Candida albicans vesical fungal ball in a neonate

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** Abstract **

In systemic candidiasis renal involvement occurs in 85 per cent of the patients. A wide variety of manifestations may take place including pyelonephritis and the formation of fungal balls, most commonly at the ureteropelvic union which cause obstruction. We report the case of a newborn who developed sepsis and a vesical fungal ball, a very unusual location. This is the third case in the world literature of a neonate with this condition, and the twelfth in the general population. Several treatments have been proposed for this condition: surgical excision, local irrigation with antifungals and others. Our patient was treated with fluconazole for 47 days whereupon the renal and vesical fungus ball disappeared. We propose that renal fungal balls should be purposely investigated with ultrasound studies in patients at risk to develop systemic candidiasis, candiduria or those exhibiting pseudomycetoma in the urine.

Palabras clave: Bolas fúngicas renales, ola fúngica vesical, infección urinaria, fluconazol, amphotericina B, sepsis.

Cases report

The patient was a one month old female born in the state of Mexico (Mexico) from a 19 year old mother's first pregnancy. There was no antenatal control. The child was born on the eighth month following a premature membrane rupture. She weighed 2,700 grams; breathed and cried spontaneously at birth. Apgar was not known. BCG and Sabin vaccines were given. Twenty four hours after birth jaundice was noted and a navel purulent secretion was detected. An unknown
amount of ampicillin was given. At six days of age, because of lack of appetite she was hospitalized and subjected to exsanguino-transfusion and plasma venous infusion. A cardiorespiratory arrest took place which necessitated cardiopulmonary resuscitation and mechanical ventilation. Klebsiella pneumoniae sepsis was diagnosed and the child was referred to our Institute on October 5, 2001. On examination this one month old patient appeared septic, unresponsive, jaundiced. No cardiorespiratory signs were detected. Bowel peristalsis was present. The liver was enlarged. A catheter had been placed in the left lower extremity; a Foley catheter and a nasogastric sound had been implanted. A protracted cholestatic syndrome and neonatal sepsis were diagnosed. Blood cultures, urianalysis and metabolic screening test were done. Marked urine aminoaciduria was reported.

The next day the child weighed 2.100 grams. Heart rate was 140/min; respiratory rate, 38/min; afebrile, hypoactive, poor general condition. The liver was more enlarged; jaundice had increased; the neck was overextended; the anterior fontanelle was normotenive; muscular mass was diminished; the spleen was palpable. On October 9 acholia was diagnosed. Laboratory findings: hemoglobin, 9.5 g/dL; wbc, 27,000; segmented neutrophiles, 71%; platelets, 284,000; total bilirubin, 19.3; direct bilirubin, 14; glutamic oxalacetic transaminase, 971%; glutamic pyruvic transaminase, 387. Blood culture for bacteriae and fungi, centrifuged urine direct exam ination, urine culture for fungi and serum antigen detection for Candida by monoclonal antibodies tests were done. Treatment was started with cephtriaxone and dicloxacillin.

Direct examination of centrifuged urine showed the presence of Candida sp, pseudomycelia and blastocandies. On October 11 serial blood cultures for fungi and renal ultrasound were performed. The patient was febrile. Treatment with fluconazole was started at the dose of 10 mg/kg/day in addition to the antibiotics. An antigen detection serum test for Candida was negative.

The patient became stable. A urine culture (October 12) was positive for Candida albicans with over 100,000 UFC/mL. Cephtriaxone and dicloxacillin were discontinued. On October 16 the patient developed intestinal ischemic disease. Marked edema of the neck and eyelids appeared. There was hypoventilation, costal retraction and nasal flaring, abdominal distention and reduced peristalsis. On October 17 an ultrasound showed a right kidney measuring 5.5 x 2.3 x 2.3 cm with marked echogenicity and hyperechogenic round patterns which did not project a posterior sonic shadow beyond the level of the caliceal systems nor the pelvis; the renal contour was normal. The left kidney measured 5.2 x 2.1 x 2.8 cm. It exhibited marked echogenicity and rounded hyperechogenic patterns which did not project a posterior shadow at the caliceal nor the pelvic level. The bottom wall of the bladder showed a hyperechogenic oval-shaped mass which did not project a shadow; it measured 7 x 3 mm; it was consistent with a fungal ball (Figures 1, 2).

