CASE REPORT

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A mechanically locked knee joint due to free-floating flake-shaped rice bodies: a case report

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Originating from the synovium, multiple free-floating intra-articular particles, called rice bodies, typically resemble cartilage and have a fibrin structure. While the etiology of rice body formation is unclear, they often occur in rheumatoid arthritis and other seronegative arthropathies; they also occur in tuberculosis, though the incidence is much lower. They are often encountered by rheumatologists or clinical orthopedists. A 33-year-old female who suffered from occasional swelling and pain of her left knee for 3 months was admitted with a mechanically locked knee. Free-floating rice bodies were identified on magnetic resonance imaging (MRI), and arthroscopic intervention was performed for diagnostic and therapeutic purposes. After the removal of all bodies and effusion with mechanical irrigation, an arthroscopic subtotal synovectomy was performed.

Keywords: Arthroscopic debridement; knee; rice bodies.

Multiple free-floating intra-articular particles, called rice bodies, may be present in various rheumatologic disorders. Generally involving the knee and shoulder, rice bodies may adhere to the synovium. Although more frequently associated with rheumatic diseases and other seronegative arthropathies, they were first reported in tuberculosis patients.[1] They occur most often as loose bodies floating in the joint but can also be seen in tendon insertions and joint bursae.[2] They rarely cause clinical symptoms such as mechanical knee locking. Therefore, we present and discuss a clinical case.

Case report

A 33-year-old female with a 3-month history of occasional swelling and pain of the left knee was seen in a rheumatology clinic and diagnosed with rheumatoid arthritis. After the first week of treatment, she was referred to us with swelling, pain, and mechanical knee locking. Physical examination revealed a severe effusion due to synovial hypertrophy, pain, and mechanical locking. The range of motion (ROM) was from 30–70°. The meniscal examination was negative. Conventional radiographs showed no pathological changes. Results of serum biochemical analysis were erythrocyte sedimentation rate (ESR): 11 mm/h; white blood cell count: 4.500/mm^3; C-reactive protein (CRP): negative; antistreptolysin O (ASO): 150 Todd units; and rheumatoid factor: negative. Her body temperature was 36.5 °C. No abnormality was seen on a posteroanterior (PA) chest X-ray. Magnetic resonance imaging (MRI) showed multiple free-float-

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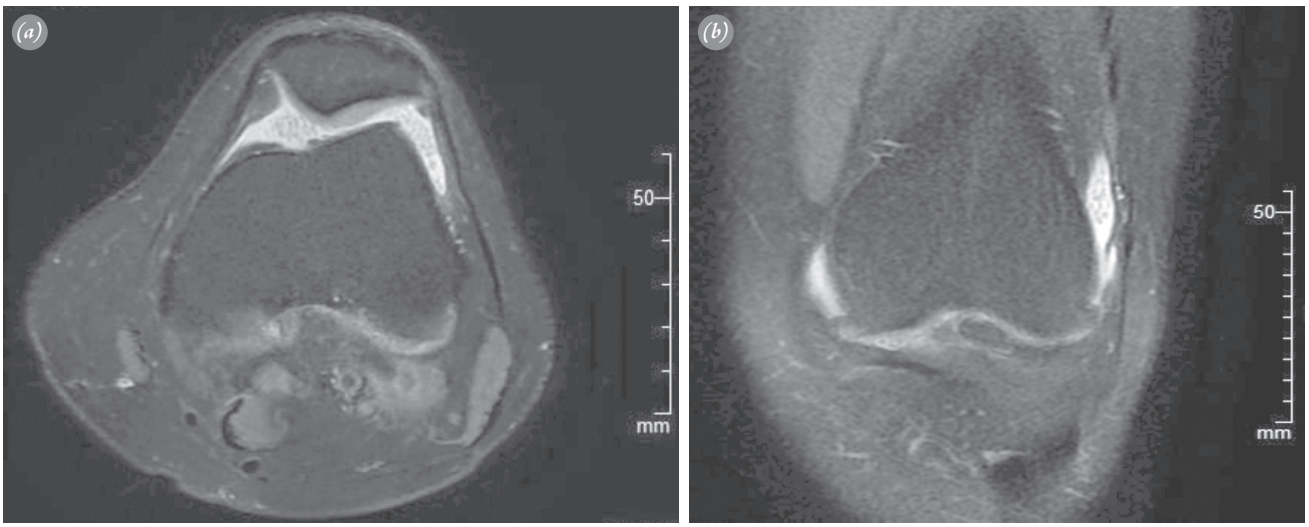

