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Case Report

Acute calcific periarthritis at the metatarsophalangeal joint - a case report

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Abstract

Acute calcific periarthritis (ACP) is an uncommon forefoot condition with a few cases reported in the literature. It is often misdiagnosed and may result in unnecessary diagnostic and therapeutic procedures due to its association with other systemic diseases with similar clinical presentation. A 70-year-old man presented in the emergency room with soft tissue swelling with local erythema and tenderness in the fifth metatarsophalangeal region of the right foot, which started two days prior with no history of injury. Passive and active movements of the joint were painful. Acute calcific periarthritis could be confused with other pathologies. A thorough clinical examination and the knowledge of its clinical presentation could prevent unnecessary diagnostic procedures.

Level of Evidence V; Therapeutic Studies; Expert Opinion.

Keywords: Metatarsophalangeal joint; Soft tissue injuries; Periarthritis.

Introduction

Acute calcific periarthritis (ACP) is an uncommon forefoot condition; only a few cases are reported in the literature. It's an inflammatory, self-limiting, monoarticular, periarticular process of dystrophic mineral deposition[1]. It is more common in the shoulder but can also involve the hip, knee, ankle, foot, elbow, wrist, and fingers[2-4]. Even though the true origin of this condition is unknown, a history of trauma, repeated stress, or strenuous use due to footwear are to blame for one-third of the patients, and it affects both genders equally, with a mean age of 45 years[5,6].

Acute calcific periarthritis is often misdiagnosed and may result in unnecessary diagnostic and therapeutic procedures[7] due to its association with other systemic conditions such as gout and pseudogout, diabetes, rheumatoid arthritis, septic arthritis, and hypothyroidism. The aim of this report is to present an uncommon condition and increase awareness in the medical community, avoid pitfalls in differential diagnosis from all the above forefoot systemic diseases, and reduce further unnecessary investigations.

Case description

This study was approved by the Institution Ethics Committee.

A 70-year-old man presented in the emergency room with swelling and severe pain in the fifth metatarsophalangeal region of the right foot, which started two days prior with no history of injury. Soft tissue was swelling with local erythema and tenderness in the fifth metatarsophalangeal region. Passive and active movements of the joint were painful. According to his medical history, the patient was a regular smoker, had no allergies, and was treated for atrial fibrillation, hypertension, and type-2 diabetes.

Radiographs of the foot demonstrated a small, calcified nodule at the head of the fifth metatarsal (Figure 1). Hematological and biochemical investigations were within the normal range, including full blood count, C-reactive protein, erythrocyte sedimentation rate, calcium, phosphate, and uric acid. At this stage, the diagnosis of ACP was suggested, and 1 ml of betamethasone (3mg/ml) was injected at the point of maximal tenderness under local anesthesia.

Study performed at the General Hospital of Athens "G. Gennimatas", Athens, Greece.

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Figure 1. Radiographs of the patient presented in the emergency room.

After the injection, a calcified toothpaste-like material streamed from the injection point. The patient was recommended to continue using analgesics and visit the department's outpatient clinic five days later.

The patient returned to the outpatient clinic five days later. The pain was relieved, and new radiographs were taken, which ascertained the clinical picture as they revealed a significant decrease in calcification (Figure 2). Laboratory investigations revealed a composition of calcium carbonate and phosphate. The patient was followed up for two months and, six months later, had no symptoms.

Discussion

Acute calcific periarthritis is presented with sudden pain, localized edema, erythema, tenderness, and decreased function of the ailing joint[1]. The pathognomonic finding in radiographs is a varying size homogeneous, monoarticular calcific deposit localized to the symptom's site. There is usually a history of trauma or repetitive stress and unsuitable footwear. Some patients report elevated temperature and inflammation indicators such as c-reactive protein, white blood count, and erythrocyte sedimentation rate may be increased, even though they are usually within the normal range[8].

The cause and ACP pathophysiology are still uncertain and debatable[9]. The prevailing theory for calcium deposition is that mechanical, metabolic, and possibly other factors induce poor blood flow and eventually local tendon hypoxia, ligament, or capsule in the joint area[10]. Four phases of macroscopic calcium deposition and its clinical outcome were described by Chung et al.[11]. In Phase 1, patients are usually asymptomatic, and calcium is contained within the tendon. In Phase 2 (mechanical), the size of the calcium deposit increases, affecting the bursa and causing pain in the affected area. Adhesive periarthritis and/or adhesive bursitis is created in Phases 3 and 4 (intraosseous loculation); calcium deposits may migrate to the tendon insertion or joint capsule of the adjacent bone, which is supported by a combination of mechanical or metabolic factors[11].

Acute calcific periarthritis is usually misdiagnosed as it may clinically imitate other pathology[7]. Its monoarticular character, which does not involve the joint, may assist in

Figure 2. Radiographs of the patient after five days in the outpatient clinic.

differentiating from other inflammatory and erosive arthropathies. Gout is usually previously diagnosed and often has asymmetric polyarticular distribution, and patients report a history of recurrent exacerbations. Calcium pyrophosphate dihydrate (CPPD) crystal deposition disease also has a bilateral distribution, uniform joint space loss, subchondral new bone formation, and intraosseous cysts. In other systemic arthritides, the calcifications tend to be multiple[12]. Tumors, metastatic calcifications, and collagen vascular diseases may mimic the calcifications of ACP; however, they have a completely different clinical presentation.

Naturally, symptoms improve a week after, and full resolution occurs in 3-4 weeks, while relapse is uncommon[3]. Therapeutic choices include local anesthetic and/or corticosteroid injections and oral non-steroidal anti-inflammatory drugs, treating the condition's symptoms and clinical course[1].

This case is presented to help orthopedic surgeons understand the importance of having ACP in their differential diagnostic quiver. Usually, the typical acute clinical presentation with sudden onset pain, swelling, and tenderness, the characteristic radiological findings, and the absence of biochemical findings are sufficient for the diagnosis.

Authors' contributions: Each author contributed individually and significantly to the development of this article: KB *(https://orcid.org/0000-0002-1601-8462) Conceived and planned the activity that led to the study, wrote the article, participated in the review process; KG* (https://orcid.org/0000-0001-7663-0103) Data collection, bibliographic review. All authors read and approved the final manuscript.*ORCID (Open Researcher and Contributor ID).

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