

Fungal Ball Masquerading as a Renal Stone in a Preterm Infant- A Case Report

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Received: March 03, 2022 Published: March 31, 2022

Abstract

We are reporting an interesting case of 67 days old infant, referred to us for anuria since 24 hours with ultrasound suggestive of bilateral renal stones. The baby was stabilized with immediate peritoneal dialysis and later operated for pyeloplasty, which showed multiple fungal balls obstructing the ureteric orifice. The baby was born premature at 30 weeks of gestation, requiring NICU stay for 30 days. Baby received systemic antifungals for 6 weeks with favourable outcome. One should keep high index of suspicion for fungal infection in any premature neonate who requires prolonged NICU stay or might have received multiple broad-spectrum antibiotics.

Keywords: Invasive candidiasis, Renal stones, Fungal ball, Pyeloplasty, Neonate.

Introduction

Candida species rapidly colonize the skin and mucous membranes of critically ill infants and can progress to invasive infection. Renal fungal ball is a mass composed of fungal cells and sloughed renal epithelial cells, capable of causing urinary tract obstruction. However, renal obstruction caused by fungus balls are rare. Here we report an interesting case of fungal bezoar mimicking renal stone in a baby who was admitted with complaints of anuria without any signs of sepsis.

Case Report

An infant, 67 days old weighing 2.3kg was admitted with complaints of anuria since last 24 hours. Baby did not have any signs of sepsis like fever, lethargy, poor feeding or increased respiratory activity. Baby was born prematurely at 30 weeks gestational age with a birth weight of 1.4 kg. Baby was delivered by LSCS (lower segment caesarian section) and had cried immediately after birth. Was given delivery room CPAP (continuous positive airway pressure) in view of respiratory distress and was shifted to the NICU (neonatal intensive care unit) where he received surfactant and was intubated with ventilatory support for 3 days. Baby had a total of 1 month stay in NICU before discharge.

Baby required readmission for 5 days, 2 weeks before the current illness in view of clinical and laboratory features (positive sepsis screen) suggestive of sepsis. Baby received IV antibiotics for the same. However, blood and urine culture examination were normal.

After the discharge, baby was at home for the last 14 days, had been feeding well, with normal activity. In the present illness, baby was referred to us for complaints of sudden onset anuria since last 24 hours without any signs of dehydration or features of sepsis with the USG (ultrasonography) reports s/o right sided 2 renal calculi of size 5mm in ureter distal to PUJ (pelvi-ureteric junction), left renal calculi at PUJ with bilateral moderate hydronephrosis and hydroureter with acute obstructive changes. The same findings were confirmed on repeat USG at our centre.

On examination vitals were stable. Baby was maintaining saturation on room air. Systemic examination was uneventful.

Peritoneal dialysis was started within 24 hours ivo persistent oliguria with deranged electrolytes and renal function tests. (Refer table 1) Initial sepsis screen done on day 1 was normal. After 48 hours of dialysis operative procedure for stone removal was planned. Multiple fungal pus balls were identified intraoperatively obstructing the ureteric orifice. Open surgery right pyeloplasty with removal of fungal balls with DJ (Double J stent) stenting was performed. Intraoperative pus fluid showed septate fungal hyphae. Urine Culture showed candida albicans. Treatment was started with injection Amphotericin B and fluconazole which were found to be sensitive against the candida. Later coexisting candidal meningitis with peritonitis was confirmed. Peritoneal fluid and CSF (cerebrospinal fluid) culture also showed candida albicans. CSF culture also grew Staphylococcus Aureus (MSSA). Baby received vancomycin for 14 days. Later tablet flu-cytocine was started. Antifungals were continued for a total of 6 weeks. USG brain was s/o mild dilatation of both lateral ventricles, non-communicating hydrocephalus.

Baby recovered completely at the time of discharge with documented negative cultures on investigation.

