

RUPTURE OF THE RENAL PELVIS FOLLOWING HYDRONEPHROSIS AND HYDROURETER AFTER A CESAREAN SECTION

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Rupture of the renal pelvis during pregnancy is rare but potentially serious because of potential hypovolemic shock following internal bleeding [1–6]. A ruptured renal pelvis during pregnancy can be caused by a variety of factors, such as traumas from traffic accidents, blunt injury or domestic violence [1], while spontaneous rupture can be due to underlying pathologic factors including renal stones, cysts, renal hematomas and renal tumors, or by chronic infection causing ureteral obstruction [2–6]. We report here on an unusual case of renal pelvis rupture following hydronephrosis and hydroureter, caused by surgical sutures after a cesarean section. Furthermore, we discuss other possible causes and appropriate management of this condition.

A 31-year-old primigravida underwent an emergency cesarean section because of fetal distress at 37 weeks 3 days of gestation. The fetal monitor showed late decelerations at that time, while the cervix was only about 4 cm dilated. On the second day after the operation, the patient complained of moderate backache, which worsened over the following 5 days, together with the development of gross hematuria. Physical examination disclosed tenderness and guarding in the left flank, with a knocking pain. An abdominal sonogram showed left renal hydronephrosis (Figure 1). Intravenous urography and abdominal computerized tomography scan showed a tear in the left renal pelvis or left upper ureter with extravasation of contrast medium into the left retroperitoneal space, associated with left hydronephrosis and hydroureter (Figures 2 and 3). She denied any history of abdominal trauma such as a car accident or domestic violence. Cystoscopy

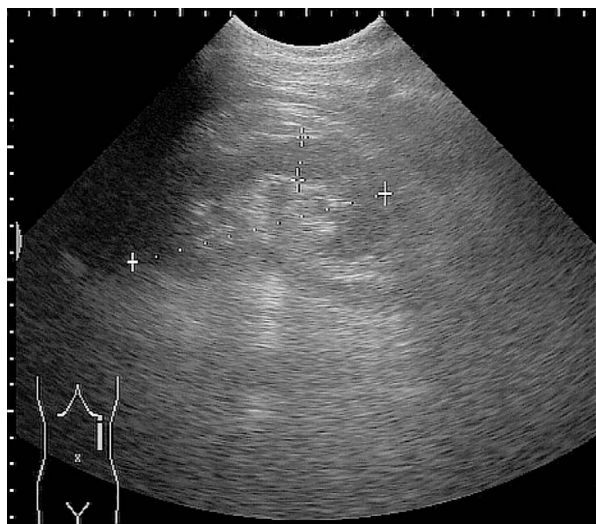


Figure 1. Sonogram of the kidney. Mild left hydronephrosis with minimal perirenal anechoic fluid collection.

revealed edematous mucosa over the posterior bladder wall surrounding the ureteral orifice and suture stitches over the left lateral posterior wall of the bladder. We, therefore, performed an emergency percutaneous nephrostomy (PCN) under fluoroscopic guidance (Figure 4). The patient was treated with cefazolin and gentamicin after PCN tube insertion. Her left flank pain subsided over the following few days. On the ninth hospital day, she was discharged with a Foley catheter and PCN tube. Voiding cystourethrography was carried out at follow-up 2 weeks after discharge and revealed a grossly normal bladder with grade I left vesicoureteral reflux. Five weeks after discharge, antegrade pyelography via the PCN tube revealed an intact left renal calyx without contrast medium extravasation or stasis (Figure 5). Based on this, we removed her PCN tube. Her progress remained uneventful over a 6-month follow-up period to the time of writing.

Urinary tract injuries in association with pregnancy have been reported to occur at an incidence rate of



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Figure 2. Intravenous urography. A tear of the left renal pelvis or left upper ureter with extravasation of the contrast medium into the retroperitoneal space associated with left hydronephrosis and hydroureter (arrow).

