Ureteroneocystostomy Versus Ureteric Stenting for the Management of Ureterovaginal Fistula

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Abstract

Background: To compare Ureteroneocystostomy versus ureteric stenting for the management of ureterovaginal fistula.

Methods: This comparative study included patients with ureterovaginal fistulas. All the patients presented with history of urinary leakage. All of these patients had undergone abdominal hysterectomies. Detailed history revealed that these patients developed continuous leakage of urine starting 1-2 weeks postoperatively. All the patients had normal voiding along with continuous leakage of urine. A Foley’s catheter was passed through urethra and methylene blue was injected through the catheter into the bladder. Cystoscopy was carried out using 22Fr ureterocystoscope sheath and 30 degree telescope. Ureteric orifices were identified and a ureteric catheter size 5 Fr was introduced, under image intensifier. When an obstruction was noticed, no force was applied to push the ureteric catheter beyond obstruction. A ureteroscope of 7.5 Fr was introduced into the side showing obstruction. A guide wire was passed through the ureteroscope and an attempt was made to negotiate the guide wire beyond obstruction, up into the ureter, to the kidney. The position of the guide wire was confirmed by the fluoro image. As the guide wire was introduced successfully, a double J stent was advanced over the guide wire and placed in position under fluoro guidance. In cases where guide wire could not be negotiated beyond obstruction the procedure was converted to an open exploration and ureteric reimplantation. In these patients a unilateral low quadrant incision was made, and the ureter was traced extraperitoneally. The dilated ureter was identified and traced down towards the bladder up to the point where it was found buried in dense fibrosis and adhesions. Beyond this point as no healthy ureter could be traced so it was divided in an oblique manner, spatulated and ureteric reimplantation was carried out following Lich-Gregoir Technique over a 6 Fr ureteric stent. Intraoperative abdominal X Ray was done to confirm the place of stent. The ureteric stents were removed three months later in the patients who had successful endoscopic ureteric stenting. The patients having open ureteric reimplant had their stents removed after 3 weeks.

Results: Endoscopic ureteric stenting was successful in six out of the twenty one cases. In the remaining cases, the patients underwent ureteric re-implant. In all the patients undergoing ureteric stenting urinary leakage stopped after the procedure. Ureteric stents were removed three months later with no complaints of urinary leakage up to six months follow up. All the thirteen patients who had ureteric re-implant became free of urinary leakage after surgery. These patients had an average post operative stay of 5-7 days. In these patients ureteric stents were removed 3-4 weeks after ureteric reimplant. Follow up up to six months didn’t reveal any recurrence of urinary leakage.

Conclusion: Endoscopic ureteric stenting should be considered the modality of choice for the management of Ureterovaginal fistula (UVF). It is minimally invasive, requires less hospital stay and is cost effective.

Key Words: Ureterovaginal fistula, Ureteric reimplant, Endoscopic ureteric stenting.

Introduction

Urinary leakage following gynaecological or pelvic surgery is a serious complication and the underlying cause of urinary leakage may be a ureterovaginal fistula. The incidence of ureteric injury during pelvic surgery has been reported in literature to be ranging from 0.5 to 2.5%. Other less common causes of ureteral injuries include vaginal repairs and colonic/pelvic vascular surgeries. Other less common causes of ureteral injuries include vaginal repairs and colonic/pelvic vascular surgeries. The condition affects the quality of life with severe social and psychological implications. According to the literature, more than 50% of all iatrogenic injuries occur during gynecologic
surgery as conditions like enlarged uterus, previous pelvic surgery and adhesions, endometriosis and unexpected massive intraoperative haemorrhage increase the risk of ureteric injury. 5 Overall 1% of abdominal hysterectomies end up in UVF. 6 Ureteral injury may be detected intra-operatively by a skillful surgeon by using methylene blue in a large number of cases. 3 Over 80% of ureteral injuries are diagnosed postoperatively. 7 Majority of the unfortunate victims of this complication pass through a long period of continuous urinary leakage, prolonged hospital stay, reoperation and potential loss of renal function. 8 Since these patients have a normal voiding in addition to urinary incontinence the diagnosis is usually overlooked. The aim of management is to prevent the damage of the affected renal unit by establishing the integrity of the urinary tract and restoration of normal voiding and lastly to abolish incontinence. Traditionally ureteroneocystostomy (UNC) has remained the sole modality of management of ureteric injury. 9 More recently less invasive techniques like retrograde and even antegrade ureteric stenting have been adopted as the first line of management for UVF. 10

