittent, condom and female suprapubic catheterization, and normal voiding the rate was 2.72, 0.41, 0.36, 0.34 and 0.06, respectively. The risk factors associated with urinary tract infection were invasive procedures without antibiotic prophylaxis, cervical injury and chronic catheterization (odds ratio 2.62, 3 and 4, respectively). Risk factors associated with repeat infection were a functional independence measure score of less than 74 and vesicoureteral reflux (odds ratio 10 and 23, respectively). Conclusions: Spinal cord injured patients with complete dependence and vesicoureteral reflux are at highest risk for urinary tract infection.


Abstract: Urethral strictures associated with the use of a urethral catheter may be more common after cardiac and aortic surgery when compared with other surgical procedures. The reasons for this are obscure. Fifty-two aortic procedures in males from 1980-1983 were reviewed with an incidence of urethral stricture of 21%. Forty anterior resections of the rectum in which a urethral catheter was used were also reviewed with an incidence of urethral stricture of only 5%. Since 1985 supra-pubic catheters have been used now in over 200 aortic procedures with no morbidity and no urethral stricture. Bacteriuria has been significantly reduced by the use of supra-pubic catheters and there would appear to be considerable advantages in the use of this technique.


Abstract: Gynaecological operations for urinary stress incontinence necessitate long-term drainage of the bladder. In this retrospective study 100 patients receiving a conventional indwelling urethral catheter system were compared with 90 patients receiving a transabdominal suprapubic catheter for postoperative bladder drainage. The transurethral catheter was removed 5 days after the operation while the suprapubic catheter was left in place until no residual urine was detected. Patients with suprapubic bladder drainage showed no residual urine two days earlier (8.8 +/- 4.3 versus 10.9 +/- 5.0 days), left the hospital two days earlier (12.3 +/- 3.8 versus 13.9 +/- 4.4 days), and had a lower incidence of urinary tract infections (17% versus 30%) than patients with urethral catheters. In five cases suprapubic catheters had to be removed prematurely because of complications such as pain, persistent haematuria or obstruction of the catheter. Rates of haematuria were similar in both groups. Catheter-related pain was less frequent with suprapubic drainage. The acceptance of the suprapubic system by patients and nursing
staff was good, particularly since measurement of the residual urine did not necessitate repeated urethral catheterization. The additional time required for placing the suprapubic catheter postoperatively is by far outweighed by the advantages of this system, such as shorter hospitalization and a lower incidence of urinary tract infections.


Abstract: A total of 86 consecutive patients who presented to the accident and emergency department with acute urinary retention due to prostatomegaly required catheterisation; 56 received suprapubic catheters and 30 were catheterised urethrally. Both groups were followed up for 3 years. Of the 30 patients catheterised urethrally, 12 (40%) developed urinary tract infections compared with 10 (18%) urinary tract infections in the 56 patients catheterised suprapubically. Five patients (17%) in the urethral group developed urethral strictures with no strictures in the suprapubic group. Two patients catheterised urethrally developed epididymo-orchitis and 1 developed septicaemia. None of the patients with suprapubic catheters developed these complications. Furthermore, 16 patients catheterised suprapubically underwent successful trial clamping of their catheter, whereas 7 patients required recatheterisation following removal of their urethral catheters. **We recommend that the use of suprapubic catheters should become the preferred initial treatment for acute urinary retention.**


Abstract: Sixty patients presenting with acute urinary retention were randomly allocated to treatment with either suprapubic or urethral catheters. An initial specimen of urine was obtained for bacteriological culture and organism count. Subsequently, repeat specimens of urine were obtained at intervals of 2 days until the catheter was removed. **The results of these cultures showed that suprapubic catheters caused less urinary tract infection** ($p<0.05$). **In addition, suprapubic catheters were more comfortable for the patients, easier to manage and more cost-effective.** In patients with suprapubic catheters, their ability to void could be assessed prior to removal of the catheter, thus avoiding the need for recatheterization. It was concluded that patients presenting with acute urinary retention should be routinely treated by drainage using suprapubic catheters.


