



Intra-articular Synovial Angiolipofibroma-like Tumor in the Suprapatellar Pouch of the Knee: A Case Report with Histological Correlation

Cheng-Kuang Chang¹, Chih-Wei Wang¹, Heng-Sheng Lee², Ru-Yu Pan³, and Guo-Shu Huang^{1*}

¹Department of Radiology; ²Department of Pathology; ³Department of Orthopedics,
Tri-Service General Hospital, National Defense Medical Center, Taipei,
Taiwan, Republic of China.

This report describes a rare intra-articular angiolipofibroma-like tumor of the knee, which developed in a 51-year-old male. The patient suffered from painful sensation, interruption of normal motion, and erythematous change of the skin over the right knee for 2 days. Magnetic resonance images showed a mass in the supra-patellar pouch of the right knee with a stalk connecting to the synovium. The mass was totally excised under arthroscopic guidance and intra-articular angiolipofibroma-like appearance with central infarction confirmed by histological examination. To our knowledge, angiolipofibroma-like lesion of the knee with MR demonstration and histological correlation has never been reported.

Key words: angiolipofibroma; knee; arthroscopy

INTRODUCTION

Angiolipofibroma and angiolipoma represent a benign lesion most commonly affecting young male patients in the second and third decades of age. The most common site of involvement is the forearm followed by the trunk and upper arm.¹ Other unusual locations such as the head and neck have been reported.²⁻⁴ This article reports a case of painful sensation and limited range of motion over the right knee caused by an intra-articular angiolipofibroma-like tumor, and the tumor has a pedicle connecting to the synovium in the supra-patellar pouch of the right knee. We also describe how it can be distinguished from other lipomatous tumors or synovial giant cell tumors and review the related literatures.

CASE REPORT

A 51-year-old male presented with fever, chills, painful sensation, and interruption of normal motion of the right knee for two days. On review of the patient's statement and past medical records, there was no history of

trauma to the right knee and he was generally well without any underlying joint disorder such as gouty arthritis or systemic disease.

Physical examination revealed swelling and erythematous change in the right knee. There was no associated open wound or skin defect. Examination of the range of motion of the right knee revealed full extension and 120 degrees of flexion. Laboratory findings showed a white blood cell count of 11700 cells/mm³ and a high C-reactive protein level of 6.25 mg/dL. The uric acid value, acid-fast stain and bacterial culture showed no abnormalities. Oxacillin was prescribed immediately under the impression of suspected septic arthritis with an unknown origin, and the inflammatory symptoms gradually subsided.

Plain radiographs of the right knee joint showed no remarkable finding. Magnetic resonance imaging (MRI) was performed with a 1.5-T scanner (Eclipse; Picker Medical systems) with QD extremity coils. Spin echo (SE) T1-weighted images (TR 550, TE 15) on axial, sagittal and coronal planes and Turbo Spin echo fat-saturated T2-weighted images (TR 2438, TE 9) on axial and sagittal planes, an 18 cm field of view, 5.0 mm thick sections with a 1.0 mm interslice gap, and a 256×192 matrix were obtained. MRI demonstrated prominent joint effusion, soft tissue swelling and synovial thickening, suggesting an inflammatory or infectious process. Moreover, MRI also incidentally found an intra-articular mass, measuring about 2.0×1.5×1.0 cm in size, in the supra-patella pouch of the right knee. This mass showed intermediate to high signal intensity on T1-weighted images (Figure 1A) and high signal intensity similar to

Received: August 6, 2009; Revised: November 17, 2009;
Accepted: November 20, 2009

*Corresponding author: Guo-Shu Huang, Department of Radiology, Tri-Service General Hospital, No. 325, Sec. 2, Cheng-gong Road, Taipei 114, Taiwan, Republic of China. Tel: +886-2-87927244; Fax: +886-2-87927245; E-mail: gsh5@seed.net.tw

