Case Report
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Synovial Sarcoma Mimicking Myositis Ossificans

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A calcification mass was incidentally found in the soft tissue of a patient who had a history of trauma to the extremity during examination. The patient had no symptom. The pathological analysis of the mass revealed it was an early-phase synovial sarcoma (SS). The diagnosis was made before the onset of symptoms and proper surgical intervention was performed. Therefore, in case of a <1 cm lesion clinically suspicious of myositis ossificans, SS should be taken into consideration as a possible diagnosis.

Keywords: **Femur, Synovial sarcoma, Myositis ossificans, Soft tissue, Injury, Neoplasm**

Synovial sarcoma (SS) constitutes 5%–10% of all soft tissue sarcomas[1)]. It is a high-grade tumor that is seen in extremities among the young population. The translocation (X; 18) (p1; q11) is typical[2)]. Since SS is an aggressive periarticular soft tissue tumor, a definitive diagnosis should be made, even though its incidence is low. However, when a calcification focus is noted during clinical and radiological examinations of a patient with a history of trauma to the extremity, myositis ossificans (MO) is considered as the first possible diagnosis. In such cases, SS may be mistaken for a frequent non-tumor periarticular pathology, resulting in a delay in diagnosis. To the best of our knowledge, a SS of <1 cm in size, has not been reported in the literature. In this report, we present our experience with a SS that was smaller than 1 cm and clinically mimicking MO.

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Case Report

A 12-year-old male patient visited our polyclinic with complaints of pain and swelling in the left knee. His medical record showed the pain had started after an impact to the lateral side of the left knee while playing football 2 months ago. Radiological and clinical examinations of the traumatic area were performed. While following the injury of the left knee suspected of ligamentous strain, swelling of the knee regressed. The pain was localized to a 2 cm^2 area on the lateral side of the distal thigh. On the anteroposterior and lateral radiographs of the left femur, a 1-cm

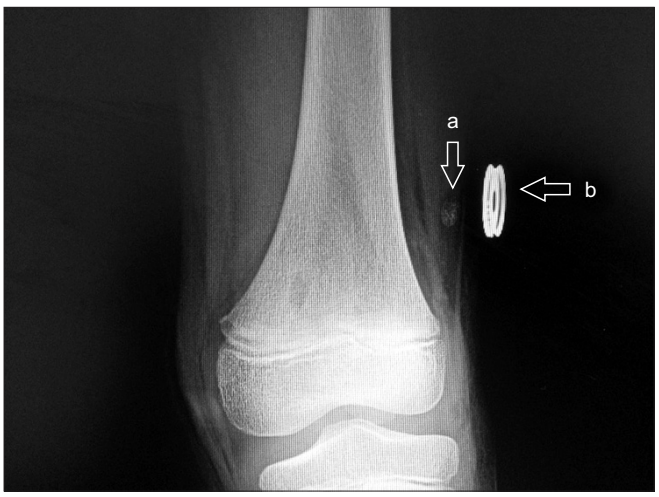

Fig. 1. Radiograph showing a radiopaque mass measuring 10 mm in diameter on the lateral side of left femur. a: radiopaque mass (white arrow), b: ring-shaped wire (white arrow).

calcified mass was detected in the distal region of the vastus lateralis muscle, where the pain was localized. Before anesthesia, the painful region was marked with a marker. The calcified mass was monitored under fluoroscopic vision. For guidance, a ring-shaped wire was placed laterally on the marked painful region. Under fluoroscopic vision, the ring-shaped guide wire was placed on the calcified mass (Fig. 1). Under regional anesthesia, a tourniquet was applied to the left femur. The operation was started at 2 cm lateral to the femur through an incision. The tensor fascia latae was opened. Over the vastus lateralis, a bright-surfaced and coin-shaped cartilage-like mass with a size of 2×10 mm was observed through the incision line. The mass was mobile. It had no adhesion to adjacent tissues. There was no abnormal appearance in adjacent tissues. Pathological analysis of the mass was made during operation. The result of intraoperative consultation (frozen section) was the neoplasm with fusiform cell. It was suspicious in terms of malignity. In macroscopic examination of the excised mass, a grey-white sectional view of an irregular-shaped solid tumoral mass of 1 cm in diameter was observed besides firm regions at certain locations. In microscopic examination of the tumor, short and irregular bundle structures, which involve wide dystrophic calcification regions and consist of large fusiform cells with narrow cytoplasm and oval nucleus, were observed. In the tumor, under 100× magnification (high magnification field), there were 12 mitoses, nuclear pleomorphic structures at mild-medium level of severity. But, no tumor cell necrosis was observed. According to the classification of soft tissue tumors in the grading scale of Fedaration Nationale de Lutte Contre le Can-

