



ONCOLOGY/RECONSTRUCTION
ORIGINAL ARTICLE

Immediate and late management of iatrogenic ureteric injuries: 28 years of experience



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KEYWORDS

Ureteric injury;
Boari flap;
Uretero-vaginal
re-implantation

ABBREVIATIONS

IUI, iatrogenic ureteric
injury;
PCN, percutaneous
nephrostomy;
UVR, ureterovesical
re-implantation;
US, ultrasonography

Abstract Objective: To evaluate the long-term results after managing intraoperative and late-diagnosed cases of iatrogenic ureteric injury (IUI), treated endoscopically or by open surgery.

Patients and methods: Patients immediately diagnosed with IUI were managed under the same anaesthetic, while those referred late had a radiological assessment of the site of injury, and endoscopic management. Open surgical procedures were used only for the failed cases with previous diversion.

Results: In all, 98 patients who were followed had IUI after gynaecological, abdominopelvic and ureteroscopic procedures in 60.2%, 14.3% and 25.5%, respectively. The 27 patients diagnosed during surgery were managed immediately, while in the late-referred 71 patients ureteroscopic ureteric realignment with stenting was successful in 26 (36.6%). Complex open reconstruction with re-implantation or ureteric substitution, using bladder-tube or intestinal-loop procedures, was used in 27 (60%), 16 (35.5%) and two (4.5%) patients of the late group, respectively. A long-term radiological follow-up with a mean (range) of 46.6 (24.5–144) months showed recurrent obstruction in 16 (16.3%) patients managed endoscopically and reflux in six (8.3%) patients. Three renal units only (3%) were lost in the late-presenting patients.

Conclusion: Patients managed immediately had better long-term results. More than a third of the late-diagnosed patients were successfully managed endoscopically

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with minimal morbidity. Open reconstruction by an experienced urologist who can perform a complex substitutional procedure was mandatory to preserve renal units in the long-term.

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Introduction

Iatrogenic ureteric injury (IUI) is an uncommon complication during gynaecological and pelvic operations, and it is difficult to diagnose without a high index of suspicion. Unrecognised or improperly managed patients are associated with severe morbidity, with urinoma, fever, septicaemia or urinary fistula, and the neglected patients present later with stricture or a non-functional renal unit. Although retrograde ureterography is the most accurate diagnostic test, CT or complete IVU are also very useful diagnostic tools [1,2]. The initial diagnosis of IUI is usually missed in up to 70% of cases and the final outcome of treatment is influenced by the time of diagnosis [3]. Injuries identified intraoperatively are immediately repaired over a stent or re-implanted into the bladder, while the primary objective in the treatment of late-presented cases is ablation of obstruction, prevention of urinary incontinence and preservation of renal function.

In the last decade, the successful endoscopic placement of a JJ stent via a retrograde or antegrade route allows the ureteric fistula to heal, preserves renal function, and is a reasonable recommendation to avoid major complex open reconstructive surgery in 23.5% of patients [4].

In the present study we evaluated the long-term results after managing intraoperative and late-diagnosed cases of IUI, treated endoscopically or by open surgery.

Patients and methods

From November 1986 to December 2014, 98 patients with ureteric injuries caused during open gynaecological surgery, or to the abdomen and pelvis, or endoscopic treatment of ureteric stones, were managed in our institution. The types of procedures that were associated with these injuries are presented in shown in Table 1. Patients with a vesicovaginal fistula and those whose fistula developed without surgery were excluded from the study. Injuries identified during surgery were concomitantly managed under the same anaesthetic, with a small cystotomy incision and passing a ureteric catheter (6 F) up to the ipsilateral ureter, with injection of sterile methylene blue. Leakage of the dye in the operative field or failure to pass the catheter confirmed the site of injury or obstruction of the ureter. In these patients, dissection around the ureter to de-ligate or

Table 1 The type of surgical operations and method of repair associated with the IUI.

Procedure (n)	Management, n		
	Immediate	Endoscopic and open late	Total n (%)
Gynaecological	9	50	59 (60.2)
Caesarean section (25)	UVR, 2	30	
Hysterectomy (11)	UVR, 4	9	
VVF repair (7)	Repair, 2	6	
Oophorectomy (5)	Re-anastomosis, 1	5	
Abdominal surgery	–	14	14 (14)
Appendectomy (5)	–	5	
Colectomy (6)	–	6	
APR (3)	–	3	
Urological	18	7	25 (25.5)
Open (4)	–	4	
Ureteroscopy (21)			
UVR	11	3	
Boari flap	3		
Re-anastomosis	3		
Repair	1		
Total	27 (27.6)	71 (72.4)	98

VVF, vesicovaginal fistula.

even repair the injury site was done whenever possible. In patients with a complete injury at the pelvic inlet, the healthy split ureteric ends were re-anastomosed around a stent. Patients with an unhealthy or short lower segment were managed with a ureteroneocystostomy or substitution to the ureteric defect using a Boari bladder flap, according to the level of the healthy proximal ureter from the urinary bladder. Most of these injured ureters had a normal calibre, and therefore a submucosal tunnel was created in the re-implanted unit, with a stent placed for 4–8 weeks.

Patients with a suspected injury who presented or were referred late after surgery, with a recurrent fever or ipsilateral flank pain, or those with a urinary fistula, had a laboratory and radiological assessment. A radiological evaluation is the first step to identify either obstruction or extravasation of the dye from its normal pathway if there is a fistula, or even absence of excretion with or with no urinoma collection. Ultrasonography (US) and IVU were used routinely for the early cases, but in the last few years contrast-enhanced CT has been used for the diagnosis, especially with coronal reconstruction films.

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