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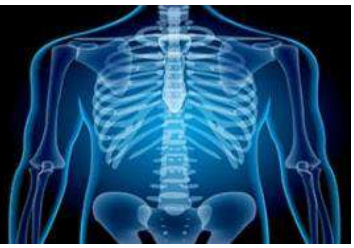

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Dr. Sachin Ajith
Final year resident,
Department of Radiodiagnosis,
Renai Medicity Hospital,
Kochi, Kerala, India

Dr. Dain Davis
Final year resident,
Department of Radiodiagnosis,
Renai Medicity Hospital,
Kochi, Kerala, India

Dr. Gayathri Kalathipadikkal Sanjeev
First year resident,
Department of Radiodiagnosis,
Renai Medicity Hospital,
Kochi, Kerala, India

Dr. Geethu Gopinath
Second year resident,
Department of radiodiagnosis,
Renai Medicity Hospital,
Kochi, Kerala, India

Corresponding Author:
Dr. Sachin Ajith
Final Year Resident,
Department of Radiodiagnosis,
Renai Medicity Hospital,
Kochi, Kerala, India

Spontaneous perinephric urinoma presenting as acute abdomen in the third trimester: A case report

Dr. Sachin Ajith, Dr. Dain Davis, Dr. Gayathri Kalathipadikkal Sanjeev and Dr. Geethu Gopinath

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Abstract
In the absence of trauma, urinoma due to spontaneous rupture of either the renal parenchyma or the renal collecting system is rare. It is even rarer and difficult to diagnose in pregnancy. Hence, imaging plays a key role in the early identification of this condition and the initiation of management. The primary imaging investigation is ultrasonography, and if it is inconclusive, magnetic resonance imaging is the preferred next step. We report a case of a 25-year-old primigravida at 34 weeks of gestation with acute pain in the right loin and loer abdomen without any history of trauma. She had a right-sided hydroureteronephrosis on ultrasound and later on MRI, a perinephric urinoma was detected without evidence of any underlying pathology. She underwent double J-stenting and soon became symptom-free. Early detection is required to prevent associated complications such as peritonitis, abscess, and periureteral fibrosis. Therefore, the clinician should have a high index of suspicion when working up flank pain during pregnancy.

Keywords: Spontaneous urinoma, urinoma in pregnancy, renal pelvic rupture

Introduction
Multiple aetiologies contribute to acute abdominal pain in pregnancy. Pathologies of the bowel, solid organs, ovaries, and uterus should be assessed for potential causes. However, the formation of perinephric urinoma due to rupture of either the renal parenchyma or the renal collecting system is rather an unusual cause of flank pain in pregnancy. This is even rarer in pregnancy. Therefore, imaging plays an important role in its early diagnosis, thereby reducing the complications associated with it and chances of foetal demise. Physiological hydronephrosis associated with pregnancy may be complicated by mechanical compression by the gravid uterus, resulting in high intrapelvic pressure. This can lead to spontaneous rupture in the absence of an underlying pathology. The primary imaging investigation in the work-up is ultrasonography, and if it is inconclusive, magnetic resonance imaging is the preferred next step. We report a case of spontaneous perinephric urinoma formation in a primigravida in her third trimester without any history of trauma.

Case description
A 25-year-old primigravida at 34 weeks of gestation presented to the department of obstetrics and gynaecology with acute-onset right loin pain for the past two days. She had no associated fever or any bleeding or spotting per vagina. She does not give any history of trauma.

She gave a history of dysuria for a few days at 29 weeks and 3 days of gestation, for which she was taking medications. On physical examination, her vitals were stable. Tenderness was elicited in the right costovertebral angle and right iliac fossa regions. The rest of the clinical examination was unremarkable for her stage of pregnancy.

Her urine routine showed cloudy urine with a white blood cell count of 50/high power field (HPF), a red blood cell count of 26/HPF, and bacteria of +4. The urine culture and sensitivity test showed no evidence of bacteriuria. Her blood routine showed raised total counts of 14,030/ mm^3 (Neutrophilic leukocytosis). Renal function tests showed normal serum creatinine and mildly reduced urea of 14.6 mg/dl. The rest of the laboratory investigations were non-contributory. A provisional diagnosis of a urinary tract infection was made.

