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Case Report

Septic arthritis following mumps in a case of steroid dependent nephrotic syndrome: a case report

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ABSTRACT

Nephrotic syndrome is a common renal disorder with an incidence of 20 to 40 per million population in developed countries. Children with nephrotic syndrome are especially susceptible to infections such as cellulitis, spontaneous bacterial peritonitis, and bacteremia. However, septic arthritis is an extremely rare complication in nephrotic syndrome. A 6-year-old girl with steroid dependent nephrotic syndrome relapsed following mumps parotitis and developed swelling of the right knee with restricted movements. Ultrasonography (USG) and magnetic resonance imaging (MRI) were suggestive of septic arthritis. The child responded to intravenous Vancomycin and Ceftazidime. We present a rare complication of nephrotic syndrome as septic arthritis, previously reported only once.

Keywords: Nephrotic syndrome, Septic arthritis

INTRODUCTION

Nephrotic syndrome is a common renal disorder with an incidence of 20 to 40 per million population developed countries.[1] It is characterized by edema with protein excretion of more than 40 mg per square meter per hour or urine protein to creatinine ratio of more than or equal to 2000 mg per gram or 3 to 4+ proteinuria on dipstick, serum albumin of less than 2.5 gm/dl and hypercholesterolemia.[2] The most common etiology is a primary glomerular abnormality. Secondary causes of nephrotic syndrome include systemic diseases and infections. Increased urinary losses of protein and protein-bound molecules contribute to several complications in patients with nephrotic syndrome. Children with nephrotic syndrome are at an increased risk of infections because of the disease process itself and the use of immunosuppressive agents.[3] Children with nephrotic syndrome are especially susceptible to infections such as cellulitis, spontaneous bacterial peritonitis, and bacteremia. This occurs as a result of many factors, particularly hypoglobulinemia as a result of the urinary losses of immunoglobulin (Ig) G and complements C3 and C5.[2] Steroid dependence and frequent relapses increase the risk of infections. The use of newly available steroid-sparing agents has reduced the frequency of relapses and complications. However, septic arthritis is an extremely rare complication in nephrotic syndrome. Here we present a case of septic arthritis of the right knee following mumps in a case of steroid dependent nephrotic syndrome.

CASE REPORT

A 6-year-old girl, diagnosed with steroid dependent nephrotic syndrome at the age of 3 years, was on regular follow-up. The child was advised to start on steroid-sparing agents; however, the parents were not willing despite adequate counselling. They deferred starting alternative agents and continued steroids during relapses. 3 weeks before the present admission, the child had an episode of relapse a few days after an episode of mumps parotitis (diagnosed clinically as there was an ongoing

mumps outbreak). Hence, she was restarted on oral Prednisolone at 2 mg per kg per day. Over the next week, the child went into remission of the episode of nephrotic syndrome. Accordingly, oral Prednisolone was tapered.

However, 10 days after the resolution of symptoms, the child started developing pain and swelling in the right knee. It was associated with redness and a restricted range of movements at the joint. The right leg was in an abducted and externally rotated position. A complete hemogram revealed hemoglobin of 13.5 g/dl, leucocytosis with total counts of 18000/µl, and a neutrophilic predominance of 50.1%. C-reactive protein (CRP) was elevated at 21 mg/dl (normal range 0-5 mg/dl). Erythrocyte sedimentation rate (ESR) was 96 mm at the end of the first hour. Serum C3 was 180 mg/dl (normal range 90-180 mg/dl) and serum ANA was negative. She was thus admitted and started on intravenous Vancomycin and intravenous Ceftazidime as per protocol for treating septic arthritis in immunocompromised children.[2] Steroids were converted to stress dose. Ultrasonography (USG) of the right knee joint revealed mild suprapatellar effusion with few internal septae with synovial thickening and effusion in the posterior aspect with synovial thickening, suggestive of septic arthritis. Magnetic resonance imaging (MRI) of the right knee joint was done, which revealed moderate knee joint effusion and suprapatellar bursal effusion with synovial thickening, and hyperintensities in the adjacent soft tissues on T2 weighted and proton density fat saturated images, suggestive of septic arthritis. Blood culture revealed no growth.

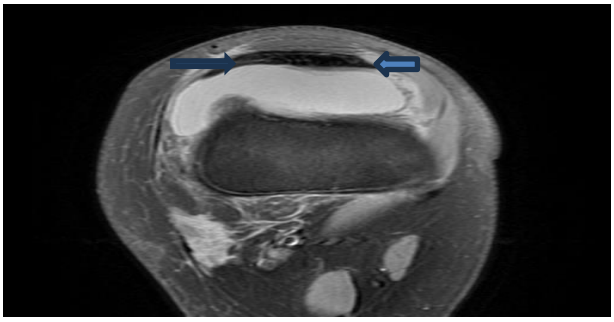

Figure 1: Axial view of the right knee joint showing suprapatellar bursal effusion with synovial thickening.

