Ureteric injury in gynecology

Lucian Pop¹, Nicolae Bacalbasu²,³, Irina Balescu⁴, Ioan D. Suciu⁵, Roxana Elena Bohiltea², Claudia Stoica⁶,⁷

¹“Alessandrescu-Rusescu” National Institute of Mother and Child Care, Bucharest, Romania
²Department of Obstetrics and Gynecology, “Carol Davila” University of Medicine and Pharmacy, Bucharest, Romania
³Department of Visceral Surgery, Center of Excellence in Translational Medicine, Fundeni Clinical Institute, Bucharest, Romania
⁴Department of Visceral Surgery, Ponderas Academic Hospital, Bucharest, Romania
⁵General Surgery Department, Floreasca Emergency Hospital, Bucharest, Romania
⁶Department of Anatomy, “Carol Davila” University of Medicine and Pharmacy, Bucharest, Romania
⁷Department of Surgery, Ilfov County Emergency Hospital, Bucharest, Romania

Corresponding author:
Lucian Pop
E-mail: popluciangh@icloud.com

ABSTRACT

Ureteric damage is a rare but a well known complication in obstetric and gynaecological practice. It has repercussions in terms of morbidity and medico-legal practice. There is wide variation of reported incidence is related to the type of surgery. Preoperative and intraoperative precautions can prevent the injury up to a point the injury but the effectiveness of these actions has not been fully assessed.

Keywords: ureteric damage, surgery, morbidity

INTRODUCTION

The most natural predator of the ureter is the gynaecologist. Next to the pelvic organs, ureters proximity makes it vulnerable to injury during gynaecological surgery. Gynaecologists share a common fear regarding ureteric injury. Its morbidity is translated in longer hospital stay, reinterventions, reoperation, potential loss of renal function, and deterioration of the woman’s quality of life. Ureteric injury can occur not only during complicated procedures but also during routine surgeries [1,2].

ANATOMICAL LANDMARKS

The most common site of ureteric injury is, at the pelvic brim, where the ureter crosses the ovarian vessels in the infundibulopelvic ligament and lateral to the cervix. Seldom, lesions in ovarian fossa du occur, mostly during oncology surgery or during endometriosis.

Table 1 lists the most common risk factors for ureteric injury. As Altgassen et al., already published, we have to enhance that surgeon’s experience is probably the most prominent factor, with experience surgeon’s having half the complications compared to beginners [3,4].

| TABLE 1. Risk factors for ureteric injury [3,4] |
|-----------------------------------------------|
| Distorted pelvic anatomy                      |
| Adhesions                                     |
| Endometriosis                                 |
| Cancer                                        |
| Obesity                                       |
| Pregnant uterus                               |
| Severe prolapse                               |

Electric cautery is involved in roughly one-quarter of this. Ureters pass lateral to the cervix at an average distance of 2.3 cm-0.8 cm. In 12% of the cases, the distance was less than 0.5 cm. The short distance is directly linked to body mass index [5].
PREVENTION

A good anatomic background is always useful for laparoscopic and open surgery. Alongside classical textbooks, simulators and cadaveric courses are most helpful, in acquiring knowledge and skills [6]. In complex cases, performing an MRI or an intravenous urography can be of help. Nevertheless, these investigations have no impact on routine cases. During the surgery, visualisation of ureteric peristalsis should be done as many times as necessary. Sometimes is easier to discover the ureters at the pelvic brim and follow its course through the pelvis, as it might be time saving. Mobilisation of the ureter can be done for a 15 cm distance, under the caveat that vascularity should be preserved. A common expert opinion states that ureteric stenting (including lighted ureteral stenting) is mandatory in extremely complicated cases such as severe endometriosis [1,7].

RECOGNITION

There are several types of ureteric injury, as listed in Table 2.

TABLE 2. Types of ureteric injury [4]

| Type         | Description |
|--------------|-------------|
| Transection  | Cut or tear of the ureter |
| Resection    | Partial or complete removal of the ureter |
| Ligation     | Occlusion of the ureter by sutures |
| Thermal      | Burns or thermal injury to the ureter |
| Crush        | Compression of the ureter |
| Laceration   | Rupture or tear of the ureter |
| Angulation   | Malformation of the ureter |

Just 30% of ureteric injury as recognised intraoperatively, therefore any suspicion of ureteric injury should promptly be investigated [8]. Cystoscopy can provide us with information about ureteric obstruction but cannot exclude other injury types.