Patients and Methods

This comparative study was conducted at Fauji Foundation Hospital, Rawalpindi in Urology and Gynecology Department from June 2009 to May 2013. The study included twenty one patients. Among these, fifteen patients came to urology outpatient clinic on their own with history of urinary leakage ranging from 1 month to 2 years, while six patients with urinary leakage were referred by the operating gynecologist within one month of surgery. All of these patients had undergone abdominal hysterectomies. Detailed history revealed that these patients developed continuous leakage of urine starting 1-2 weeks postoperatively. All the patients had normal voiding along with continuous leakage of urine. Six patients had unilateral flank pain. The patients were under great psychological stress because of constant leakage of urine, soiling of clothes and irritation of the perineal and vulval area. Clinical examination revealed transverse suprapubic scar. Unilateral flank tenderness was demonstrated in ten patients while all had signs of urinary dermatitis over vulval area, upper thighs extending up to the suprapubic area. A Foley’s catheter was passed through urethra and methylene blue was injected through the catheter into the bladder. A swab was placed in the vagina before catheter placement. The swab was removed, five minutes after injection of methylene blue into the bladder, and inspected. It was found soaked with urine but not stained with the dye. An abdominal ultrasound was performed for all the patients. Ureteric dilatation was performed in one case (Figure 1) Eight patients had their intravenous urograms done prior to presentation (Figure 2). After routine investigation and counselling examination under anaesthesia and cystoscopy were performed. Under general anesthesia vaginal examination revealed clear fluid (urine). Cystoscopy was carried out using 22Fr uretherocystoscope sheath and 30 degree telescope (Fig 3). Bladder mucosa was normal and no fistulous opening seen. Bladder capacity was found normal as shown (Fig 4). Ureteric orifices were identified and a ureteric catheter size 5 Fr (Fig 5) was introduced on either side. The procedure was conducted under image intensifier. When an obstruction was noticed, no force was applied to push the ureteric catheter beyond obstruction. A
ureteroscope of 7.5 Fr was introduced into the side showing obstruction. A guide wire was passed through the ureteroscope (Fig 6) and an attempt was made to negotiate the guide wire beyond obstruction, up into the ureter, to the kidney. The position of the guide wire was confirmed by the fluoro image. As the guide wire was introduced successfully, a double J stent was advanced over the guide wire and placed in position under fluoro guidance (Fig 5). In cases where guide wire could not be negotiated beyond obstruction the procedure was converted to an open exploration and ureteric reimplantation. In these patients a unilateral low quadrant incision was made, and the ureter was traced extraperitoneally. The dilated ureter was identified and traced down towards the bladder up to the point where it was found buried in dense fibrosis and adhesions. Beyond this point as no healthy ureter could be traced so it was divided in an oblique manner, spatulated and ureteric reimplantation was carried out following Lich-Gregoir Technique over a 6 Fr ureteric stent (11). A drain was placed for 2-3 days and a Foley’s catheter was kept for 5-7 days. Intraoperative abdominal X Ray was done to confirm the place of stent. The ureteric stents were removed three months later in the patients who had successful endoscopic ureteric stenting. The patients having open ureteric reimplant had their stents removed after 3 weeks.