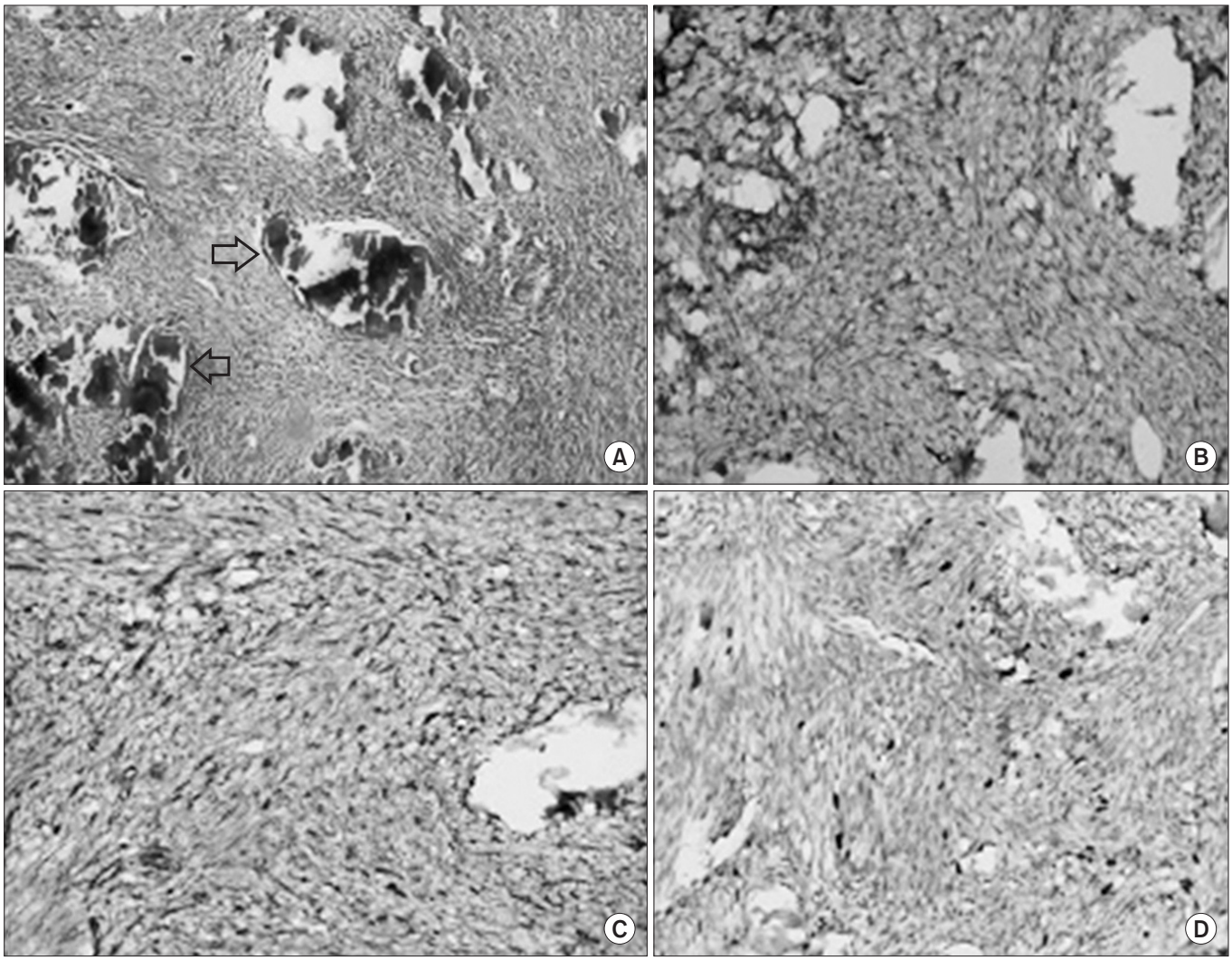

Fig. 2. (A) Spindle tumor cells containing common dystrophic calcification (black arrows) (H&E, ×100). The tumor cells were focal positive for cytokeratin 7 (B) and diffuse positive for vimentin (C) with a low Ki-67 proliferation index (D) (Immunostaining, ×200).