Abstract: Background: Although bladder drainage is widely used for general surgical patients undergoing laparotomy, there is little consensus on whether suprapubic or transurethral catheterization is better. Method: A systematic database search was undertaken to find all studies of suprapubic catheterization. Randomized controlled trials were identified for inclusion. Endpoints for analysis were bacteriuria, patient satisfaction and recatheterization rates. A meta-analysis was performed using fixed-effect or random-effect models as appropriate, depending on heterogeneity. Results: After abdominal surgery, transurethral catheterization is associated with significant bacteriuria (relative risk (RR)=2.02, $P<0.001$, 95 percent confidence interval (c.i.) 1.34 to 3.04) and pain or discomfort (RR=2.94, $P=0.004$, 95 percent c.i. 1.41 to 6.14). Recatheterization rates using the transurethral method were not increased significantly (RR=1.97, $P=0.213$, 95 percent c.i. 0.68 to 5.74) with heterogeneity between studies. Conclusion: **The suprapubic route for bladder drainage in general surgery is more acceptable to patients and reduces microbiological morbidity.**

Abstract: Background: Indwelling urinary catheters are often used for bladder drainage during hospital care. Urinary tract infection is a common complication. Other issues that should be considered when choosing an approach to catheterisation are patients' comfort, other complications/adverse effects, and costs. Objectives: To determine the advantages and disadvantages of alternative approaches to catheterisation for short-term bladder drainage in adults. Search Strategy: We searched the Cochrane Incontinence Group Specialised Register (searched 20 December 2004). Additionally, we examined all reference lists of identified trials. Selection Criteria: All randomised and quasi-randomised trials comparing catheter route of insertion for adults catheterised for up to 14 days. Data Collection and Analysis: Data were extracted by both reviewers independently and compared. Disagreements were resolved by discussion. Data were processed as described in the Cochrane Handbook. If the data in trials had not been fully reported, clarification was sought directly from the authors. Main Results: Seventeen parallel-group randomised controlled trials met the inclusion criteria. Fourteen trials compared indwelling urethral catheterisation with suprapubic catheterisation. Groups managed with an indwelling catheter had more cases of bacteriuria (RR 2.60; 95%CI 2.12 to 3.18), more frequent recatheterisation (RR 4.12; 95%CI 2.94 to 7.56), and more people with discomfort (RR 2.98; 95%CI 2.31 to 3.85). There were no reports of complications during insertion, although not all trials stated this explicitly. Three trials compared indwelling urethral catheterisation with intermittent catheterisation. In the two trials with data, there were fewer cases of bacteriuria in the suprapubic catheterisation group (RR 2.90; 95%CI 1.44 to 5.84). Costs analyses reported in two trials favoured the indwelling group. Authors’ Conclusions: There was evidence that suprapubic catheters have advantages over indwelling catheters in respect of bacteriuria, recatheterisation and discomfort. The clinical significance of bacteriuria was uncertain, however, and there was no information about possible complications or adverse effects during catheter insertion. There was more limited evidence that the use of intermittent catheterisation was also associated with a lower risk of bacteriuria than indwelling urethral catheterisation, but might be more costly. Using intermittent catheterisation postoperatively limits catheterisation to those people who definitely need it.


Abstract: Spinal injury patients initially treated by intermittent catheterisation (IUC) and those who received a fine-bore suprapubic catheter (SPC) have been reviewed. The results show that fine-bore suprapubic catheterisation seems to be superior to intermittent catheterisation because the rate of urinary tract infections is significantly lower in the SPC-group (50%) than in the IUC-patients (71.9%), and the first infecting organisms in the SPC-group differ from those in the IUC-group and are much more easily treated by antibiotic therapy.

Abstract: Background: The objective of this study was, to prospectively and retro respectively evaluate urethral catheterization (UC) versus supra-pubic cystostomy (SPC) in prevention of urinary tract infection (UTI) in patients with spinal cord injury lesion. Methods: A total of 125 patients with neurogenic bladder and a mean age of 30 years had UC (n=80) and SPC (n=40) at the Jos University Teaching Hospital (JUTH) between January 1984 and June 2005. Results: Episodes of UTI were significantly more; UC 65% versus 14% for SPC (P< 0.05). Urinary tract infection occurred relatively late in the course of admission, in patient who had SPC. Patients in SPC group were significantly satisfied with this management option; 57% versus 8% for UC. Similarly, mortality at 1 year post admission was significantly less; 9% versus 36% for UC and death due to UTI related septicaemia was 33% versus 18% respectively. Conclusion: **It was concluded that SPC was a better management option since it was associated with a low morbidity, better quality of life and a longer life expectancy than UC.**


Abstract: Sixty-six patients requiring catheterization in the course of general surgical operations were randomly allocated into two groups. Of the 34 patients catheterized urethrally 16 developed urinary tract infections whereas of the 32 suprapublically catheterized patients only 2 developed an infection (P less than 0.001). Five patients required recatheterization after removal of their urethral catheters. There were no major complications associated with the use of suprapubic catheters. We propose that, when catheterization is required during a general surgical procedure, the suprapubic route is to be preferred.


