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Total knee arthroplasty in a patient with synovial chondromatosis: Case report

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Abstract
The authors report the rare occurrence of a case of synovial chondromatosis in a patient with genu varum associated with severe osteoarthritis who underwent total knee arthroplasty. A literature review is presented, and the correlation between total knee arthroplasty and synovial chondromatosis is discussed. Total knee arthroplasty is considered a viable treatment option for patients with synovial chondromatosis associated with severe osteoarthritis.

Keywords: Synovial chondromatosis, Total knee arthroplasty, knee, severe osteoarthritis

Introduction
Synovial chondromatosis is a rare, typically monoarticular disorder characterized by metaplastic formation of multiple cartilaginous nodules within the connective tissue of the synovial membrane, tendon sheaths, and bursae. Some of these nodules may become pedunculated and subsequently detach into the joint cavity, where they persist as loose bodies nourished by synovial fluid and may progressively enlarge [1].
This condition may be idiopathic or secondary to other joint pathologies, including osteoarthritis, osteochondritis dissecans, chondral fractures, and neuropathic arthropathy [2]. The knee is the most frequently affected joint, followed by the hip, shoulder, and hand, with a strong predominance of monoarticular involvement [3].
It occurs approximately twice as often in males compared to females and is most commonly diagnosed between the ages of 20 and 40². Intra-articular synovial chondromatosis is particularly rare, with an estimated incidence of 1.8 per million individuals [4].
The objective of this study is to report a case of total knee arthroplasty in a patient diagnosed with synovial chondromatosis.

Case Report
A 61-year-old female patient, with a medical history of hypertension and prior thyroidectomy due to thyroid nodules, and a body mass index of 26 kg/m², presented with severe right knee pain, swelling, and crepitus. Her medical history revealed recurrent episodes of joint effusion since 2011. Physical examination identified a varus deformity of the right knee. Range of motion was limited to 0-90°.
Radiographic imaging revealed a single, large, oval-shaped ossified lesion measuring approximately 8 cm in its greatest dimension, located in the anterolateral region of the distal third of the right thigh, adjacent to the femur. Although not in direct contact with the cortex, the lesion caused noticeable cortical saucerization (Figure 1).
The patient underwent spinal anesthesia combined with peripheral nerve blocks of the femoral and sciatic nerves. The procedure was performed under a tourniquet inflated to 125 mmHg above systolic blood pressure following exsanguination of the limb. The surgery was conducted with the patient in the supine position, using a standard medial parapatellar approach.
Following arthrotomy, the intra-articular mass was excised, partial synovectomy was performed, and a total knee arthroplasty was carried out (Figure 2). The implant used was a NexGen LPS-Flex (Zimmer®), a posterior-stabilized prosthesis, without patellar resurfacing.
In the immediate postoperative period, the patient reported significant improvement in pain and joint function. She resumed her daily activities and expressed satisfaction with the surgical outcome. Postoperative range of motion improved to 0-95° (Figure 3). Her Knee Society Score (KSS)[5] increased from 50 preoperatively to 92 at two-year follow-up.

Black arrow-calcified mass (synovial chondromatosis); white arrow-erosion of the medial cortex of the femoral diaphysis.

Fig 1: Preoperative clinical and radiographic evaluation.

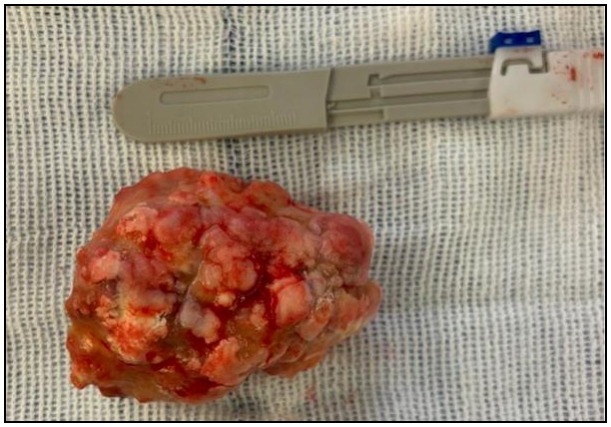

Fig 2: Synovial chondromatosis

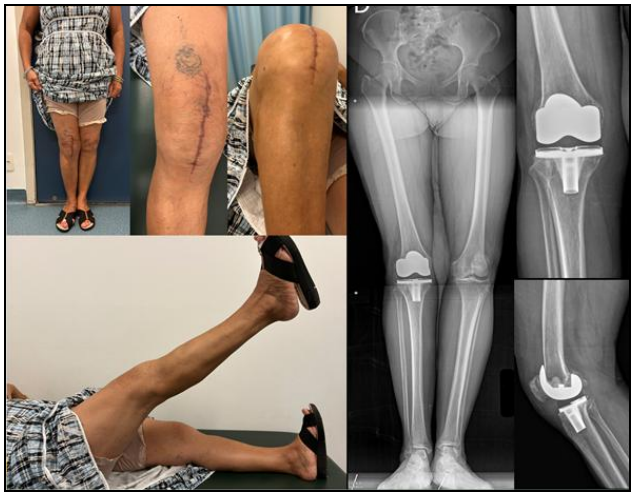

Fig 3: Postoperative clinical and radiographic evaluation

Discussion

Synovial chondromatosis is an uncommon condition of unknown etiology, characterized by cartilaginous metaplasia of the synovial membrane, underscoring the significance of the present case [2]. We report a case involving a female patient, which is particularly noteworthy given the higher prevalence of this condition in males. Delayed diagnosis or inadequate treatment of synovial chondromatosis may result in secondary osteoarthritis due to progressive cartilage degradation. This mechanical injury to the articular cartilage is often caused by intra-articular loose bodies and disruption of cartilage nutrition [6].

Our patient was 61 years old, which is an atypical age for this diagnosis, as the condition most commonly affects individuals between 20 and 40 years of age.

Magnetic resonance imaging and radiography are the primary imaging modalities used in the diagnosis of synovial chondromatosis, with radiography being particularly effective in identifying mineralized nodules[4]. In this case, radiographic evaluation revealed a single, large, ossified lesion.

Shafie *et al*. describe the presence of a loose body as a pathognomonic radiographic sign [7]. Ossified loose bodies, as seen in our case, are typically detectable on plain radiographs [8]. The patient exhibited a large, calcified intra-articular body, consistent with advanced disease.

We consider the treatment approach to have been appropriate, given the patient's severe knee osteoarthritis. During the total knee arthroplasty procedure, resection of the intra-articular mass was performed, along with partial synovectomy and replacement of degenerated articular components. Braun *et al*. have documented cases of synovial chondromatosis following total knee arthroplasty [9]. Total knee arthroplasty is widely recognized as a viable treatment option for patients with synovial chondromatosis unresponsive to conservative management [10]. However, Houdek *et al*. reported a high complication rate in patients undergoing arthroplasty following synovial chondromatosis [11].

Our patient remains asymptomatic after two years of follow-up, with no evidence of recurrence.

Gómez-Rodríguez *et al*. have reported that ossified cartilaginous nodules may cause erosion of adjacent bone surfaces [12]. This finding is in agreement with our observation of cortical wear on the medial diaphysis of the femur.

Lasmar *et al*. argue against the routine use of radiotherapy, noting that only one case of metastasis from synovial chondromatosis has been reported in the literature[3]. We concur that the risk of malignant transformation is exceedingly low.

Conclusion

Total knee arthroplasty represents a feasible and effective treatment option for patients with synovial chondromatosis associated with severe osteoarthritis.

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The authors declare no conflict of interest.

Conflict of Interest

Not available

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Not available

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