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for young doctors

Case Report

PRUNE BELLY SYNDROME: CASE REPORT OF A FAILED MANAGEMENT IN A LOW-INCOME COUNTRY.

Marcella Schiavone[1], Olga V. Denysyuk [1,2], Olivier Wingi [2], Chiara Boscardin [3], Beatrice Galeazzo [1,3], Angela De Palma[4] , Giovanni Putoto [5], Damiano Pizzol [1], Francesco Di Gennaro[1,6].

Summary

Prune Belly Syndrome (PBS) is a rare congenital syndrome characterized by three main features: abdominal wall flaccidity, bilateral intra-abdominal cryptorchidism, and urologic abnormalities.

In this study we describe the case of a 2,600 gr baby, born at the Central Hospital of Beira, Mozambique.

Our study confirms that in a low-income country only conservative management can be delivered, and therefore prognosis is worse and less effective than high-income countries.

Introduction

Prune Belly Syndrome (PBS), also called Eagle Barrett Syndrome (EGBRS), is a rare congenital syndrome that was first described by Frohlich in 1839, and name PBS was given by Osler in 1901 [1]. PBS is characterized by three main features: abdominal wall flaccidity, bilateral intra-abdominal cryptorchidism, and urologic abnormalities [2].

The incidence is estimated at 1 in 35.000, and only 1 in 50.000 is born alive [2]. However, chronic renal failure and end-stage renal disease (ESRD), due both to different degrees of renal hypoplasia or dysplasia and infectious complications, develops in 20-30% of patients who survive the neonatal period [2]. About 97% of those affected are males, in females the condition is rare with fewer than 30 cases reported in literature [3].

The etiology of Prune Belly Syndrome (PBS) is poorly understood, but several theories have been advanced to explain the anomaly in recent years.

One of the theories is the "fetal outlet obstruction", which suggests that the PBS oc-

Address of the authors:

[1] *Operative Research Unit, Doctors with Africa, Beira Mozambique*

[2] *Pediatric and Neonatal Department, Central Hospital of Beira, Sofala, Mozambique*

[3] *Department of Woman's and Child's Health, University of Padua; Padua – Italy*

[4] *Section of Thoracic Surgery, Department of Emergency and Organ Transplantation, University of Bari "Aldo Moro"; Bari, Italy*

[5] *Operative Research Unit, Doctors with Africa, Padova Italy*

[6] *Department of Clinical Infectious Diseases, University of Bari; Bari-Italy*

Send correspondence to: Francesco Di Gennaro, *cicciodigennaro@yahoo.it*

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curs secondary to a bladder outlet obstruction. Dilation of the bladder was also believed to result in atrophy of the abdominal wall through venous infarction and also obstruct the normal dissent of the testicles [4]. Based on the development timeline of the fetus, it would seem that the obstruction would need to occur between the 13th and 15th week of gestation [5].

Recent evidence suggests that it is caused by a mesodermal delay during the fetal development because of an intrauterine injury [6].

No clear genetic pattern for PBS exists, although it is reported to occur in twins, cousins and both male and female siblings, suggesting a familial inheritance. Moreover, recent studies also support the theory by which a homozygote mutation of chromosome 1 is involved (number MIM of phenotype 100100, gene/locus CHRM3, gene/locus 118494, on 1q43 chromosome) [7].

Again, some studies suggest a sex influenced, autosomal recessive inheritance pattern may account for these isolated reports [10].

PBS has a broad spectrum of affected anatomy with different levels of severity [8].

Urethral obstruction early in development, is the result of a massive bladder distention and urinary ascites, leading to degeneration of the abdominal wall musculature and failure of testicular descent. [8]. The skin of the anterior abdominal wall is wrinkled, thin and lax, with a prune-like appearance and cryptorchidism is present in 95% of patients [9].

The genitourinary anomalies, instead, consist primarily of variable degrees of renal dysplasia, the ureters are usually dilated, ectatic and thick-walled. There may be focal areas of ureteral stenosis. The ureterovesical junction is usually widely patent and vesicoureteral reflux occurs in 75% of patients. Urinary bladder is non-trabeculated, enlarged, and thickened [5], leading to impaired elimination of urine and therefore to oligohydramnios, pulmonary hypoplasia, and Potter's facies [4].

