The Great Mimicker an Interesting Case of Pseudogout in the Ankle: A Case Report

MERCYHEALTH St. Rita's Medical Center

Brock Polish DPM PGY2[1], Jordyn Wolfe DPM PGY2[2], Darryl M. Haycock DPM, FACFAS [3]

1 Resident Physician St. Rita's Medical Center Lima, OH; 2 Resident Physician St. Rita's Medical Center Lima, OH; 3 Attending Physician St. Rita's Medical Center Lima, OH

Statement of Purpose

The purpose of this study was to expound understanding and the recognition of an uncharacteristic presentation of CPPD (Calcium Pyrophosphate Deposition Disease). In addition to highlighting systemic effects in the setting of a critically ill patient.

Procedures

Procedure #1: Right ankle joint aspiration performed under local at bedside in ED. Area numbed with 5cc 1% lidocaine. An 18-gauge needle was used to aspirate the ankle. Fluid was noted to be cloudy in nature and sent for culture and analysis.

Procedure #2: Patient taken to OR to perform bilateral ankle arthroscopy and debridement. No purulence was noted from the right ankle during procedure. Thick synovitis was noted and debrided. Cartilage was noted to be intact with no evidence of destruction. Right ankle was flushed with 3L of sterile saline.

Attention was then directed to the left ankle. Purulent drainage was noted upon insertion of scope. Fluid obtained for analysis and culture. Again, cartilage was noted to be intact to the talocrural joint. Thick hemorrhagic synovitis was noted and debrided. Ankle was then flushed with 3L of sterile saline. Incisions closed using nonabsorbable suture.

Orthopedics at bedside in the OR to perform arthrocentesis of bilateral wrists and right knee. Yellow straw-colored aspirate was noted and sent for analysis from the right knee. Right wrist unable to be aspirated. Left wrist aspirated with no issue.

Fluid analysis returned as birefringent crystals with morphological and polarization characteristics of calcium pyrophosphate dihydrate crystals (pseudogout). Patient started on daily prednisone. Significant improvement with patients' cooperation.

Case Study

The patient is a 64-year-old male with significant past medical history of type 2 diabetes mellitus, BPH, osteoarthritis, hypothyroidism, skin cancer, hypertension, rheumatoid arthritis, hyperlipidemia and recent lumbar laminectomy and cervical decompression. He initially presented to the ED 3 days prior for the same chief complaint of swelling and pain to the right ankle as well as a history of recent falls. Patient was given NSAIDS and told to follow up outpatient by ED. ED believed his falls likely related to an orthostatic hypotension. Patient was discharged home. Patient returning to the ED and relates that he now has been experiencing systemic symptoms such as nausea, fever, and vomiting. Wife also stating he is experiencing altered mental status and is not himself. He relates that he is unable to bear weight on the right ankle due to pain and has been experiencing frequent falls due inability to use his right ankle. He denies any trauma to the right ankle. Patient also related arthralgias of his knee, shoulders, and wrists. Podiatry consulted. On physical exam, ankles noted to be erythematous and edematous. Skin temperature is hot, and evidence of lymphangitis is evident(Fig. 1). Podiatry performed an ankle tap to the right ankle. This was sent for analysis. Patient started on broad spectrum antibiotics. While in ED, patient began to decline. Patient went into septic shock and was started on fluids and admitted to ICU. Radiographic imaging of the ankle continued to be negative for infectious process(Fig. 2). Patient taken to OR by podiatry for bilateral ankle scopes and I&D. Orthopedics consulted and present to tap knee, shoulder, and wrist. Fluid sent for analysis. Results and relevant labs listed (Fig. 3). Synovial fluid showing no bacterial growth but did show birefringent crystals with morphological and polarization characteristics of calcium pyrophosphate dihydrate crystals (pseudogout). Patient started on prednisone and showed rapid improvement. Patient seen postoperatively with noted improvement of symptoms (Fig.4). Patient extubated and discharged from ICU to med-surg floor. Patient's pain and symptoms continued to improve with steroids. Patient to follow up with Rheumatology to determine possible etiology behind this flare and to continue taking oral steroids.

