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Case Report / Olgu Sunumu

Calcific Ligamentitis of the Lateral Collateral Ligament: A Rare Case of Lateral Knee Pain and Review of the Literature

Lateral Kollateral Ligament Kalsifik Ligamentiti: Nadir Bir Lateral Diz Ağrısı Olgusu ve Literatür Derlemesi

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ABSTRACT

Calcific ligamentitis of the lateral collateral ligament (LCL) is an extremely rare cause of lateral knee pain. Only fifteen cases were reported in the literature. It consists of a calcific deposit in the LCL and accompanying edema-like changes. It causes inflammatory pain, and conservative treatment has been successful in most cases. We reported a 44-year-old man with acute-onset lateral knee pain during the chemotherapy period for testicular seminoma. We reviewed all the reported cases and summarized them on a table. Plain radiography of our case demonstrated a well-circumscribed calcific deposit in the soft tissue adjacent to the lateral femoral condyle. Magnetic resonance imaging revealed its location in the proximal portion of the LCL and edema-like soft tissue changes. Pain was relieved with conservative treatment. Calcific ligamentitis of the LCL should be considered in the differential diagnosis of lateral knee pain. The combination of radiography and magnetic resonance imaging findings is useful in diagnosis, and radiography is sufficient during the follow-up period.

Keywords: Calcification, edema, ligamentitis, lateral collateral ligament

ÖZ

Lateral kollateral ligamentin (LCL) kalsifik ligamentiti lateral diz ağrısının oldukça nadir bir nedenidir. Bugüne kadar literatürde sadece on beş olgu bildirilmiştir. Bu durum LCL'de kalsifik birikim ve buna eşlik eden ödem benzeri değişikliklerden oluşur. Enflamatuvar ağrıya neden olur ve çoğu durumda konservatif tedavi başarılıdır. Bu yazıda testiküler seminom nedeniyle kemoterapi döneminde akut başlangıçlı lateral diz ağrısı olan 44 yaşında erkek hastayı sunmayı amaçladık. Ayrıca literatürde bildirilen tüm olguları derledik ve bir tabloda özetledik. Olgumuzun direkt radyografisinde lateral femoral kondile komşu yumuşak dokuda iyi sınırlı kalsifik birikim mevcuttu. Manyetik rezonans görüntüleme, kalsifikasyonun LCL proksimalindeki yerleşimini ve ayrıca ödem benzeri yumuşak doku değişikliklerini gösterdi. Cerrahi müdahaleye gerek kalmadan konservatif tedavi ile ağrı giderildi. Lateral diz ağrısının ayırıcı tanısında LCL kalsifik ligamentiti de düşünülmelidir. Radyografi ve manyetik rezonans görüntüleme bulgularının bir arada kullanılması tanıda faydalıdır ve takip döneminde radyografi yeterlidir.

Anahtar Kelimeler: Kalsifikasyon, ödem, ligamentit, lateral kollateral ligament

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INTRODUCTION

Calcification of the ligaments is a heterogeneous disease characterized by the storage of calcium hydroxyapatite crystals in various shapes and sizes on or between the collagen fibrils.[1] Calcific ligamentitis is not a terminology commonly used in the literature but may be suitable for ligament calcifications due to their pathogenesis are similar to calcific tendinitis and bursitis. Although calcification of various ligaments and tendons is common in the body, it is detected relatively less in the ligamentous structures in the knee region. Calcifications of the anterior cruciate ligament, medial collateral ligament, and popliteus tendon in the knee have been described in several articles.[1-3] However, there are few reports on the lateral collateral ligament (LCL) calcification.[4-9] Our aim is to present a case with LCL calcification, which is a rare cause of lateral knee pain, with plain radiography and magnetic resonance imaging (MRI) findings, and to review the reported cases in the literature.