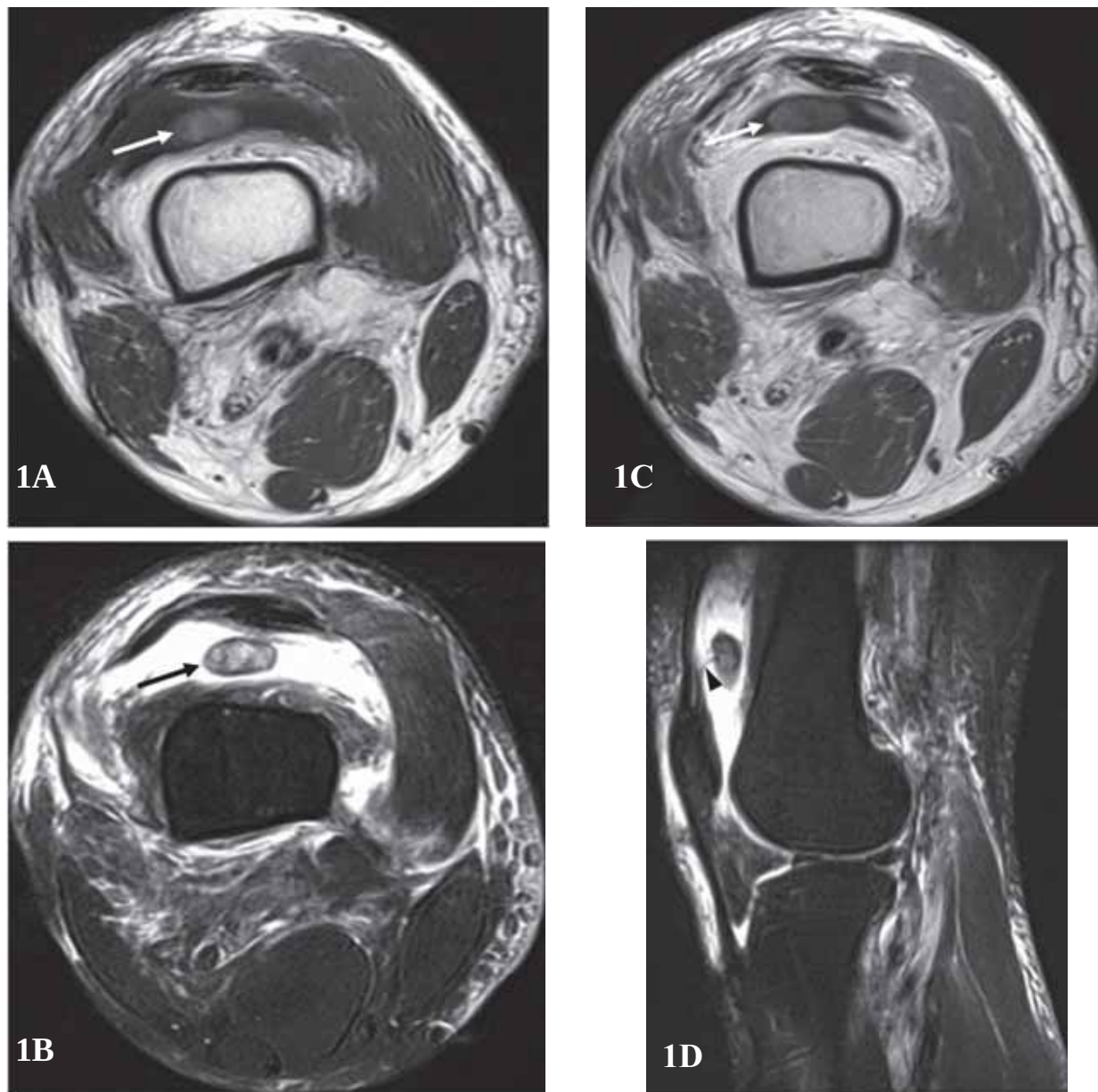


Fig.1 MRI of the right knee revealed an intra-articular tumor in the supra-patellar pouch. The tumor (arrow) was of intermediate to high signal intensity on (A) T1-weighted images and high signal intensity similar to subcutaneous fat with some dark spots on (B) T2-weighted images. (C) Gadolinium-enhanced T1 weighted images demonstrated mild enhancement. (D) Sagittal fat-saturation T2-weighted images showed the tumor with a stalk (arrowhead) connecting to the synovium of the right knee.

subcutaneous fat with some dark spots on T2-weighted images (Figure 1B). Following intravenous Gadolinium injection, mild enhancement of the tumor was identified (Figure 1C). The mass connecting to the synovium with a stalk was clearly identified on sagittal fat-saturation T2-weighted images (Figure 1D). At the time of imaging, the differential diagnosis of the mass included synovial giant

cell tumor with bleeding and synovial fat-containing tumor.

