

# A Fortuitous Diagnosis of Pyonephrosis Complicating Pyeloureteral Junction Syndrome During Pregnancy: A Case Report

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## ABSTRACT

Acute urinary tract infection is a common clinical problem, especially during pregnancy due to urinary stasis. Superinfection of this urinary stasis in the intra-renal excretory ducts produces pyonephrosis, the occurrence of which during pregnancy has rarely been described in the literature. Herein, we report a case of pyonephrosis complicating pyeloureteral junction syndrome treated at the Gynecology Obstetrics and Pediatric Hospital of Yaounde. A 23-year-old pregnant woman at 25 weeks of gestation consulted at our gynecology and obstetrics department for exacerbation of chronic left flank pain associated with a localized left flank swelling and frank pyuria. She denied any history of fever. An abdominal ultrasound requested showed signs suggestive of a pyonephrosis with significant destruction of the left renal parenchyma. Emergency management consisted of drainage using percutaneous nephrostomy till delivery. At 6 months postpartum, she underwent surgery for a definitive cure. Intraoperative findings were bilateral pyeloureteral junction syndrome more marked on the left kidney and managed intraoperatively by a pyeloplasty. The 5<sup>th</sup> post-operative day was complicated by a bulky subcapsular hematoma with active intrarenal bleeding on sonography which required a total left nephrectomy. The post-operative course was uneventful. Pyonephrosis in pregnancy is a diagnostic and therapeutic emergency because the prognosis of the renal function is at risk. Timely diagnosis is important to prevent lethal complications such as septic shock. Ultrasound-guided percutaneous nephrostomy drainage constitute an essential therapeutic modality.

**Key words:** Percutaneous nephrostomy, pyeloureteral junction syndrome, pyonephrosis, Yaounde Gynecology Obstetric and Pediatric Hospital

## INTRODUCTION

Urinary tract infections such as asymptomatic bacteriuria, cystitis, and acute pyelonephritis are common complications in pregnant women.<sup>[1,2]</sup> The anatomical, physiological and immunological changes in pregnancy favour urinary stasis whose evolution can lead

to suppuration, causing pyonephrosis.<sup>[3,4]</sup> Pyonephrosis is a serious renal infection that associates retention of pus in the intrarenal excretory tract with inflammation of the renal parenchyma and suppuration.<sup>[5,6]</sup>

In pregnancy, the importance of screening and treating asymptomatic bacteriuria is justified by maternal and

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foetal complications often observed.<sup>[7]</sup> The clinical diagnosis of pyonephrosis during pregnancy is quite challenging.<sup>[5-7]</sup> Investigations entailing ultrasound guided fine needle aspiration of the renal pyelocaliceal cavities often help in making the diagnosis.<sup>[7]</sup> Herein, we report a clinical case of an atypical pyonephrosis in a pregnant woman of 23 years old at 25 weeks of pregnancy.

## CASE REPORT

This was a 23-year-old patient at 25 weeks of her third pregnancy with one living child in good health. She presented with a history of chronic left flank pain that had been evolving for 3 years. This spasmodic, intermittent mild to moderate pain with no associated urinary symptoms occurred at the 16<sup>th</sup> week of her first pregnancy, and no investigation was carried out. The recrudescence of pain during the current pregnancy associated with progressive swelling of the left flank in a febrile context, prompted admission in a health center where the patient received quinine infusions, intravenous paracetamol 1 g/06 h and ceftriaxone 1g/12 h for a week. The occurrence of frank pyuria urged her referral to the emergency unit of the Yaounde Gynecology Obstetric and Pediatric Hospital (YGOPH).

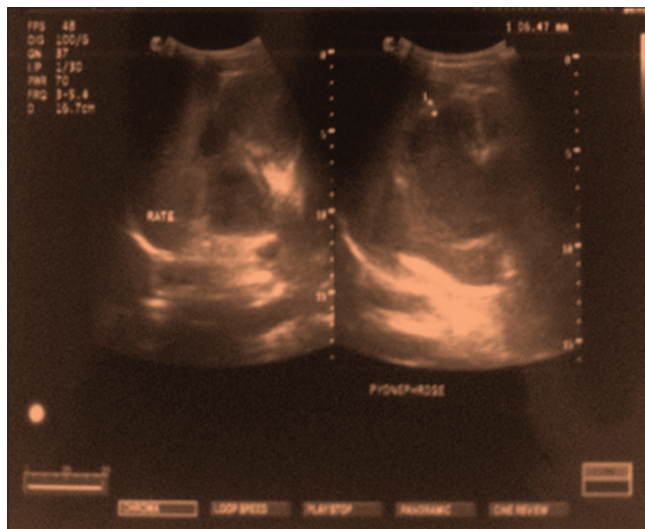
On admission to the YGOPH, she was ill-looking and had the following vital signs; a temperature of 39°C, a blood pressure of 110/70 mm Hg. She passed out 1800 ml of pyuric urine over 24 h. Her conjunctiva was moderately colored. The examination of the abdomen revealed a hot mass in the left flank, poorly defined, more or less firmed and fluctuating in places, tender to palpation, free from the gravid uterus which was itself painless. The uterine height was 25 cm, and the fetal heart sounds were present and regular at 147 beats per minute.

