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Pyogenic Sacroiliitis in a Healthy and Fit Adolescent

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Abstract

We report the case of a 14 year old girl admitted with a two day history of left sided thigh and buttock pain and fever. There was no preceding history of trauma. Physical examination revealed a temperature of 38.7°C, tenderness over the left sacroiliac joint, pain on manipulation of the joint and limited abduction and external rotation of the left hip. Radiographs of the sacroiliac joints were normal while an MRI pelvis showed signs consistent with a diagnosis of left sacroiliitis. Although initial blood cultures were negative, intravenous ceftriaxone and cloxacillin were commenced. Symptoms persisted with subsequent MRI showing an adjacent abscess. The CT guided aspiration of the abscess with a study of synovial fluid demonstrated the presence of Salmonella (non-typhi species). A second set of blood cultures revealed the same pathogen and confirmed sensitivity to ceftriaxone. Antibiotics were tailored to this result. She received intravenous ceftriaxone for a total of 90 days. On completion of intravenous antibiotic therapy, there was significant resolution of pain and improvement in ambulation. MRI findings were consistent with resolution of infection. Oral cefixime was continued for a total of 30 days. Her condition resolved with no recurrence of symptoms at the time of last follow up.

Keywords: Pyogenic sacroilitis; Sacroiliitis; Salmonella; Paediatrics; Orthopaedic surgery; Paediatric orthopaedics; Infectious disease

Background

The Salmonella genus consists of a large group of Gram-negative rod-shaped bacilli that affect both humans and animals. In general, humans are infected with Salmonella via ingestion of contaminated food or water.

These infections can manifest in a multitude of ways such as gastroenteritis, enteric fever, bacteraemia with or without endovascular infections and focal infections such as sacroiliitis, osteomyelitis and abscess formation. Although the most common manifestation of Salmonella infection is acute gastroenteritis, spread to the blood stream may occur, presenting with focal lesions in almost any organ with or without septicaemia. Factors that predispose to blood-stream invasion include infections with Salmonella serotypes such as *Salmonella choleraesuis*, loss of gastric acidity, immunosuppression, and sickle cell disease. Bacterial septic sacroiliitis is an extremely uncommon infection that occurs in children and young adults and is thought to arise from haematogenous spread. It has been suggested that 10% of children with pyogenic sacroiliitis have a pre-existing history of pelvic trauma. Pyogenic sacroiliitis is a relatively rare form of septic arthritis, accounting for approximately 1% of all cases of septic arthritis. The most common pathogens implicated are *Staphylococcus aureus* and Streptococci with *Pseudomonas aeruginosa* being more prevalent amongst intravenous drug users. Other rarer causes include *Escherichia coli*, *Salmonella sp*, *Mycobacterium tuberculosis* and Brucella.

From 2014 to 2015, there was a 51% increase in the number of patients with Salmonella infections presenting to our hospital. As Salmonella is commonly spread by the handling of raw food such as poultry and eggs, there might have been a lapse in hygiene standards during the period of study. In fact, it was reported two months ago (May 2016) that salmonella contamination was the cause of mass food poisoning among 231 people who consumed food prepared by a certain catering company [1]. We report a case of acute sacroiliitis due to Salmonella (non-typhi species) in a teenage patient without evidence of predisposing factors. The aim of this case report is to highlight the unusual presentation of Salmonella sacroiliitis without typical gastroenteric symptoms or history of trauma [2-10].

Case Report

A 14-year-old Asian female was admitted to hospital through the children's emergency department with a two-day history of left sided buttock pain radiating to the posterior thigh and an associated fever. Nocturnal pain that prevented her from sleeping was also noted. The pain was also worse on movement with the patient unable to bend or stand for a prolonged period of time. There was no previous history of trauma, prodromal symptoms or pre-existing immunocompromise conditions. She has no bowel or bladder symptoms preceded this presentation nor were there any systemic symptoms such as fevers, chills, rigors, night sweats, weight loss or loss of appetite. Physical examination revealed a temperature of 38.7°C, tachycardia with a pulse rate of 100/min and a blood pressure of 120/60 mmHg. Manipulation of the sacroiliac joint was painful, resulting in xxx limitation of passive and active range of movement of the left hip. There was tenderness over the lumbosacral region, particularly over the left sacroiliac joint which was not associated with any warmth or erythema. No other abnormality was detected on systematic examination.

Investigations

Haematological investigations revealed a neutrophil leukocytosis (Neutrophil 94.1%), an erythrocyte sedimentation rate of 29 mm and a C-reactive protein of 206 mg/L. The total white cell count was not raised. Initial blood cultures were negative. The sacroiliac joints, pelvis, lumbosacral spine, and hip joints were normal on radiographs. However, magnetic resonance imaging (MRI) confirmed unilateral left sacroiliitis. A small, rim-enhancing fluid collection was also seen arising from the anteroinferior aspect of the synovial component of the left sacroiliac joint. The adjacent synovium was thickened (Figures 1 and 2).

Treatment

After consulting with the rheumatologists, autoimmune

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Figure 1: MRI showing a small, rim-enhancing fluid collection arising from the anteroinferior aspect of the synovial component of the left sacroiliac joint. The adjacent synovium is thickened.

