Synovial chondromatosis is the cartilaginous metaplasia of the subsynovial connective tissue. It is most common in middle age, with a slight male predominance. The disease is commonly monoarticular and affects large joints, such as the knee and hip. Diagnosis in synovial chondromatosis is generally confirmed by histology after clinical and radiologic examination. Diagnosis may sometimes be difficult because synovial chondromatosis resembles a soft-tissue mass and may give no radiologic findings. We describe a case of synovial chondromatosis stemming from the subtalar joint, in which diagnosis was difficult clinically and radiologically. The patient presented with pain in the ankle and with a soft-tissue mass. This case is presented with a review of the literature on subtalar joint involvement of synovial chondromatosis (J Am Podiatr Med Assoc 98(4): 318-321, 2008).

**Case Report**

A 35-year-old woman presented to Farabi Hospital, Trabzon, Turkey, complaining of increasing soft-tissue swelling in the left ankle for the previous 12 months. The patient had episodic pain but no history of trauma. Physical examination revealed a 4 × 6-cm fixed soft-tissue mass posterolateral to the talocalcaneal joint under the lateral malleolus in the left ankle. The ankle was free, apart from inversion and eversion movements, and was without pain. Neurologic and vascular structures were normal.

Radiographs of the left ankle demonstrated a soft-tissue mass about the posterolateral subtalar joint. At MRI the feature was a lobulated mass (4 × 6 × 6 cm) with a fluid-like density and signal intensity along with internal septa (Fig. 2). The radiologist’s preliminary diagnoses were multiseptate ganglion, synovial sarcoma, or fibrohistiocytic tumor.

In light of these data, the patient was taken for an open biopsy. During the biopsy a thin, fibrous mem-
brane was observed over the soft-tissue mass. When this membrane was opened, synovial fluid and a large number of wide, cartilaginous nodules were observed. A diagnosis of synovial chondromatosis was agreed on and an arthrotomy was performed. At arthrotomy of the lateral subtalar joint, multiple large cartilaginous bodies were removed, and synovectomy was performed. The tissue was composed of friable cartilaginous nodules. Each nodule was less than 1 cm wide and adherent to one another. The diagnosis of synovial chondromatosis was confirmed by histologic examination, which revealed well-defined lobules of hyaline cartilage with varying degrees of cellularity (Fig. 3). The patient became asymptomatic following surgical treatment. After a follow-up period of more than 1 year, the patient was free from symptoms without recurrence.

Discussion

Synovial chondromatosis is a rare, generally benign condition characterized by the formation of multiple cartilaginous nodules in the synovium of joints and, on occasion, in tendon sheaths or bursae. Histologically, fibroblasts (or stem cells or mesenchymal cells) in the subintimal layer of the synovium undergo a transformation to chondrocytes, which start to produce multiple nodules of cartilage. These bodies may be extruded in the joint; they may calcify or even ossify.

In the diagnosis of synovial chondromatosis, clinical examination, radiography, ultrasonography, computed tomography, and MRI with or without arthrography are useful. Diagnosis is confirmed by histologic examination. Diagnosis in our patient was difficult because of the absence of calcified nodules at radiologic examination and localization of the disease in an uncommon site. Diagnosis was only made during

Figure 1. Preoperative radiograph of the left ankle demonstrated a soft-tissue mass about the posterolateral subtalar joint without evidence of calcification or bone ossification.

Figure 2. The feature at magnetic resonance imaging (MRI) was a lobulated mass of fluid-like density and signal intensity along with internal septa. A, Coronal MRI depicting multiseptate mass in the lateral border of the sinus tarsi. B, Transverse MRI depicting a large multiseptate mass in both medial side and lateral side of the calcaneus.
surgery and confirmed with histologic examination. In only one out of four cases in the literature, preliminary diagnosis of synovial chondromatosis was considered because of the presence of multiple ectopic ossifications in radiographs and MRI. The other cases, as with our case, presented with normal or unsupportive radiologic findings (Table 1).

As with our case, histologic examination of three cases in the literature revealed metaplasia of chondrocytes and hyaline cartilage. On the other hand, hyaline cartilage and extensive areas of cancellous bone was reported in the case with multiple ectopic ossifications in radiology.

Magnetic resonance imaging is a valuable tool in detecting synovial chondromatosis at an early phase and estimating the intrasynovial extent of the disease. Knowledge of MRI features of noncalcified or nonossified synovial chondromatosis is important to distinguish it from simple or complicated effusion, hemarthrosis, or other synovial processes. Rarely, difficulty diagnosing may occur, even with MRI. Indeed, in our patient no finding was determined in post-contrast MRI sections apart from irregular nodules in the mass inferoposterior. Soft-tissue tumors, multiseptate ganglion, synovial sarcomas, desmoid tumor, or fibrohistiocytic tumor were first considered at differential diagnosis. Biopsy was planned to establish a definitive diagnosis.

Van et al reported multiple cystic-appearing masses on MRI in their case. The masses demonstrated decreased T1-weighted and increased T2-weighted signals and no ossification. Therefore, a multiseptate ganglion was considered as a preliminary diagnosis for their case. Similarly, MRI for the cases in Hocking and Negrine revealed synovitis in the regions of the sinus tarsi and the posterior facet of the subtalar joint. In three of the four cases in the literature, as in our case, the diagnosis of synovial chondromatosis was not considered before surgery or histologic examination. In these three cases and our case, there were no pathologic findings in x-ray except that of a soft-tissue mass. Only in the case of Sugimoto et al were multiple ectopic ossifications observed either in x-ray or in MRI. In this case, the patient had a mass for 6 years and plantar pain for 13 years. We think that this period allowed the nodules to calcify and be radiologically visible.

In our case, giant chondroid nodules presented as a soft-tissue mass. There was no calcification. Such lesions may mimic a malignant neoplasm (eg, synovial sarcoma or chondrosarcoma) and pose a diagnostic problem that may easily be confused with a soft-tissue sarcoma. Indeed, Goel et al reported multiple giant synovial chondromatoses of the knee. Like ours, their patient had a soft-tissue mass exhibiting no calcification that was difficult to diagnose radiologically. As in our case, diagnosis was made through biopsy.

Table 1. Cases of Synovial Chondromatosis Involving the Subtalar Joint

<table>
<thead>
<tr>
<th>Case No.</th>
<th>Age (years)</th>
<th>Gender</th>
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Abbreviation: NA, not applicable.
A few reports in the literature have associated malign transformation of synovial chondromatosis, which occurs over a prolonged period.\(^\text{18}\) According to Anract et al,\(^\text{19}\) malign transformation is rare and should be suspected when a rapid deterioration of the clinical status occurs and when bone involvement is detected by MRI. However, the danger still lies in the misinterpretation of chondrosarcoma as synovial chondromatosis. After more than 1 year of follow-up, our patient showed no signs of malignancy or recurrence.

**Conclusion**

We described an unusual presentation of monoarticular synovial chondromatosis of the subtalar joint. We evaluated this case with the other four patients described in the literature. We think that because there is little soft tissue around the ankle, soft-tissue swelling can be recognized early, with patients usually seeking medical attention before the nodules are ossified and radiologically visible. When swelling develops at or around a joint in the foot, synovial chondromatosis should be considered in differential diagnosis.

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**Conflict of Interest:** None reported.

**References**