Abstract: Objective: To assess whether chronic suprapubic catheterization (SPC) in patients with spinal cord injury (SCI) is associated with a higher incidence of significant urinary tract complications than in patients whose urinary tracts are managed by other methods. Patients and Methods: Our experience suggested that the incidence of complications in patients with SCI and SPC was acceptable and relatively low. Between 1988 and 2001, 1018 patients were admitted to our unit after SCI; 149 were managed by SPC and we retrospectively reviewed them, with a mean follow-up of 6 years. There were no complications in 49% of patients. Most complications were minor (urinary tract infection 27%, bladder stones 22%) and were easily managed. Only 20 patients had upper tract complications. Nine patients had renal scarring and 14, all quadriplegic, had upper tract calculi. One patient developed well-differentiated superficial transitional cell bladder cancer. Conclusions: Patients with SCI often prefer SPC than other methods offered to them, because of quality-of-life issues. The incidence of significant complications might not be as high as previously reported, and with a commitment to careful follow-up, SPC can be a safe option for carefully selected patients if adequate surveillance can be ensured.

Abstract: Background: Lower urinary tract dysfunction is a common morbidity related to radical hysterectomy (RAH). Although transurethral catheterization (TUC) has traditionally been used for postoperative bladder drainage following RAH, suprapubic catheterization (SPC) is an alternative method that may be advantageous. Objectives: To determine, by means of a retrospective cohort study, the incidence of urinary tract infection (UTI), duration of postoperative hospital stay, and time to trial of voiding in women catheterized suprapubically or transurethrally after RAH for early stage cervical cancer. Methods: Two hundred twelve patients who underwent RAH and staging for stage IA1 + LVS, IA2, and IB1 cancer of the cervix in Edmonton between 1996 and 2006 were included in the study. Three gynaecologic oncologists performed the surgeries. Operative, postoperative, and demographic data were extracted from patient records. Patients were catheterized either suprapubically (SPC group) or transurethrally (TUC group) according to the surgeon's discretion. Comparative tests and multivariate regression analysis were used to compare outcome measures between the groups and to adjust for confounding variables. Results: The TUC group had a higher proportion of patients with UTI (27%) than the SPC group (6%) (P < 0.001). The SPC group had a shorter postoperative hospital stay (4.8 vs. 5.7 days; P < 0.001) and an earlier trial of voiding (2.7 vs. 4.4 days; P < 0.001). Following regression analysis, statistically significant differences remained for UTI and time to initiation of a trial of voiding. Conclusion: After RAH for early stage cervical cancer, suprapubic catheterization is associated with a lower rate of UTI and an earlier trial of voiding than transurethral catheterization.

Percutaneous Cystolithotripsy


Abstract: Background: The majority of vesical calculi in adults can now be treated per-urethrally with the use of ultrasonic or pneumatic lithotripsy. However, the use of these devices is restricted in pediatric patients by the narrow caliber of the urethra. A percutaneous suprapubic approach to the bladder circumvents the problem of urethral caliber in these situations. Patients and Methods: Thirty-eight children presenting with bladder stones underwent percutaneous suprapubic cystolithotripsy (PCCL) between November 1989 and April 1996. The age ranged from 1.5 to 7 years. The stone size ranged from 0.8 to 2.4 cm. Seven of these were recurrent stones, and five of the patients were female. The procedure was done under general anesthesia, and the equipment was the same as for upper tract endourology. The bladder was distended with saline and a suprapubic puncture made. The nephroscope was introduced after tract dilation and the stone removed, intact if small or after fragmentation if >1 cm. The procedure was done without fluoroscopy. A suprapubic catheter was left in for 48 hours. Results: All patients had an uneventful recovery following stone removal. The average hospital stage was 3 days. Here, the access provided by percutaneous suprapubic cystostomy has been combined with the experience gained in upper-tract endourology to perform procedures that would otherwise require open operation because of nonavailability of urethral access. Conclusion: Extension of endourologic procedures to the lower tract reduces morbidity and hospital stay and thus the cost of treatment. Percutaneous suprapubic cystolithotripsy, in our experience, is a safe and cost-effective alternative to open surgery in children.
2) **Ahmadnia H, Younesi Rostami M, Yarmohammadi AA, Parizadeh SM, Esmaeili M, Movarekh M.**


