

# The Rare Occurrence of Gout Arthritis in Calcaneocuboid Joint: A Case Report

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## ABSTRACT

**Introduction:** Gout stands out as the predominant form of inflammatory arthritis caused by the accumulation of monosodium urate (MSU) crystals within joints and connective tissues. The classic manifestation of gout typically involves repeated acute episodes impacting the first metatarsophalangeal joints. However, sometimes the unusual occurrence of cyst can be happened and sometimes lead to misdiagnosis or be mistaken for other conditions. This will be the first case report about the unusual occurrence of gout arthritis in calcaneocuboid joint.

**Case presentation:** A-30-years old male came with pain on his left foot which was worsen by walking and relieved by resting since 6 months ago. History of trauma was denied. Patient underwent for x-ray and did not show any significance abnormality. Then, patient was treated as osteoarthritis metatarsal cuboid. He was given intraarticular injection of sodium hyaluronate 25 mg for twice in the period of one month. However, the symptoms were not significantly relieved. Patient underwent for CT-Scan 3D reconstruction. Then, it was found there was subchondral cyst in the lateral aspect of distal cuboid. Uric acid test showed increasement up to 12.8 mg/dL. Patient underwent for debridement and bone

graft to evacuate the cyst. After the surgery, patient showed good functional and pain result.

**Conclusion:** Unusual presentation of gout arthritis is rarely happening and may lead to misdiagnosis. In this case, we presented a 30-year-old male with gout arthritis cyst inside the cuboid joint. Patient was successfully diagnosed with comprehensive approach although it is a rare occurrence.

**Keywords:** calcaneocuboid joint, foot, gout arthritis, osteoarthritis, uric acid.

## INTRODUCTION

Gouty arthritis is a notable condition often linked with inflammatory arthritis and is prevalent globally. Gout develops when there is an elevation in serum urate levels exceeding 7 mg/dL or 420  $\mu$ mol/L, leading to the formation of deposits of monosodium urate (MSU) crystals. The prevalence of gout within populations shows significant variation, influenced by ethnic and regional disparities worldwide.<sup>1</sup> Based on the results of the Riskesdas in 2018, the prevalence of gout arthritis in Indonesia increased with age and reached up to 18.9% in the age group of 75 years or older.<sup>2</sup> In Bali, a study by Raka Putra et al. showed a prevalence of hyperuricemia reached up to 14.5%.<sup>3</sup> The classic manifestation of gout typically involves repeated acute episodes impacting

the first metatarsophalangeal joints. However, sometimes the unusual occurrence of cyst can be happened and sometimes lead to misdiagnosis or be mistaken for other conditions.<sup>4</sup> This will be the first case report about the unusual occurrence of gout arthritis in calcaneocuboid joint.

### **CASE PRESENTATION**

A-30-years old male came with pain on his left foot which was worsen by walking and relieved by resting since 6 months ago. History of trauma was denied. The complaints initially arose when the patient began working for one month on a cruise ship, followed by sudden onset of pain. Other accompanying complaints such as tingling and numbness were denied. No previous medical history was reported. Daily dietary history included seafood consumption, but there was history of alcohol intake. He did not smoke. Family history included a positive presence of gout in the patient's biological mother. On physical examination, there was not any swelling nor erythema on the left foot. Pain was felt in the calcaneus cuboid joint. Range of motion was altered, but not significant. Patient underwent for x-ray and did not show any significance abnormality (Figure 1). Then, patient was treated as

osteoarthritis metatarsal cuboid. He was given intraarticular injection of sodium hyaluronate 25 mg for twice in the period of one month.



**Figure 1. X-ray of the left foot**

However, the symptoms were not significantly relieved. Patient underwent for CT-Scan (Figure 2). Then, it was found there was subchondral cyst in the lateral aspect of distal cuboid. Uric acid test showed increasement up to 12.8 mg/dL. Patient underwent for debridement and bone graft to evacuate the cyst (Figure 3). After the surgery, patient showed good functional and pain result.



