Management of ureterovaginal fistula: a retrospective study

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ABSTRACT

Background: Ureterovaginal fistulae are a rare but extremely serious complication of gynaecologic surgery. The objective of this study is to evaluate the feasibility and outcome of endourology in the management of ureterovaginal fistulae.

Methods: Retrospective study from August 2018 to April 2022 comprising 18 consecutive cases. Patients ranged from 25-45 years, most common preceding gynaecological intervention was total abdominal hysterectomy, most common presenting complaint was urinary leak. All patients in which the imaging studies showed the ureter communicating with the urinary bladder were taken up for primary stenting. Rest of the cases were subjected to a urinary diversion by percutaneous nephrostomy.

Results: 12 cases had fistula on right and 6 on left side. Imaging studies showed communication in 12 cases in which primary retrograde stenting was attempted. We were successful in 8 cases. In remaining 10 cases percutaneous nephrostomy was done. In the 10 cases of urinary diversion, antegrade stenting could be done in 3 cases, 2 out of these did not show any ureteric communication in the initial imaging studies. Overall, 11/18 cases (61.1%) could be stented, rest 7 cases were managed by ureteric reimplantation.

Conclusions: Primary retrograde stenting should be considered the primary mode of intervention in all cases of ureterovaginal fistula where imaging studies show a ureteric communication with the bladder. When it is not possible or when imaging studies fail to demonstrate a communication, achieve a urinary diversion by nephrostomy and reassess after 2 weeks. All cases managed by endoscopic approach must be followed up after stent removal.

Keywords: Ureterovaginal fistula, Urinary diversion, Percutaneous nephrostomy

INTRODUCTION

Ureterovaginal fistulae are a rare but extremely serious complication of gynaecologic surgery. The incidence ranges from 0.5-2.5% in major gynaecologic surgeries. Risk factors for the development of such fistulae include endometriosis, obesity, pelvic inflammatory disease, radiation therapy and pelvic malignancy.¹⁻⁴

Ureterovaginal fistulae can potentially lead to obstructive uropathy which may result in irreversible loss of renal function. It is for this serious fallout that they need to be optimally managed at the earliest.

The mechanism of injury in iatrogenic ureterovaginal fistulae after gynaecologic surgery includes ureteral transection or laceration, blunt avulsion/ crush injury, suture ligation which could be partial or complete and lastly ischemia caused by devitalization of the vascular supply of the ureter. The ischemic injuries which typically have a delayed presentation were commonly reported in the early days of TLH (Total laparoscopic hysterectomy). However, with the availability of energy devices with minimal lateral spread and refinement of surgical technique, the incidence of ureterovaginal fistulae in laparoscopic hysterectomy has gone down significantly.
The ureter is most commonly injured in the distal third or pelvic portion and usually manifests as a ureterovaginal fistula. The most common clinical presentation is continuous urinary incontinence 1-4 weeks after surgery along with normal voiding habits. This could be preceded by ipsilateral flank pain/ abdominal pain, nausea and low grade fever.

Ureterovaginal fistulae can be either managed by endoscopic means by stenting or by surgery (open/ laparoscopic) where a ureteric reimplantation is undertaken. The objective of this study is to evaluate the feasibility and outcome of endourology in the management of ureterovaginal fistulae.

METHODS

This was a retrospective study carried out at RKDF medical college and research center from January 2015 to January 2022. During this period we managed 18 consecutive cases of iatrogenic ureterovaginal fistulae after gynaecologic surgery. The selection criteria was continuous urinary leak arising after a gynaecological surgery and investigations revealing only a ureterovaginal fistula. Any case with a concomitant vesicovaginal fistula was excluded from the study.

An approval was taken from the hospital’s ethical committee which classified the study in the minimal risk category (as defined by ICMR).

For statistical analysis results were interpreted in terms of percentage.

Diagnostic algorithm

Physical examination

All patients were subjected to a thorough physical examination. A per speculum examination was carried out and urinary leak from vagina was documented. Thereafter a 16 Fr. Foley catheter was inserted per urethrally in the urinary bladder. The bladder was filled with N.S. (normal saline) mixed with methylene blue until the patient complained of suprapubic pain. The Foley catheter balloon was distended with 15 ml distilled water (DW) and catheter was kept on traction to prevent any pericatheter leak. Per speculum examination of the vagina was carried out to rule out any leak which was blue stained. This was done to rule out a vesicovaginal fistula. None of the patients in our series had a vesicovaginal fistula.

The flanks and lower abdomen were examined to rule out any tenderness.

Ultrasonogram

Abdominal sonography was done in all the patients. In 12 patients mild to moderate hydroureteronephrosis was seen on the right side whereas in 6 patients mild to moderate hydroureteronephrosis was seen on the left side.

CT urogram

All the patients with documented hydroureteronephrosis on ultrasonogram were subjected to a CT urogram. A lower ureteric injury with contrast extravasation was seen in all the patients. A special note was made if the injured ureter was still communicating with the urinary bladder.

Cystourethroscopy

The integrity of urethra and urinary bladder was documented in all the cases by a meticulous endoscopic examination.

Retrograde pyelogram (RGP)

RGP was done in all the cases, the ureteric orifice was cannulated by a 5 Fr. Ureteric catheter and contrast was instilled retrogradely. Contrast could not be instilled proximally in all cases in which ureteric communication was not seen on CT urogram.

Management algorithm

All patients in which the imaging studies showed the ureter communicating with the urinary bladder were taken up for primary stenting.

