Original Research Article

Prospective Study of Role of Endoscopic Approach in the Management of Ureterovaginal Fistula

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Abstract

Introduction: The causes of iatrogenic post-operative ureterovaginal fistulae (UVF) include ureteral laceration or transection, blunt avulsion, crush injury, partial or complete suture ligation, and ischemia due to operative devitalization of the ureteral blood supply and/or cautery injury. Traditionally, most ureterovaginal fistulas have been repaired by ureteroneocystostomy. In recent years, Endourological management is highly successful in treating ureterovaginal fistulas and ureteral stricture does not appear to be a common complication. **Aim:** The aim of our study was to evaluate the endourological management of iatrogenic Ureterovaginal fistula.**Materials and Methods:** A total of 60 patients referred to us after hysterectomy was confirmed of UVF. Once the diagnosis is confirmed, all patients underwent retrograde ureterogram and ureteroscopy with double-J stenting if stenting was not achievable, percutaneous nephrostomy (PCN) was performed, and then after 4 weeks retrograde double-J stenting was attempted. **Results:** About 58 (96.6%) out of 60 patients were managed successfully with retrograde ureterogram and ureteroscopy with double-J stenting and 2 (3.4%) out of 60 patients required PCN followed by after 4-6 weeks retrograde successful double-J stenting. **Conclusion:** Ureteroscopy and placement of double-J stent is technically challenging but is still a good option if detected and intervened early, causing minimal morbidity and discomfort. It is more effective, reliable, less invasive, and readily accepted by patients

Keywords: Percutaneous Nephrostomy, Ureterovaginal Fistula, Retrograde Ureterogram, Ureteroscopy, Double J Stent.

Introduction

Ureterovaginal fistula (UVF) is a serious complication of unrecognized ureteral injuries during open or laparoscopic surgeries[1]. The ureter is susceptible to injury during vascular, gynaecologic, urologic, and colonic operations. The most common cause for UVF is a surgical injury to the distal ureter, with gynaecologic procedures being by far the most common cause[2]. The majority of UVF occur during procedures for benign rather than malignant indications including hysterectomy most commonly but also caesarean section, cystocele repair, and other pelvic surgery such as infertility procedures[3]. The risk of ureteral injury appears to be greatest during laparoscopic hysterectomy, followed by abdominal and then vaginal hysterectomy[1.] The incidence of iatrogenic ureteral injury during major gynaecologic surgery is estimated to be about 0.5-2.5%[4]. Loss of continuity of the ureter results from division or laceration, or from ischemic necrosis related to clamping, ligation, or damage to the blood supply of the ureter. Traditionally, most ureterovaginal fistulas have been repaired by ureteroneocystostomy. In recent years, Endourological management is highly successful in treating ureterovaginal fistulas and ureteral stricture does not appear to be a common complication. Endourological approaches are highly successful in treating UVF[5]. We evaluated the endourological management of iatrogenic Ureterovaginal fistula.

Materials and Methods

A prospective, non-randomized study done from June 2017 to July 2021. The total of 60 patients referred to us after hysterectomy with mean age of 49.71 years (range from 41 to 56). For all the patients, hysterectomy was done for benign causes of various reasons. There were 36 patients (57.2%) post laparoscopic hysterectomy, 22 patients (35.7%) post abdominal hysterectomy, and 2 patients (7.1%) post vaginal hysterectomy (Table 1). All cases were referred, within 2 weeks. All 60 patients presented with vaginal drainage within two weeks of the original operation. Median day of presentation after primary surgery was 6th day and earliest being 5th day and latest by the 14th day. There were 42 patients (70%) who presented with urine leak per vagina, 14 patients (24%) presented with flank pain with urine leak per vagina, and 4 patients (6%) had a fever with flank pain with urine leak per vagina (Table 2). A detailed evaluation of patient was done by taking medical and surgical history, verification of details of primary surgery and thorough examination was done. Full laboratory routine blood investigations, urine analysis, and urine culture were sent for all patients. Preliminary ultrasound screening was done in outpatient visit itself. Patients were started on intravenous (IV) antibiotics.

All patients underwent imaging studies either Intravenous urogram or computerized tomographic urogram (Figure 1, 2) and diagnosis were confirmed. There were 32 patients of right UVF and 28 patients of left UVF. There were 4 (14.2%) patients with urinoma who presented with fever with loin pain and urine leak per vagina.