Associated anomalies involve cardiopulmonary, gastrointestinal, and/or musculoskeletal systems [10]. The most common pulmonary problem presenting in the neonatal period is severe pulmonary hypoplasia, as well as lobar atelectasis and pneumonia due to poor ventilation and deficiency of abdominal musculature and thoracic wall deformity [10]. Approximately 30% of patients have malrotation and malfixation of the intestines; splenic torsion, intestinal atresia and stenosis are also common. [10]. Orthopedic findings in PBS patients include *talipes equinovarus* (clubfoot), vertical talus, congenital hip dislocation and lower extremity hypoplasia or aplasia also [11].

With advances in prenatal screening techniques, the diagnosis of PBS can occur before birth [8].

In high-income countries PBS may be suspected as early as 11 weeks of gestation via prenatal ultrasound, and most cases of PBS are diagnosed antenatally through ultrasound and confirmed at birth [5]. By contrast, in low-income countries, in resource-limited settings, the use of ultrasound for prenatal diagnosis of congenital abnormalities is limited.

After birth the diagnosis is suggested by the clinical picture, and confirmation requires a multi-disciplinary approach, depending on the clinical profile: evaluation of the renal function (a rise in creatinine over the first several weeks portends a poor prognosis); evaluation of urinary function with renal US and voiding cystourethrography; exclusion of pulmonary complication, as pulmonary hypoplasia, pneumothorax, pneumomediastinum with a chest radiography.

Clinical Case

In this study we describe the case of a 2,600 gr male baby, born at the Central Hospital of Beira - Sofala, Mozambique. The mother was 25 years old, gravida 4 and para 3, she was HIV negative. She belonged to a low socioeconomic level and there was no history of prior antenatal care. The baby was delivered by cesarean section due to his face presentation. At birth the amniotic fluid was stained with meconium and the Apgar

score was 7 at 5 min, and 8 at 10 min. Physical examination showed edema of the face because of his malpresentation during delivery; his abdomen was distended with thin, wrinkled skin and visible peristalsis. During palpation, kidneys and bladder were not palpable and there was no hepatosplenomegaly. Scrotal sac was empty. At neurological examination, he presented hypo-reactivity, had an increased muscle tone and hyperreflexia. Other systemic examinations revealed no abnormality except for a deformity of the right foot (clubfoot). He was admitted to the Neonatology Department with a diagnosis of moderate hypoxic ischemic encephalopathy (stage II sec. Sarnat) and of congenital malformation of the abdominal wall, cryptorchidism and monolateral clubfoot. Because of fever and the results of the meconium stained amniotic fluid he was treated with antibiotic therapy: ampicillin (100mg/kg/12h) for 4 days and gentamicin (4 mg/Kg/die) for 5 days at first; after 5 days without improving with cefotaxime (50mg/Kg/12h) for 11 days, and ciprofloxacin (7.5 mg/Kg/12h) for 10 days. An orogastric tube was collocated at birth, and in the second day of life he presented a gastrointestinal bleeding with clinical signals of hypovolemia (tachycardia, arterial hypotension). In the third day of life blood test revealed anemia (Hb 9.4 g/dl); an abdominal Rx was performed, which excluded intestinal perforation and necrotizing enterocolitis. A second dose of Vitamin K (5 mg im) was administered - the first prophylactic (1 mg im) administered at birth a plasma infusion (40 ml), and he received an RBC transfusion (50ml). On the 7th day, the baby, still anemic (Hb was 9.2), received another RBC transfusion with success, resulting in a resolution of the bleeding and normalization of vital signs. At the end of the first week of life his clinical condition was improving. Because of the physical picture suggestive of Prune Belly Syndrome, he underwent an abdominal echography that showed the presence of hypertrophy of the bladder wall (Figure 1), of a bilateral severe hydroureteronephrosis and of bilateral renal dysplasia (Figure 2-3). Unfortunately, due to technical problems in the laboratory, it was only possible to perform a hemogram, and to obtain the erythrocyte sedimentation rate (ESR), both with normal results, but it was not possible to check the kidney function and the electrolyte balance. He was evaluated by a nephrologist that confirmed the diagnosis, recommending to give prophylactic antibiotic therapy to prevent urinary tract infections. He was discharged at 18 days of life in therapy with amox-