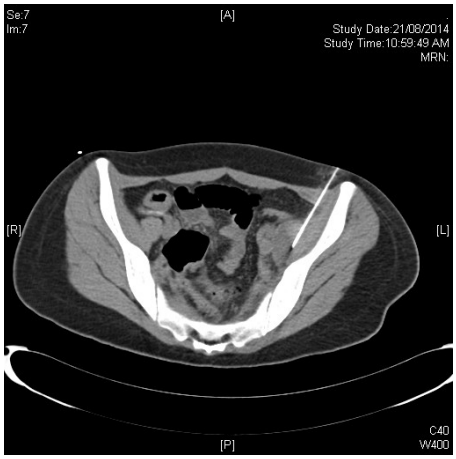

Figure 2: Left iliac fossa puncture under CT guidance was used to access the left iliopsoas collection.

inflammatory conditions such as inflammatory bowel disease and juvenile idiopathic arthropathy were deemed to be less likely and the diagnosis of septic arthritis of the sacroiliac joint was made. The patient was started on intravenous ceftriaxone. This was subsequently changed to cloxacillin as recommended by infectious disease specialists in view of the high probability of Gram-positive organisms associated with sacroiliitis. On changing the antibiotics however, the patient's temperature continued to rise at 39 degrees Celsius, her C-reactive protein levels increased from 141 to 182 and a transaminitis was also noted. As a result, intravenous ceftriaxone was recommenced in addition to the cloxacillin to broaden the spectrum of cover. A peripherally inserted central catheter line was also inserted in view of the prolong duration of antibiotics cover.

Although the C-reactive protein levels began to drop following the new formulation of antibiotics, the spiking temperature and pain over her sacroiliac joint persisted. A repeat MRI scan demonstrated unilateral left sacroiliitis with increase in subchondral marrow edema and a new discovery of left ilio-psoas edema with development of an abscess medial to it. CT-guided aspiration and drainage of the abscess was subsequently performed. Pustular fluid was obtained and cultured, and Salmonella (non-typhi species) was isolated and found to be sensitive to ceftriaxone. Antibiotic therapy was then converted to ceftriaxone alone. The patient showed clinical improvement in terms of pain over the coming days and began to ambulate with crutches and assistance. She was discharged after two weeks with a treatment plan of two months of intravenous ceftriaxone daily. Hospital guidelines promote a 2-3 week period of IV antibiotic therapy followed by oral therapy for a total of 4-6 weeks. However, the decision was made by the infectious disease specialist to continue IV antibiotic therapy for 9 weeks due to the development of an abscess and the unresolved clinical signs.

Outcome and Follow-Up

After three months, there was significant resolution of pain and improvement in ambulation. There was evidence of radiological resolution; the repeated MRI scan revealed markedly decreased subchondral marrow edema and enhancement. It was noted that synovial thickening, enhancement and marrow edema can persist even after resolution of infection. A more significant finding was the fusion of the sacroiliac joint seen on subsequent radiographs five months after the presentation of symptoms. There was no recurrence of fever or hip pain. Inflammatory markers and the total white cell count resumed back to normal state. Antibiotic treatment was switched to oral cefixime for one month prior to her last clinic visit.

Discussion

A literature review of all the relevant references identified 27 previously reported cases of Salmonella sacroiliitis. To these authors' knowledge, this is the only case of pyogenic sacroiliitis in a healthy and fit adolescent. Septic arthritis is an inflammatory disease of a joint or joints that develops after infection with various microorganisms. The most frequent microorganisms causing pyogenic infections in the sacroiliac joint are Staphylococcus aureus, Streptococcus species and Pseudomonas aeruginosa, the latter being more frequent in patients following extended use of medication via intravenous route. Reactive arthritis following Salmonella gastroenteritis is a well-recognized clinical entity. HLA-B27 positive patients are associated with an increase in the severity of acute disease and poorer prognosis. Unlike reactive arthritis, Salmonella infection of the SI joint is an uncommon cause of joint infection and the diagnosis is difficult to ascertain. Differential diagnoses are broad, and the symptoms can mimic other diseases as the pain may radiate to the abdomen, hip, thigh, buttock, low back and leg. The literature states that the diagnosis of pyogenic sacroilitis is most often missed because of a lack of awareness amongst physician, the nonspecific presentation of the illness and the discrete physical presentation [11-14].

Previous case reports have frequently highlighted delays in diagnosis. It is important to highlight that a high index of suspicion is required in young patients presenting with fever and unexplained unilateral lower back and buttock pain. Earlier reports have also recommended a wide range of antibiotic regimes; Zimmerman et al. recommend a minimum of 4 weeks intravenous antibiotic therapy followed, in some cases, by a course of oral antibiotics. In contrast, Ulug et al. report using intravenous antibiotics for 1 week followed by 5 weeks oral therapy. In this case, we prescribed intravenous antibiotics for 90 days followed by oral therapy for a further 4 weeks with full resolution of the disease process both in terms of clinical and radiological presentation. In addition, it has been reported that MRI scan provides optimum diagnostic accuracy in septic sacroilitis. MRI scan has the ability to detect fluid in the sacroiliac joint, bone marrow edema and soft tissue abscesses without the risks of ionizing radiation. Having said that, early changes may be subtle and MRI results should

be correlated with clinical symptoms. If a diagnosis is established, rapid treatment within a multidisciplinary care setting is recommended to avoid further local and systemic complications [15-17].

Learning Points

• Sacroiliitis should be considered as a diagnosis in all patients presenting with buttock or hip pain and difficulty in bearing weight.

• A high clinical suspicion and prompt antibiotic therapy is required to prevent long-term sequelae.

• Multidisciplinary care is integral to achieving the best clinical outcomes for the patient.

• Sacroiliitis is best investigated using MRI.

• Initial blood cultures may be negative and thus clinical judgement should be relied upon for further management.

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