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Case Report

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Burden of symptomatic renal stones in pregnancy managed till normal delivery: a case report in developing nation

Abstract

Although urolithiasis occurs in pregnancy, its management remains a great challenge in our region. It creates a diagnostic puzzle due to many differentials that can simulate the symptoms in pregnancy. This is further challenged by the limitations of the accepted imaging investigations, burden of monitoring the pregnancy and managing urolithiasis till delivery at term. We present a case of intractable flank pain due to left renal calculus in an eighteen year old primigravida which was successfully managed. Where possible, treatment of urolithiasis before conception should be our focus in addition to general preventive measures of urolithiasis.

Keywords: urolithiasis, pregnancy, stones, hydronephrosis

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Introduction

Urinary tract calculi presenting during pregnancy are rare, with recurrent incidence about 1 per 1500 (0.07%) pregnant patients.[1] Cumulative incidence of hospital admission for nephrolithiasis during pregnancy is as low as 1.7 per 1000 deliveries.[2] Despite this, urolithiasis is still the most common cause of non-obstetrical abdominal pain that requires admission of pregnant patients.[3] Also the risk of pre-term delivery due to nephrolithiasis has doubled the one in pregnant women without nephrolithiasis,[2] hence the need for commitment in the management of this category of patients. Maternal kidney stones are significantly associated with several pregnancy complications, including recurrent abortions, hypertensive disorders, gestational diabetes and increase in the number of caesarean deliveries.[4] Urolithiasis in pregnancy may be more common in multiparous women, and more commonly present during the second and third trimesters.[5] Generally, men have been reported in the past to have higher urolithiasis than women, but the overall man to woman ratio were reported later to have decreased from 3.1:1 to 1.3:1 during a 30 year period in a city of united states.[6] The increasing incidence of nephrolithiasis these women might be due to lifestyle associated risk factors, such as obesity. Diagnosing urolithiasis in pregnancy remains a great challenge, because many differential diagnoses can exist in pregnancy, and also the common symptoms and signs may be silent in some patients. We present a case of left ureteric stone in pregnancy.

Case presentation

A.A.I was an eighteen year old unbooked primigravida with estimated 3 months old gestation, presented to the Gynaecology Emergency unit with a sudden worsening episode of colicky left flank pain, which preceded several episodes of left flank pain for the past 4 years that were relieved by oral analgesics. No symptoms in the right flank. There was occasional high grade fever with chills, no passage of calculus through the urethra and no Lower Urinary Tract Symptoms (LUTS). Also no hematuria recently or during childhood. There were episodes of vomiting but no other gastro-intestinal symptoms. Gynecological history and other systems were normal. No past history of pelvic surgery. She is not a sickle cell disease or diabetic patient. Examination revealed a young woman, in pain distress, afebrile, not pale, not jaundiced, and not dehydrated and no pedal edema. Vital signs were within normal limit. Abdomen was full, moved with respiration, no tenderness at the renal angle or other parts of the abdomen. The liver and spleen were not enlarged and the kidneys were not ballotable. The uterus was not palpable per abdomen; also the percussion findings, bowel sounds, Vaginal and rectal examination including other systems were normal. An initial diagnosis of left pyelonephritis with differentials of left ureteric calculus and left renal calculus were made.

Abdomino-pelvic ultrasound scan revealed an intrauterine viable gestation of 13 weeks with 5 days old as shown in Figure 1A, there was also dilatation of the pelvicalyceal system involving the proximal part of left ureter and presence of 2 calculi within the left renal pelvis, the larger one measured 1.6cm in size as shown in Figure 1B and the right kidney was normal. Serum electrolytes, Urea and Creatinine including urinalysis, urine culture and full blood count were normal. She was then planned and had urethrocystoscopy and Double J stenting of the left ureter under general anaesthesia as shown in Figure 2A. Cystoscopic findings were minimal resistance while stenting the left ureter, which was ultimately, overcame, otherwise normal bladder mucosa and ureteric orifices and no stones within the bladder. Postoperative condition was satisfactory and symptoms subsided. She was later discharged home on oral antibiotics. Since then, she has been regular with her follow up and has been doing well until when she was re-admitted with an assessment of anemia in pregnancy secondary to Malaria and Urinary Tract Infection (UTI) at 32nd week gestation. She responded well to antibiotics and antimalarial, and also had blood transfusion. The serial electrolytes urea and creatinine remained normal. The pregnancy was monitored till term and had spontaneous delivery of normal female neonate weighing 3kg. Patient was re-evaluated in the first week of puerperium, the findings