Later, an ultrasonography was performed using the Voluson E8 ultrasound system (General

Electric HealthCare, Chicago, Illinois, United States), which showed minimal relative fullness of the right renal pelvicalyceal system, probably secondary to mass effect by the gravid uterus or due to an undetected ureterolithiasis.

She was admitted, and antenatal steroid coverage was given. Her symptoms did not improve. Her total counts elevated to 18170/mm^3 the following day; hence, a urological consultation was taken. The urology team advised magnetic resonance imaging (MRI) of the abdomen for further evaluation.

MRI scan of the abdomen was performed using a 3.0 Tesla Philips Ingenia Scanner (Philips Medical System, Netherlands) equipped with standard quadrature coils and high speed gradient coils. The acquisition included a balanced turbo field echo (BTFE) sequence with fat saturation in axial and coronal planes, T1 weighted images (T1WI) and T2 weighted images (T2WI) acquired using two-dimensional turbo spin echo sequences, and single shot echo planar imaging for diffusion weighted images (DWI) with b values of 800 and 1000/mm^2. The imaging protocols were adapted to include the whole abdomen and pelvis, from above the diaphragm up to the level of the lesser trochanter of bilateral femur.

The scan showed a dilated pelvicalyceal system on the right side. Fluid collection showing uniform hyperintense signal on BTFE (Figure 1), and T2WI was noted within the perirenal space on the right side. No evident septations were noted within the collection. No evident diffusion restriction was noted (Figure 2), suggesting that no evident abscess had formed around the right kidney. Dilatation of the ipsilateral ureter is also noted (Figure 3). Other causes of acute abdominal pain, including appendicitis or bowel obstruction, were not evident. No filling defect was noted within the dilated ureter on the right side to suggest the presence of ureteric calculus. No evident mass lesions were noted in either adnexa. From the MRI, no evident pathology could be attributed to the perinephric urinoma. Hence, the possibility of spontaneous perirenal urinoma on the right side with mild hydroureteronephrosis due to back pressure changes from the gravid uterus was considered. However, the exact site of the rupture could not be identified.

An antenatal growth scan for the foetus was performed afterwards, which showed normal interval growth with normal doppler parameters. In view of her symptoms, the urology team decided to proceed with cystoscopy and double-J stent placement in the right ureter to relieve the hydronephrosis. After the procedure, she improved symptomatically. She was symptom-free the following day and was discharged with oral antibiotics the day after. She was advised to have interval ultrasound scans to look for progression and to review in gynaecology and urology outpatient departments for follow-up.

Discussion

Physiological dilatation of the urinary tract during pregnancy is common, more frequently on the right side [1]. It can be attributed to hormone-mediated smooth muscle relaxation, compression of the ureter between the uterus and psoas muscle, or a combination of both [2]. Symptomatic hydroureteronephrosis in pregnancy is seen only in < 3% of cases [3].

Urolithiasis can also occur within the dilated urinary system due to stasis and is one of the common causes of non-obstetrical abdominal pain in pregnancy. The most common reason for emergency non-obstetric surgery in pregnancy is acute appendicitis. Therefore, imaging plays an important role in the early diagnosis of these causes.

Extravasation of urine into the retroperitoneal space is termed urinoma [4]. Urine extravasation occurs commonly as a result of renal trauma, obstruction, or post-instrumentation [5]. But spontaneous rupture of the renal collecting system or the renal parenchyma is rare. The extravasated urine causes inflammatory changes and fibrosis, which will result in an encapsulated sac surrounding the urine collection, forming a perirenal pseudocyst [6]. The development of spontaneous urinoma is an uncommon complication during pregnancy. However, cases of rupture of the kidneys and renal tract have been reported in pregnancy [7, 8]. Various pathologic findings are associated with rupture, which include renal cysts, angiomyolipoma, renal tumours, or evidence of chronic infection and abscess formation in association with obstruction. In some cases, no definite pathological cause was identified. Spontaneous urinoma in pregnancy is thought to develop secondary to the rupture of the calyceal fornix, when the pressure in the renal pelvis exceeds a critical level between 20 -75 mm Hg due to ureteral or renal compression [9, 10].