A panel of laboratory tests showed a hemoglobin level of 8.7 g/dl, leukocytes at 6,500/mm<sup>3</sup>, C-reactive protein level of 96 mg/l, serum creatinine at 8.36 mg/L, a negative HIV serology, fasting blood glucose at 0.8 g/l, a normal thick blood film, and a sterile blood and urine culture. An abdominopelvic ultrasounds can show a large left kidney completely dedifferentiated with laminated parenchyma, a dilated pyelocaliceal cavity containing a heterogeneous collection estimated at 1928 ml [Figure 1]. In addition, the obstetrical ultrasound revealed a live intrauterine pregnancy of 24 weeks and 5 days with satisfactory morphology.

The diagnosis of pyonephrosis of the left kidney was made. Antibiotic therapy was initiated with intravenous ofloxacin 200 mg/12 h. A team of urologists and radiologists urgently performed an ultrasound-guided percutaneous nephrostomy [Figure 2]. The nephrostomy drained about 2000 ml of pus within 5 h, followed immediately by a state of shock which necessitated emergency fluid resuscitation with lactated Ringer.

The evolution was marked by apyrexia after 48 h of hospitalization and less turbid urine. On the 5<sup>th</sup> day, the urine drained was completely clear [Figure 3], and her diuresis was 1.2 ml/Kg/h. The nephrostomy drain was maintained until delivery. A multidisciplinary decision of urologists and obstetricians placed her on sulfamethoxazole and trimethoprim (BACTRIM®) 960 mg 12 h throughout the rest of the pregnancy.

At 37 weeks and 2 days of gestation, obstetrical sonography showed intrauterine growth retardation with normal biophysical scores. Labor was induced, leading to the delivery of a female newborn weighing 2100 g. The neonate was admitted into the neonatology department for observation. Scintigraphy requested in the postpartum period reported a very impaired left renal function at 28% with a satisfactory right renal function despite the existence of a huge stage 4



**Figure 1:** Ultrasound image showing dilatation of the cavities of the left kidney with the purulent collection (Rate: Spleen)



**Figure 2:** Percutaneous nephrostomy for drainage, frank purulent fluid collected



**Figure 3:** Collection getting clearer from the 5<sup>th</sup> day after nephrostomy

hydronephrosis in a context of tight pyeloureteric junction; the glomerular filtration rate was 88 ml/min. Blood urea and creatinine levels were within normal limits. Surgical exploration revealed significant left peri-renal inflammatory changes, with bilateral pyeloureteral junction syndrome which was more marked on the left, with inferior polar vessels crossing the junction. Pyeloplasty of the left junction was performed. The post-operative course was marked by the left-sided pain of increasing intensity, exacerbated on the 5<sup>th</sup> day post-operation. A second operation was carried out, which revealed a large subcapsular hematoma with active bleeding of the left kidney. A total left nephrectomy was performed with a satisfactory post-operative evolution. The patient was discharged on the 14 post-operative day. She was referred for further follow-up by a nephrologist, so far it has been uneventful.

## DISCUSSION

Pyonephrosis is an extremely rare pathology<sup>[1]</sup> that can mislead the clinician to three major problems: Wrong or late diagnosis, wrong therapy, and poor prognosis. The delay in diagnosis and treatment greatly increases the risk of maternal and fetal morbidity and mortality. Lithiasic obstruction of the urinary tract, malformations, compression by an expansive process, post-operative stenosis, and subvesical obstruction are risk factors for dilation of pyelocaliceal cavity. The predisposing factors for superinfection of this stasis are mainly diabetes and immunodepressive situations such as pregnancy. The dilation of the pyelocaliceal cavities is a well-known phenomenon during pregnancy;<sup>[2]</sup> over 70% of women develop dilatation of the urinary tract during the second and third trimesters.<sup>[3]</sup> This dilatation is much more frequent on the right because of the dextrorotation of the uterus or the more lateral position of the left ureter compared to the right.<sup>[4]</sup> In our case, the localization was on

