



# Calcium Deposits of the Metacarpophalangeal Joint on the Fourth and Fifth Finger

## Dördüncü ve Beşinci Parmak Metakarpofalangeal Eklemde Kalsiyum Depolanması

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### Abstract

Acute calcium deposition disease is characterized by calcium hydroxyapatite crystal deposition within tendons and surrounding tissue of joints. It can manifest acute or chronic. It's most common symptom is pain in affected area. Two patients applied to our outpatient clinic with complaints of hand pain. Calcific masses were detected by radiological imaging. After radiological imaging and laboratory examinations the patients diagnosed acute calcium deposition disease. One of the patients had ongoing symptoms for 2 years, the other one had ongoing symptoms for 3 years. Both of the patients had tried conservative treatment multiple times. These patients were treated surgically because of long-standing symptoms. Although acute calcium deposition disease usually resolves spontaneously with conservative treatment, patients with recurrent or persistent lesions can be treated surgically.

**Keywords:** Calcium deposition disease, hand surgery, peritendinitis, periarthritis

### Öz

Akut kalsiyum birikimi hastalığında hidroksiapatit birikimi meydana gelmektedir. Bu durum, eklemleri çevreleyen tendonlarda ve dokularda oluşmaktadır. Akut veya kronik olarak kendini gösterebilir. En sık görülen semptom etkilenen bölgede ağrıdır. İki hasta polikliniğimize el ağrısı şikayeti ile başvurdu. Radyolojik görüntüleme ile kalsifik kitleler tespit edildi. Radyolojik görüntüleme ve laboratuvar incelemelerinin ardından hastalara akut kalsiyum depo hastalığı tanısı konuldu. Hastalardan birinin semptomları iki yıldır, diğerinin semptomları üç yıldır devam ediyordu. Her iki hasta da konservatif tedaviyi defalarca denemişti. Bu hastalar uzun süredir devam eden semptomlar nedeniyle cerrahi olarak tedavi edildi. Akut kalsiyum birikimi hastalığı genellikle konservatif tedavi ile kendiliğinden düzelse de, tekrarlayan ağrı semptomları ve kalıcı lezyonları olan hastalar cerrahi olarak tedavi edilebilir.

**Anahtar Kelimeler:** Kalsiyum depo hastalığı, kalsifik peritendinit, kalsifik periartrit, el cerrahisi

## INTRODUCTION

Acute calcium deposition disease, most commonly named as calcific tendinitis, is a disease in which calcium phosphate crystals, including hydroxyapatite are deposited around tendons and joint-capsule insertions (1).

Calcium deposition in the hand has been classified as calcific peritendinitis and periarthritis based on the locations of the calcium deposits (2).

Although some cases are asymptomatic, generally it

is a painful clinical condition. Symptoms like fever and redness are uncommon. Symptoms can appear sudden onset and generally patients complain of dull pain, tenderness and edema at the joint or around the tendon. A differential diagnosis should be made because gout, pseudogout, tumoral calcinosis and septic arthritis can mimic the same symptoms. Some patients have elevated erythrocyte sedimentation level; however, other laboratory findings are usually normal. It is a self-limiting process and showing resolution within one month (3).

In this case report, we present two cases of calcium

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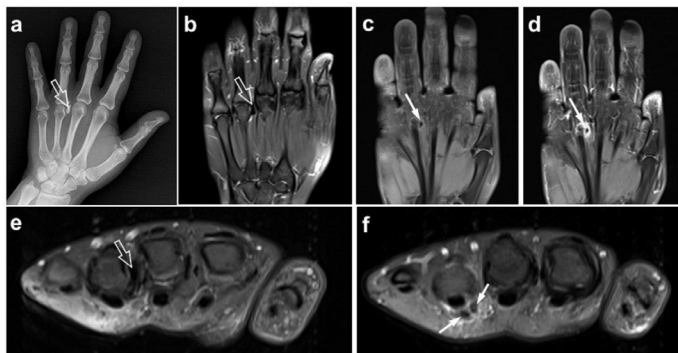
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deposits localized in the hand that have not resolved with non-surgical treatment. Because of long ongoing symptoms the two patients were treated surgically in our clinic.

