Multifocal Septic Arthritis Secondary to Infective Endocarditis: A Rare Case Report

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What to Learn from this Article?

In a patient presenting with a septic joint, a meticulous clinical examination is important to prevent unnecessary morbidity and mortality.

Abstract

Introduction: Infective endocarditis (IE) is a rare cause of septic arthritis. We report a patient who presented with multifocal septic arthritis as a result of IE, which is an extremely rare condition.

Case Report: This 69-year-old gentleman presented to the emergency department (ED) with a 3-day history of acute right knee pain. Initial investigations demonstrated chondrocalcinosis on knee radiographs, acute renal failure with rhabdomyolysis and a CRP of 520. After treatment with intravenous fluid rehydration and analgesia, the knee aspiration grew a Group B *Streptococcus,* and the patient underwent arthroscopic washout. 48 h after admission the patient developed left wrist and right elbow pain. Further aspirations revealed Group B *Streptococcus* and the patient underwent further washouts. A multidisciplinary approach was used. Due to ongoing sepsis, an echocardiogram was performed identifying IE. The patient eventually died due to ongoing sepsis and duodenal ulceration.

Conclusion: This case highlights the importance of considering a systemic cause such as IE for patients presenting with features of multifocal septic arthritis and ensuring all patients undergo a full medical examination as part of the clerking process. Furthermore, it emphasizes the need to adopt a multi-disciplinary approach when presented with complex patients so that the best medical care can be given to prevent morbidity and mortality.

Keywords: Septic arthritis, infective endocarditis, sepsis, polyarticular, multifocal.

Introduction

Septic arthritis of a native joint is a common complaint to the orthopedic department and often presents with monoarticular joint pain [1]. The most common pathogen involved is *Staphylococcus aureus* [2]. Although rare, infective endocarditis (IE) causing septic arthritis has been previously reported, largely involving monoarticular joints. Herein, we report a patient who presented with multifocal septic arthritis of native joints and after the investigation was found to have IE.

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Author's Photo Gallery


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Methods

This is a discussion of a case report.

Case Report

A 69-year-old patient presented to the emergency department (ED) with a 3-day history of a red, hot, and swollen right knee. The patient had fallen onto his right knee 3 days before current presentation. Medical history included gout of his right first metatarsal. The patient was otherwise well, had never smoked and drank minimal alcohol. He lived with his wife and was self-caring.

On examination, the patient was afebrile but flushed, slightly confused, and disorientated. The knee was objectively swollen and hot compared to the contralateral limb. There was a positive patella tap with joint tenderness. He was unable to actively straight leg raise (SLR) or flex his knee. Pain-free passive movements were obtained, SLR limited to 45° and knee flexion to 30°. The limb was neurovascularly intact. Examination of the right hip and ankle were found to be normal.

AP and lateral radiographs of the right knee (Fig. 1 and 2) demonstrated chondrocalcinosis and an effusion with a background of osteoarthritic changes in both medial and lateral joint spaces. There was no fracture. Radiographs of both the hip and ankle were normal. A head computerized tomography was performed due to the confusion and a history of a fall, which was found to be normal. Bloods test revealed acute derangements of biochemistry and inflammatory markers: Creatine kinase - 3936, urea - 25.3, creatinine - 260, eGFR - 21, sodium - 130 and potassium - 3.8, CRP: 520, WCC 8.5. Sinus tachycardia and right bundle branch block were demonstrated on a 12-lead ECG. Preliminary results of the knee aspirate identified 2+WBC and no organism or crystals.

The patient was admitted under joint orthopedic and medical care and based on chondrocalcinosis being present on the radiograph, was treated for crystal synovitis in addition to rhabdomylosis, acute renal failure and dehydration with intravenous fluid hydration, antibiotics and analgesia.

On the post take ward round, the patient was found to be febrile and septic. Microbiology results of the right knee aspirate grew Group *B Streptococcus,* and the patient was taken to theater for arthroscopic washout. Intraoperatively this demonstrated pus. IV antibiotics were changed according to local policy to flucloxacillin and benzylpenicillin.

An USS KUB was performed to investigate the acute renal failure, which did not reveal any obstructive nephropathy. Biochemistry and inflammatory markers improved only marginally. 48 h after admission the patient developed left wrist and right elbow pain with an effusion and reduced ROM. Examinations revealed the joints to be hot, swollen, and tender. Radiographs were normal. Arthrocentesis identified purulent fluid, which grew Group B *Streptococcus*. The patient was again taken to theater and received a secondary washout of the right knee including primary washout of left wrist and right elbow.