The appropriate initial imaging investigation in these cases is ultrasound. However, because the gravid uterus displaces the location of intraabdominal organs, identification of structures such as the appendix and ovaries may not be easy on ultrasound. In our case, besides mild right-sided hydroureteronephrosis, there were no clear signs of renal pelvis rupture. Since the ultrasound was inconclusive and her symptoms aggravated, she was advised to undergo an MRI. Plain radiographs have no role in this clinical setting. Intravenous pyelography has been used in some cases previously to detect extravasation of contrast during excretory urography. MRI is considered a second-line investigation that can help locate the site of rupture more accurately; otherwise, performing a CT should justify the risks versus benefits of imparting a high radiation dose to the mother and foetus. On MRI, urinary extravasation can be seen as retroperitoneal collection within the perirenal space. Complications like abscess formation can also be identified with the help of DWI. Delay in diagnosis may lead to foetal distress, causing rapid progression of labour leading to preterm delivery and an emergency caesarean section. Severe complications like peritonitis and periureteral fibrosis, with the later development of hypertension, renal failure, and renal atrophy, can also occur [11].

Management of urinoma in pregnancy depends on whether it has occurred through the renal parenchyma or the collecting system. Surgical exploration for rupture of the renal parenchyma was done in some cases due to the associated haemorrhage [8].

However, treatment of renal pelvis rupture with double J-stenting provides immediate symptomatic relief and is now considered the main line of management [12, 13]. In our case, the patient improved symptomatically after stenting and was symptom-free the following day. The challenge lies not in treating this condition but rather in accurately diagnosing this complication in pregnancy. For this reason, physician awareness of maternal urinoma as a complication of gestational hydronephrosis is required while working up flank pain during pregnancy.

Figures with legends

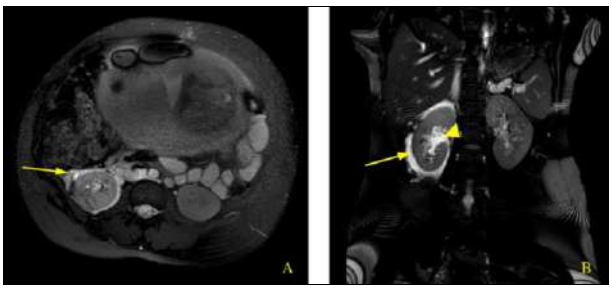

Fig 1: BTFE fat saturated axial (A) and coronal (B) images showing hyperintense fluid collection in right perirenal space as shown by the arrows, suggestive of urinoma. Dilated right renal pelvis (B) shown by the arrow head.

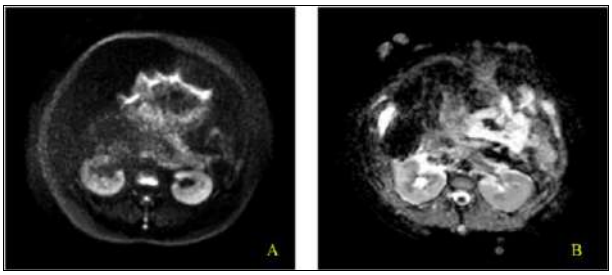

Fig 2: DWI (A) and ADC (B) axial images show no evident diffusion restriction within the right perinephric collection

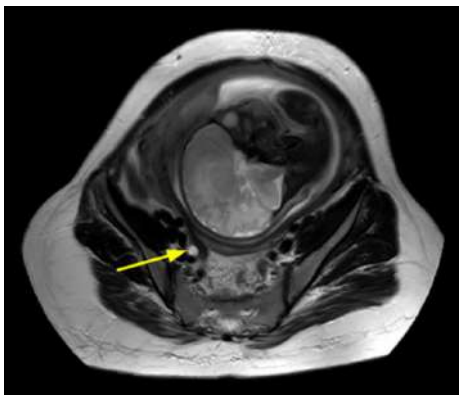

Fig 3: T2WI axial section through the pelvis shows dilated right ureter

Conclusion

In the absence of an identifiable aetiology, spontaneous urinoma during pregnancy may be attributed to increased intrapelvic pressure due to the mechanical compression of the ureter by the gravid uterus. Ultrasonography is the standard diagnostic tool. MRI is a second-line investigation in such patients and may delineate the site of rupture more accurately. Double-J stenting is suggested as the initial management prior to any other treatment interventions. Undiagnosed urinoma increases morbidity for mother and foetus by increasing the risk of obstetric complications. Close monitoring with serial ultrasonography and interval follow-up to look for resolution of the urinoma is essential for the overall outcome.

Conflict of Interest

Not available

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Not available

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