## CASE REPORT

### Case 1

A 25 year-old female patient presented to our outpatient clinic with the complaint of pain in the fourth metacarpophalangeal joint of her left hand and an unspecified sensation in the fourth finger. The complaints have been continuing for about three years and elevated periodically. The patient has no history of trauma. In the examination of the patient; there was no redness or warmth in the joint. The fourth finger capillary filling was normal, but there was hyperalgesia on the radial side of the finger. The fourth finger pulp-palm distance measured 1 cm. Plain radiographs of the hand showed an oval-shaped calcific lesion on the radial side of the fourth metacarpophalangeal joint. Magnetic resonance imaging (MRI) revealed this oval-shaped calcific lesion as well as smaller sized calcific deposits around the adjacent flexor tendon with surrounding soft tissue edema and inflammation (Figure 1).



**Figure 1.** Anteroposterior radiography (a) shows well-defined calcification (open arrow) adjacent to the fourth metacarpophalangeal (MCP) joint. Coronal (b) and axial (e) fat-saturated proton density (PD) MR images show calcific deposit (open arrows) adjacent to the radial aspect of the fourth MCP joint. Also, coronal fat-saturated T1-weighted (c), contrast-enhanced fat-saturated T1-weighted (d) and axial fat-saturated PD (e) MR images show smaller sized calcific deposits just superficial to the flexor tendon with edema and inflammation in the surrounding soft tissues (solid arrows)

### Case 2

A 37 year-old female patient was presented to our outpatient clinic with complaints of swelling and pain between her 4th and 5th fingers of the right hand. The complaints have been continuing for two years and have elevated especially with using. The patient has no history of trauma. In the examination of the patient; there was no redness or warmth on the joint. Capillary filling of the fourth and fifth fingers was normal, and the patient's neuro-motor and tendon examinations were normal. The pulp-palm distances of the fourth and fifth fingers measured zero cm. An anteroposterior radiograph of the hand showed an amorphous calcific lesion on the

radial side of the fifth metacarpophalangeal joint. MRI demonstrated the calcific lesion and also surrounding soft tissue edema which is extending into the fourth web space (Figure 2).

Both patients were housewives and they had no history of disease. There was no history of regularly used drugs. The rheumatological parameters (C-reactive protein, Anti-Streptolysin O, rheumatoid factor) of the patients were negative. Hemogram and routine biochemical parameters were both normal. The MR images of the patients were reported as calcific deposits (Figure 1,2). With the presented findings, excision was planned.



**Figure 2.** Anteroposterior radiography (a) shows amorphous calcification (solid arrow) adjacent to the fifth MCP joint. Coronal PD (d), T1-weighted (e) and contrast-enhanced fat-saturated T1-weighted (f) MR images show the calcific deposits with surrounding soft tissue edema and inflammation around the joint (solid arrows). In addition, the extension of the soft tissue edema towards to the fourth finger space on the dorsal side is seen on the axial short-tau inversion recovery (STIR) (b, c) MR images (open arrows)

Axillary anesthesia was applied to both patients before the operation. Both of the patients were operated on in the supine position using the hand table. Dorsal approaches made for both lesions and lesions were excised carefully. Care was taken not to damage the surrounding anatomical structures (Figure 3a,3b). The obtained materials were sent for pathological examination (Figure 3d). Pathological evaluation for the first patient reported as histiocyte aggregates and fibrosis. For the second patient, pathological evaluation reported as lesion consist of multinuclear giant cells and mononuclear stroma.

The first patient's follow-up showed no symptoms for nine

months and the second patient's follow-up have showed no symptoms for six months.



**Figure 3.** Intraoperative surgical approach of case 1 (a) Intraoperative surgical approach of case 2 (b) excised mass of case 2 (c) (d)

## DISCUSSION

Acute calcium deposition disease is a self-limiting disease process that typically resolves within one month (4). The disease most often occurs in the shoulder; the wrist and hand are affected in only 2% of patients (5). Women are affected more frequently than men. It has been reported in the literature that women are affected two to five times more than men (6). The most commonly affected site in the hand is the insertion of the flexor carpi ulnaris (FCU). Multiple various locations have been reported, including the interphalangeal, metacarpophalangeal joints of all five fingers (6).

Acute calcium deposition disease usually occurs without any other medical problem, it is idiopathic. The pathogenesis of the disease is controversial. Researches on the shoulder suggest that this is a degenerative disease (7). Repetitive tissue stress can cause tissue hypovascularity, which leads to necrotic tissues in which calcium can be deposited. Metabolic disorders and cartilaginous metaplasia are the other theories. The second patient's complaints have elevated with repetitive movement, we can say that using is a kind of irritative tissue stress.