Results

Endoscopic ureteric stenting with ureteroscope under fluoroscopic guidance was successful in 5 cases (Group A). In thirteen patients ureteric reimplant was successfully performed (Group B). One patient had bilateral stenting because of ureterovaginal fistula on one side and a ureteric stricture 4 cm above the ureteric orifice on the contralateral side as shown (Fig 8). In all these patients ureteric catheter passed up freely on one side, whereas an obstruction was noted 4-5 cm on the affected side. None of the patients required Boari flap or Psoas Hitch. Urinary leakage stopped in all patients belonging to Group A following ureteric stenting and remained dry after removal of stents three months post operatively. In Group B the patients stopped urinary leakage after ureteric reimplant. The Group A patients were discharged from the hospital on first postoperative day. Intravenous antibiotics used postoperatively for 24 hours only. A single dose of NSAIDS was given intramuscularly postoperatively. Group B patients had an average 5-7 days of hospital stay. These patients received intravenous antibiotics for an average period of 5 days along with parenteral analgesia for a similar period. None of the patients developed fever or wound infection. The drain kept extraperitoneally was withdrawn after 24-48 hours after surgery. Cost of hospitalization was less in patients with endoscopic ureteric stenting than in patients with ureteric reimplant surgery.

Discussion

Ureterovaginal fistula is a serious complication of gynaecological surgeries and can also be associated with vesicovaginal fistula. An estimated incidence of ureteral injury during major gynecologic surgery is 0.5-2.5% and abdominal hysterectomy accounts for over half of the total. Among the obstetric procedures, cesarean section is clearly the most common surgery resulting in a ureteric injury. Approximately 90% of the ureteric injuries occur in distal portion of ureter where it passes beneath the uterine vessel. The ureter may be ligated, severed, partially transected, crushed when caught in a clamp, devascularised or damaged during diathermy applications. The reported incidence of complete ureteric transaction is 61%, excision 29%, ligation 7% and partial transaction 3%. Patients with ureteric fistula present with a typical symptom of urinary leakage along with normal voiding. The anatomic proximity of the lower urinary tract and the female reproductive system renders the ureter vulnerable to injury during obstetric and gynecologic procedures.
Also early identification and repair of ureterovaginal fistulas results in few postoperative complications and preservation of renal function. The patients with ureterovaginal fistula are under great stress which leads to psychological and social problems. The first and foremost priority is to make the patient dry and relieve her agony.

In the management of ureterovaginal fistula, medical treatment has no role but unfortunately many patients waste their time and money by visiting different physicians who prescribe urinary antiseptics and bladder relaxant medication. Traditionally ureteroneocystostomy has been carried out for the management of ureterovaginal fistula and it remains the gold standard. Once the site of damage is identified with anatomic details, the management of ureteral injury should be done as soon as possible. If the lesion occurs above the pelvic brim then the option of repair includes end to end anastomosis of ureter, transureteroureterostomy or ileal substitution. Another option for repair is use of a Memo Kath stent placement. Memo Kath stent is a thermo expandable stent with a closed tight spiral structure rendering it suitable to stay in ureter for a longer time with a negligible risk of stone formation or ischemic injury to ureteric tissue. The problem associated with Memo Kath stent was stent migration. Spontaneous resolution of fistula is reported in some cases but in that case fistula was very small in size. Percutaneous nephrostomy is also performed in some cases but it is not curative for fistula as the dribbling of urine persists in > 70% of cases. Along with this, antegrade stenting is performed in those cases where retrograde stenting is difficult or not possible.

Nowadays there is a trend towards minimally invasive procedures in order to reduce patient's morbidity and the cost of treatment. In this study we attempted vaginal repair of ureterovaginal fistulas through endoscopic transvaginal approach. In five patients we were successful in passing double J stent and relieved the symptoms of continuous dribbling of urine. In thirteen patients, however endoscopic stenting was not successful and the procedure was converted, in the same setting, to an open ureteroneocystostomy. Ureteric stenting was proved to be a better option where possible to manage the ureterovaginal fistula. It certainly has decreased morbidity, is cost effective and has better patient acceptance. In our study, the stents were kept for six weeks postoperatively and patient remained catheterized for two weeks in order to keep the bladder decompressed with improved fistula healing. In conclusion, ureteric stenting should be considered as a preferred modality of treatment for UVF. It is a minimally invasive technique with less morbidity as compared to open surgery and UNC. The cost of hospitalization is also less in patients with endoscopic ureteric stenting than in patients with ureteric re-implant surgery due to the prolonged stay in the latter.

References