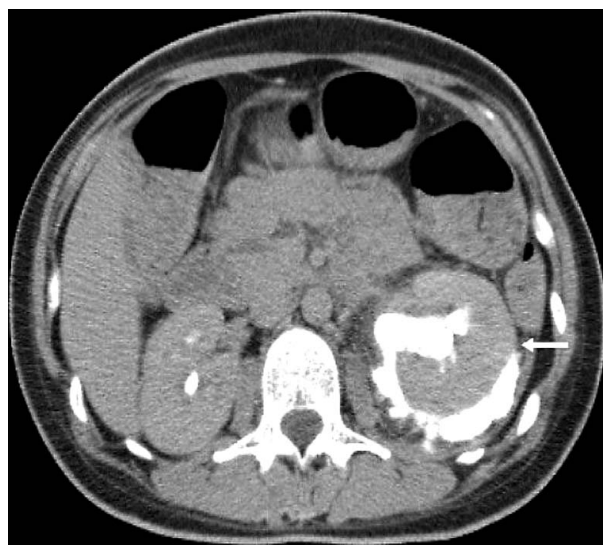


Figure 3. Abdominal computerized tomography scan. A tear in the posterior inferior wall of the extrarenal portion of the left renal pelvis with extravasation of the contrast medium into the left perirenal space (arrow).

0.04% [7]. Around 75% of these injuries are iatrogenic, and only about 25% are caused by blunt abdominal trauma or perforation [8]. Spontaneous rupture of the renal pelvis during pregnancy is relatively uncommon. It can occur with or without pre-existing pathologies, such as renal cysts, renal hematomas, renal tumors, or chronic infection with ureteral obstruction [2–6]. Rupture of the renal pelvis during pregnancy preferentially affects the right kidney owing to physiologic dilatation of the right urinary tract associated with increased

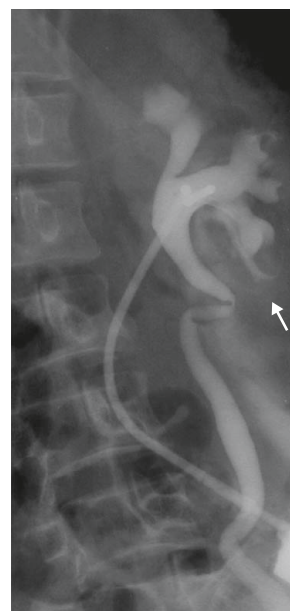


Figure 4. Left percutaneous nephrostomy under fluoroscopic guidance was used for treatment (arrow).



Figure 5. Left antegrade pyelography via percutaneous nephrostomy tube. The normal appearance of the left renal calyx, pelvis and left ureter, with free passage of the contrast medium into the urinary bladder without extravasation or stasis.

urinary pressure; this is caused by dextrorotation of the expanding uterus beginning at 20 weeks' gestation and lasting until 2 weeks after delivery [9]. Two cases of left-sided rupture of the renal pelvis have been previously reported; one case had a left pararenal abscess [10] and the other case had no underlying condition [11]. In the current case, there was no history of abdominal trauma or of external force exerted on the abdomen during labor. Left hydroureter and hydronephrosis were confirmed by abdominal sonogram and intravenous

urography, and may have resulted from acutely increased left renal pelvic and ureteral pressures, which were caused by obstruction of the left ureteral orifice after cesarean section. This suggests that urinary tract injury could have occurred during the cesarean section procedure.

Treatment of rupture of the renal pelvis depends on the rupture site and the severity of the urinary tract injury [5]. Renal parenchymal injury frequently requires exploratory nephrectomy because of the possible association of uncontrollable hemorrhage; one maternal death due to shock has been reported [12]. In cases with local extravasation involving the renal collecting system without massive hemorrhage, conservative treatment with an indwelling ureteral catheter or PCN has been shown to be successful [4,5]. In our patient, the tear in the extrarenal portion of the left renal pelvis was not associated with massive hemorrhage or with renal parenchymal rupture, and her vital signs remained relatively stable, even though obstruction of the left ureteral orifice was revealed by cystoscopy. We used PCN drainage and an indwelling Foley catheter to relieve the acutely increasing left renal pelvic pressure after rupture. The symptoms of left flank pain and hematuria in our patient subsided within 2 days, and the urinary tract healed uneventfully, as shown by antegrade pyelography at 5 weeks after discharge.

Rupture of the renal pelvis following hydronephrosis and hydroureter after cesarean sections is a rare issue. Immediate diagnosis and adequate treatment are important. Intravenous urography and abdominal computed tomography are useful tools for the diagnosis of renal pelvis rupture and could help to avoid more severe complications such as hypovolemic shock and irreversible renal damage.

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