Abstract: Introduction: We sought to evaluate the safety and efficacy of percutaneous cystolithotripsy in children. Materials and Methods: Thirty children (27 boys and 3 girls; mean age, 6.06 ± 2.64 years; range, 1.5 to 12 years) with bladder calculi underwent percutaneous stone removal. The mean size of the largest diameters of the calculi was 24.8 ± 8.47 mm (range, 13 mm to 50 mm). Under general anesthesia, a 1-cm incision was made 1 to 2 cm above the pubic symphysis. A 26-F nephroscope was introduced into the bladder following tract dilation, and the calculi were removed. If the calculi were larger than 1 cm, fragmentation was performed. The procedure was done without fluoroscopy. Finally, a urethral catheter was placed for 48 hours. Results: All patients became stone free. The mean operative time was 23.13 ± 8.38 minutes (range, 12 to 40 minutes). All patients were discharged 24 hours after operation, except 1, who was hospitalized 2 more days for suprapubic pain and severe irritating symptoms. No significant intraoperative or postoperative complications were seen. Conclusion: Percutaneous suprapubic cystolithotripsy is an efficient and safe technique for treating bladder calculi in children. We recommend this technique for treating large bladder calculi (larger than 1 cm) in children.

3) **Aron M, Goel R, Gautam G, Seth A, Gupta N.**

Percutaneous versus transurethral cystolithotripsy and TURP for large prostates and large vesical calculi: Refinement of technique and updated data. *International Urology and Nephrology.* 2007; 39(1): 173-177

Abstract: Background and purpose: We compare two modalities of treatment; transurethral cystolithotripsy (TUCL) and percutaneous cystolithotripsy (PCCL), for large vesical calculus in patients who underwent simultaneous transurethral resection of prostate (TURP), and present refinements of the technique of PCCL. Patients and methods: Between July 1999 and June 2003, 54 patients were subjected to either TUCL (n = 19) or PCCL (n = 35) along with simultaneous TURP. Inclusion criteria were prostate volume > 50 ml, aggregate stone size > 3 cm with each individual stone > 1 cm, In the TUCL group, calculi were treated with 26F nephroscope, pneumatic lithotripsy and fragment extraction. This was followed by TURP with 26F continuous-flow resectoscope. In the PCCL group, calculi were removed through a suprapubic 30F Amplatz sheath followed by standard TURP with the suprapubic sheath in situ to provide continuous drainage. A 20F two-way Foley catheter was inserted suprapubically and urethrally in cases of PCCL and a 22–24F three-way catheter urethrally after TUCL. Results: The two groups were comparable in age. The mean prostate size as well as aggregate stone size was significantly larger in PCCL group. The operating time for stone removal was significantly less in the PCCL group while time required for TURP was statistically similar in two groups. In the TUCL arm three patients had residual stones requiring repeat TUCL, and one developed a urethral stricture. Conclusions: Combined TURP and PCCL is safe, more effective and a much faster alternative to combined TURP and TUCL in patients with large bladder calculi and large prostates.

4) **Aron M, Agarwal M, Goel A.**

Comparison of percutaneous with transurethral cystolithotripsy in patients with large prostates and large vesical calculi undergoing simultaneous transurethral prostatectomy. *BJU Intl.* 2003; 91: 293-295

Abstract: Vesical calculi in adults are usually associated with BOO caused by BPH, and treatment involves removing the bladder calculus and relieving the BOO. The endoscopic management of BOO commonly involves TURP. Vesical calculi can be managed simultaneously and endoscopically either by the transurethral or suprapubic percutaneous routes. We compare the outcome of the two methods for managing vesical calculi in patients undergoing simultaneous TURP. In conclusion, although the present series was small, it appears that combined TURP and PCCL is faster and probably associated with fewer complications than TURP and TUCL. We recommend reserving TURP combined with TUCL
for patients with small prostates and small bladder calculi. In patients with large calculi and/or large prostates PCCL and TURP should be used, as the vision is excellent during rapid stone fragmentation and removal, and the resection is faster with the continuous suprapubic drainage.