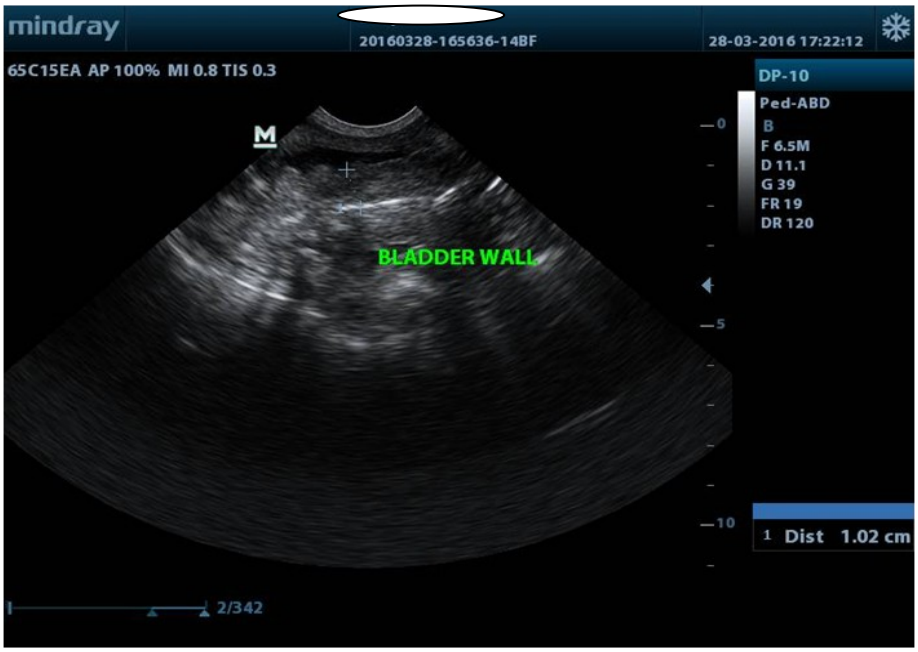

Figure 1: Bladder wall

icillin/clavulanic acid for 7 days, and Hemovit oral solution for 2 weeks to treat anemia (Hb 12.2 g/dl). The first day after discharge he presented a high fever (more than 39 degrees) and dark urine. He was hospitalized and treated with ceftriaxone 75 mg/Kg/day for 10 days. Later the presence of leukocytosis more than 25 x 10^9/L led to start a new treatment with nalidixic acid for 10 days.
At 39 days of life he was discharged, recommending a follow up after 1 month but there was no compliance. At three months of life the mother communicated the death of the baby.

Discussion

Prune Belly is a complex syndrome with many comorbidities requiring frequent operative interventions, mainly urologic and infective ones.
Early Parental education helps in reducing defaults from follow-ups [12]. Con-

