

Second case of spontaneous left ureter rupture during normal spontaneous vaginal delivery

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Abstract

CASE REPORT: A healthy 26-year-old nulliparous woman presented for elective induction of labor at 40 weeks 5 days gestation. Her pregnancy, past medical and surgery history were unremarkable. She was given 2 doses of Cytotec for cervical ripening followed by spontaneous rupture of membranes. She received epidural anesthesia and was completely dilated 13-1/2 hours later. The second stage of labor lasted 18 minutes before she delivered via NVSD over an intact perineum without laceration. As the epidural analgesia was wearing off, the patient reported severe left sided abdominal pain radiating into her back. Physical exam was significant for guarding and rebound tenderness. A stat hemoglobin was normal, but a CT scan of the abdomen/pelvis demonstrated spontaneous proximal complete ureteral disruption with mild left proximal hydronephrosis and extravasation of urine into the retroperitoneum as well as focal cortical thinning/scar involving the superior and medial left kidney. (Imaging available for publication.) Intravenous narcotics gave no significant pain relief. Urology was immediately consulted, and a left ureteral stent was successfully placed in the operating room. The stent remained in place for 6 weeks and imaging during stent removal confirmed an intact left ureter. Rheumatology consultation ruled out any connective tissue disorder.

Two and a half years later the same patient had an uncomplicated pregnancy. She underwent a scheduled prophylactic placement of a left ureteral stent under spinal anesthesia at 38 6/7 weeks. The following day she was admitted for labor induction and had an uncomplicated vaginal delivery. The epidural remained in place for regional anesthesia until the following morning when urology removed the left ureteral stent. An intraoperative left retrograde pyelogram confirmed the left ureter to be intact and she has had no subsequent problems to date.

DISCUSSION: Spontaneous ureteral rupture is a rare event, which requires immediate medical intervention. It can present similar to many acute obstetric complications, such as uterine rupture and retroperitoneal hematoma/bleeding. Ureteral rupture most commonly is due to increased pressure within the renal system or increased external forces. Potential causes of intraluminal pressure increases include nephrolithiasis, iatrogenic or post-radiation ureteric strictures, neoplasm, fibrosis, and increased laxity of ureter wall due to connective tissue disorders. External pressure causing compression of the renal system resulting in increased intraluminal pressure may be due to urinary retention, vascular structures, neoplasm, and gravid uterus.

This is an exceedingly rare obstetric complication, especially if involving the left ureter. Spontaneous ureteral rupture has been found to occur more commonly in nulliparous women and almost always involves the right ureter. The mechanisms are likely due to physiologic compensations of pregnancy, involving an interplay of both hormonal and anatomical changes that occur during pregnancy.

Renal physiology changes significantly during pregnancy to compensate for the pronounced volume expansion and vasodilation. These changes are hypothesized to occur more commonly on the right ureter than the left due to the relationship of the right ureter with the right iliac and ovarian arteries at the pelvic brim, along with the natural dextro-rotation of the uterus by the sigmoid colon, which also helps to provide a cushion to the left ureter. Progesterone is thought to play a role in ureteral dilation via relaxation of the smooth muscle, however, there has not been strong evidence supporting this association and no relationship has been found between progesterone levels and severity of dilation.

Approximately 35 cases have been previously reported of spontaneous rupture of the urinary tract during pregnancy. Rupture of the proximal ureter and fornix have been the most common. Most cases of ureter rupture have been on the right. In fact, we could only identify 1 other reported case involving the left ureter. It has been theorized that increased intra-abdominal pressures during active labor with physiologic changes of pregnancy may contribute to increased traction and pressure on the ureters due to downward force on the bladder.

Other published case reports do not discuss subsequent pregnancies. There are no recommendations for reducing risk of ureteral rupture in future pregnancies. Almost 3 years later, during this patient's next pre-delivery planning, we coordinated with Urology. Since there was no clear evidence that a cesarean delivery would reduce her risk, we were planning for a vaginal delivery. In this patient's case, the prophylactic left ureteral stent placement protected her ureter and recurrent ureteral rupture did not occur with this delivery. Her postpartum period was uncomplicated.

Spontaneous ureteral rupture is an exceedingly rare obstetrical complication that requires acute awareness with early diagnosis due to high risk of complications.