Case Report

Multiple Loculated Peritoneal Abscesses in a Child with Nephrotic Syndrome: A Rare Presentation

Md. Azizur Rahman¹, Md. Habibur Rahman², Md. Rezaul Karim³, Syed Saimul Huque²

¹Department of Pediatrics, National University Hospital, Singapore, ²Department of Pediatric Nephrology, Bangabandhu Sheikh Mujib Medical University, Dhaka, ³Department of Pediatrics, Comilla Diabetic Hospital, Comilla, Bangladesh

ABSTRACT. Infection in nephrotic syndrome (NS) is an important cause of mortality and morbidity, especially during corticosteroid therapy. Delayed diagnosis and treatment of these infections can result in some severe consequences. Common infections are peritonitis, meningitis, pneumonitis, and cellulitis. They may even cause abdominal abscess formation. Although literature review reveals abdominal abscesses in NS, multiple loculated peritoneal abscesses are rare in childhood NS. Here, we report a case of multiple loculated peritoneal abscesses in an 8-year-old male child with NS.

Introduction

Nephrotic syndrome (NS) is now considered the most common kidney disease in children.¹ Here, infections remain an important cause of mortality and morbidity, especially during corticosteroid therapy. It triggers relapses and may also be responsible for a poor response to steroid therapy.¹ In the presteroid era, 30% of affected children died of their illness and in pre-antibiotic era, the proportion was even higher. This high mortality is because of defective cell-mediated immunity in NS patients. In addition, steroid or immunosuppressive therapy causes immunological dysfunction, which also leads to increased susceptibility to infections in these patients.¹

Although bacterial infections are more frequent in nephrotic children, viral infections may also be observed in immunosuppressive state. The most common infection is peritonitis (estimated to have an incidence of 5%), often with *Streptococcus pneumonia*. Apart from peritonitis, children may develop meningitis, pneumonitis, and cellulitis. Some factors may contribute to this problem. These are low serum levels of immunoglobulins (Igs), particularly IgG; low serum factor B (C3 pro-activator); defect in the opsonization of bacteria; and immunosuppressive therapy.²,³ Infectious episodes in nephrotic patients are responsible for high morbidity and can also cause an inadequate response to corticosteroid therapy and recurrences among patients in remission.⁴

Peritonitis has been reported with an incidence
of 1.5%–16% in nephrotic children.\(^5\) Delayed diagnosis and treatment of these infections can result in some severe consequences. They may even cause abdominal abscess formation. Although literature review reveals abdominal abscesses in NS, multiple loculated peritoneal abscesses are rare in childhood NS. Here, we report a case of multiple loculated peritoneal abscesses in an 8-year-old male child with NS.

**Case Report**

Informed consent was obtained from the parents of the child for publication of the case as well as the pictures of the child.

An 8-year-old boy, a known case of frequently relapsing NS, presented with the complaints of swelling of the whole body and scanty micturition for two months, high-grade intermittent fever for 15 days, and severe dull-aching pain in the whole abdomen for the same duration (Figure 1). He is the second child of his nonconsanguineous parents. His medical history was unremarkable with no known history of kidney disease. On physical examination, the patient was febrile (temperature: 101°F), puffy, severely pale, edematous, severely underweight (Z score −3.3), and moderately stunted (Z score −3). His pulse was 110 beats/min, respiratory rate was 28/min, blood pressure was 100/60 mm Hg, and bedside urine for albumin was +++. The abdomen was soft but tender. There were multiple solid masses, with the largest one measuring about 5 cm × 4 cm, which was nodular, firm in consistency and fixed, and occupying the umbilical, right lumbar, and right iliac regions. There was no organomegaly. Ascites, scrotal swelling, and staghorn penis were present. His cardiovascular, respiratory, and neurological examinations were normal. Laboratory findings revealed hemoglobin of 5.4 g/dL, total white blood cell count of 19,780/mm\(^3\), platelet count of 450,000/ mm\(^3\), neutrophils of 79%, and lymphocytes of 16%. Peripheral blood film showed microcytic hypochromic anemia with neutrophilic leuko-cytosis. Urine examination showed significant proteinuria (albumin+++), but no hematuria or casts. His 24-h urinary total protein was 3.2 g/day. Serum albumin was 10 g/L, serum creatinine was 0.2 mg/dL, electrolytes were normal, and blood and urine culture showed no growth. Ultrasonography (USG) of the abdomen revealed loculated thick peritoneal fluid in subphrenic and pelvic regions (Figure 2). Computed tomography (CT) scan of the abdomen was performed which revealed multiple loculated peritoneal abscesses (Figure 3). Subsequently, ultrasonogram-guided drainage was done. Approximately 350 mL of pus was drained, which revealed plenty of polymorphs with few lymphocytes, no malignant cell, protein of 3 g/L, no acid-fast bacillus, and no growth of bacteria. There was lack of growth on pus culture, which might be due to prior partial treatment with antibiotics. Initially, he was managed by ceftazidime, flucloxacillin, and metronidazole along with albumin infusion. Due to poor response with this treatment, antibiotics were changed to meropenem and continued for three weeks. After peritoneal drainage, the patient’s condition gradually improved (Figure 4). Then, the patient was discharged with follow-up advice.
Discussion