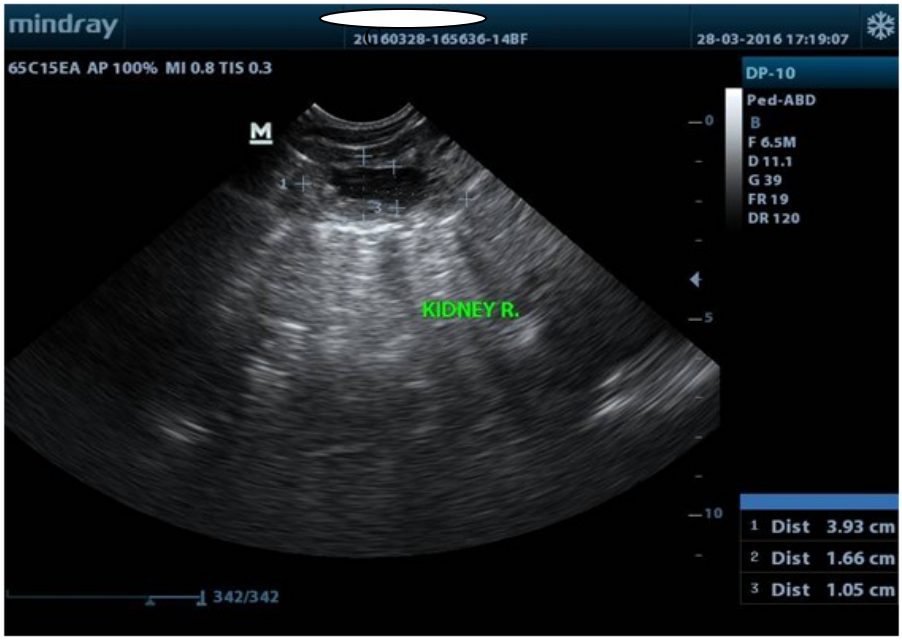

Figure 2: bilateral severe hydroureteronephrosis

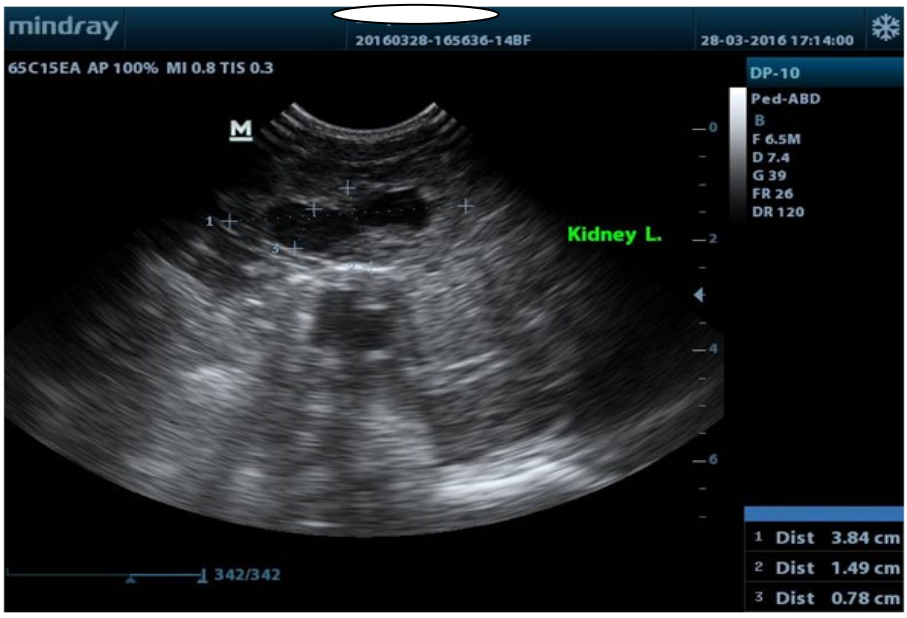

Figure 3: bilateral renal dysplasia

servative management of the urinary tract represents standard treatment in both low-income and high-income countries.

Moreover, in high-income countries abdominoplasty and orchiopexy have both showed to improve physiological conditions and quality of life.

Early end-stage renal disease is prevalent, with approximately 15% of children requiring kidney transplantation [13].

PBS is primarily a pathology of pediatric interest as demonstrated, for example, by the reported average age at transplantation, which usually does not exceed fifteen years of age. Therefore, the need for renal replacement therapy (RRT) in adult patients with PBS is unusual. It is reasonable to suppose that the abdominal muscular defects may represent a limit for peritoneal dialysis (PD) use in PBS adult patients in many Kidney Units where, conversely, treatment with hemodialysis would be probably the easier choice [2].

In low-income countries, instead, surgery and dialysis are not easy to perform, leading to worse prognosis, and to an earlier death of the patient than in high-income countries. Our study confirms that difficulties in the management of PBS, indicating the need for the establishing a prenatal and cytogenetic infrastructure in Mozambique to enhance early detection of congenital malformation and chromosomal aberrations, and the need to increase surgery and transplantation possibilities to manage PBS as well. In the meantime, early detection of fetuses with Eagle-Barret syndrome, using ultrasound, could facilitate timely practices of antenatal management options and lead to favorable birth outcomes of affected babies.

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