

Atypical Presentation of Septic Arthritis in an Elderly Patient

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Abstract

Septic arthritis is an infection that travels through bloodstream infections or direct inoculation of the organism into the joint space especially in trauma-related situations. The symptoms of septic arthritis include swelling, erythema, extreme discomfort, limited range of motion, and fever. If not dealt with promptly, it can lead to severe life-threatening consequences. However, as with most illnesses, septic arthritis does not always present with the full range of symptomatology. Here we present a case of septic arthritis that manifested as mild tenderness upon palpation of the joint which was attributed to the Covid-19 vaccine the patient got two days prior to her admission.

Introduction

Infectious diseases, such as septic arthritis, have high morbidity and complications in elderly patients. Various microbes may cause septic arthritis such as Multi-Resistant Staphylococcus Aureus (MRSA), Haemophilus Influenza, gram-negative bacteria, Streptococci, Gonococci, and viruses. Prompt diagnosis and treatment are required to reduce the damage it could potentially cause to the joint. Atypical presentations of septic arthritis are not uncommon and should be suspected when a patient meets Systemic Inflammatory Response Syndrome (SIRS) criteria. Confounding factors can mask the presentation of the patient's illness, leading to the attribution of symptoms to causes other than the underlying diagnosis. This report conveys how such a presentation of septic arthritis may lead to numerous unnecessary tests which cause undue financial strain. Over, under, or mistreatment can be avoided by careful evaluation of the pertinence of a patient's individual symptoms. This case report will serve as a way to increase awareness about such instances.

Case Report

A 78-year-old female, with a past medical history of End-Stage Renal Disease (ESRD) on hemodialysis, hypertension, hyperlipidemia, Diabetes Mellitus type 2, cerebrovascular accident causing left-sided residual weakness, atrial fibrillation, Mitral Valve (MV) repair, Chronic Heart Failure Preserved Ejection Fraction (CHFP EF) (55%), Chronic Obstructive Pulmonary Disease (COPD) on home 2 L nasal cannula, gout, peripheral vascular disease, and uterine cancer, who presented to our institution complaining of a two-day history of shortness of breath and pain in the right shoulder. The next of kin attributed the right shoulder pain to the second dose of the covid

vaccine which she received two days prior to admission. There was mild tenderness upon palpation, mildly limited range of motion, no erythema, and no edema of the right shoulder. The patient was found to be in acute on chronic hypoxic respiratory failure and was placed on Bilevel Positive Air Pressure (Bi-PAP). The patient was recently admitted to the hospital due to an Arteriovenous (AV) fistula malfunction that was repaired. In that same week, she had her permacath removed from the right chest wall without any complications. She tested negative for Covid-19, on this admission.

Upon admission, the patient met SIRS criteria: fever of 101.3 F, tachycardia (103 bpm), white blood cell (WBC) count of 16.20 K/UL. The patient was immediately given 1.9L Bolus intravenous (IV) fluids, STAT doses of Vancomycin, and Zosyn. Chest X-ray identified bilateral infiltrates with significant right lower lobe involvement. A computer tomography (CT) angiogram of the chest was negative for pulmonary embolism. Urinalysis identified urinary tract infection but the patient denied dysuria. Blood culture was positive for gram-positive cocci in clusters identified as Staphylococcus aureus with mecA gene by polymerase chain reaction (PCR) within 24 hours. Initially, the differentials included hospital-acquired pneumonia vs endocarditis. Infectious disease (ID) consult was called for MRSA bacteremia. ID team suspected catheter-related bloodstream infection due to recent manipulation of permacath and fistula repair and recommended a CT scan of the neck.

CT scan of the neck identified a complex fluid collection associated with the right subscapularis muscle which was suggestive of an abscess. MRI identified a full-thickness retracted tear of the supraspinatus tendon, and large glenohumeral joint

effusion, subacromial and subdeltoid bursal effusion. These findings increased the suspicion of septic arthritis and the orthopedic specialist was consulted. The patient was scheduled for a right shoulder arthroscopy lavage. The joint fluid culture showed MRSA with the same sensitivity as blood culture.