CASE REPORT

A 44-year-old male patient was referred to the orthopedic clinic due to knee pain from the oncology clinic, where he was treated for testicular cancer. He had undergone radical orchiectomy two months ago for seminoma and then received bleomycin-etoposide-cisplatin chemotherapy. There was newly developed pain in the lateral and posterior parts of the knee joint. He had no history of trauma or strain. Because of bed rest after surgery and during chemotherapy treatment, the level of his physical activity decreased compared with the preoperative period. Although the joint range of motion was normal during his examination, the lateral McMurray test was suspicious. There was no swelling or redness in the knee. In laboratory tests, the calcium level was 10 mmol/L and alkaline phosphatase level was 89 IU/L. Similarly, there was no abnormality in the hemogram and other biochemical values. Incidentally, HCV antibody positivity was detected, but HCV-RNA was negative. There was no osseous pathology on plain radiography, but a well-defined calcific deposit of approximately 1 cm in size was noted in the soft tissue adjacent to the lateral femoral condyle (Figure 1). It was decided to evaluate this calcification with MRI to examine its relationship with the lateral ligamentous complex, as well as because of the suspicion in the lateral McMurray test. On MRI, there was a low-signal structure showing intra-ligamentous localization in the proximal part of the LCL, compatible with the calcification on plain radiography (Figure 2). Edema-like signal changes were observed in and around the proximal part of the LCL, and between the lateral femoral condyle

Figure 1. Anteroposterior radiograph of the knee joint shows a well-defined calcific deposit (arrow) in the soft tissue adjacent to the lateral femoral condyle

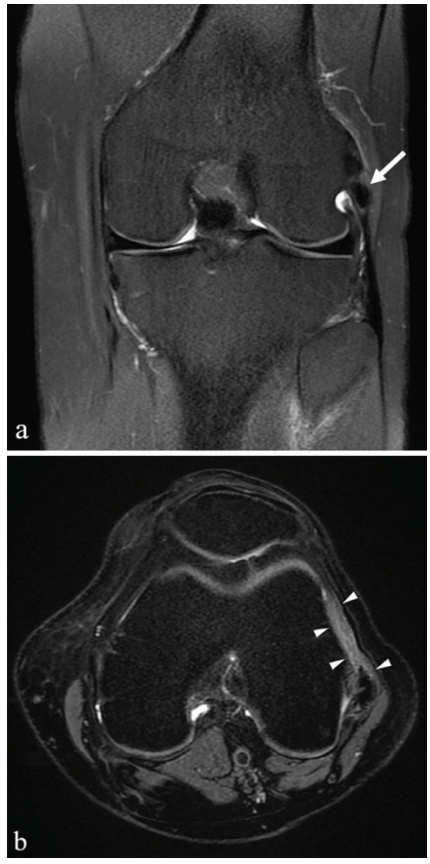

Figure 2. Magnetic resonance imaging of the knee joint. a) Coronal fat-suppressed proton density image demonstrating the intraligamentous localized low signal area compatible with calcification, and edema-like changes near the insertion of the lateral collateral ligament (arrow). b) Axial fat-suppressed proton density image demonstrating edema-like changes between iliotibial band and lateral femoral condyle (arrowheads)

and iliotibial band (Figure 2). The LCL was otherwise intact. In addition, a minor horizontal tear was noted through the posterior horn of the medial meniscus. With these findings, it was concluded that there was a LCL calcification, and secondary ligamentous strain, and iliotibial band friction syndrome. Jones bandage was applied by the orthopedic clinic, non-steroidal anti-inflammatory-analgesic treatment was given to the patient, and rest was initiated. During this period, it was decided to follow-up with conservative treatment due to the decrease in pain. After a 2-week follow-up period, the patient's complaints were completely relieved.

DISCUSSION

Calcification of LCL is extremely rare. To the best our knowledge, there are only eleven reports (fifteen cases) in the English literature that are indexed in the Web of Science and Google Scholar.[4-14] Of these cases, eight were men and seven were women, ages ranging from 38 to 71 years. Acute-onset symptoms were common. In some cases, a slight increase in C-reactive protein, erythrocyte sedimentation rate, and leukocytes in supporting inflammation was noted. A combination of radiography and MRI findings was preferred for diagnosis. Edematous soft tissue changes adjacent to calcification are frequently present. Calcification was in the proximal part of the ligament in almost all cases in the literature. The knee pain mostly relieved in the 1-or 2-week period. Conservative treatment, such as analgesic-anti-inflammatory medication and rest, was generally preferred. Open surgical or arthroscopic excision of ligament calcification has also been described in cases not responding to medical therapy.[6,12,13] In cases undergoing follow-up imaging after conservative therapy, resolution of calcification was observed within 2 weeks to 5 months. None of the cases had a history of trauma. No systemic disease predisposing to soft tissue calcification or associated with calcium metabolism was detected. Other differences and our case are summarized in Table 1.