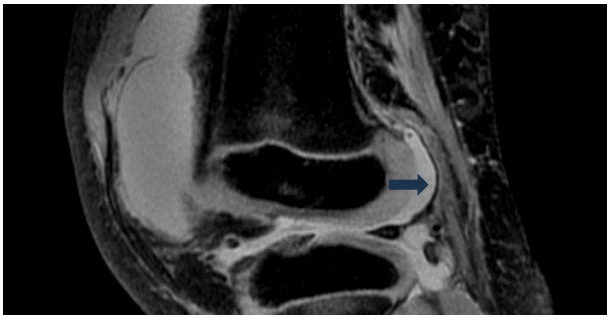

Figure 2: Coronal view of the right knee joint showing posterior joint effusion with septal thickening.

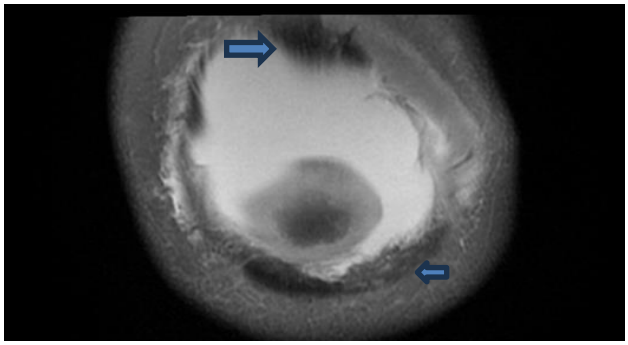

Figure 3: Axial view of the right knee joint showing suprapatellar bursal effusion with synovial thickening and mild posterior effusion.

The child was then advised aspiration of the right knee joint and debridement. However, despite proper counseling about the urgency and need of the procedure, the parents were unwilling. An above-knee cast was applied to alleviate the pain and intravenous antibiotics continued. Over the next 3 weeks, the swelling and pain at the right knee joint reduced. Subsequently, the child was able to resume normal movements at the right knee.

DISCUSSION

Increased urinary losses of protein and protein-bound molecules contribute to several complications in patients with nephrotic syndrome. Children with nephrotic syndrome are especially susceptible to infections such as cellulitis, spontaneous bacterial peritonitis, and bacteremia. This occurs as a result of many factors, particularly hypoglobulinemia as a result of the urinary losses of immunoglobulin (Ig) G and complements C3 and C5.[2] Steroid dependence and frequent relapses increase the risk of infections. The use of newly available steroid-sparing agents has reduced the frequency of relapses and complications. However, there is only one previously reported case of septic arthritis in nephrotic syndrome.[5] Staphylococcus aureus is the most common cause of bacterial arthritis in all age groups. The other etiological agents include group A *Streptococci*, *Streptococcus pneumoniae*, and *Kingella kingae* among others. Mumps infection is known to cause reactive arthritis.[2] However the child was already on steroids so the chances of reactive arthritis were low. Even MRI finding was suggestive of septic arthritis as against reactive arthritis. Parents refused to send fluid for evaluation.

Septic arthritis is more common in young children. Most cases occur by 2 years of age and three-fourths of all cases occur by 5 years of age. Most infections in otherwise healthy children arise due to hematogenous spread. Immunocompromised patients are at an increased risk of joint infection.[2] Most cases of septic arthritis are monoarticular. Ultrasonography is included in routine evaluations because it is particularly helpful in detecting joint effusion and fluid collection in the soft tissue and subperiosteal regions. It serves as a tool for performing

aspiration. Infection of the hip is a surgical emergency because of the vulnerability of the blood supply to the head of the femur. Other joints may need daily aspirations of synovial fluid. Usually, one or two subsequent aspirations suffice. A joint puncture is done to detect any purulent aspirate and obtain samples for bacteriological analysis.[4] Blood cultures are obtained. At the time of surgery, the joint is flushed with a sterile saline solution. Antibiotics are not instilled because they irritate the synovial tissue, and adequate amounts of antibiotic concentration are achieved in joint fluid even with systemic administration.[2] Antibiotic therapy should include coverage for *Staphylococcus aureus*, *Streptococcus species*, and *Kingella kingae*. If there is a strong suspicion of methicillin resistant *Staphylococcus aureus*, Vancomycin must be considered. For immunocompromised patients, combination therapy is initiated, with Ceftazidime and Vancomycin, or with extended-spectrum penicillins and beta-lactamase inhibitors with an aminoglycoside.[2] Monitoring CRP helps to assess response to therapy or to identify complications. Open arthrotomy is reserved for patients who do not respond to conventional therapy. Patients with delay in diagnosis or MRSA infection carry a poor prognosis.[4] The use of newer steroid-sparing agents also helps to prevent such complicated relapses of nephrotic syndrome.

CONCLUSION

We present this case to highlight the rare occurrence of septic arthritis in nephrotic syndrome, which requires a high degree of suspicion as symptoms of inflammation may be suppressed by ongoing steroids. Diagnosis should be confirmed by a joint puncture, and a sample for bacteriology should be obtained before intravenous antibiotics are administered. Combination therapy of antibiotics is to be used in immunocompromised children.

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