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Case Report

Laparoscopic ureteroneocystostomy: PSOAS hitch following ureteral injury during hysterectomy

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ABSTRACT

Injury to ureter is a known complication of pelvic or abdominal surgery, including laparoscopy and ureteroscopy. The incidence of iatrogenic ureteral injury during vaginal hysterectomy is 0.02 to 0.5% and after abdominal hysterectomy is 0.03 to 2%. Patient with ureteric injury should be evaluated and intervened at the earliest. The laparoscopic technique of ureteral reimplantation for the repair of ureteral obstruction due to hysterectomy injury may be challenging, but is feasible. vesicopsoas hitch is done to relieve tension after ureteroneocystostomy. A complete exposure and a good knowledge regarding the course of the ureter is necessary to avoid iatrogenic ureteral injury. JJ stenting can be done in cases with high risk of ureteric injury.

Keywords: Ureteroneocystostomy, PSOAS hitch, Ureteric injury

INTRODUCTION

Gynaecological surgery has been reported to be the most common cause of ureteral injuries worldwide. The reported rate of ureteral injury after laparoscopic hysterectomy varies between 0.5% to 14% based on their experience. In developing countries, open gynaecological surgery is the leading cause however in developed countries, laparoscopic vaginal hysterectomy is the leading cause of ureteral injury.

The most common gynaecological procedure performed is hysterectomy since it is done for most of the benign conditions affecting the uterus.1 the ureter and uterine vessels, lies in close proximity to uterus, and therefore iatrogenic injury to ureter during uterine surgeries are not uncommon. Ureteral injury may be caused due to sutures, clip, or staple ligation; crush injury or electrocautery thermal spread, which can lead to the development of hydronephrosis, loss of renal function, fistula formation, and sepsis if not detected intraoperatively.2 Optimal management of distal ureteral stricture includes stenting or tension-free ureterovesical anastomosis.

CASE REPORT

A 50-year-old female P2L2/ previous normal delivery/ LCB 25 years with history of total laparoscopic hysterectomy with B/L salphingo oophorectomy done 2 years back for AUB-L. Now presented with loin pain since 2 months.

Patient was asymptomatic for 1 and half years, then she developed increased frequency of micturition, dysuria and dribbling of urine on and off.

USG KUB done which showed left gross hydroureteronephrosis GRADE 3.

CT revealed a left distal ureteral block with gross ureter nephrosis with thinning of renal parenchyma and left mild delayed nephrogram (Figure 1).

Figure 1: CT scan of left distal ureteral block with ureter nephrosis.

Patient was planned for laparoscopic left ureterovesical anastomosis with psoas hitch.

Procedure

Identification of the ureteral stricture was made preoperatively with computed tomography (CT).

Figure 2: Ureteral stricture identification.

Figure 3: Ureterolysis done.

Trocar placed and pneumoperitoneum was created.

Left sigmoidolysis done

Peritoneum over the left ureter was opened till the level of ureteric tunnel. Care was taken not to damage the adventitious layer of ureter.

Ureter was released, dissected above the stenotic area and mobilized (Figure 2 and 3).

The posterior wall of bladder mobilized from vault, space of Retzius opened, and anterior wall of bladder further mobilized to achieve a good length for a tension free anastomosis.

PSOAS muscle was prepared by opening the peritoneum over it (Figure 4) and bladder was hitched to the psoas muscle using 2'0 vicryl (PSOAS hitch) (Figure 5).

Figure 4: Identification of psoas muscle.

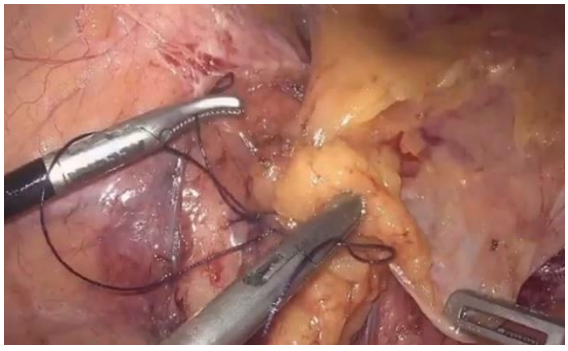

Figure 5: PSOAS hitch.

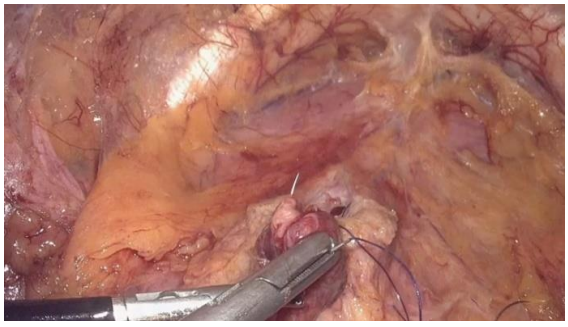

Figure 6: Incision made on anterior wall of bladder.

Figure 7: Mucosa to mucosa anastomosis.

By use of harmonic scalpel, a 1 cm full thickness incision (Figure 6) was made the anterior wall of bladder. Mucosa-mucosa anastomosis was performed starting at the 6-o'clock position (Figure 7). No spatulation of ureter was required due to mega ureter.