Abstract: Introduction: Bladder lithiasis is one of the oldest pathologies known to man and its treatment has been a subject of discussion throughout history. Percutaneous surgery and the use of shock wave lithotripsy has been one of the great advances in the treatment of this pathology, eliminating the use of rigid surgical instruments in the urethra and possible complications from their use. Materials and Methods: Two groups were formed from a total of 21 patients who had undergone percutaneous surgical treatment of bladder lithiasis. Dilators (Amplatz®) were used in the first group and 12mm laparoscopy trocars were used in the second. Both groups were similar with respect to age, sex, number of fragmented stones, stone size and number of days of hospitalization. Results: There was significant difference in the time in surgery favoring the laparoscopy trocar technique. Conclusions: Bladder lithiasis percutaneous surgery was shown to be a safe, efficient and economic method with minimal morbidity.


Abstract: Background and Purpose: To evaluate the success and complications of percutaneous suprapubic cystolithotripsy (PCCL) in pediatric and adult patients with neurogenic bladder. Patients and Methods: Between 2000 and 2004, 72 patients, all male (30 children aged 2 to 7 years [mean 4.7 years] and 42 spastic paraplegic adults aged 34 to 62 years [mean 53 years]), with sterile urine underwent PCCL under general anesthesia in one sitting. An 18-gauge needle, Amplatz dilatation set, 30F Amplatz sheath, rigid nephroscope, lithotripter (pneumatic, mechanic), and stone forceps were used. Fluoroscopy was not. A suprapubic catheter was placed in the first two patients only. Results: The dimensions of the stones were on average 3.2 cm (range 1-5 cm) for the pediatric patients and 5.5 cm (4-10 cm) for the adult patients. The operating time was 20 minutes (10-35 minutes). In all cases, the stones were taken out. No serious intraoperative or postoperative complications were observed. In all cases, the transurethral catheter was removed on postoperative day 5. No recurrence was observed during the follow-up period (mean 20 months). Conclusion: As urethral diameters are narrow in pediatric patients and adult spastic paraplegic patients in whom an endoscopic approach could not be performed, PCCL is a safe alternative with low morbidity and complication rate. The technique is also more advantageous than open surgery with regard to cosmetic outcome and length of the hospital stay.


Abstract: Percutaneous procedures for the removal of calculi from reconstructed bladders have not been compared in a single institution with traditional open methods. The records of patients undergoing seven percutaneous and six open procedures for the removal of calculi from augmented bladders were reviewed. Operative time, hospitalization time, complications, stone burden, and recurrence were compared. All patients were stone-free at the end of either one or two procedures. Four of six patients in the percutaneous group and four of six patients in the open group had recurrent bladder calculi during average follow-up of 30 months. The average hospital stay was 1.1 days for patients undergoing percutaneous procedures and 3.7 days for those undergoing open cystolithotomy. Narcotic use was significantly lower in the percutaneous group. Percutaneous cystolithotomy is safe, effective, and currently the preferred method for removing stones from an augmented bladder.

Abstract: Purpose: Although vesical calculi are routinely treated transurethrally, open vesicolithotomy is generally performed in patients with an impassable or surgically ablated urethra. We describe a technique of percutaneous vesicolithotomy which we used in patients who had undergone urethral ablation and concomitant continent diversion by appendicovesicostomy. Materials and Methods: Bladder stones were detected in 3 patients with neurogenic bladder who had undergone continent urinary diversion with bladder neck closure and appendicovesicostomy. To treat the stones access to the bladder was achieved percutaneously and the tract was enlarged using a balloon dilator. An Amplatz sheath was slipped over the inflated balloon and after the dilator was removed the sheath provided a working channel through which stones were fragmented and removed using a nephroscope. Results: Each patient was rendered stone-free and discharged home the same day as the procedure. Conclusions: Percutaneous vesicolithotomy provides an alternative approach for bladder stone removal in patients with an impassable urethra with decreased morbidity compared to open procedures.


Abstract: A total of 36 patients with bladder stones underwent percutaneous suprapubic cystolithotripsy. The successful rate was 89%. There were 11% failures due to nonfragmentation of the stones by the ultrasound probe. According to the presence of associated diseases 3 groups of patients were established. Two groups underwent concomitant treatments for benign prostatic hyperplasia and urethral stricture. No complications occurred even in patients with concomitant treatment. There was no statistically significant difference when these groups were compared (p > 0.05). Fluoroscopy was not necessary during the procedure. Since the technique is simple, safe and effective, it represents an alternative in the management of bladder stones.

10) Kamat N. Comparison of percutaneous with transurethral cystolithotripsy in patients with large prostates and large vesical calculi undergoing simultaneous transurethral prostatectomy. BJU Int. 2003;92(9):1047.


