

Spontaneous rupture of the left renal collecting system during pregnancy

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Spontaneous rupture of a normal renal collecting system during pregnancy is uncommon and all reported cases have occurred in right kidneys. We report a case of spontaneous rupture of the left renal collecting system during pregnancy. A 33-year-old pregnant woman presented with left loin and lower abdominal pain, and signs of preterm labour, at 32 weeks' gestation. An emergency caesarean section was performed for foetal distress but the left loin pain did not subside after delivery. Ultrasonography and a computed tomogram showed a left perinephric collection and urine extravasation, compatible with rupture of the renal collecting system. A percutaneous nephrostomy was inserted and the symptoms subsided. A summary of the literature discussing management of this clinical situation is provided.

Introduction

Spontaneous rupture of the renal collecting system is an uncommon complication occurring during pregnancy. It can happen in kidneys with or without pre-existing pathology. All cases reported to date involving normal kidneys have occurred on the right side. We present a case where a pregnant woman suffered from a spontaneous rupture of a normal left renal collecting system during preterm labour and provide a summary of the literature on the management of this clinical problem.

Case report

A 33-year-old primigravida presented at 32 weeks of gestation in March 2006, with gradual onset of lower abdominal and left loin pain for 3 days. There was no precipitating event before the onset of symptoms. She had no fever, urinary tract symptoms, vaginal bleeding or leaking. She gave a history of threatened abortion at 6 weeks of gestation, which was managed conservatively, and an otherwise uneventful antenatal course. On examination she had mild lower abdominal and left loin tenderness with no peritoneal signs. There was no tenderness over her uterus and the uterine size corresponded to her gestational dates. A speculum examination revealed a closed cervical os and a urine dipstick was negative for red blood cells, nitrates, and leukocyte esterase. Her serum creatinine level was 48 $\mu\text{mol/L}$ (reference range, 44-80 $\mu\text{mol/L}$) and her white blood cell count was $9.8 \times 10^9/\text{L}$ (reference range, $4.0\text{-}10.8 \times 10^9/\text{L}$). The cardiotocogram (CTG) showed irregular uterine contractions every 5 to 10 minutes with a reactive foetal heart tracing so she was managed for threatened preterm labour. Dexamethasone was commenced to accelerate foetal lung maturity. Tocolytic therapy was not commenced because of maternal tachycardia (an electrocardiogram revealed a sinus tachycardia with a rate of 110-120 per minute). Her symptoms gradually decreased initially but 2 days later she developed a fever of 38°C and reported increased left loin pain. At the same time, the CTG revealed foetal bradycardia suggestive of foetal distress. An emergency caesarean section was performed and a baby boy delivered uneventfully.

Key words

Hydronephrosis; Kidney diseases;
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Despite delivery, her left loin pain persisted. An ultrasound examination showed bilateral hydronephrosis and a left hydroureter. There was some avascular hypoechoic material surrounding the left proximal ureter suggestive of a fluid collection. A computed tomogram confirmed bilateral hydronephrosis and hydroureters down to the level of the enlarged uterus. No parenchymal lesions or urinary calculi were seen but there was a retroperitoneal collection of fluid surrounding the left kidney and upper ureter, with evidence of contrast extravasation from the collecting system (Fig). A spontaneous rupture of the left renal collecting system was diagnosed. Retrograde ureteric stenting was performed but failed because of the tortuosity of the dilated ureter. A percutaneous nephrostomy was then inserted and the symptoms subsided. An antegrade pyelogram performed 3 weeks later showed a normal left collecting system and an unobstructed ureter so the nephrostomy was removed. A follow-up intravenous urogram performed at

3 months after delivery showed a normal left urinary system.

Discussion

Loin pain is a common problem during pregnancy. The differential diagnoses include common urological problems such as symptomatic hydronephrosis, ureteric stones and pyelonephritis; general surgical conditions; and gynaecological complications of pregnancy. A spontaneous renal rupture is a rare but potentially fatal complication. Ruptures can occur in the renal parenchyma or the collecting system. Rupture of the renal parenchyma usually occurs in diseased kidneys, with tumours being the commonest cause.¹ Nevertheless, in the 17 cases of spontaneous rupture of the collecting system reported in the English literature, the majority (12 cases) occurred in normal kidneys.¹⁻⁵ All 12 of these patients had ruptures in their right kidneys. This is probably related to the fact that hydronephrosis is more common and also more severe on the right side during pregnancy.^{6,7} Spontaneous rupture is probably due to an increase in the hydrostatic pressure within the collecting system exceeding the holding capacity of the calyceal-renal capsular junction.⁸ A sudden increase in urine flow may be a possible precipitating event for the rupture.⁴

Our patient had the first reported spontaneous rupture of a normal left kidney. Because of this unusual presentation, all the clinical information was reviewed but no cause for the rupture was identified. No structural abnormality was detected in all the imaging (include that done at the time of presentation and during follow-up) and there was no clinical evidence of urosepsis. We did not know whether the preterm labour was the cause or the result of the spontaneous rupture. Nonetheless we recommend that if a pregnant woman is found to have a spontaneous rupture of the left renal collecting system, detailed investigations should be performed to rule out any underlying abnormality causing the rupture.

While patients with ruptured renal parenchyma may present with a sudden onset of haematuria, loin pain, a loin mass or even hypotension, patients with ruptured collecting systems mainly complain of persistent severe loin pain with or without haematuria.¹ The latter can occur from 18 weeks of gestation till 1 day after delivery.⁷ The investigation for persistent loin pain in pregnant women usually starts with ultrasonography, which is non-invasive and radiation-free. If there is a ruptured collecting system, there will be evidence of hydronephrosis and a perinephric/periureteric fluid or collection. Further investigations to confirm the diagnosis include an intravenous urogram, computed tomogram, or a magnetic resonance urogram. According to the

懷孕期間左腎盂的突發性破裂

在懷孕期間，正常腎盂發生突發性破裂十分罕見，而所有病例全是發生在右腎。本文報告一宗左腎盂突然破裂的案例。一名33歲孕婦，在懷孕32週時，因突發性下腹和左腰劇痛而入院。檢查後發現病人有早產徵兆，須進行緊急剖腹產子。但手術後左腰痛的情況持續，超聲波檢查和電腦掃描顯示左腎外側有積水和有顯影劑外流，證實為腎盂破裂。病人進行經皮腎穿刺造瘻術後，徵狀減退。本文將總結有關文獻，並討論此病例的處理方法。



FIG. Excretory phase of computed tomogram of the patient showing extravasation of contrast from the left renal collecting system
Evidence of extravasation (arrow)

American College of Obstetricians and Gynecologists' guidelines,⁹ X-ray exposure of less than 5 rads has not been associated with an increase in foetal anomalies or spontaneous abortion. Therefore, a limited intravenous urogram (two films) will not result in a significant radiation hazard to the foetus, and will be helpful for confirming the diagnosis.¹⁰ Although a computed tomogram will expose the foetus to a higher dose of radiation, the actual dosage the foetus receives is still within the safety limit, especially if it is done after 18 weeks of gestation.⁷ Alternatively, magnetic resonance imaging can be used safely after the first trimester and allows differentiation between a urinoma and a haematoma.^{4,11}

Rupture of the collecting system is best managed with drainage either by percutaneous nephrostomy or ureteric stenting, as in our case. The symptoms will usually resolve within days and the system will heal uneventfully.

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