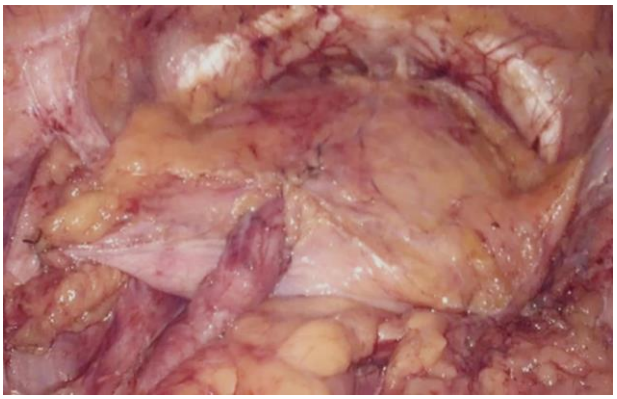

Figure 8: Ureteroneocystostomy done.

Before the ureterovesical anastomosis was finalized, a ureteral stent was placed with guidewire, and the bladder anastomotic site was tested for watertightness with irrigation and filling up the bladder with 250 cc of normal saline (Figure 8).

A foley catheter was removed 2 weeks postoperatively. Cystography was performed at 4 to 6 weeks at the time the double-J ureteral stent was removed if no extravasation was identified. CT intravenous urography was performed and serum creatinine levels were obtained at 3 months to reassess the ureteroneocystostomy.

DISCUSSION

A good knowledge of the anatomy of ureter and its course in pelvis is essential to prevent injury. The ureter lies in close association with several pelvic structures and is prone for injuries.

Points at which the ureter is prone for injury (Figure 9).

At the pelvic brim, while clamping the ovarian vessels. In the broad ligament while clamping the uterine vessels. In the ureteric tunnel in cardinal ligament. At the vault of vagina. Devascularisation - entire course of ureter.

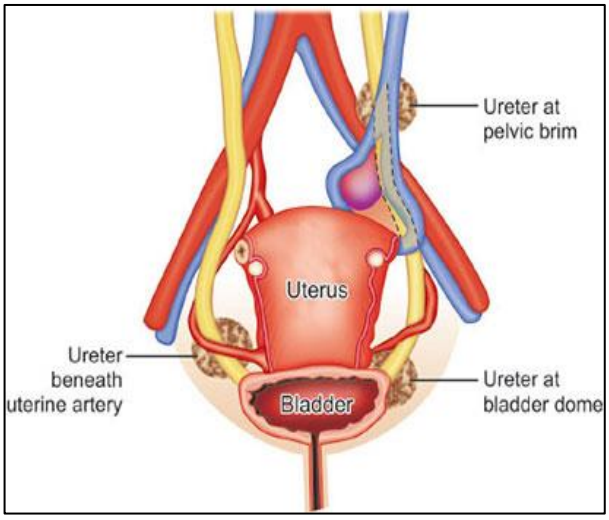

Figure 9: Points prone for ureteric injury.

Table 1: Comparison of series of laparoscopic ureteral reimplantation in adults.

Study	Cause	Procedure	Complication	Follow-up
Simmons et al[3]	Iatrogenic	LUR, boari flap	Urinoma	23 months
Modi et al[5]	Gynecological surgery	PSOAS hitch	0	8 months
Nezhat et al[6]	Endometriosis	PSOAS hitch	0	33 months
Rassweiler et al[4]	Mixed	PSOAS hitch, boari flap	0	17 months
Present study	Iatrogenic	PSOAS hitch, ureteroneocystostomy	0	6 months

It is important to know the points at which there is close proximity so that care can be taken to avoid injuries. Iatrogenic ureteral injury is a grave complication that can occur during abdominal or pelvic surgeries. Ureteral injuries have a documented incidence of 0.3% to 1.5%.[7] Gynecological laparoscopic procedures account for more than half of the injuries, and the most common location is the lower ureter.[10,11]

Transection of lower third of ureter can be managed as follows: If 3-4 cm proximal to ureterovesical junction, ureteroureterostomy can be done. If within 2 cm from

ureterovesical junction go for ureteroneocystostomy. If previous 2 cannot be done without tension, vesicopsoas hitch is done. In vesicopsoas hitch, the bladder is mobilized and fixed to the psoas muscle to relieve tension after ureteroneocystostomy. Indications for psoas hitch include iatrogenic injury of ureter, radiation fibrosis, trauma, endometriosis, transitional cell cancer of distal ureter etc.[12,13] Short term complications are urinary leak. Long term complications are recurrent UTI, LUKS, kidney failure, recurrent tumor. A few studies done previously conclude that the outcome after psoas hitch due to iatrogenic injury is better than outcome after psoas hitch done for radiation fibrosis. BOARI FLAP is used in extensive midureteral injuries.[14,16] Boari bladder flap is shaped into a tube and; the ureter is tunnelled in and attached to the flap to provide extra length and prevent tension. JJ stenting should be attempted in all patients presenting with ureteric injuries.[15] If unsuccessful, these are the candidates for PCN or ureteric reimplantation depending on the clinical situation.

CONCLUSION

The laparoscopic technique of ureteral reimplantation for the repair of ureteral obstruction due to hysterectomy injury may be challenging, but is feasible. To avoid ureteral injury in suspected cases, a complete ureteral exposure must be done. A clear knowledge of ureter anatomy and a complete exposure of entire course of pelvic ureter in high-risk cases is necessary to avoid iatrogenic urteric injury.

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