Abstract: Bladder calculi associated with benign prostatic hyperplasia are fairly common, and a popular treatment is transurethral resection of the prostate (TURP) with endoscopic lithotripsy as a combined procedure. We have been routinely using a Reuter's suprapubic trocar and cannula for continuous irrigation during TURP for medium-size and large glands. Rather than performing the vesicolithotripsy per urethra, we have found it easier and faster to use the suprapubic route, especially because the suprapubic tract was already partly made by the Reuter's trocar and half sheath. We describe the technique in detail and explain why we find it easier to extract the stone by the suprapubic rather than the urethral route.

Abstract: Vesical calculus is a common problem that is treated traditionally with open cystolithotomy or cystolithalopaxy. Open surgery has the inherent problems of a long scar, prolonged catheterization, extended hospitalization, and risk of infection. Transurethral cystolithalopaxy also requires special instruments that carry a risk of trauma, which could lead to urethral strictures. Thirty-eight patients (15 children and 23 adults) were treated for vesical calculi by percutaneous cystolithotomy (PCCL), a minimally invasive procedure. A fluoroscopic-guided tract was made to the bladder through a small suprapubic puncture (9-10 mm) and a nephroscope was inserted via an Amplatz sheath placed suprapubically. The calculus was fragmented with ultrasound or pneumatic energy before being flushed out. A suprapubic catheter was kept in place for 48 hours postsurgery; no urethral catheter was needed. Urethral instrumentation was kept to a minimum. After 48 hours, the suprapubic catheter was clamped and removed after the patient had two or three normal voids. No significant intraoperative or postoperative complication was encountered. Given that the urethra is spared, percutaneous cystolithotomy is a preferred approach in patients with vesical calculi.


Abstract: Purpose: To report our results with percutaneous removal of calculi from reconstructed bladders. Patients and Methods: Twelve patients with reconstructed bladders who underwent endoscopic cystolithotomy were identified from our departmental database, and retrospective review of case notes and imaging was performed. Results: Access was gained via an ultrasound-guided new tract in 9 patients (75%). An old suprapubic tract site was used in two patients, and the Mitrofanoff stoma was the route of access in one patient. The procedure was successful, with stone clearance achieved in all 12 cases. No major complications were observed. At a median follow up of 24 months, stone recurrence was observed in 5 patients (42%), 4 of whom underwent repeat procedures. Follow-up showed no change in continence in the patient with a Mitrofanoff stoma. Conclusion: Percutaneous cystolithotomy is a safe and effective minimally invasive option for removal of stones in a reconstructed bladder. We recommend endoscopic removal as the treatment of choice in these patients.


Abstract: Bladder calculi account for 5% of urinary calculi and usually occur because of bladder outlet obstruction, neurogenic voiding dysfunction, infection, or foreign bodies. Children remain at high risk for developing bladder lithiasis in endemic areas. Males with prostate disease or relevant surgery and women who undergo anti-incontinence surgery are at a higher risk for developing vesical lithiasis. Open surgery remains the main treatment of bladder calculus in children. In adults, the classical treatment for bladder calculi is endoscopic transurethral disintegration with mechanical cystolithotripsy, ultrasound, electrohydraulic lithotripsy, Swiss Lithoclast, and holmium:YAG laser. Novel modifications of these treatment modalities have been used for large calculi. Open and endoscopic surgery requires anesthesia and hospitalization. Alternatively, extracorporeal shock wave lithotripsy has been demonstrated to be simple, effective, and well tolerated in high-risk patients. Recently, simultaneous percutaneous suprapubic and transurethral cystolithotripsy has been tested as well as percutaneous cystolithotomy.

