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Original article

Transperitoneal laparoscopic ureteric reimplantation for lower ureteric strictures and ureterovaginal fistulas: A study from north India



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KEYWORDS

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Abstract

Introduction: Incidence of lower ureteric injuries has increased due to proliferation of complex pelvic laparoscopic and ureteroscopic procedures.

Objective: To describe our experience of laparoscopic ureteric reimplantation for lower ureteric strictures and ureterovaginal fistulas due to different aetiologies.

Patients and methods: A total of 42 patients underwent laparoscopic ureteric reimplantation from January 2007 to December 2013 after preoperative evaluation by intravenous urography or CT urogram to delineate the site and length of stricture or ureterovaginal fistula. All the patients were followed up with ultrasonography and micturating cystourethrogram at 3 months. Out of the total 42 patients, 22 patients (group 1) underwent laparoscopic ureteric reimplant for lower ureteric stricture and 20 patients (group 2) underwent laparoscopic ureteric reimplant for ureterovaginal fistula.

Results: There were 5 male and 37 female patients. The mean patient age was 43.5 ± 12 (range 24–62 yrs), mean operating time was 129 ± 11 (range 110–160) minutes, mean hospital stay was 2.8 (range 2–6) days and mean follow up period of 16 months (range 6–70). Two procedures had to be converted to open (one each in both groups). There were no major (Clavien grade III and above) intra-operative or post-operative complications. One of the failures in lower ureteric stricture group was managed by open reconstruction with boari flap.

Conclusion: Laparoscopic ureteric reimplantation is an excellent modality for both lower ureteric strictures and ureterovaginal fistulas with long term good outcomes in addition to the advantage of lesser hospital stay and lesser comorbidities.

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Introduction

The incidence of ureteral injuries has been increasing due to proliferation of complex pelvic laparoscopic and ureteroscopic procedures [1,2]. Short ureteric strictures may be managed endoscopically but long ureteric strictures fare poorly when managed by the same method. Long ureteric strictures have traditionally been managed by open surgical procedures which may be morbid in terms of long hospital stay and convalescence. Results comparing laparoscopic to open ureteroneocystostomy are similar with lesser morbidity reported for laparoscopic ureteroneocystostomy [3,4]

One of the frequent complications of pelvic surgery is ureteral stricture. Ureteral stricture is caused by surgical trauma, impacted ureteral stone, pelvic tumour, extrinsic compression or congenital anomalies [5].

Herein, we describe our experience of patients who underwent laparoscopic ureteric reimplantation for lower ureteric strictures due to different etiologies.

Subjects and methods

From January 2007 to December 2013, 42 patients (37 female and 5 male) with a mean age of 43.5 (24–62) years underwent laparoscopic ureteric reimplantation for various aetiologies. Out of the total 42 patients, 22 patients (group 1) underwent laparoscopic ureteric reimplant for lower ureteric stricture due to pelvic surgeries ($n=15$) like hysterectomy ($n=10$) and pelvic mass excision ($n=5$), ureterolithotomy for impacted ureteric calculus ($n=4$) and obstructed labour ($n=3$). The other 20 patients (group 2) underwent laparoscopic ureteric reimplant for ureterovaginal fistula formation following lower segment caesarean section (LSCS) ($n=6$), following hysterectomy ($n=10$) and following obstructed labour

($n=4$). The indications for ureteric reimplantations are summarised in Table 1. All the patients had an initial failed retrograde JJ stent placement attempt and 22 patients of lower ureteric stricture were on ipsilateral percutaneous nephrostomy till the reimplantation procedure. All the cases had a preoperative evaluation by intravenous urography or CT urogram to delineate the site and length of stricture or ureterovaginal fistula. Stricture length and location were determined in all the cases by appropriate antegrade and retrograde studies. All the patients were operated by same laparoscopic surgeon (Tables 2 and 3).

Surgical technique

All patients underwent transperitoneal laparoscopic ureteric reimplantation by *Trendelenburg* modified Lich Gregoir technique. Patients were placed in flat dorsal trendelenburg position and a small infraumbilical incision was given to establish pneumoperitoneum using Veress needle. A blunt tip 10 mm infraumbilical trocar was inserted to act as camera port. Subsequently, one 5 mm and other 10 mm trocar were placed according to shown in Figs. 1 and 2 respectively.

After placement of the trocars, colon was mobilised medially along the line of Toldt. Ureter was identified above the bifurcation of iliac vessels. Careful ureterolysis was done distally to avoid devascularisation of ureter. All ureteric reimplantation were done utilising extra-vesical modified Lich Gregoir technique. The ureter was transected and spatulated near the stricture or ureterovaginal fistula. The bladder was distended with sterile normal saline up to 300–400 ml. Detrusor muscle was opened lengthwise for 3–4 cm to expose the mucosa of the bladder. Ureterovesical anastomosis was achieved over JJ stent after opening the bladder mucosa with 4–0 vicryl suture. Buttressing by detrusor muscle was done for creation of anti-reflux mechanism by taking 3–4 interrupted sutures for

Table 1 Indications for laparoscopic ureteric reimplantation.

| | Lower ureteric stricture | | | Ureterovaginal fistula | | |
|--------------|---|------------------|-------------------|------------------------|------------------------|-----------------------------|
| | Pelvic surgeries (like hysterectomy and pelvic mass excision) | Ureterolithotomy | Obstructed labour | Following LSCS | Following hysterectomy | Following obstructed labour |
| No. of cases | 15 (10 + 5) | 4 | 3 | 6 | 10 | 4 |

Table 2 Characteristics of the patients and operative data.

| Criterion | Group 1 (lower ureteric stricture) | Group 2 (uretero-vaginal fistula) | Total |
|---|------------------------------------|-----------------------------------|----------------------------|
| Number of patients | 22 | 20 | 42 |
| Female/male | 18/4 | 20/0 | 38/4 |
| Mean age in years (range) | 47 (24–58) | 38 (26–62) | 43.5 (24–62) |
| Mean stricture length in cm | 2.6 | 2.1 | 2.4 |
| Mean operative time in minutes | 174 (122–242) | 152 (114–210) | 169 (122–242) |
| Mean hospital stay in days | 2.9 (2–6) | 2.6 (2–5) | 2.8 (2–6) |
| Mean drop in haemoglobin | 0.6 | 0.3 | 0.4 |
| Open conversion | 1 (difficult adhesions) | 1 (difficult adhesions) | 2 |
| Mean analgesic requirement (tramadol in mg) | 156.3 ± 13 (range 100–250) | 146.6 ± 12 (range 100–250) | 152.7 ± 13 (range 100–250) |
| Psoas hitch | 2 | 1 | 3 |
| Recurrence | 1 (4.54%) | 0 | 1 (2.38%) |
| Success in % | 95.46% | 100% | 97.62% |
| Mean Follow up in months (range) | 18.2 (6–56) | 13.8 (6–70) | 16.4 (6–70) |

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