Table 1: Investigations

Investigation	Value	Investigation	Value
Haemoglobin	12.7gm/dL	CRP	7.85 mg/L
TLC	35,000/uL	CSF	Cells-1350cells/uL, Neutrophils-40%,
Platelet	11,00000/uL	CSF protein	29mg/dL
Urea	35 mg/dL	CSF sugars	16mg/dL
Creatinine	2.86 mg/dL	Peritoneal fluid	Cells-2200/uL, (Polymorphs75%)
Potassium	6 mEq/L	Peritoneal Fluid Protein	133.3 mg/dL
Sodium	122 mEq/L	Arterial blood gas	Normal

Discussion

Invasive candidiasis is one of the serious causes of late-onset sepsis in preterm neonates with a mortality as high as 30%. Invasive fungal infection can affect various organ systems like kidneys, eyes, brain, spleen, heart, liver, and joints. About 35 to 42% of neonates hospitalized at NICU with candiduria have renal candidiasis.⁽¹⁾ Candida species rapidly colonize the skin and mucous membranes of critically ill infants and can progress to invasive infection.

The risk factors could be, low gestational age, use of broad-spectrum antibiotics, central venous catheters, use of parenteral alimentation and steroids.

Formation of a fungal ball can be initiated by agglutination of a necrotic tissue nucleus (papillary necrosis), mucous debris and foreign or stone debris. Such a fungal ball can in turn cause upper urinary tract obstruction with hydronephrosis.⁽²⁾ Treatment varies from conservative strategies with single or combined antifungal therapies to drainage with percutaneous nephrostomy with or without local irrigation or open/endoscopic surgical removal of fungal balls. Treatment depends on the presence of complete or incomplete obstruction of the pelviureteric junction. When local irrigation fails, a fibrinolytic agent (streptokinase or urokinase) has been used in few cases to clear obstructing fungus balls.⁽³⁾

Percutaneous nephrostomy procedure because of the small renal pelvis and the small size of the preterm neonate could be challenging and surgical removal of fungus balls with open procedures may be required. Oedematous bladder and small urethra prevent endoscopic procedures in small size babies. It is expected that fungal ball in the pelvis of the kidney is differentiated from calculus on sonography. However, this is possible only when there is high index of suspicion by the clinician.⁽⁴⁾

The drug of choice for treating *Candida* UTI is fluconazole. Amphotericin deoxycholate is active against all *Candida* species krusei and few resistant species. Liposomal amphotericin although is less toxic, should not be used to treat renal candidiasis as the large molecules in this variety fails to reach the renal parenchyma and is ineffective.

In NICUs with high rates (>10%) of invasive candidiasis, intravenous or oral fluconazole prophylaxis, 3–6 mg/kg twice weekly for 6 weeks, in preterm neonate with birth weights <1000 g is strongly recommended according to the IDSA (Infectious Diseases Society of America) guidelines Oral nystatin, 100 000 units 3 times daily for 6 weeks, is an alternative to fluconazole in neonates with birth weights <1500 g in situations in which availability or resistance preclude the use of fluconazole. Oral bovine lactoferrin (100 mg/day) may be effective in VLBW neonates.⁽⁵⁾

Conclusion

This case emphasizes the need for having high index of suspicion by the clinician for timely diagnosis of fungal infection in high-risk babies who are premature or required prolonged NICU stay or may have required prolonged antibiotics previously. It also must be noted that rarely fungemia affecting organ systems may not show any symptoms of septicaemia and can even mimic other diseases like in our case. It is also emphasized that suspected radiolucent stones in a susceptible preterm infant could actually be a fungal ball. Therefore, a thorough evaluation for the diagnosis of fungal infection should be made for timely treatment to avoid grave consequences in the vulnerable neonatal population.

Conflict of Interest

The authors declare no conflict of interest.

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Citation: Anusha R, Parikh TB, Nakade SY, Shrotriya S. “Fungal Ball Masquerading as a Renal Stone in a Preterm Infant- A Case Report”. *SVOA Paediatrics* 1:2 (2022) Pages 35-37.

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