Our case had acute onset knee pain, which was intense in the lateral, similar to the examples in the literature. MRI showed edema-like signal changes in the ligament and adjacent soft tissues supporting local inflammation, as well as calcification in the proximal portion of the LCL. Moreover, edema-like signal changes were observed in the soft tissue between the femoral lateral condyle and the iliotibial band. This situation might have occurred secondary to the spread of the inflammation to this area and may mimic iliotibial band friction syndrome. Our patient had a history of chemotherapy, but no calcification-like side effects of these chemotherapeutics were reported. Like most cases, he benefited from conservative treatment, and no intervention was required.

The cause and pathogenesis of calcium hydroxyapatite crystal deposition in periarticular tissues are not well-known. Deposition of crystals begins heterogeneously and is observed primarily as indeterminate and cloudy periarticular densities on radiographs. As the deposition increases over time, it becomes denser and more homogeneous without the cortex or internal trabecular pattern.[4] Also, milk of calcium deposits can migrate by gravity into potential spaces over time.[8] While plain radiographs are useful in initial evaluation and follow-up, MRI is useful in demonstrating the location of the calcific deposit in the LCL and accompanying inflammatory changes. Additionally, tiny calcifications can be evaluated by sonography before they become clear on radiography and MRI.

Depending on the stage of calcification, it may cause inflammatory pain. This may be confused with other causes of knee pain associated with inflammation, such as arthritis, bursitis, or acute traumatic meniscal-ligamentous injury. If the inflammatory character is dominant, as in the cases of Anderson et al.[4], who reported the first LCL calcification in the literature, an increase in pain at night may be observed. It is usually self-limiting and conservative treatment reduces symptoms in a few weeks, and in the next process calcification resolves.[5]

Post-traumatic calcifications, calcium pyrophosphate dihydrate disease, gout, septic arthritis, collagen vascular disease, hyperparathyroidism, and renal osteodystrophy can be considered in differential diagnosis.[7] However, the presence of other accompanying findings and abnormal laboratory tests in these cases is useful in the diagnosis. Also, the storage of hydroxyapatite crystals in areas close to the insertion sites of ligaments and tendons is helpful.[11]

This case demonstrated a particularly classic LCL calcification and its course with radiography and MRI. Since these cases are extremely rare, patient-based approaches rather than general for lateral knee pain may be useful. Ligament calcifications can also be defined as calcific ligamentitis, similar to the nomenclature of other soft tissue calcifications. MRI is important in evaluating the location of calcification and accompanying soft tissue pathologies. The resolution of calcification can also be monitored with plain radiography.

Table 1. All cases of lateral collateral ligament calcific ligamentitis in the literature