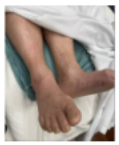

Fig. 1 Initial presentation to the ED

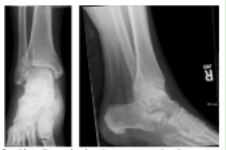

Fig. 2 R ankle radiographs showing no osseous involvement or soft tissue emphysema

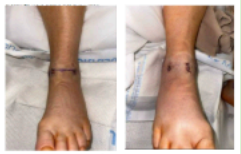

Fig. 4 Post operative day 1 from bilateral ankle arthroscopy

Fig. 3 Relevant labs and synovial fluid analysis

Analysis and Discussion

Pseudogout or CPPD is often misdiagnosed as an infectious process due to being associated with acute onset of joint pain, fever, and elevated inflammatory markers. The only true diagnostic confirmation is through visualization of crystals under polarized microscopy. Chondrocalcinosis can sometimes be seen in involved joints on radiographic imaging but is not always seen. Patients with chronic renal failure, hypothyroidism, osteoarthritis, and hypomagnesium can be at higher risk of developing CPPD. However, this process is not always well understood. It is important that CPPD always be considered as a differential for sudden onset of joint pain, warmth, and erythema. It is important to obtain a joint aspiration to confirm diagnosis as there is not current diagnostic criteria that can help confirm diagnosis. There is also a need for better targeted therapies for disease modification as there is only steroid treatment for acute attacks. Patients for whom steroids are contraindicated do not have a treatment alternative. There is a need for further investigation into presentations of CPPD that lead to systemic symptoms as well as the need for treatment alternatives to steroids.

References

1. Rosenthal, A. K., & Ryan, L. M. (2016). Calcium Pyrophosphate Deposition Disease. *The New England Journal of Medicine*, *374*(26), 2575–2584. https://doi.org/10.1056/NEJMra1511117
2. Anna Paula Duque Sousa, Carlos Moura, Priscila Ribeiro da Hora, Mittermayer Santiago, Calcium crystal-associated arthropathy mimicking a febrile systemic inflammatory disease in an elderly patient, *Oxford Medical Case Reports*, Volume 2019, Issue 5, May 2019, omz030, https://doi.org/10.1093/omcr/omz030
3. Mukhopadhyay, S., Guha, A., & Perera, A. (2011). Monoarticular pseudogout of the hip presenting as septic arthritis: a case report. *Acta orthopaedica et traumatologica turcica*, *45*(3), 200–202. https://doi.org/10.3944/AOTT.2011.2318

Literature Review

- Rosenthal et. al discussed that acute CPP Crystal Arthritis can lead to sudden onset of monoarticular or oligoarticular arthritis, often affecting the knee or wrist. Can present with symptoms like warmth, erythema, and swelling. fever, and inflammation. Risks factors consist of aging, joint trauma, and metabolic diseases (hyperparathyroidism, hemochromatosis, hypomagnesemia). Definite diagnosis can only be made with identification of positively birefringent, rhomboid-shaped CPP crystals within synovial fluid. Chondrocalcinosis can sometimes be seen on radiographic imaging. However, on its own it is insufficient for diagnosis. CPPD disease is a common but underdiagnosed form of arthritis with significant inflammatory process on the joints. CPPD lacks effective long-term treatments, and systemic steroids are the current mainstay of treatment. Research is ongoing to identify better diagnostic methods and disease-modifying therapies.

•Mukhopadhyay et. al presented a case report about an 89-year-old man with acute hip pain, inability to bear weight, and fever. The patient had medical history including ischemic heart disease, chronic renal failure, hypothyroidism, and osteoarthritis. Who presented with a right hip that was warm, swollen, and tender. Blood tests showed elevated inflammatory markers. Septic arthritis was suspected. A joint aspiration was performed and produced 2ml of thick yellow fluid that after fluid analysis showed positively birefringent CPP crystals. There were no signs of bacterial infection, ruling out septic arthritis. Joint aspiration is essential before considering surgical intervention. Management of CPPD focuses on symptom relief, since there are no disease-modifying treatments.

•Sousa et. al presented a case report on a 70-year-old man admitted with fever (38°C), widespread joint pain, and polyarthritis affecting large and small joints. Patient had no history of hyperuricemia or infection (negative serology for HIV, hepatitis, and syphilis). CPPD can mimic systemic inflammatory diseases due to its association with fever, elevated inflammatory markers, and leukocytosis. Risk factors include osteoarthritis, joint trauma, and metabolic disorders (hemochromatosis, hyperparathyroidism, hypomagnesemia). Initial treatment with prednisone led to partial improvement and colchicine was introduced, resulting in rapid resolution of symptoms within 48 hours. Definitive diagnosis requires synovial fluid analysis, but imaging findings can be strongly suggestive.