Synovial osteochondromatosis in a master runner - a case report with clinical and radiological findings

Ali Eraslan1, Ali Eroglu2, Bekir Erol3
1Antalya Education and Research Hospital, Department of Sports Medicine, Antalya, Turkey
2Erenköy Physical Medicine and Rehabilitation Hospital, Department of Sports Medicine, Istanbul, Turkey
3Antalya Education and Research Hospital, Department of Radiology, Antalya, Turkey

Abstract. In this report, we presented a 49 year-old master athlete with synovial osteochondromatosis of the knee joint. His main complaints were pain and limitation of movement. Both intraarticular (posterior recess) and extraarticular (popliteal bursa, semimembranosus tendon) involvements were present in the affected knee. He initially refused the surgery, therefore a conservative treatment was planned. However symptomatic relief was temporary, and after 2 years he inevitably experienced arthroscopic surgery. Returning to sports was achieved, but it was not at previous level. Symptomatic or radiological recurrence was not observed at 18 months follow-up. The presence of extraarticular osteochondromatosis in semimembranosus tendon have been firstly described in the literature.

Key words: synovial osteochondromatosis, athlete, knee.

Introduction
Synovial osteochondromatosis (SOC), is an etiologically unknown disease characterized by development of osteocartilaginous foci within the synovial membrane. According to the classical view, these foci originate from metaplastic transformation of the synovial tissue. But in recent years, the primary form of the disease has been suggested to be benign neoplastic formations caused by cytogenetic abnormalities rather than metaplasia (1,2). On the other hand, secondary form of SOC has been associated with trauma, degenerative joint disease, osteochondritis dissecans and inflammatory arthropathy. Primary SOC can be seen in both young and elderly, while secondary SOC usually occurs after the age of 40. The developmental process of SOC was divided into three phases for the first time by Milgram (3). Early phase; active intrasynovial disease only, no loose bodies. Transitional phase; both active intrasynovial proliferation and free loose bodies. Late phase; multiple free loose bodies, no demonstrable intrasynovial disease.

Knee is the most commonly affected joint in patients with SOC. Hip, shoulder, elbow and ankle also can be affected. Symptoms consist of pain, swelling, restricted joint movement and catching (1). Synovial involvement may not always be intraarticular. Extraarticular forms of SOC can arise from other synovial membranes, such as tendon sheaths and bursae. Extraarticular involvement is seen mostly in the hand, foot, wrist, ankle and less frequently in the knee (1,4).

Case Report
A 49 year-old, male master runner was admitted to the clinic with pain and limited range of motion on his right knee. He had participated in several sports like skiing and tennis for many years, but the complaints forced him to give up the sport 1 year ago. He had no benefit from medical treatment. In the history, he had many minor knee injuries that did not require long break for the sports, but he had no history of major knee trauma, knee surgery or chronic illness. In physical examination, there were slight swelling, slight tenderness on the medial retropatellar facet and a painful flexion blockage (at 120 degrees) on the right knee. Ligamentous laxity was not found on specific tests of the knee. There was a tenderness on the medial area of popliteal region when deeply palpated.

Radiographs showed multiple radio-opaque masses in the posteromedial and popliteal regions of the knee, in addition to moderate osteoarthritic changes (Figure 1).
Mild effusion, synovitis, minimal horizontal tear in medial meniscus and femoral chondropathy were identified with magnetic resonance imaging (MRI). Furthermore, in many MRI sections, multiple ossified bodies smaller than 1 cm were observed in posterior intraarticular recess, popliteal bursa and semimembranosus tendon (Figure 2).

Biochemical and rheumatologic parameters were normal in laboratory tests. In the light of these clinical and radiological findings SOC was considered for diagnosis.

