

# Duplex ureter damaged during laparoscopic hysterectomy

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**Abstract:** Purpose: This paper presents the case of a 43 year old woman who developed a uretero-vaginal fistula from a previous undiagnosed duplex ureter following a laparoscopic assisted vaginal hysterectomy. Results: The patient presented with 6 weeks of vaginal discharge and the fistula was diagnosed by CT urogram. The fistula and ureteral defect were repaired and a ureteroneocystostomy was formed. Conclusion: Duplex ureters are an anatomic anomaly which, if unrecognised, can complicate surgery. Ureteral injury is a recognised complication of pelvic surgery which is often diagnosed post operatively.

**Keywords:** Duplex, Ureter, Hysterectomy, Fistula

A 43 year old woman was referred to a urology clinic 6 weeks post laparoscopic assisted vaginal hysterectomy. Post operatively, she had ongoing vaginal discharge which was thought to be urine. She had no significant flank pain and renal function was normal on blood tests. Investigation with CT urogram identified previously undiagnosed duplex ureters on the right side (see figure 1) and a pelvic collection indicating a uretero-vaginal fistula. Both the upper and lower moieties were hydronephrotic. The right upper pole duplex ureter appeared obstructed at the level of the bladder and the right lower pole ureter was continuous with the collection (see figure 2). The left ureter appeared normal. Cystoscopy and retrograde pyelogram showed partial transection of the right lower pole ureter approximately 1cm from the vesicoureteral junction, the medial ureteral orifice (upper pole ureter) was not able to be cannulated due to bladder deformity adjacent to the urinoma. An open surgical repair was conducted through a Pfannensteil incision. The duplex ureters were found as in the CT; the lower pole ureter partially transected and the upper pole ureter intact but obstructed due to extrinsic compression and tissue inflammation. The duplex ureters were then both transected near the bladder, joined in parallel and reinserted into the bladder through a single tunneled ureteroneocystostomy. Two double pigtail ureteral stents were placed in the ureters. A flexible cystoscopy was performed two weeks later, the neo-ureteral orifice was healing well and the stents were removed. A follow up renal ultrasound showed no evidence of hydronephrosis and the patient has been discharged from clinic.

## DISCUSSION

Duplex ureters are have an estimated incidence of 0.8-1.8% and are more commonly found in women. Duplex collecting systems occur equally on the right and left sides and bilateral duplication anomalies occur in 15% of cases.<sup>1</sup> Abnormalities are described as double (no communication between two ureters), bifid (dual origin to single distal ureter) or abortive (single origin to dual distal ureters). Duplex systems are implicated in childhood urinary tract infections, hydronephrosis and parenchymal scarring but are often identified as incidental findings. The patient noted above had an undiagnosed double ureter system despite previous CT and ultrasound of the abdomen and pelvis.

Ureteral injury is a recognized complication of urological, gynaecological, general and vascular surgeries. Historically 75% of ureteral injuries occurred during gynaecology procedures however the proportion has changed with the increased prevalence of endoscopic ureteral procedures.<sup>3</sup> The incidence of ureteral injury during hysterectomy is under 1% however is higher in laparoscopic compared to abdominal or vaginal approaches.<sup>5</sup> Iatrogenic injuries are most common in the distal third of the ureter and are more

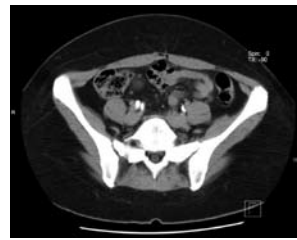


Fig. 1. – Axial CT showing right sided duplex ureters.



Fig. 2. – Coronal CT showing right sided ureters in communication with pelvic collection.

likely to be detected intraoperatively in urological operations compared to other surgeries.<sup>4</sup> Careful inspection of the ureters at the end of pelvic operations is recommended and, in cases of suspected injury, intraoperative investigation with methylene blue should be considered.<sup>6</sup> Typically, as in this case, a ureteral injury is not noticed during the procedure and presents post-operatively. Injuries not recognized and repaired may progress to urinomas, hydronephrosis or ureteral fistulae, presenting late with fever, flank pain or nausea. Management depends on the location and extent of the ureteral injury and can range from a simple ureteral stent to more complex ureteroureterostomies and bladder flap repairs.

This case illustrates an often missed intraoperative injury and highlights the importance of awareness of anatomic anomalies during surgical procedures.

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