If at any time, the surgeon notices air or blood during ureteric inspection, suggests injury. Stenting is another way of assessing ureteric integrity, which can be at the same time a therapeutic treatment in cases of angulation [9]. Ureteroscopy might locate the level and extent of the injury.

POSTOPERATIVELY RECOGNITION

The methods of identifying a ureteric injury postoperatively are analogous to those for bladder injuries. If a patient failure to thrive, that should immediately raise suspicious of organ damage. Within the first 48 hours following surgery, there might be pain and tenderness, watery leak, haematuria. A urinoma occurs due to fibrous reaction. This in turn can cause abscess and even sepsis. In cases of cAUTery damage, this can become obvious 14 days post-surgery [10,11]. Ureteric injury can heal spontaneously or lead to stricture formation, fistula, and kidney damage and in up to 25% of the cases, it can result in kidney loss [12].

Whenever gynaecologist surgeons have an ureteric injury, multidisciplinary management is mandatory. This is necessary as ureteric injury belongs to another speciality, for medical legal reasons and also for reducing long-term morbidities. It is up to the urologist to choose the most suitable procedure for ureteric repair.

CONCLUSIONS

A quote is often said: “To avoid all injuries to the urinary tract, one would have to stop operating”. Occasionally, even the best of us will have injuries. Hence, it is of upmost importance to be accustomed with different strategies that can reduce the incidence of such complications and avoiding litigation and long-term morbidity.

Conflict of interest: none declared
Financial support: none declared

REFERENCES

1. De Cicco C, Ret Davalos ML, van Cleynenbreugel B, Verguts J, Konincx PR. Iatrogenic ureteral lesions and repair: a review for gynecologists. J Minim Invasive Gynecol. 2007;14(4):428-435.
2. Grosse-Drieling D, Schlutius JC, Altgassen C, Kelling K, Theben J. Laparoscopic supracervical hysterectomy (ASH), a retrospective study of 1,584 cases regarding intra- and perioperative complications. Arch Gynecol Obstet. 2012;285(5):1391-1396.
3. Altgassen C, Michels W, Schneider A. Learning laparoscopic-assisted hysterectomy. Obstet Gynecol. 2004;104(2):308-313.
4. Minas V, Gul N, Aust T, Doyle M, Rowlands D. Urinary tract injuries in laparoscopic gynaecological surgery; prevention, recognition and management. The Obstetrician & Gynaecologist. 2014;16:19-28.
5. Ostrzenski A, Radolinski B, Ostrzenka KM. A review of laparoscopic ureteral injury in pelvic surgery. Obstet Gynecol Surv. 2003;58(12):794-799.
6. Stenzl A, Kolle D, Eder R, Stoger A, Frank R, Bartsch G. Virtual reality of the lower urinary tract in women. Int Urogynecol J Pelvic Floor Dysfunct. 1999;10(4):248-53.
7. Ibeanu OA, Chesson RR, Echols KT, Nieves M, Busangu F, Nolan TE. Urinary tract injury during hysterectomy based on universal cystoscopy. Obstet Gynecol. 2009;113(1):6-10.
8. Jha S, Coomarasamy A, Chan KK. Ureteric injury in obstetric and gynaecological surgery. The Obstetrician & Gynaecologist. 2011;6:203-208.
9. Schornan R, De Cicco C, Corona R, Soriano D, Konincx PR. Accident analysis: factors contributing to a ureteric injury during deep endometriosis surgery. BJOG. 2008;115(13):1611-1615.
10. Mischianu D, Bratu O, Ile C, Madan V. Notes concerning the peritonitis of urinary aetiology. J Med Life. 2008;1(1):66-71.
11. van Ooijen P, ter Haar JF, Pijnenborg JM. Extensive cellulitis as the first symptom of ureter lesion after laparoscopic hysterectomy. J Laparoendosc Adv Surg Tech A. 2011;21(3):249-250.
12. Wetter PA, K.M., Levinson KM, et al. Laparoscopic ureteral surgery. Management of Laparoendoscopic Surgical Complications. 2nd ed.. Society of Laparoendoscopic Surgeons; 2005.