from the repeated abdominal ultrasound scan and KUB were 2 left renal calculi, and one of them has already enlarged to a bigger size of 2.5cm in its widest dimension and presence of intact left ureteric double J stent, otherwise no soft tissue or bony abnormalities seen. She later had left Nephrolithotomy and extraction of double J stent. Intra-operative findings were ''stag horn calculus'' with another small calculus in the left renal pelvis as shown in Figure 2 (B & C). Post-operative condition was satisfactory and was later discharged home. The metabolic evaluation and stone analysis revealed calcium oxalate and calcium phosphate and she was counseled on dietary calcium.

Figure 1 (A) USS scan of fetus.

Figure 1 (B) USS of left renal calculi.

Discussion

Anatomic and physiological changes occurring during pregnancy affect the whole of urinary tract and accentuation of such changes can alter the renal function leading to stone formation.[7] Pregnancy related conditions that promote stone formation include renal pelvis and ureteral dilatation due to the effect of progesterone, obstruction by the gravid uterus and decreased ureteral peristalsis, all of which are causes of physiological hydronephrosis. The bilateral hydronephrosis of index case presented is not physiologic because there was background history of flanks pain even before the pregnancy. Other promoters of stone formation include UTI and increase in urinary excretion of calcium and uric acid resulting from increased Glomerular Filtration Rate (GFR) and Renal Plasma Flow of Pregnancy.[1,8] However, the effect of the extra solute load is countered by the increased urinary excretion of citrate which is a urolithiasis inhibitor as such the rate of stone formation in pregnant patient is similar to age-matched non pregnant women.[9,10] Stones in pregnant patients are mainly ureteric rather than renal pelvic stone.[11] It predominantly composed of calcium phosphate.[12] Pregnant women with renal colic have increased risk of preterm delivery.[2] Clinical presentation for urolithiasis in pregnancy occurs commonly in the 2nd and 3rd trimesters. Such symptoms include acute flank pain in 90% of cases, haematuria in 75-90%, dysuria and fever.[11,13] The location of the pain often reflects the site of urolithiasis. Stones at the uretero-pelvic junction cause flank pain, middle ureteral stones may cause loin pain and uterovesical junction stones are commonly associated with irritative bladder symptoms.[14] Our index patient presented with severe colicky flank pain, this could possibly be due to obstruction of uretero-pelvic junction by the smaller stone which was relieved by the double j stenting of ureter.

Figure 2 (A) Cystoscopy and ureteral DJ stenting.

Pregnant women with suspected renal colic present a diagnostic and therapeutic challenge because signs and symptoms of urolithiasis resemble features of normal pregnancy, it has many differential diagnoses, and this was further challenged by limited chances of imaging investigations due to potential teratogenicity risk resulting from exposure to ionizing radiation particularly in the first trimester. Other risks to the fetus include adverse effects of anesthesia and the stress of surgery for urolithiasis which is best avoided.[10] There is need for thorough evaluation to rule out differentials such cholecystitis, Hepatits twisted ovarian cyst, Ectopic pregnancy and others.[15] Ultrasonography is considered the first line safe imaging modality of choice in pregnant women's.[16] Up to present time, Magnetic Resonance Urology (MRU) without contrast is considered as the safe second line imaging with no fear of fetal exposure to ionizing radiation. MRU using T2 weighted images with thick slabs is useful in revealing details of urinary tract, which differentiates physiological dilatation from the abnormal ones related to urolithiasis. Thin-slice, high-resolution,

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highly T2-weighted fast spin echo improves the chances of MRU in detection of tiny calculi.[17] X-rays, Intra-Venous Urography (IVU) and Computerized Tomography (CT) scan are avoided in pregnancy due to potential fetal teratogenicity associated with high dose of ionizing radiation.[11] Diagnostic radiations in the antenatal period has been associated with the risk of childhood malignancy such as leukemia later in life, with a relative risk of up to 1.92, even though only few studies reported the association of dose of radiation and oncogenic effect. There should be a routine consideration to minimize diagnostic exposure to radiation required by conditions in pregnancy, and when indicated, it is necessary to balance the risk of the procedure with the benefit to gained.[18]

