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Clinical image

Duplicated ureter diagnosed during total laparoscopic hysterectomy

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Introduction

A double ureter is a congenital anomaly of the urinary tract that can lead to various clinical problems, including vesicoureteric reflux, urinary tract infections, ureterocele, ectopic ureter, and ureteric obstruction.[1] Decisions regarding treatment (conservative or operative) depend on the renal function and condition of both ureters and bladder. Among patients who are asymptomatic, many cases of double ureter are accidentally found on abdominopelvic imaging or during surgery. Such cases are extremely rare.

We report a rare case of a double ureter diagnosed during total laparoscopic hysterectomy (TLH).

Case report

A 43-year-old female (gravida 2, para 2, body mass index = 30.7 kg/m^2) with no history of health problems presented with hypermenorrhea. Transvaginal ultrasonography revealed a submucous leiomyoma measuring 4 cm in size. We suggested two surgical options (hysteroscopic myomectomy or TLH) to the patient. After a lengthy discussion with the patient about the various implications, at the patient's request we decided to perform TLH. The patient was hospitalized and underwent TLH. The operative time was 161 minutes and the intraoperative blood loss was 100 mL. The weight of the resected specimen was 220 g.

During TLH, we routinely expose the avascular retroperitoneal space by the lateral approach at the beginning of the operation. By displacing the uterus to the contralateral side, a pelvic sidewall triangle formed by the round ligament, the external iliac artery, and the infundibulopelvic ligament is identified. The peritoneum in the middle of the triangle is then incised, and the broad ligament is opened by bluntly separating the areolar tissues. We next proceed to locate the umbilical ligament in the retroperitoneal space. After identifying the umbilical ligament, we search caudally for the uterine artery along its structure. The uterine artery is then ligated at its origin with 2–0 Vicryl to reduce the blood flow. The ureter, which adheres to the posterior leaf of the broad ligament, can thus be identified at the same time. In order to prevent ureteral injury, the course of the ureter is caudally exposed until the entrance of the ureteral tunnel. Usually, the entire pelvic course of the ureter becomes visible during these procedures. However, in this case, the course of the ureter was not clearly visible. Therefore, we searched for the ureter distal (cranial) to the pelvic brim and then peeled the ureter from the posterior leaf of the broad ligament for its entire pelvic course in order to expose it. Surprisingly, incomplete duplication of the right ureter was observed during the procedure (Fig. 1). Distally, both ureters were joined together and running as a single segment for approximately 5 cm in length prior to entering the bladder. The left ureter and the bladder were normal in appearance.

The patient was uneventfully discharged on postoperative Day 4. Renal ultrasonography later confirmed no evidence of hydronephrosis. Intravenous pyelography was not performed during the postoperative period at the patient's request. The patient was doing well during the postoperative follow-up.

Discussion

Ureteral duplication is a relatively common condition with a reported incidence of approximately one in 125 (0.8%) people, on the basis of an autopsy series.[2] It is slightly predominant in females, with an estimated ratio of approximately 1.6:1. Unilateral duplication of the ureter is six times more common than bilateral duplication.[3]

During the embryological period, the ureteric bud arises from the mesonephric duct and extends caudally to form the trigone of the bladder. The bud also grows dorsocranially and joins with the renal mesenchyme, giving rise to the epithelium of the renal pelvis, the ureter, and part of the trigone. Structural anomalies of the urinary tract such as duplicated ureter are considered to be associated with abnormal positioning and development of the primary

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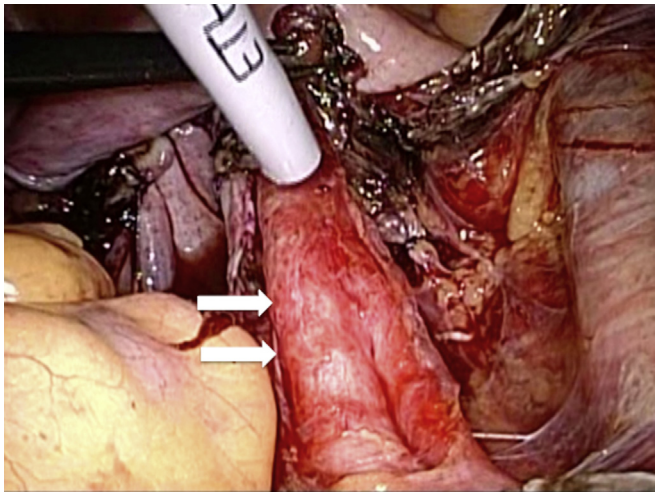

Fig. 1. Double ureters join prior to emptying into the bladder. Note the branch point of "Y-shaped" ureter (white arrows).

ureteric bud. Anatomical variations of duplicated ureters have been previously described: (1) incomplete or partial duplication, (2) complete duplication, (3) ectopic ureterocele, and (4) ectopic ureter.[1] A duplex kidney and ureter refers to a renal unit in which the kidney is composed of two pelvicalyceal systems associated with partial or complete duplication of the ureters. Complete ureteral duplication occurs when two ureteral buds arise from the same mesonephric duct. Each ureter drains a separate pelvicalyceal system and opens separately into the urinary tract. By contrast, partial or incomplete duplication occurs when double ureters join prior to emptying into the bladder.

Duplication is commonly accompanied by a ureterocele. In these duplex systems, one ureter is usually orthotopic and the other is ectopic.[1] Most importantly, one of the ureters is usually refluxing or obstructed, whereas the other typically remains uninvolved. Ureteral duplication is often diagnosed in children evaluated for urinary tract infections or females who present with urinary incontinence.[4] In asymptomatic patients, it may also be incidentally discovered during surgery or diagnosed on abdominopelvic imaging.[5]

Treatment depends on the condition of both ureters (ipsilaterally), the function of the ipsilateral kidney, and the anatomic characteristics and function of the bladder. If the duplex collection system leads to various clinical problems, upper-pole partial nephrectomy, uretero–uretero anastomosis, or reimplantation of both ureters should be considered. Recently, laparoscopic treatment for symptomatic ureteral duplication has gained popularity because of its feasibility, minimal morbidity, excellent cosmetic results, and short hospital stay.[6] By contrast, conservative treatment may be appropriate for asymptomatic cases. If the patient is symptom-free, particularly in the absence of recurrent urinary tract infections or renal function loss, no further intervention is required.[1]

Patients with duplicated ureters represent a challenge to laparoscopists who do not recognize the presence of this anatomical variant. Recognizing a second ipsilateral orifice in cases of complete ureteral duplication or the location of the branch point of a partially duplicated “Y-shaped” ureter is essential during surgery. However, those who do not consider these anatomical variants may waste time unsuccessfully trying to identify the ureter, which may lead to ureteric injury.

In conclusion, we report a rare case of a duplicated ureter diagnosed during TLH. Surgeons should consider the possibility of anatomical variants that are not recognized prior to surgery.

Appendix A. Supplementary data

Supplementary data related to this article can be found online at http://dx.doi.org/10.1016/j.gmit.2013.05.003.

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