In the remaining cases where imaging studies did not demonstrate any communication of the ureter with the urinary bladder, a urinary diversion was achieved by inserting a percutaneous nephrostomy under ultrasonography guidance under local anesthesia.

RESULTS

Age distribution

The youngest patient in our series was 26 years old whereas the oldest was 45 years old. Majority (8) patients were between 40-45 years of age (Figure 1).

Figure 1: Age distribution.
**Preceding interventions that led to fistulae**

In our series most common preceding gynaecological intervention that led to a ureterovaginal fistula was total abdominal hysterectomy (TAH) accounting for 9 cases. Other preceding interventions were total laparoscopic hysterectomy (TLH), LSCS and cystocele repair (Figure 2).

![Figure 2: Preceding interventions that led to fistulae.](image-url)

**Presenting complaints**

The most common presenting complaint was urinary incontinence and urinary leak per vaginam which was reported ubiquitously by all the patients. All patients reported leak between 10 days and 3 weeks of the previous surgery. The next common complaint was ipsilateral flank pain documented in 13 patients and history of low-grade fever was reported by 10 patients (Figure 3).

![Figure 3: Presenting complaints.](image-url)

**Site distribution**

In 12 cases there was a right ureterovaginal fistula whereas in 6 cases there was a left ureterovaginal fistula (Figure 4).

![Figure 4: Site distribution.](image-url)

The imaging studies (CT urogram and RGP) showed communication in 12 out of 18 cases. Primary retrograde stenting was attempted in all 12 cases. We were successful in retrograde stenting in 8 out of 12 patients. Rest 10 patients were subjected to percutaneous nephrostomy under ultrasonography guidance (Figure 5).

Our success rate in primary retrograde stenting was 8/18 (44.44%).

**Technique of primary retrograde stenting**

In lithotomy position, the ureteric orifice was cannulated by a 5 Fr. Ureteric catheter and contrast was instilled retrogradely and was confirmed to pass proximally above the site of ureteric injury. Thereafter a .035” straight tip Terumo guide wire was passed across and the ureteric catheter was gently negotiated over it across the injured segment. Once the tip of ureteric catheter reached the pelvicalyceal system, the terumo guide wire was replaced by a 0.035” straight tip zebra guide wire. The ureteric catheter is removed and a 5 Fr./26 cm DJ stent is slid over the zebra guide wire and its upper end is positioned in the pelvicalyceal system.

![Figure 5: Depicts cases which could be stented out of those in which communication was seen. Also shows those cases in which communication was not seen.](image-url)
In the 10 cases which underwent urinary diversion by percutaneous nephrostomy, antegrade stenting could be done in 3 cases. 2 out of these 3 did not show a ureteric communication with the urinary bladder in the initial imaging studies. Overall, 11/18 cases (61.1%) could be stented. Rest 7 patients were managed by ureteric reimplantation, 5 by laparoscopic and 2 by open approach (Figure 6).

Follow up protocol

Our standard protocol is to remove the stent after 6 weeks and thereafter all these patients are followed up for 5 years.

An ultrasonogram is done every 3 months for the first 2 years and every 6 months in the next 3 years. If any hydroureteronephrosis is seen, the plan is to evaluate by a CT urogram along with isotope renal scan and managed the case accordingly.

All cases continue to be on meticulous follow up, special emphasis is laid on those managed only by stenting. So far, no hydroureteronephrosis has been documented in any of the patients in our series after stent removal.

DISCUSSION

There is unequivocal consensus that primary retrograde stenting must be considered as the first option in a case of ureterovaginal fistula where ureteric communication with the urinary bladder is seen beyond the site of injury on imaging studies. A successful stenting may lead to a closure of the fistula and avoid the need for a major procedure of ureteric reimplantation.

However, it cannot be overemphasised that most such ureterovaginal fistulae may be a sequela of ischemic strictures which may restrict after stent removal. Therefore, a long term follow up is absolutely mandatory.

We attempted primary retrograde stenting in only those 12 patients where the imaging studies showed a communication, we were successful in 8 patients. The remaining 10 patients underwent a urinary diversion by percutaneous nephrostomy. All these patients were reassessed after 2 weeks and we were successful in performing antegrade stenting in 3 more patients. Interestingly 2 out of these 3 did not show a ureteric communication with the urinary bladder in the initial imaging studies.

It is important to understand that rarely despite a partial ureteric injury no communication is demonstrated on imaging studies because of a large communicating fistula with the vagina. Initial retrograde stenting would usually be unsuccessful as would be antegrade stenting as the guide wire would preferentially follow the large fistulous tract from either direction. This explains our protocol of not attempting a stenting in those cases where imaging studies did not show any communication.

However timely urinary diversion by inserting a percutaneous nephrostomy may lead to the closure of the fistulous tract and a communication with the bladder may be now seen which was not seen earlier thus facilitating the placement of a stent. The keyword here is timely urinary diversion because a delay would cause epithelialisation of the fistula which would not obliterate even after diversion.10

The major limitation of our study is the inadequate follow up time. As stated earlier, all cases of ureterovaginal fistulae which are managed by endoscopic approach should be ideally followed up for a period of 5 years. None of the cases in our study have completed the five-year period and continue to be followed up.

CONCLUSION

Primary retrograde stenting is the gold standard option in a case of ureterovaginal fistula where ureteric communication with the urinary bladder is seen beyond the site of injury on imaging studies. A successful stenting lead to a closure of the fistula thus avoiding a ureteric reimplantation.

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REFERENCES