**Figure 2. CT-Scan of the left foot.**

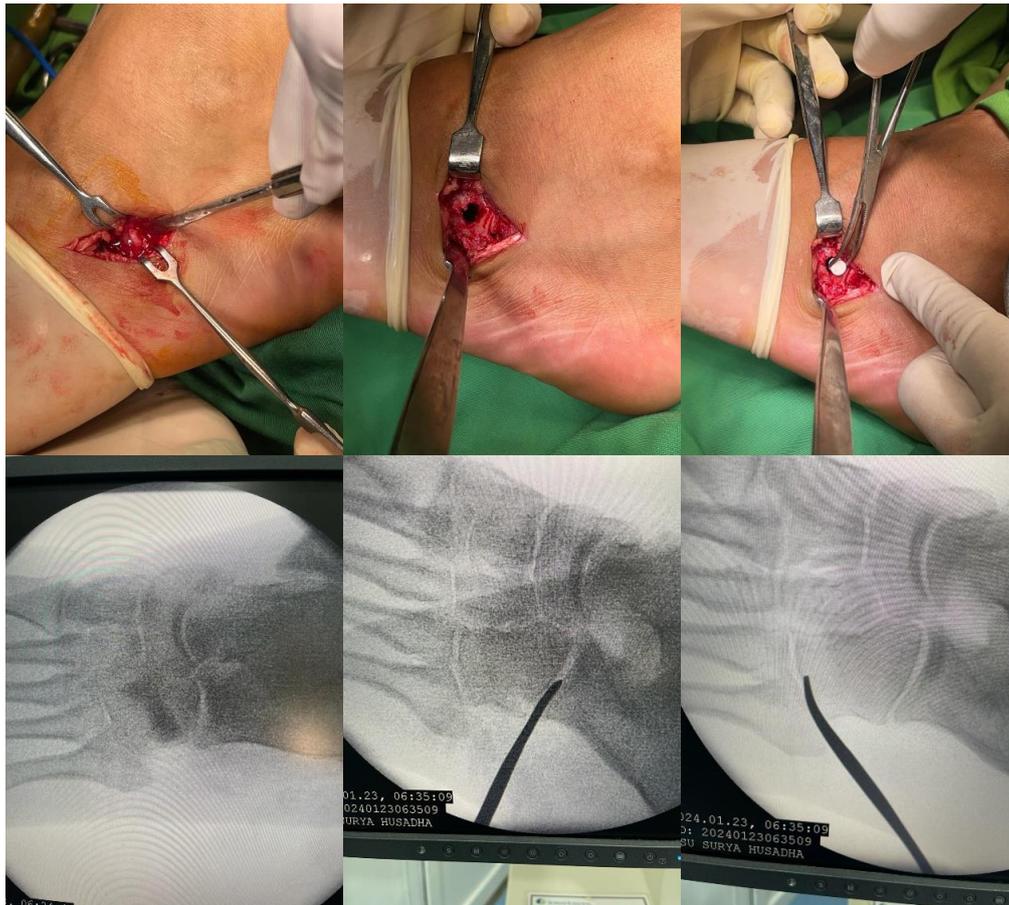


Figure 3. Surgical procedure of debridement and bone graft, Bone graft was in a good place as confirmed by C-arm.

## DISCUSSION

Gout is an inflammatory joint condition marked by the buildup of monosodium urate (MSU) crystals in individuals with consistently high levels of uric acid. Acute gout episodes present with intense pain and swelling in the joints, sometimes resembling septic arthritis or coexisting with an infection. On the other hand, chronic gout can lead to the formation of tophi, which are deposits of MSU crystals that cause erosion of nearby bones and damage to surrounding tissues like nerves and tendons.<sup>5</sup> In this case, there was pain but without swelling which is uncommon for a gout arthritis. At first, this case was more likely to be diagnosed as osteoarthritis.

Elevated uric acid levels ( $>6$  mg/dL) result from either excessive production or inadequate excretion of uric acid. Once hyperuricemia sets in, some individuals may develop uric acid crystals. Cooler peripheral joints are more prone to MSU crystal

formation. Once MSU crystals form within a joint, they trigger an inflammatory response by activating immune cells like neutrophils and inducing the release of inflammatory molecules called cytokines. Over time, these crystals can aggregate to form tophi, which gradually erode nearby bone tissue.<sup>6</sup>

The tendency of gout to affect the first metatarsophalangeal joint likely stems from a variety of factors. This includes the joint's susceptibility to osteoarthritis, as well as other factors affecting urate solubility and crystal formation, such as temperature and minor physical injuries, which are especially relevant in foot-related activities. Taking these risk factors into account, there is a possibility that the cyst could have formed in a location outside the typical area.<sup>7</sup> So far, there were reports of unusual occurrence of gout cyst such as in subcutaneous tissue of buttock,<sup>8</sup> second distal interphalangeal joint,<sup>4</sup> intraosseous,<sup>9</sup>

and extensor tendon.<sup>10</sup> But, this will be the first case report about the unusual occurrence of gout arthritis in calcaneocuboid joint. Therefore, the diagnosis itself is challenging

Achieving fusion in bone procedures involving the foot and ankle poses distinctive challenges for surgeons. Numerous patients have underlying health conditions that diminish bone healing rates. Additionally, the confined space and significant weight-bearing stress on fusion sites complicate the selection of bone grafts.<sup>11</sup> Bone autografts have been documented to possess osteoconductive, osteoinductive, and osteogenic characteristics. These properties furnish the framework, growth factors, signaling proteins, and mesenchymal cells necessary for promoting robust bone growth and effective healing.<sup>12</sup> Therefore, we chose to use bone autograft to fulfill the empty space from the taken cyst.

## CONCLUSION

Unusual presentation of gout arthritis is rarely happening and may lead to misdiagnosis. In this case, we presented a 30-year-old male with gout arthritis cyst inside the cuboid joint. Patient was successfully diagnosed with comprehensive approach although it is a rare occurrence.

### *Declaration by Authors*

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