the left: This is unusual and made us suspect the existence of a pre-gestational cause, notably a lithiasic obstruction, a malformation or a compression by an expansive process. Chronic changes in symptoms that occurred well before this pregnancy may also support this hypothesis. Diallo *et al.*<sup>[5]</sup> described a left localization of pyonephrosis on a pelvic kidney discovered during pregnancy. The particular situation of the ectopic kidney exposes it to trauma or compression. A case of left pyonephrosis due to compression of the excretory urinary tract by a large cyst of the Gartner canal has also been described in the literature.<sup>[6]</sup> In our case, the localization was on the left and was associated with bilateral uropathy due to a malformation which was more marked on the left. The left localization of pyonephrosis necessitates a search for an associated malformation.

The clinical presentation of pyonephrosis is variable and nonspecific. In pregnancy, the diagnosis is made difficult because the symptomatology can be masked by an evolutive pregnancy. Fever, pain, and swelling of the flanks are the most common symptoms.<sup>[7,8]</sup> However, in a few cases, signs of systemic involvement may be absent.<sup>[9]</sup>

The culture of «renal urine» provides bacteriological data not provided by in 50% of cases.<sup>[7]</sup> The most commonly found germs are *Escherichia coli* and *Enterococcus* species.<sup>[7]</sup> Less encountered germs include *Candida*, *Enterobacter*, *Klebsiella*, *Proteus*, *Pseudomonas*, and *Bacteroides* species. Jonathan<sup>[9]</sup> described a case of tuberculous pyonephrosis in an asymptomatic pregnant woman who had a mass in the right flank. In the present case, the culture of bladder urine and renal urine was sterile probably because the patient had received antibiotics for a week before realization of this test.

Ultrasonography is the examination of choice which can show dilated pyelocaliceal cavities with echogenic content. Jeffrey *et al.*<sup>[10]</sup> and Subramanyam *et al.*<sup>[11]</sup> found that ultrasound had a sensitivity ranging between 62% and 90% in the diagnosis of pyonephrosis. However, there is no clinical or laboratory indicator to distinguish a pyonephrosis from hydronephrosis. It is the fine-needle aspiration of the pyelocaliceal cavities in case of sepsis which will make the diagnosis. The computed tomography-scan with injection and intravenous urography may be helpful in diagnosis but is contraindicated in pregnancy.

The management is multidisciplinary involving the obstetricians, urologists, and radiologists. According to Meares,<sup>[12]</sup> percutaneous nephrostomy remains the treatment of choice during pregnancy. This ultrasound-guided procedure must be performed under local anesthesia by an interventionist urologist or radiologist. Percutaneous nephrostomy has several advantages, namely it allows immediate drainage and culture of the urine for sensitivity studies and the possibility of using drains of varied calibers which can be left in place for a long

period is less expensive and is realized successfully in 90% of patients.<sup>[13]</sup> However, some complications may occur such as peri-nephric hematoma, obstruction or displacement of the drain, bacterial colonization, discomfort or flank pain. This bedside procedure is best performed during the second trimester and more difficult to realize in the third trimester. The pregnancy of our patient was complicated by intrauterine growth retardation. However, these complications occur in <5% of patients.<sup>[14]</sup> In our case, in collaboration with urologists and radiologists, a percutaneous nephrostomy was performed without complications. Pyonephrosis is often associated with massive renal destruction.<sup>[7]</sup> In the above case, the kidney was already friable with significant peri-renal inflammatory changes and failure of an attempted pyeloplasty complicated by a large renal capsular hematoma that required radical treatment. Some authors<sup>[7,15,16]</sup> advocate nephrectomy as the first-line and definitive treatment for pyonephrosis to avert lethal septic complications. However, this major surgery may have adverse outcomes on the course of pregnancy, leading to abortions, or premature delivery.<sup>[12]</sup> As such, nephrectomy may be indicated when there is a failure of percutaneous nephrostomy or in the postpartum period. In our case, percutaneous nephrostomy had the merit of allowing the pregnancy to come to term despite the discovery of intra-uterine growth retardation.

## CONCLUSION

Pyonephrosis is a pathology that requires urgent treatment during pregnancy. The location on the left is quite unusual and seems to be associated with an underlying malformation. Percutaneous nephrostomy has an integral place in the therapeutic approach of this pathology which always has a vital risk. Early diagnosis is the key. The whole process can succeed only through a close multidisciplinary collaboration involving radiologist, obstetrician, and urologist.

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