Fig. 1. **(a, b)** MRI images show multiple free-floating intra-articular flake-shaped rice bodies.

ing intra-articular particles (Figure 1). Diagnostic and therapeutic arthroscopy was performed. Cannulation of the knee joint through the anterolateral portal during arthroscopy resulted in the spillage of numerous tiny white cartilage-like bodies. In addition to the free-floating particles within the intra-articular space, there was extensive villous hypertrophy of the synovium and similar bodies adherent to the suprapatellar synovial tissue (Figure 2). After the removal of all bodies and effusion with mechanical irrigation, a subtotal synovectomy was performed. Our patient was discharged on the first postoperative day following drain removal and treated with cold packs and anti-inflammatory drugs. Terminal extension and active ROM exercises were started on the first postoperative day. A mild effusion was seen at the 1-week follow-up but subsequently disappeared completely. Full ROM and quadriceps muscle strength were established within 4 weeks postoperatively. The patient was able to perform all daily and sports activities and reported no recurrence of the pretreatment symptoms at the 6-month follow-up. The histopathological evaluation showed that the rice bodies were composed mainly of organized fibrin and collagenous nuclei, surrounded by a thin fibrin layer. Additional findings were chronic synovitis with villous hyperplasia and intra-articular fluid with a predominance of polymorphonuclear cells.

Discussion

Surgical debridement is not routinely practiced for complications of rheumatic diseases. However, mechanical symptoms and the presence of intra-articular free-floating bodies sometimes require arthroscopic debridement at the first step of treatment. Mechanically locked knee

Fig. 2. **(a)** Arthroscopic view of free-floating intra-articular flake-shaped rice bodies. **(b)** Flake-shaped rice bodies. [Color figure can be viewed in the online issue, which is available at www.aott.org.tr]

joint is a rare clinical presentation of rheumatic diseases. Rheumatology clinics frequently attempt to treat many other patients with similar complaints, thus often delaying definitive treatment.

Although this joint pathology was first described in the early 17th century, the structure and etiology of rice bodies has long remained unclear.[3] Synovial joint inflammation and ischemia occur as a result of microinfarctions, microvascular disease, and non-specific inflammatory response.[2] Although rice bodies can be caused by granulomatosis arthritis such as tuberculosis, rheumatoid arthritis and other seronegative arthropathies are more common causes. Rice bodies were initially described by Riese in 1896 as occurring in joints in tuberculosis arthritis.[4] Currently, however, with the successful treatment of tuberculosis, such cases are only rarely reported. Rice bodies secondary to tuberculosis arthritis are larger than those with a rheumatic etiology. Treatment consists of surgical debridement and antituberculosis therapy if appropriate. Although they have a white cartilage-like appearance, histopathological examination reveals that rice bodies are composed of either fibrin or a nucleus consisting of types I (40%), II (40%), and V (20%) collagen surrounded by a thin fibrin layer. This finding suggests that the collagen is synthesized by the rheumatoid synovial membrane and coated by fibrin.[5,6] Patients must be evaluated for rheumatological diseases before surgical treatment. In doing so, rheumatic biochemical markers should be evaluated.

Calcifications are often observed in conventional radiographs in synovial chondromatosis and should be considered in the differential diagnosis.[6] MRI plays an important role in the diagnosis. Preoperative radiographs show no calcific masses, while MRI shows tiny free intra-articular or intrasynovial bodies characteristic of rice bodies. Rice bodies are iso- and hypointense on T1- and T2-weighted MRI, while chondromatosis is mostly hyperintense on T1 and T2 sequences.[7–9] Clinical presentation can be confused with pigmented villonodular synovitis, but the arthroscopic findings of the 2 entities are quite distinct. There are cases where patients have had knee and shoulder rice bodies treated via arthroscopic debridement without determination of the primary pathology.[10–12]

Our patient had been treated in the rheumatology clinic for 1 week and started on methotrexate twice on Sundays, clomipramine hydrochloride twice a day, sulfasalazine 2 tablets twice a day, prednisolone 5 mg once a day, and folic acid 1.5 g/week. However, we could not detect any positive findings and continued the antirheumatic therapy. We believe that when rice bodies are detected, a rheumatology work-up should be performed to identify the underlying cause. As in our case, patients might not have active disease and should be followed in the long-term.

Conflicts of Interest: No conflicts declared.

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