Figure 1. Renal sonogram which shows fungal balls in the collectors without the projection of a sonic shadow.

Figure 2. Vesical sonogram which shows the presence of an oblong shaped fungal ball in the bottom wall of the bladder.
The patient developed pneumonia and cephotaxime was started at 150 mg/kg/day divided in three doses and clindamycin, 40 mg/kg/day divided in four doses. Blood and urine cultures were repeated.

On October 27 the patient was in poor condition. Severe anemia required a blood transfusion, 4 mL/kg in three hours; a new transfusion of 10 mL/kg in three hours was required. Urine culture were negative. Antibiotics were discontinued in November 9 after 21 days, fluconazole was kept up. Renal fungus balls were still present by November 12, some of which gave a sonic shadow; the largest fungal ball was located in the lower wall of the bladder. It disappeared subsequently. There were still signs of pyelocaliceal dilatation. Treatment was continued for ten more days. Antimycotics were kept up for a total 57 days because of the poor response caused by the immunologic condition of the patient. A new ultrasound showed no renal fungal balls; pyelocaliceal dilatation persisted. Fluconazole was discontinued. One month later, direct examination of centrifuged urine and urine culture for fungi were negative. The last renal ultrasound only reported pyelocaliceal dilatation.

Discussion

The diagnosis of Candida urinary infection has usually been approached with different criteria. Among the most reliable has been the UFC count of Candida in urine cultures. A Candida urinary infection is considered positive with counts >10,000 UFC/mL in urine obtained by catheterization. Most reports on Candida urinary infection base the diagnosis on the presence of blastoconidiae (yeasts) and on the Candida count of UFC/mL in urine cultures. However the presence or absence of pseudomycelia in the urine has not been specifically investigated. It has only been documented when patients eliminate "fungal balls" in their urine, which seldom occurs. We believe that intentional search of pseudomycelia in the urine is most important based on the fact that in the pseudomycelial stage originated from blastoconidiae the fungi avoid phagocitosis and are capable of invading the surrounding tissues; blastoconidiae are the saprophytic form whereas the mycelial is the pathogen or parasitic form.

In our patient we detected abundant blastoconidiae and pseudomycelia elimination. The presence of abundant pseudomycelia and a count greater than 100,000 UFC/mL suggested that an invasive renal or vesical process was present. Whereas the renal fungal balls had the typical shape and size described in numerous reports, the vesical fungal ball had an oblongue shape.

The reports on vesical balls indicate that their shape is amorphous. Microscopic examination shows their laminated structure resembling onion skin layers; they exhibit calcium and phosphate deposits.

This is the third case in the literature of vesical fungal ball in a neonate. This location is uncommon in other age groups; only nine such cases have been reported.

There is no general agreement on the method of treatment. Several authors recommend a parenteral treatment in addition to intravesical irrigation with amphotericin B and the need for surgical removal of pelvicaliceal mycelia. Other authors advocate only the use of fluconazole or of amphotericin B; some of these treatments have been successful while others have had remissions or have failed altogether.

The duration of antimycotic treatment has not been firmly established. In our opinion it should be continued until direct examination of centrifuged urine and blood cultures are negative for fungi in the presence of Candida sepsis associated with a renal infection; in addition, the renal ultrasound must be negative for the presence of fungal balls with reappearance of normal echogenicity of the renal parenchyma.

We propose that the diagnostic approach in cases with Candida urinary tract infection should include a renal ultrasound study in every patient with systemic candidiasis, with candiduria and over 10,000 UFC/mL of Candida sp. and in cases with abundant pseudomycelia in the urine.

REFERENCES