Following her right shoulder arthroscopy lavage, the patient's WBC count began trending downwards and normalized within 5 days. She was treated with presumptive diagnostics of prosthetic valve endocarditis with vancomycin, gentamicin, and rifampin for 2 weeks followed by vancomycin and rifampin for additional 4 weeks.

Discussion

Septic arthritis is a life-threatening emergency with considerable mortality. As such, the prompt diagnosis and treatment of the affected joint is a major concern. However, monoarticular arthritis is a nonspecific presentation and as in our patient, an unrelated event such as trauma, overuse, or vaccine administration can mask the affected joint.

Typically, septic arthritis demonstrates a bimodal distribution; young patients with greater vascularization of the joints and older patients with potential comorbidities and prostheses are more susceptible to initial inoculation of the joint capsule [1]. The placement of long-term tunneled hemodialysis catheters is an established practice, with well-described benefits and commensurate well-described risks [2]. Short-term catheters are useful in patients whose AV fistulae have yet to mature; while longer-term catheterization is indicated in patients for whom AV fistula formation is unsuccessful or contraindicated [3]. Infection is a known complication of long-term tunneled catheter placement. While estimates as to the prevalence of infection in PermaCath placement vary, one descriptive analysis of 214 patients estimated infection rates of approximately 12%, another notable finding of this study was a higher mean age in patients who experienced infection (67.64 years) as opposed to the overall population of patients receiving long-term hemodialysis catheterization (57.67 years) [4]. One small (n=15) retrospective review demonstrated findings that were in many ways demographically consistent with our patient. In their study of septic arthritis in patients on hemodialysis for ESRD, 12 of 15 patients demonstrated clear access-site related sources of the sepsis, and 13 of the 15 patients had Staphylococcal species isolated from cultures [5].

In 2011, a systematic review of 34 articles, Carpenter et al. highlighted that the specificity, sensitivity, and likelihood ratios for various risk factors derived from the patient's history and physical presentation [6]. Of these factors, pain on motion, joint effusion, and limited range of motion were highly (>92%) sensitive; while these findings are nonspecific very few septic arthritis cases will present without these symptoms. Redness, on the other hand, is a much less sensitive finding. While the sensitivity varied between the individual publications reviewed, the range of 13 - 64% sensitivity made it one of the less prevalent symptoms, supporting the conclusion that targeted imaging is warranted when suspicion of septic arthritis is high [6]. Indeed, another case report of atypically presenting septic arthritis in an elderly female concludes with the advice "Clinicians must keep in mind that septic arthritis can present atypically, especially in elders; thus, septic arthritis must be included in the differential diagnosis of any patient presenting

with joint pain and effusion until this diagnosis is ruled out by sterile joint aspiration." [7] This statement, reinforcing the importance of maintaining septic arthritis as a differential with only limited symptomatology, is consistent with our experience in achieving optimal care for our patient.

Ultimately, elderly patients often express immune responses that would be considered atypical in a healthier cohort [1]. Due to the presence of comorbidities in this population, the importance of prompt and accurate diagnosis is even greater; but these comorbidities often compromise the quality of life and cause a financial burden for the patient. Our patient serves as a reminder to maintain vigilance for infectious complications in patients with tunneled long-term hemodialysis catheters when they present with mild to moderate localized symptoms but more with generalized systemic symptoms.

Conclusion

Elderly patients can present with atypical signs and symptoms that can be attributed to recent minor trauma or vaccination. In patients with joint pain and recent predisposition to infection through an access point such as temporary catheter placement, AV fistula creation, and prosthesis it may be useful and cost-effective to rule out septic arthritis. Early intervention of septic arthritis can prevent further complications especially in elderly patients with multiple comorbidities.

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