Abstract: Objective: To evaluate our experience with percutaneous suprapubic cystolithotripsy (PCCL) in Yemeni children with endemic urinary bladder stones. Patients and Methods: Between January 1993 and December 1998, 117 children underwent percutaneous suprapubic lithotripsy in Arabia Felix Modern Hospital, Sana'a Republic of Yemen. The patients' ages ranged from 8 months to 14 years (average 3.7 years). Ninety patients (77%) were under 5 years old; 20 patients (16%) were between 6 and 10 years old, and 7 patients (6%) were between 11 and 14 years old. There were 116 boys and 1 girl. The stone size ranged from 0.7 to 4 (average 2.3) cm. Five patients had coexisting urinary bilharziasis and another 5 patients had coexisting renal stone. In 10 patients, the stone was in the urethra. The procedure was done under general anesthesia. Dilation of the tract was made under fluoroscopy. The instrument was an adult 26-french nephroscope, the same as that used for percutaneous nephrolithotripsy. Ultrasound disintegration was needed for stones of > 1 cm. A suprapubic catheter was left for 24 h, and a urethral catheter was kept for 48 h. Results: All patients became stone free. The average operating time was 15 (5-50) min. The average hospital stay was 2.7 (2-5) days. No severe intra- or postoperative complication was observed. The nucleus and/or the main component of the stones were ammonium acid urate in 109 patients (93%). Conclusion: Based on our experience we can conclude that percutaneous suprapubic lithotripsy is a safe and effective method for the treatment of bladder stones in children. It reduces morbidity and hospital stay and thus the cost of treatment. Our series proves the nutritional etiology of endemic pediatric bladder stones. To our knowledge, this is the largest series reported on percutaneous suprapubic management of endemic bladder stones in children.


Abstract: Bladder calculi are a common problem traditionally treated with open cystolithotomy or transurethral cystolitholapaxy. Percutaneous cystolithotomy via an Amplatz sheath is a recent approach that keeps urethral instrumentation to a minimum. We describe a percutaneous approach to bladder stones using a Hasson’s trocar. With this approach, one or more watertight approaches to the bladder can be created, allowing any kind of endoscopic surgical material to be introduced, thus opening new possibilities in the design of percutaneous bladder surgery techniques.


Abstract: Objective: Bladder stone is traditionally treated with transurethral cystolithotripsy or open cystolithotomy. In this study, percutaneous suprapubic cystolithotripsy was attempted to deal with bladder stones larger than 3 cm in diameter. Patients and Methods: Six male patients were treated with percutaneous suprapublic cystolithotripsy for large bladder stones (stone burden average 5.4cm). These stones were effectively disintegrated with Pneumatic Swiss Lithoclast® via a 26Fr. zero degree nephroscope placed through the suprapubic cystostomy tract. The fragmented stones were removed by forceps via the suprapubic tract and cystoscopic irrigation. We compared this method with transurethral cystolithotripsy (n=21, stone burden average 2.5cm) and open cystolithotomy (n=6, stone burden average 5.8cm). Results: The efficacy index of stone removal was 0.11 cm/min for percutaneous suprapubic cystolithotripsy, 0.06 cm/min for transurethral cystolithotripsy and 0.09 cm/min for open cystolithotomy. The hospital stay was 3.3 days for percutaneous suprapubic cystolithotripsy, 2.4 days for transurethral cystolithotripsy and 6.5 days for open cystolithotomy. Conclusions: Percutaneous suprapubic cystolithotripsy is a safe and effective alternative technique for the removal of large calculi.

Abstract: Objectives: To present a combined endourologic approach to treat bladder calculi consisting of simultaneous percutaneous suprapubic and transurethral cystolithotripsy. Methods: We report on a series of 12 consecutive patients with bladder stone burdens of 40 mm or greater. Percutaneous 30F access was obtained under cystoscopic control. Fragmentation and stone removal were performed simultaneously by two urologists using a Swiss lithoclast, holmium laser, and/or ultrasound lithotriptor through both percutaneous and transurethral routes. Suprapubic and transurethral catheters were placed postoperatively. Results: Twelve patients with a median age of 66 years (range 33 to 80) were treated by simultaneous percutaneous suprapubic and transurethral cystolithotripsy. Six underwent transurethral resection of the prostate at the completion of stone clearance. The median stone size was 60 mm (range 40 to 80), and the median lithotripsy time was 56 minutes (range 45 to 70). The median postoperative hospitalization was 2.7 days (range 2 to 5), and complete stone clearance was achieved in all cases. One patient, who underwent concomitant transurethral resection of the prostate, developed urinary retention 1 week postoperatively and was successfully treated by temporary transurethral catheterization. One patient with a positive urine culture preoperatively developed fever on the first postoperative day and was treated with intravenous antibiotics according to the antibiogram results for 5 days. No other complications had occurred after a median follow-up of 10 months (range 3 to 15). Conclusions: *Simultaneous percutaneous suprapublic and transurethral cystolithotripsy appears to be a safe approach for the management of large bladder calculi and may shorten the total fragmentation time*. It can be combined with transurethral resection of the prostate without prolonging hospitalization. The simultaneous use of two modalities of stone fragmentation represents an effective and minimally invasive way of treating large bladder calculi.