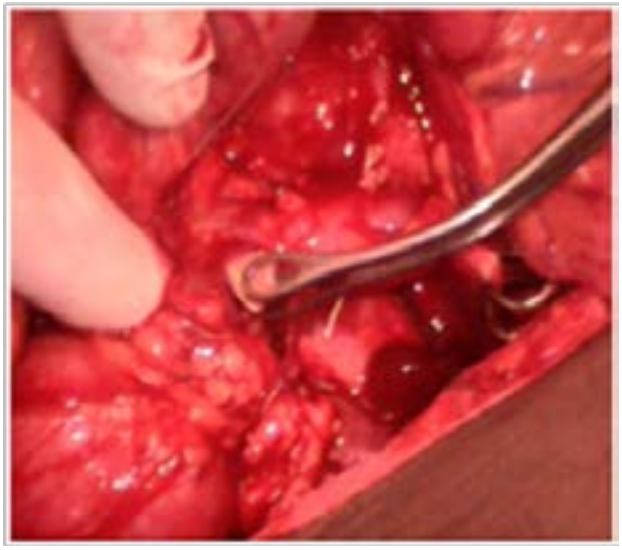

Figure 2 (B) Intraoperative calculus extraction.

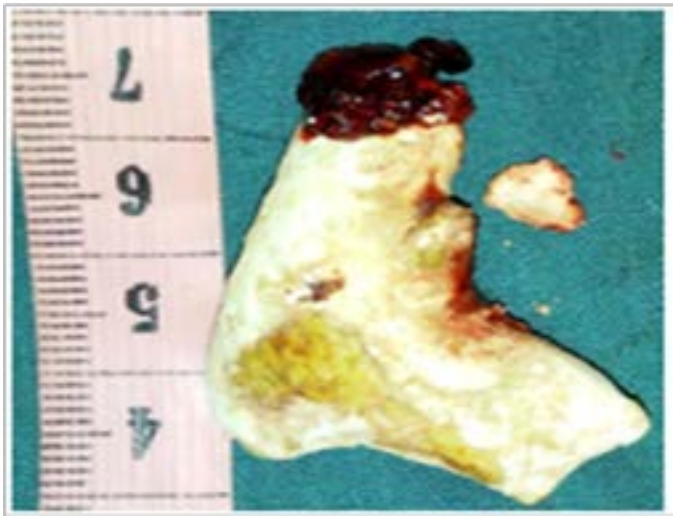

Figure 2 (C) Size of calculi.

Once the diagnosis of renal stone has been established, initial treatment should be conservative, comprising of hydration, analgesics and antibiotics which can result in spontaneous passage of stones particularly the smaller ones in 64-84% of patients.[19] Our patient failed to conservative management even before the pregnancy. The stone size was 1.6cm and the symptom worsen at presentation, which was intervened by cystoscopy with ureteral double j stenting and the placement was confirmed by renal ultrasonography with remarkable outcome till delivery. This intervention was similarly done for 7 patients in other study.[20] Our patient later had pyelolithotomy done in the pueperium due to limited facility for endoscopic management. Recent advances have now made it safe to do definitive ureteroscopy for calculi in all the trimesters of pregnancy. Successful and effective treatment outcome was recently reported for doing definitive ureteroscopy with pneumatic lithotripsy in over 75% pregnant patients.[21] This can be considered if the initial conservative management failed. Some category of patients actually developed the urolithiasis before pregnancy, and this extended to pregnancy period. In this situation, our noble advice for the urologists and Gynecologists is to widen their focus toward detection and treatment of urolithiasis among females of reproductive age before they conceive. These can be achieved by increasing public awareness about symptomatology of urolithiasis and challenges associated with urolithiasis in pregnancy. This will motivate them to present earlier for treatment before pregnancy and hence the challenges in pregnancy avoided. This preconception management of urolithiasis can be proposed to the World Health Organization and other health bodies for its inclusion among the list of medical conditions for preconception care. Such cares for chronic diseases were previously published.[22,23]

Conclusion

Urolithiasis in pregnancy remains a great challenge particularly to nations with limited facilities. We reported a case that was managed successfully despite our limited facilities. Challenges of management extend from diagnosis to definitive treatment. In advanced centres, recent outcomes of definitive ureteroscopy for intervention of urolithiasis in pregnancy are really encouraging and a great motivation for easing the management. It is obvious that management of urolithiasis is easier before pregnancy than during pregnancy; hence clinicians should widen their focus and consider inclusion of pre-pregnancy detection and treatment of urolithiasis as part of the whole management of urolithiasis.

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Conflicts of interest

The author declares there is no conflict of interest.

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