

## Giant intra-articular synovial osteochondromata of the knee

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### Abstract

**Background/Aim:** Synovial chondromatosis associated, intra-articular loose bodies are usually small in size. Giant intra-articular loose bodies are rare.

**Case report:** We present the case of a patient with synovial chondromatosis associated giant intra-articular loose bodies located under the patella and the intercondylar fossa, treated successfully with combined arthroscopic and open excision.

**Conclusion:** Giant intra-articular loose bodies should be considered when treating patients with synovial chondromatosis. Arthroscopy confirms the diagnosis, allows the thorough examination of the knee joint, and subsequent excision of small or medium size attached synovial nodules or intra-articular loose bodies. Arthrotomy may be needed to excise giant loose bodies.

**Keywords:** Synovial chondromatosis, knee joint, giant, joint loose bodies, arthroscopy

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### Introduction

Synovial chondromatosis is a benign monoarticular arthropathy characterized by the formation of hyaline cartilage multiple small nodules around the affected joint<sup>1</sup>. It most frequently affects the knee, followed by the hip, elbow, wrist, ankle, and shoulder joints<sup>1-4</sup>. The aetiology of synovial chondromatosis is unclear. Bone morphogenetic proteins<sup>5</sup> and karyotype abnormalities on chromosomes 1, 5 and 6<sup>6</sup> have been implicated. Apart from nodules fixed to the synovial membrane, osteochondral loose bodies may float freely inside the joint<sup>7</sup>. They are usually numerous and small in size<sup>7</sup>. Rarely, loose bodies may be exceptionally large<sup>8-13</sup>. The current article presents the case of a patient with giant intra-articular loose bodies related to synovial chondromatosis of the knee, who was successfully treated with a combination of knee arthroscopy and arthrotomy.

### Case Presentation

A 55-year-old man presented with a 10-year history of dull pain, and recurrent swelling of his left knee. The pain was reported to be constant and frequently severe over the year before his presentation. He underwent radiographic examination of his knee, 2 years earlier, without any abnormal findings, and had been treated with analgesics and physical therapy. He denied any past history of knee injury.

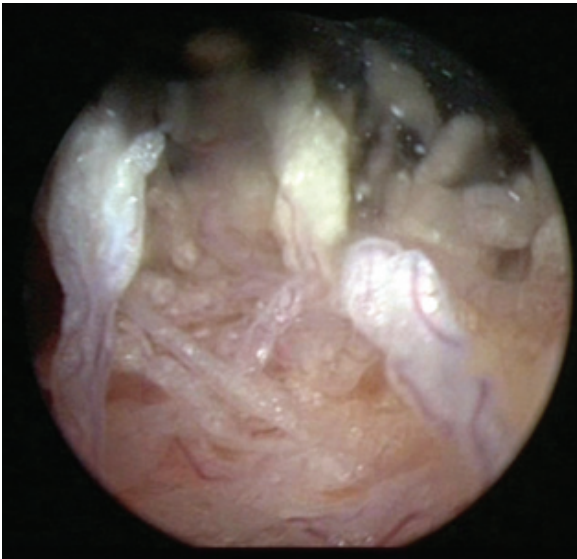
Clinical examination at presentation showed diffuse left knee swelling with palpable effusion. The knee range

of motion was limited to 15 degrees of flexion and 20 degrees of extension. Radiographs showed an approximately 5 cm osteochondral lesion, located under the patella (Figure 1). The lesion had smooth contour and multiple central lucencies, surrounded by dense sclerosis. A second similar lesion was faintly noticeable in the intercondylar fossa. Magnetic resonance imaging showed knee effusion and hypertrophy of the synovium. No other joint involvement was evident in the bone scan. Biopsy was not performed. Synovial fluid aspirate was sent for culture and cytological examination, which were negative.

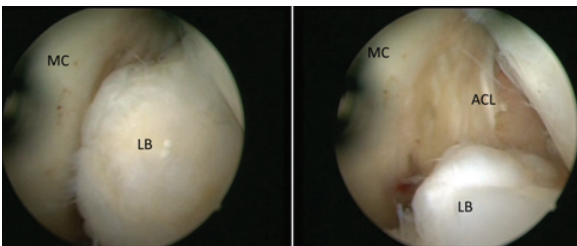
With the preliminary diagnosis of synovial chondromatosis, the patient underwent arthroscopy of his left



**Figure 1:** Anteroposterior (*left*) and lateral (*right*) radiographs of the left knee show an intra-articular loose body located under the patella.



**Figure 2:** Arthroscopic view shows hyperaemia of the synovium of the suprapatellar pouch with large hypertrophic villi floating within the joint space.



**Figure 3:** Arthroscopic view shows an intra-articular loose body, 1.8x1.5x0.5 cm in dimensions, located within the intercondylar notch (LB: loose body, MC: medial femoral condyle, ACL: anterior cruciate ligament).