Surgical treatment was recommended to the patient as a result of orthopedic consultation, but he did not accept the operation. Thereupon, a conservative treatment of 15 sessions was planned. This treatment aimed to relieve the pain, reduce the flexion limitation and increase the muscular strength. It consisted of TENS, ultrasound, short wave diathermy and therapeutic exercises. Exercise program is seen in the Table I. Due to the presence of free loose bodies, open-kinetic-chain exercises of the knee (leg extension, leg curl) were not selected. Symptomatic remission was observed with the treatment. Pain score (evaluated by visual analog scale) fell from 6 to 2. Active knee flexion became 130 degrees and squatting was almost fully provided.
Table I. Therapeutic exercise program

<table>
<thead>
<tr>
<th>Exercise Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knee ROM exercises</td>
<td>Passive flexion, Active assisted flexion</td>
</tr>
<tr>
<td>Knee isometrics</td>
<td>Quadriceps, Hamstrings, Adductors, Abductors</td>
</tr>
<tr>
<td>Hip exercises with resistance band</td>
<td>Flexion, Extension, Adduction, Abduction</td>
</tr>
<tr>
<td>Closed-kinetic-chain exercises</td>
<td>Mini squat, Half leg press</td>
</tr>
<tr>
<td>Proprioceptive training</td>
<td>Rocker board, Wobble board, Mini trampoline</td>
</tr>
</tbody>
</table>

Figure 3. At 18 months postoperatively, there was no new mass formation in radiography. Unremoved masses (in the semimembranosus tendon) are seen.

Discussion
SOC is a benign but insidiously developing disease. Symptoms usually become apparent with the increase of intraarticular osteochondral bodies. The mineralisation and size of the osteochondral lesions can differ. The disease most frequently affects knee joint and male gender (1). Our case also was a man with knee involvement. There are usually pathognomonic findings on plain radiographs (1). However, the diagnosis of SOC with radiography may be difficult if there is not adequate ossification in loose bodies (5,6). Computed tomography (CT) or magnetic resonance imaging (MRI) should be used in such situations (4). MRI is also especially useful in determination of extraarticular synovial tissue involvement. SOC was diagnosed in our case due to the presence of typical radiological masses in radiographs and extraarticular involvement in MRI. It was thought as “secondary SOC” taking into consideration the patient's age (49 years), presence of degenerative arthritis and history of many sports traumas.
There were combined intraarticular and extraarticular lesions (popliteal bursa and semimembranosus tendon) in our case. Cases with extraarticular SOC localised in the popliteal bursa have already been reported in previous studies (6,7). However, the presence of extraarticular SOC lesions in the semimembranosus tendon have been identified for the first time. To our knowledge, there was no such information in the literature. Irritative mechanical effects such as displacement of loose bodies in the joint space may lead to secondary osteoarthritis in chronic phase of SOC (1,5). Therefore, following the diagnosis of SOC, patients should undergo surgery without delay. Besides the removal of all osteocartilaginous bodies, synovectomy is an appropriate method in SOC treatment to prevent possible recurrence (3,8). The current patient had played sports for many years and experienced many knee injuries, so these factors might have accelerated the development of SOC. Also, surgical treatment was delayed for two years due to his own refusal. During this time, the size and number of the masses did not increase significantly, but their irritative effects may be responsible for the increased degenerative changes and symptoms. Despite surgical treatment, returning to previous sports level was not achieved.

There are several publications mentioning about SOC in athletes. The affected joint of an athlete may be knee (as in our case) or another joint such as shoulder, elbow, hip (9,10,11). In the sports medicine practise, the possibility of SOC should be considered in an athlete with joint pain and refractory ROM limitation. These frequently encountered symptoms may be signs of such a rare disease. On the other hand, repetitive activities in the sports may increase joint damage especially at the early phase of disease or in the absence of apparent symptoms. Differential diagnosis of SOC includes osteochondritis dissecans, crystal deposition diseases, pigmented villonodular synovitis, inflammatory arthritis, granulomatous infections and neuropathic arthropathy (1,3,5). Also, patients with SOC should be long term followed-up due to a 6.4% incidence of malignant transformation (synovial chondrosarcoma) (12).

References

Corresponding author
Ali Eraslan
Antalya Education and Research Hospital, Department of Sports Medicine
Kazim Karabekir Caddesi, 07100 Antalya, Turkey
Phone: +90 242 249 44 00
Email: eraslanali@yahoo.com

Received: December 25, 2014
Accepted: February 25, 2015

Medicina Sportiva