Following surgery, the patient was monitored in the high dependency unit where he developed melena with a hemoglobin of 68 g/dl. An esophagogastroduodenoscopy (OGD) was performed by the surgical consultant, demonstrating duodenal ulceration and a spurting vessel. This was treated with adrenaline infiltration 1:10000 and hemospray. Despite this, a further two OGDs were required, with repeated treatment.

Figure 1: Right Knee - AP radiograph.

Figure 2: Right Knee - Lateral radiograph.

Following discussion with the surgical teams, the patient was deemed a poor candidate for a laparotomy.

There was mild improvement in the patient and despite an initial decline in the CRP and WBC, they continued to rise. A medical review was conducted, and an echocardiogram performed which demonstrated large vegetations on the mitral valve consistent with features of endocarditis. The patient was transferred to the coronary care unit and following a discussion with the microbiologist; antibiotics were changed to gentamicin and amoxicillin. The patient, unfortunately, died 37 days after admission. The cause of death was overwhelming sepsis, secondary to IE and septic arthritis with duodenal ulceration being a contributory factor.

Discussion

Musculoskeletal complications of IE have been noted in numerous studies. A review of 9 studies found that between 19% and 44% of patients with IE had musculoskeletal symptoms, commonly arthralgias and lower back pain, though documented infection in these patients was uncommon [3]. According to Sapico *et al*., infections are more common in intravenous drug abusers [4].

Septic arthritis typically presents as a tender, hot, swollen joint or multiple joints. The most commonly affected joints are the hip and knee [5]. In

IE, bacteria can cause inflammation of a joint, typically resulting in the signs and symptoms of acute monoarticular septic arthritis. In subacute bacterial endocarditis, the presentation of arthritis can be asymmetrical and can affect up to 3 joints.

A literature review using PubMed, Embase, and Medline between 2005 and 2016 has found only a handful of reported cases of multifocal septic arthritis [6, 7]. Only one case of bilateral septic arthritis was found, specifically bilateral acromioclavicular septic arthritis [8]. This patient had no previous medical history, and notably, polyarticular septic arthritis is usually associated with an infection on a background of rheumatoid arthritis [9]. The most common bacteria which have been associated with polyarticular septic arthritis are mainly *S. aureus*, followed by *Streptococci*. These bacteria can seed to produce polyarticular disease. The knee joint is most commonly affected, followed by the elbow, shoulder, and hip [10].

Our case demonstrates a rare example of multifocal septic arthritis associated with IE. It highlights the importance of a full cardiovascular examination in a patient presenting with an acute arthralgia and fevers, as an associated murmur may be heard on auscultation. In addition, the threshold for obtaining blood cultures should be low given the potential for IE. Transthoracic echocardiography may be useful when suspecting IE since the sensitivity is around 75% and specificity more than 90% [11]. Although the occurrence of septic arthritis in patients with IE is low, musculoskeletal symptoms should prompt a rigorous search for the cause. Joints should be aspirated promptly if there is a suspicion of bacterial infestation.

Clues to the presence of septic arthritis in the setting of IE include involvement of multiple joints and involvement of the axial skeleton (e.g., sacroiliac, pubic, or manubriosternal joints). Acute septic arthritis involving one or more joints may be the first indication to the presence of IE, particularly for cases in which an organism with known propensity to cause IE (such as *S. aureus* or *Streptococcus viridans*,) grows from a joint aspirate.

Strains of *Streptococcus* and *Staphylococcus* bacteria form part of the diagnostic criteria due to their correlation with IE. However, there are now novel bacteria that have become associated with IE. For example, *Moraxella lacunata* has been associated with bilateral septic arthritis and endocarditis [12]. In 2014, the first case of IE caused by *Helicobacter cinaedi* was reported [13].

Conclusion

Patients presenting with septic arthritis of a native joint require a full diagnostic workup including systematic examination. Early involvement of medical and microbiology teams is advantageous to seek secondary opinions so that early diagnosis and effective treatment can be delivered in a timely manner, preventing morbidity and mortality. For our case, it may have been useful to obtain specialist cardiology input earlier. In addition, we recommend prescribing proton pump inhibitors to reduce the formation of duodenal ulcerations, which may occur with stresses of surgery. Where septic arthritis of one or more joints is considered the source of infection should be investigated.

Clinical Message

Septic arthritis can occur due to local infection or infection distant from the joint. As such, patients can have recurrent or multifocal septic arthritis. In a patient presenting with a septic joint, a meticulous clinical examination is important to prevent unnecessary morbidity and mortality.

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