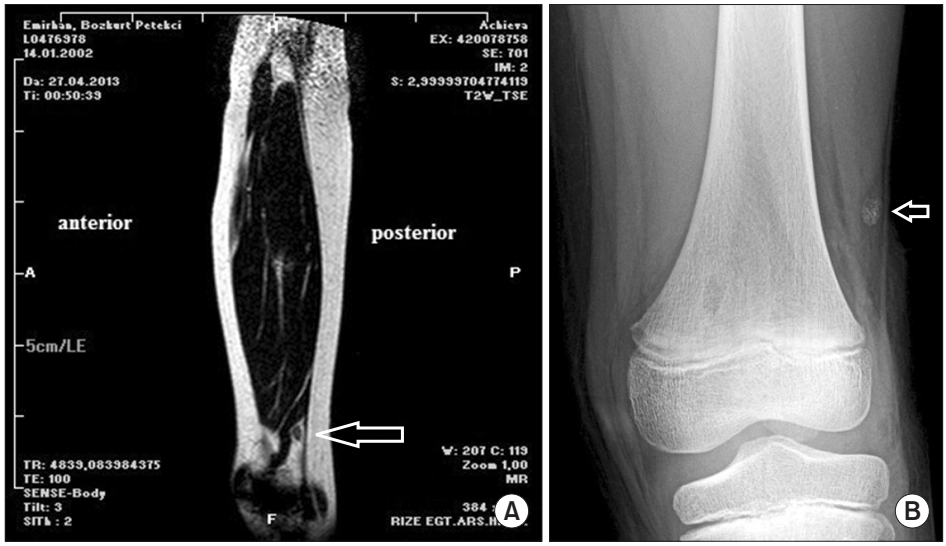

Fig. 3. (A) Sagittal magnetic resonance imaging scan showing a mass on the lateral side of the left thigh (white arrow). (B) Anteroposterior radiograph showing a radiopaque mass (white arrow).

cer[3], tumor differentiation of the mass was 3, mitosis was 2 (12/10 high magnification field), tumor necrosis was 0, and total score was 5. The histological grade of tumor was grade 2. In 10%–15% of the tumor, mildly differentiated regions were observed. The diameter of tumor at its largest point was 1 cm. Facial tissues were invaded, but no tumor at the surgical limits was observed. The distance to the closest surgical border was 0.6 cm. Furthermore, in immune-histochemical analyses of our tissue samples, Ki-67 proliferation index was found to be slightly high (range, 5% to 6%). Vimentin was positive. Cytokeratin 7 and EMA were focal positive. Pathological diagnosis was mono-phasic type SS (Fig. 2). At 1 month after the operation, patient had no complain regarding the lateral side of the knee. Late recurrence and metastasis to a distant organism were not found during the long-term follow-up (3 years).

During active and passive flexion and extension movements of the left knee, the patient felt pain lateral to the knee, which restricted knee movement. While walking, stand phase of left-lower extremity was short. The patient was able to walk without support. There was a swelling throughout the lateral side of the left knee. There was sensitiveness that could be localized distal and lateral to the femur. Varus position of the knee provoked pain in the lateral collateral ligament region. Instability tests of the left knee were negative. Routine biochemical parameters were within the normal limits. Roentgenogram and magnetic resonance imaging were performed (Fig. 3).

Discussion

The majority of SSs are located around the extremity[4,5], and they are less frequently seen in the neck, heart, and lung[2]. In extremities, they are located around large joints such as the knee joint. They are in close relation with the joint capsule, tendon sheath, bursa and facial structures. It is commonly believed that SS does not originate from synovial cells but from mesenchymal cells[1]. If it is calcified, it can be detected within the soft tissue in radiography[2]. Prognostic indicators of SS include inefficient excision of the mass, a mass larger than >5 cm, male gender, >20 years of age, high-degree tumor, presence of necrosis, neurovascular invasion, high mitosis rate, and *SYT-SSX1* variant[6]. The metastatic spread of SS is to regional lymph nodes and lung in general[7].

SS appears as a heterogeneous multi-lobular soft tissue mass having similar or higher signal density than muscle on T1-weighed magnetic resonance imaging (MRI). On T2-weighed MRI, there is also an obvious heterogeneity with dominantly high signal density[8]. The image obtained in MRI evaluation of our case was in accord with that presented in the literature.

Even though the radiological characteristics of SS are not pathognomonic, it is seen as a calcified mass in soft tissues in up to 30% of cases[8]. Considering that formation of calcified mass also occurs in case of MO, it should also be added to the differential diagnosis. MO is characterized by heterotypic benign bone formation in soft tissue. It generally occurs after a soft tissue trauma[9]. In the X-ray assessment of our case, a calcified mass was noted in the soft tissue. In addition, the patient had a history of trauma in the mass region, and the clinical picture indicated MO.

SS has 3 subtypes from the histological aspect; biphasic, monophasic, and poorly differentiated types[10]. In the histological anal-

ysis of our case samples, spindle tumor cells containing common dystrophic calcification were detected.

There was no symptom in our patient with SS. During the evaluation of the injury caused by a trauma, a <1 cm calcified mass was detected. Thus, the diagnosis of SS was made in the early-stage before the symptoms emerged and appropriate surgical treatment was performed. Therefore, it is advised to consider a diagnosis of SS in patients with a history similar to our patient's and radiographic evidence of <1 cm lesions suspicious of MO.

Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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