Acute calcium deposition disease consist of three stages; precalcific stage, calcific stage and post calcific stage. The main event of precalcific stage is fibrocartilaginous transformation. In early calcific stage calcium crystals are deposited in matrix vesicles and at the end of calcific stage the deposit is removed by macrophages and multinuclear giant cells. In post calcific stage fibroblasts remodel the remaning space after calcium removal (8).

Calcium deposits in the hand and wrist have a similar symptomatology to commonly encountered conditions. Differential diagnosis is required for infective conditions, fractures, metabolic disorders and rheumatological disease (9). The clinical presentation of the disease, its

confinement to a single joint, and radiological imaging of calcium deposits may help differentiate acute calcific tendinitis from other condition (2). The rheumatological parameters (CRP-ASO-RF) of our patients were negative, hemogram and routine biochemical parameters were normal.

Treatment of calcific periarthritis or peritendinitis should first be non-surgical. It is reported that the disease is self-limited. During the acute period, the best treatment is achieved by nonsteroidal anti-inflammatory drugs, with resting or splinting. Local anesthetic or steroid injections are useful to relieve the pain (10). When the patients applied to our outpatient clinic their complaints had been continuing for years. Several times nonsteroidal anti-inflammatory drugs had been given to them. Splinting had been tried for both patients.

Long-term persistence of symptoms and long-term persistence of calcification are not common in acute calcium deposition disease (11). But as in our cases, success can be achieved with surgical treatment in cases with long-term symptoms. Surgical excision provides relieve from pain within a very short time. Surgery is very beneficial in patients who have persistent lesions that do not improve with non-surgical treatment (12).

## CONCLUSION

Calcium deposition disease is not rare, the important point in treatment is to evaluate each patient and to make a treatment plan for their own according to the symptoms.

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**Informed Consent:** Informed consent was taken from the patient.

## REFERENCES

1. Lehmer LM, Ragsdale BD. Calcific periarthritis: more than a shoulder problem: a series of fifteen cases. *JBJS.* 2012;21:e157.
2. Doumas C et al. Acute calcific periarthritis of the hand and wrist: a series and review of the literature. *Emer Radiol.* 2007;4:199-203.
3. Garcia GM, Mccord GC, Kumar R. Hydroxyapatite crystal deposition disease. In: *Seminars in musculoskeletal radiology.* Copyright© 2002 by Thieme Medical Publishers, Inc., 333 Seventh Avenue, New York, NY 10001, USA. 2003. p. 187-94.
4. Moradi A, Kachooei AR, Mudgal CS. Acute calcium deposits in the hand and wrist. *J Hand Surgery Am.* 2014;9:1854-7.
5. Sandstrom C. Peritendinitis calcarea. A common disease of middle life: its diagnosis, pathology and treatment. *AJR.* 1938;40:1-21.
6. Yosipovitch G, Yosipovitch Z. Acute calcific periarthritis of the hand and elbows in women. A study and review of the

- literature. *J Rheumatol.* 1993;9:1533-8.
7. Gosens T, Hofstee DJ. Calcifying tendinitis of the shoulder: advances in imaging and management. *Curr Rheumatol Rep,* 2009;2:129-34.
  8. Uhthoff HK, Loehr JW. Calcific tendinopathy of the rotator cuff: pathogenesis, diagnosis, and management. *J Am Acad Orthop Surg.* 1997;4:183-91.
  9. Chung CB, Gentili A, Chew FS. Calcific tendinosis and periarthritis: classic magnetic resonance imaging appearance and associated findings. *J Comput Assist Tomogr.* 2004;3:390-6.
  10. Moyer RA, Bush DC, Harrington TM. Acute calcific tendinitis of the hand and wrist: a report of 12 cases and a review of the literature. *J Rheumatol.* 1989;2:198-202.
  11. Tomori Y, Nanno M, Takai S. Acute calcific periarthritis of the proximal phalangeal joint on the fifth finger: A case report and literature review. *Medicine (Baltimore).* 2020;99:e21477.
  12. Nikci V, Doumas C. Calcium deposits in the hand and wrist. *J Am Acad Orthop Surg.* 2015;23:87-94.