All women underwent cystourethroscopy with gentle retrograde ureterogram and ureteroscopy with 4.5/6.5 Fr ureteroscope up to the injured site. With slow negotiation and gentle irrigation, guide wire was passed to the proximal segment through ureteroscope and double-J stenting done with 5 Fr/26 cm double-J stent, over guide wire under fluoroscopy guidance and urethral Foley catheter placed. A Foley catheter was left indwelling for 48 hours to minimize stent-related reflux. Catheter removal was done after 48 hours. Only in 2 patients (7.1%) the proximal segment was very narrow so guide wire was not

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negotiable, so patient was shifted to prone, and percutaneous nephrostomy (PCN) was done. After 4 weeks, cystoscopy with retrograde ureterogram done. With ureteroscopy, retrograde double-J stenting was done. The ureteral stent was removed approximately after 6 weeks of procedure. All patients underwent intravenous urogram and ultrasound at 3 and 6 months after stent removal to rule out stricture. The success of procedure was measured by the patient's history of dryness and the results of follow-up imaging studies.

Results

About 58 (92.9%) out of 60 patients managed successfully with retrograde ureterogram and ureteroscopy with double-J stenting and 2 (7.1%) out of 60 patients required PCN followed by retrograde successful double-J stenting after 4 weeks (Table 3). All patients were dry by 24 hours. Urethral Foleys catheter was removed after 48 hours for all patients. The ureteral stent was removed after 6 weeks. Median day of presentation after primary surgery was 6th day, earliest being 5th day, and latest by 14th day. There were 42 patients (70%) who presented with urine leak per vagina, 14 patients (24%) presented with flank pain with urine leak per vagina, and 4 patients (6%) with fever with flank pain with urine leak per vagina. Only 2 (7.1%) patients developed ureteric stricture after stent removal and then managed by open surgery later. Our average follow-up period was 18.7 months (ranges from 36 to 6 months).

Table 1: Type of hysterectomy in relation to UVF

Surgery	n
Laparoscopic hysterectomy	36
Abdominal hysterectomy	22
Vaginal hysterectomy	2

Table 2: Clinical Presentation

Type of presentation	n
Urine leak per vagina	42
Flank pain with urine leak	14
Flank pain with urine leak fever	4

Table 3: Type of Endoscopic Management

Cystoscopy + RGP + Double-J stenting	58
PCN followed by RGP and double-J stenting (later)	2

Fig. 1: Contrast Image of KUB

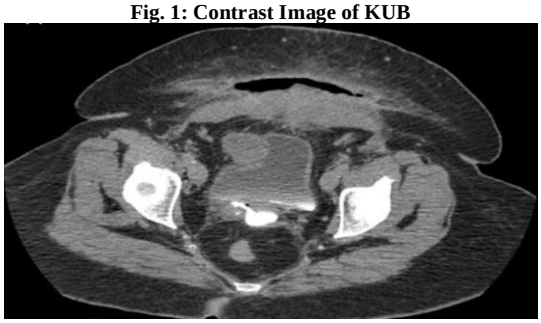

Fig. 2: Transverse section of contrast Lower Abdomen

Discussion

The causes of iatrogenic post-operative Ureterovaginal fistula includes ureteral laceration or transection, blunt avulsion, crush injury, partial or complete suture ligation, and ischemia due to operative devitalization of the ureteral blood supply and/or cautery injury.[2] Overall, the ureter is most commonly injured during gynecologic surgery in the distal one-third or pelvic portion, which is accordingly the only location at which a ureteral injury may result in Ureterovaginal fistula[4]. Most commonly this occurs inadvertently during an attempt by the surgeon to control active bleeding using clamps or suture ligation of large tissue segments in the deep pelvis[5].

The Ureterovaginal fistula is a complication of iatrogenic ureteral injuries. Gynecological surgery is the most common cause for the UVF[6].The UVF is the most serious of the Urogynecological fistulae because of its potential to cause incontinence, sepsis, and

renal loss[5]. An excretory urogram or a computer tomography urogram should be performed if the Ureterovaginal fistula is suspected. An oblique or lateral film may be necessary to differentiate the contrast in the bladder from that in the vagina[7].

Ureteroneocystostomy has been the traditional treatment for the UVF. Recently, conservative endoscopic treatment has been followed. Primary treatment with PCN has been reported to be less effective in the treatment of UVF. Success rates were 6% to 100%, although the overall closure rate across all series is calculated at 50% ± 18%.

Schmeller et al. reported on 11 patients with UVF treated only by PCN, with 6 (55%) having persistent fistulas, while 2 (18%) having strictures[8].The use of ureteral stenting in patients with ureterovaginal fistulae was reported in 11 studies[9-13].

In our series, only 2 patients are treated initially by PCN. No case of persistent fistula observed.

Conclusion

From this study we conclude that the minimally invasive approach (endoscopic) as the first choice in iatrogenic UVF. Combined ureteroscopic and fluoroscopic technique to reestablish ureteral integrity is a successful treatment. It is more effective, reliable, less invasive, less expensive and readily accepted by patients and has minimal morbidity. Ureteric stent insertion is a primary management for the UVF. If retrograde approach is impossible, PCN and stent insertion (later) are the recommended approach. Ureteroscopy and placement of double-J stent is technically challenging but it is a good option if detected early.

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