

Early Endoscopic Management of Ureterovaginal Fistula: A Prospective Study

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Abstract

Introduction: The mechanism of injury resulting in iatrogenic post-operative ureterovaginal fistulae (UVF) includes ureteral laceration or transection, blunt avulsion, crush injury, partial or complete suture ligation, and finally, ischemia due to operative devitalization of the ureteral vascular supply and/or cautery injury.

Aim: The aim of our study was to evaluate the endourological management of iatrogenic UVF.

Materials and Methods: A total of 30 patients referred to us after hysterectomy surgery was confirmed of UVF. Once confirmed, all patients underwent retrograde ureterogram and ureteroscopy with double-J stenting if this was not achievable, percutaneous nephrostomy (PCN) was performed, and then after 4 weeks retrograde double-J stenting was attempted.

Results: About 29 (96.6%) out of 30 patients managed successfully with retrograde ureterogram and ureteroscopy with double-J stenting and 1 (3.4%) out of 30 patients requiring 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 viable option if detected and intervened early, causing minimal morbidity and discomfort.

Key words: Percutaneous nephrostomy, Retrograde ureterogram, Ureterovaginal fistula, Ureteroscopy

INTRODUCTION

Ureterovaginal fistulae (UVF) are serious sequelae of unrecognized ureteral injuries during open or laparoscopic surgeries.¹ The ureter is especially susceptible to injury during vascular, gynecologic, urologic, and colonic operations. The most common etiology for UVF is a surgical injury to the distal ureter, with gynecologic procedures being by far the most common cause.² The vast majority of UVF occur during procedures for benign rather than malignant indications including hysterectomy most commonly but also cesarean section, cystocele repair, and other pelvic surgery such as infertility procedures.³ Regarding the approach for hysterectomy, 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 gynecologic surgery is estimated to be about 0.5-2.5%.⁴ Loss of continuity of the ureter may result from division or laceration, or from ischemic necrosis related to clamping, ligation, or damage to the blood supply of the ureter. Endourological techniques are highly successful in treating UVF.⁵ We evaluate the endourological management of iatrogenic UVF.

MATERIALS AND METHODS

A prospective study, non-randomized done from June 2009 to July 2015. The total of 30 patients referred to us after hysterectomy from gynecology with mean age of 49.71 years (range from 41 to 56). All patients were hysterectomy done for benign causes of various reasons. There were 18 patients (57.2%) post laparoscopic hysterectomy, 11 patients (35.7%) post abdominal hysterectomy, and 1 patient (7.1%) post vaginal

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hysterectomy (Table 1). All cases were early referrals, within 2 weeks. All 30 patients presented with vaginal drainage within two weeks of the original operation. Median day of presentation post primary surgery was 6th day and earliest being 5th day and latest by the 14th day. There were 21 patients (70%) who presented with urine leak per vagina, 7 patients (24%) presented with flank pain with urine leak per vagina, and 2 patients (6%) had a fever with flank pain with urine leak per vagina (Table 2). A detailed evaluation of patient was done involving medical and surgical history, verification of details of primary surgery and thorough examination was done. Full laboratory blood investigations, urine analysis, and urine culture were sent for all patients. Preliminary ultrasound screening was done in office visit itself. Patients were started on intravenous (IV) antibiotics.

All patients underwent imaging studies either IV urogram or computerized tomographic urogram (Figure 1) and diagnosis were confirmed. There were 16 patients of right UVF and 14 patients of left UVF. There were 2 (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 Fr ureteroscope up to the injured site, with slow negotiation and gentle irrigation and guide wire was passed to the proximal segment through ureteroscope and double-J stenting with 5 Fr/26 cm double-J stent, over guide wire under fluoroscopy and urethral Foley catheter placement. A Foley catheter was left indwelling for 48 h to minimize stent-related reflux. Catheter removal was done after 48 h. Only 1 patient (7.1%) the proximal segment was very narrow so guide wire was not negotiable, so patient was shifted to prone, and percutaneous nephrostomy (PCN) was done. After 4 weeks, cystoscopy with retrograde ureterogram with ureteroscopy and retrograde double-J stenting was done. The ureteral stent was removed approximately after 6 weeks. All patients underwent intravenous urogram and renal ultrasound at 3 and 6 months after stent removal to rule out stricture. Success was measured by the patients' reports of dryness and the results of follow-up imaging studies.

RESULTS

About 29 (92.9%) out of 30 patients managed successfully with retrograde ureterogram and ureteroscopy with double-J stenting and 1 (7.1%) out of 30 patients requiring PCN followed by after 4 weeks retrograde successful double-J stenting (Table 3). All patients were dry by 24 h. Catheter removal was done by 48 h for all patients. The

ureteral stent was removed approximately after 6 weeks. Median day of presentation post primary surgery was 6th day, earliest being 5th day, and latest by 14th day. There were 21 patients (70%) who presented with urine leak per vagina, 7 patients (24%) presented with flank pain with urine leak per vagina, and 2 patients (6%) with fever with flank pain with urine leak per vagina. Only 1 (7.1%) patient developed ureteric stricture after stent removal and then managed by open surgery later. Our average follow-up was 18.7 months (ranges from 36 to 6 months).

DISCUSSION

The mechanism of injury resulting in iatrogenic post-operative UVF includes ureteral laceration or transection, blunt avulsion, crush injury, partial or complete suture ligation, and finally, ischemia due to operative devitalization

Table 1: Type of hystrectomy in relation to uvf

Surgery	Number of cases
Laparoscopic hysterectomy	18
Abdominal hysterectomy	11
Vaginal hysterectomy	1

Table 2: Clinical presentation

Type of presentation	Number of cases
Urine leak per vagina	21
Flank pain with urine leak	7
Flank pain with urine leak+fever	2

Table 3: Type of endoscopic management

Cystoscopy+RGP+double-J stenting	29
PCN followed by RGP and double-J stenting (later)	1

PCN: Percutaneous nephrostomy, RGP: Retrograde pyelogram



Figure 1: Right distal ureteric injury with ureterovaginal fistula

of the ureteral vascular 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 UVF.⁴ Not uncommonly 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 UVF is a complication of iatrogenic ureteral injuries. Gynecological surgery is considered to be the major cause for the UVF.⁶ The UVF is the most serious of the UVF 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 UVF 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 non-invasive treatment has been followed. Primary treatment with PCN has been reported to be less effective in the treatment of UVF. 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

In our series, only one patient treated initially by PCN. No case of persistent fistula observed.

CONCLUSION

From our experience, we recommend minimal invasive approach (endoscopic) as the first choice in iatrogenic UVF. Combined ureteroscopic and fluoroscopic technique to reestablish ureteral integrity is a successful treatment. Early endoscopic intervention in iatrogenic UVF is of minimal morbidity and discomfort, and less expensive. 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 is still a viable option if detected early.

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