knee. Arthroscopy showed hyperaemia and thickening of the synovium, with large hypertrophic villi floating within the joint space. These findings involved the whole knee joint, but were more prominent in the suprapatellar pouch (Figure 2) and the lateral compartment of the joint. Synovial tissue samples were collected for frozen section biopsies that showed areas of normal bone, normal hyaline cartilaginous tissue, and partly fibro-cartilaginous tissue containing focal degenerative lesions and focal necrosis. A floating loose body, measuring 1.8 x 1.5 x 0.5 cm, was found at the intercondylar notch (Figure 3) in contact with, but not adherent to the anterior cruciate ligament and was able to be excised using a grasping forceps, with extension of the central arthroscopic portal. A second loose body, measuring 3 x 1.7 x 1 cm, was found at the lateral knee compartment, adjacent to the anterior horn of the lateral meniscus (Figure 4); this was considered to be relatively large to be excised through the classical arthroscopic portals. Finally, a giant osteochondral loose body with smooth surface, measuring 5.3 x 3 x 2.3 cm, was found below the inferior pole of the patella, attached to the patella and the infrapatellar fad pad. This giant loose body was not possible to be excised from the

arthroscopic portals. A straight midline knee incision and medial parapatellar arthrotomy was performed and the two sizeable loose bodies were excised, in addition to complete synovectomy (Figure 5). Histological examination of the excised specimens confirmed the diagnosis of synovial chondromatosis.

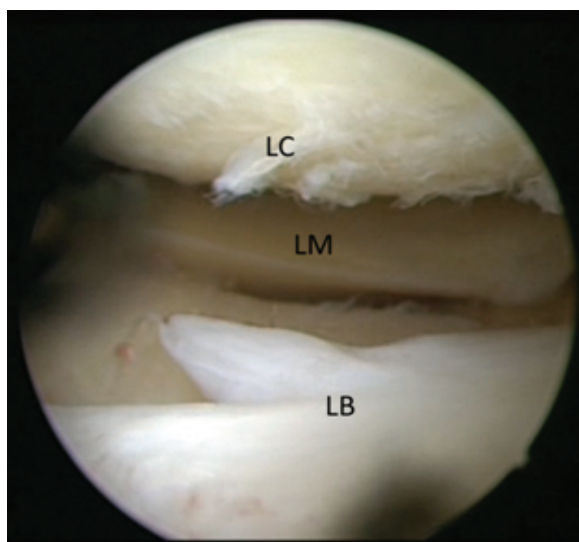
Patient's recovery was uneventful. At the last follow-up, 2.5 years after the operation the patient is asymptomatic, without radiographic evidence of recurrent loose bodies and the patient returned to his daily activities.

### Discussion

Synovial chondromatosis or osteochondromatosis is a benign, slow growing tumorous proliferation of the synovium<sup>14</sup>. It is usually characterized by numerous, small intra-articular loose bodies, giving the so-called "snow storm appearance"<sup>7,8,14</sup>. Loose bodies in the knee joint can be small (<3 mm), medium (4-10 mm), or large (>11 mm)<sup>7</sup>. Large loose bodies are usually located in the intercondylar notch or the suprapatellar pouch, as in the present patient, while smaller loose bodies can be found in any anatomical site, even below the medial or lateral meniscus or the popliteal region<sup>7</sup>.

Previous studies reported cases with few large loose bodies co-existing with multiple smaller loose bodies<sup>12,13</sup>, as well as cases with a single giant loose body<sup>10,11,15</sup>. The latter cases have been described as "giant solitary synovial osteochondromatosis"<sup>15</sup>. This can be either gradually growing or formed by the fusion of many smaller nodules, and may be as large as 20 cm in maximum diameter<sup>15</sup>. The number of the loose bodies relates to the aetiology. A solitary intra-articular loose body usually results from injury of the articular cartilage (chondral or osteochondral fracture, osteochondritis dissecans), the menisci or cruciate ligaments. Some intra-articular loose bodies may continue to grow in size, because they receive nutrients from the synovial fluid<sup>16</sup>. The shape of the surface of the loose bodies are also important for the management and prognosis of the lesions. A loose body with a rough surface is probably a chondral or osteochondral fracture that occurred within the last few days; with time, bone remodelling smoothens the rough surface. In this setting, arthroscopy may show the origin of the loose body, and detect secondary chondral lesions caused by entrapment of the loose body.

The management of synovial chondromatosis associated, loose bodies is excision of the osteochondromata. Synovectomy has been advocated by some authors, aiming to remove the metaplastic focus and prevent recurrence<sup>14</sup>. The prognosis is generally good. Rare cases with recurrent formation of loose bodies<sup>5</sup> or malignant transformation to chondrosarcoma<sup>17</sup> have been reported. Arthroscopic excision of the loose bodies depends on their size. It may be performed with a grasping forceps or with the suction, by extending the existed portals or creating a new portal, directly over the loose body. In cases of large loose bodies, a mini-arthrotomy is preferred because ex-



**Figure 4:** Arthroscopic view shows an intra-articular loose body, 3x1.7x1 cm in dimensions, located in the lateral knee compartment (LB: loose body, LC: lateral femoral condyle, LM: anterior horn of the lateral meniscus).



**Figure 5:** Photograph shows the excised intra-articular loose bodies.

tension of the arthroscopic portals may result in increased fluid extravasation which may complicate the remaining of the procedure. Additionally, arthroscopic fragmentation of the large loose body using bone shaver, although possible, carries the risk of incomplete excision. It was therefore decided, in the described case, to en block excise the very large fragment. The lack of recurrence of osteochondromatosis after 2.5 years, in this patient, supports our decision making.

In conclusion, giant intra-articular loose bodies should be considered when treating patients with synovial chondromatosis. Arthroscopy confirms the diagnosis, allows the thorough examination of the knee joint, and subsequent

excision of small or medium size attached synovial nodules or intra-articular loose bodies. Arthroscopy may be needed to excise giant loose bodies.

#### Conflict of Interest

Authors declare no conflict of interest.

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