Infection is an important cause of relapse in NS, the prevention and treatment of which could reduce proteinuria. A high frequency of infections in children with NS has been reported from developing countries such as India, Pakistan, and Bangladesh. The frequency of infections that ranges from 38% to 83% has been observed in various studies.\textsuperscript{7} Multiple factors contribute to increased susceptibility to bacterial infections. These include decrease in IgG levels due to impaired synthesis and urinary loss; edema fluid acting as a culture medium; protein deficiency, especially low serum albumin; hypovolemia leading to decreased perfusion of spleen; loss of complement factors B and D required for phagocytes of encapsulated organisms; and impaired T-lymphocyte function and effects of immunosuppressive therapy commonly used in these children.\textsuperscript{1,7}

Peritoneal abscess is an uncommon complication in patients with NS. This condition can occur at different places within the abdominal cavity when an infection or inflammation occurs.
An abscess in the peritoneal cavity can be the result of generalized peritonitis, and it is one of the major causes. Patients may present with fever, abdominal pain, abdominal mass, lack of appetite, nausea, and/or vomiting.

Our patient presented with generalized body swelling, scanty micturition, high-grade fever, and abdominal pain. For diagnosis, the following investigations were helpful: a complete blood count which showed neutrophilic leukocytosis and CT scan of the whole abdomen which revealed multiple loculated intra-abdominal abscesses. After CT scan, a needle was placed through the skin into the abscess cavity to confirm the diagnosis as well as to drain the abscess. Other tests including USG of the abdomen and abdominal X-ray were done, but these were not conclusive.

Treatment of peritoneal abscess requires broad-spectrum antibiotics (given by intravenous route) and drainage. Drainage involves placing a needle through the skin into the abscess, usually under USG or X-ray guidance. The drain is left in place for days or weeks until the abscess goes away. Occasionally, abscess cannot be safely drained this way. In such cases, surgery must be done.

In Medline search, we have not come across a report of peritoneal abscess in a patient with NS. We, therefore, report this rare event of multiple loculated peritoneal abscesses in a patient with NS.

**Conclusion**

From this case scenario, it was observed that a child with NS may present with multiple loculated intraperitoneal abscess, which may be confused with intraabdominal mass. If it is not detected and treated properly in time, it may be fatal to the patient.

**Conflict of interest:** None declared.

**References**

1. Moorani KN, Mukesh R. Spectrum of infections in children with newly diagnosed primary nephrotic syndrome. Pak J Med Res 2012;51:10-4.
2. Schnaper HW. Immunization practices in childhood nephrotic syndrome: A survey of North American pediatric nephrologists. Pediatr Nephrol 1994;8:4-6.
3. Harris RC, Ismail N. Extrarenal complications of the nephrotic syndrome. Am J Kidney Dis 1994;23:477-97.
4. MacDonald NE, Wolfish N, McLaine P, Phipps P, Rossier E. Role of respiratory viruses in exacerbations of primary nephrotic syndrome. J Pediatr 1986;108:378-82.
5. Chuang TF, Kao SC, Tsai CJ, Lee CC, Chen KS. Spontaneous bacterial peritonitis as the presenting feature in an adult with nephrotic syndrome. Nephrol Dial Transplant 1999;14:181-2.
6. Moorani KN. Infections are common cause of relapse in children with nephrotic syndrome. Pak Paed J 2011;35:213-9.
7. Paul SK, Islam QR, Uddin GM, Hossain MM. Infections in children with newly diagnosed idiopathic nephrotic syndrome. Chattagram Maa-o-Shishu Hosp Med Coll J 2013;12:1-4.

Date of manuscript receipt: 10 November 2018.
Date of revised copy receipt: 17 December 2018.
Date of final acceptance: 18 December 2018.