Abstract: Purpose: To compare transurethral cystolithotripsy (TUCL) and percutaneous cystolithotripsy (PCCL) modalities performed during simultaneous transurethral resection of the prostate (TURP) in patients with prostate hyperplasia and large bladder stones. Patients and Methods: Sixty-three patients with prostate volume >40 cc and aggregate stone size >2.5 cm were enrolled in the study between August 2003 and February 2007. TUCL (n = 38) or PCCL (n = 25) procedures were performed during simultaneous TURP. In the TUCL group, the stones were removed after fragmentation through a 23F cystolithotripter with pneumatic lithotripsy. This was followed by TURP, performed with a 26F continuous-flow resectoscope. In the PCCL group, the stones were removed through a suprapubic 30F Amplatz sheath after fragmentation. TURP was then performed with the suprapubic sheath providing continuous drainage. RESULTS: Mean age and prostate volumes of the groups were similar. Mean aggregate stone sizes were significantly larger in the PCCL group. The operative time for stone removal was significantly less in the PCCL group while time needed for TURP was statistically similar in the two groups. In the TUCL group, three patients had residual stones necessitating repeated TUCL and urethral stricture developed in three patients. Conclusion: The smaller caliber of the working channel during TUCL, compared with PCCL, necessitates disintegration of the stones into smaller fragments. This elongates the duration of the intervention and results in increased urethral and bladder trauma. **Combined TURP and PCCL is a safer, more effective, and much faster alternative to combined TURP and TUCL in patients with large bladder stones and prostate hyperplasia.**

Abstract: Objectives: To assess the feasibility and effectiveness of percutaneous cystolithotripsy under local anesthesia in selected patients. Methods: Thirty-one patients with bladder stones of different etiologies underwent percutaneous cystolithotripsy under local anesthesia. Suprapubic access was obtained with ultrasound guidance, and fragmentation of the stone was performed using the Swiss lithoclast. Suprapubic and transurethral catheters were placed postoperatively. Results: No major intraoperative complications occurred. The whole procedure was well tolerated, and no significant differences were found in the mean pain score between the percutaneous suprapubic cystolithotripsy group and a group of male patients who underwent rigid cystoscopy under local anesthesia (P = 0.35). Complete stone clearance was achieved in all but 1 patient (96.78%). Bladder irrigation because of gross hematuria was needed in 5 patients, but no blood transfusion was required. Fever developed in 1 patient and was treated with intravenous antibiotics. The average hospitalization was 2.3 days (range 2 to 5). After a mean follow-up of 10 months, no recurrent stone developed. Conclusions: **Percutaneous suprapubic cystolithotripsy under local anesthesia is a safe and effective technique to remove bladder calculi.** Thus, it may be used as an alternative treatment option in selected patients.


Abstract: Background and Purpose: The treatment options available for managing bladder calculi include transurethral cystolithotripsy, open cystolithotomy, and shockwave lithotripsy. For larger calculi, transurethral treatment can be time consuming, and the manipulation has the potential to cause urethral injury. Percutaneous suprapubic cystolithotripsy represents another treatment option for bladder calculi which is effective and minimally invasive. Patients and Methods: Fifteen patients had bladder calculi treated with percutaneous cystolithotripsy over a 3-year period. The mean stone size was 39 mm (range 10-64 mm). Stones were single in seven patients and multiple in eight patients. The indications for cystolithotripsy were stone size >3 cm, multiple stones >1 cm, and inability to perform transurethral cystolithotripsy because of patient anatomy. Percutaneous suprapubic cystolithotripsy was done through either a 30F or a 36F cystotomy tract. Fragmentation and removal was performed with a 26F rigid nephroscope and the pneumatic Swiss Lithoclast. Suprapubic and urethral catheters were placed postoperatively in all patients. Results: Each patient was cleared of the stone burden with a single procedure, and there were no major complications. The mean duration of suprapubic catheterization was 2.6 (range 1-5) days. Conclusion: **Percutaneous suprapubic cystolithotripsy is an effective and safe technique for treating large bladder calculi.** It is minimally invasive, avoids urethral injury, and, in combination with the pneumatic Swiss Lithoclast, can be used to fragment and remove large and hard bladder calculi.


Abstract: An 18-year-old patient with repaired bladder extrophy developed a 550-g stone burden in his augmented bladder. The stones were removed percutaneously with the aid of a pneumatic stone lithotripter. This should be considered the method of choice in these difficult cases.