Author (year)	Age/sex	Imaging method	Location	Imaging findings	Treatment	Follow-up	Symptoms	Additional findings	Systemic disease (medication)-Abnormal laboratory test
Anderson et al.[4] (2002)	38-46 (4 cases)/M	Radiography, MRI	Proximal	Calcification in the intact thickened LCL, with adjacent soft tissue oedema	Nonsteroidal anti-inflammatory, local heat, and cold therapy	Pain relieved in 2 weeks; calcification resolved in 4-6 weeks	Acute lateral knee pain	LCL-biceps femoris bursa calcification (1 of 4 cases) Medial meniscus tear (1 of 4 cases)	Slightly elevated WBC and ESR
Schindler et al.[10] (2006)	52/M	MRI, CT	Proximal	Calcification in the thickened LCL with adjacent tissue oedema	–	–	Lateral knee painand tenderness	Slight remodeling of the lateral femoral condyle	–
Khan and Rashid[7] (2012)	64/F	Radiographyand MRI	Distal	Calcification in the intact thickened LCL, with adjacent soft tissue oedema	Anti-inflammatory medication	Pain relieved in a week; calcification resolved after 5 months	Acute lateral knee pain	A degenerative horizontal tear through the posterior horn of the medial meniscus	Hypertensionand hypercholesterolemia and osteoporosis (anti-hypertensive, statin, and bisphosphonate) Slightly elevated CRP and WBC
White et al.[6] (2013)	51/M	Radiography	Proximal	Calcification over the lateral aspect of the lateral femoral condyle	Intravenous morphine, local anesthetic injection, surgical excision	Pain relieved in 2 weeksand full functional recovery in 6 months	Acute lateral knee pain, tenderness, oedema, and effusion	–	Elevated CRP and WBC
Watura et al.[5] (2015)	71/F	Radiography, MRI, ultrasound	Proximal	Calcification in the LCL, oedema within and around the LCL	Paracetamol	Pain relieved in a week; movement restored in 2 months	Acute pain, swelling, and restricted movement	–	Atrial fibrillation (rivaroxaban)
Gotecha et al.[11] (2015)	50/F	Radiography, CT	Proximal	Calcification in the thickened LCL	Rest, analgesic, and cold therapy	Pain relieved in 5 days; calcification resolved in 2 weeks	Acute painand tenderness	Calcification along the lateral joint capsule and the popliteus tendon	–

Table 1. Continued

Author (year)	Age/sex	Imaging method	Location	Imaging findings	Treatment	Follow-up	Symptoms	Additional findings	Systemic disease (medication)-Abnormal laboratory test
Matsuda et al.[8] (2018)	42/M	Radiography and MRI	Proximal	Calcification in the LCL with surrounding tissue oedema	Local steroid injection	Pain was relieved after 2 months	Knee pain, swelling, numbness, and restricted movement	Calcification migrated downwards and disappeared	–
Ji et al.[13] (2019)	58/F	Radiography, MRI, CT	Proximal	Calcification in the LCL with adjacent tissue oedema	Anti-inflammatory medicationand arthroscopic excision	Symptoms improved immediately after surgery	Knee pain for two months and tenderness	Lateral femoral condyle erosion and oedema	–
Yousif and Yousif[9] (2019)	55/F	Radiography, ultrasound	Proximal	Calcification in the LCL	Nonsteroidal anti-inflammatory, exercise, therapeutic ultrasound, and shock wave	Pain relieved in 2 weeks; calcification resolved in 2 months	Acute pain, swelling, restricted movement, and tenderness	Moderate varus deformity	–
Puttaswamy et al.[12] (2019)	50 and 54/F	Radiography and MRI	Proximal	Calcification in the LCL	Anti-inflammatory medication, physiotherapy, and arthroscopic excision	–	Knee pain for several months	Medial meniscus root tear (1 of 2 cases)	–
Özçakar et al.[14] (2019)	47/M	Ultrasound	Proximal	Small calcification in the LCL	Conservative, exercises	–	Knee pain for 3 months	–	Multiple sclerosisand arthroscopic meniscectomy
Our case	44/M	Radiography and MRI	Proximal	Calcification in the LCL, oedema in and around the LCL, and adjacent to the iliotibial band	Restand anti-inflammatory medication	Pain was relieved in 2 weeks	Acute lateral and posterior knee pain	Medial meniscus posterior horn horizontal tear	Seminoma (bleomycin, etoposide, cisplatin)

CRP: C-reactive protein, CT: Computed tomography, ESR: Erythrocyte sedimentation rate, F: Female, LCL: Lateral collateral ligament, M: Male, MRI: Magnetic resonance imaging, WBC: White blood cell

Ethics

Informed Consent: Written informed consent has been obtained.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: A.M.D., Concept: A.H.Ç., B.D.M., Ö.T., Design: A.H.Ç., Ö.T., Data Collection or Processing: A.H.Ç., Ö.T., Analysis or Interpretation: A.H.Ç., A.M.D., B.D.M., Ö.T., Literature Search: A.H.Ç., Writing: A.H.Ç., Ö.T.

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