Although the inflammatory symptoms gradually subsided, pain and interruption of motion over the right knee still bothered the patient. He underwent an arthroscopy procedure with intra-articular tumor resection. The arthroscopy revealed a smooth and ovoid tumor with a



Fig. 2. The arthroscopic photograph of the tumor revealed an ovoid tumor with a stalk (arrow) connecting to the synovium in the supra-patellar pouch of the right knee. Mild hemorrhage was noted on the surface of the tumor.

stalk connecting to the synovium in the supra-patellar pouch of the right knee (Figure 2). The tumor was totally excised under arthroscopic guidance and mild bleeding was noted on the surface of the tumor. Histological examination revealed supplying vessels in the connecting stalk (Figure 3A). The central hypocellular area indicated infarction with hemorrhage (Figure 3B). The tumor was composed of proliferative well-formed blood vessels, adipose cells and inflammatory infiltrates with fibrosis (Figure 3C). No evidence of malignant cells was seen. The histological diagnosis suggested a synovial angiolipofibroma-like tumor with central infarction.

The patient received regular out-patient follow-up. The clinical symptoms of the knee pain gradually improved. He was asymptomatic with a full range of motion of the knee and no recurrence has been found until now.

DISCUSSION

Angiolipofibroma and angiolipoma are rare and benign tumors composed of capillaries and adipose tissue with or without fibroblasts.⁵ They most commonly affect young male patients in the 2nd to 3rd decades of age. Angiolipofibroma represents a small (< 2 cm), benign, slowly growing mass that is painful on palpation. The other type of tumors previously described as being deep infil-

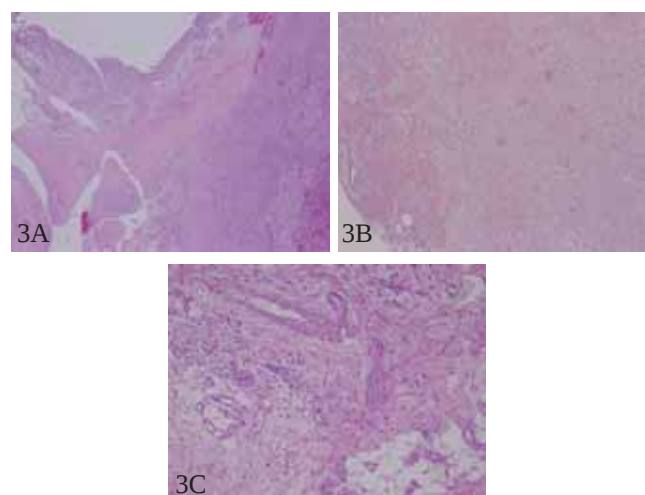


Fig. 3 Microscopically, (A) the angiolipofibroma-like tumor had supplying vessels in the connecting stalk. Infiltration of abundant foamy cells could be identified (hematoxylin and eosin, x40). (B) The central hypocellular area indicated an infarction area with hemorrhage (hematoxylin and eosin, x40). (C) In the focal area, the tumor was composed of proliferative well-formed blood vessels, adipose cells and inflammatory infiltrates with fibrosis (hematoxylin and eosin, x200).

trating angiolipomas have been recognized by the WHO as intramuscular hemangiomas.⁶⁻⁷ The most common site of involvement is the forearm followed by the trunk and upper arm.⁸ Some unusual locations, such as paranasal sinus, cranium and parotid gland, have been reported. Angiolipofibroma occurring at the suprapatellar pouch of the knee has never been reported. In this article, we used the term “angiolipofibroma-like tumor” and explained its tumorigenesis by histology.

With the popular use of MRI, this diagnostic modality plays an important role in diagnosing intra-articular lesions. The typical MR findings of angiolipofibroma represent a mass with iso-intense signal intensity similar to fat. Areas of lower signal intensity on T1-weighted images corresponding to the vascular component with enhancement after intravenous contrast injection are also demonstrated.⁷ Therefore, intra-articular angiolipofibroma should be distinguished from other similar lipomatous conditions, such as synovial lipoma and villous lipomatous proliferation of the synovial membrane (lipoma arborescens). The synovial lipoma lacks a vascular component and lipoma arborescens appears as a large, frond-like mass.⁹⁻¹¹ The possibility of synovial lipoma and lipoma arborescens can be excluded because this re-

ported case presents with a single nodule with dark spots on T2-weighted images, indicating hemorrhage. There is another concern of synovial giant cell tumor of the tendon sheath, so called nodular tenosynovitis, since MRI clearly demonstrated a nodule with a stalk connecting to the synovium.

The intra-articular giant cell tumor, or localized nodular synovitis, is not uncommon. It occurs more commonly in the knee joint. Homogeneous lower or intermediate signal intensity on T1-weighted images has been noted in most cases. However, intermediate-to-slightly high signal intensities have also been noted.¹² The T2-weighted images are variable, ranging from lower to high signal intensity. In our case, intermediate to high signal intensity on T1- and hyper-intensity on T2-weighted images with dark spots within the lesion on T2-weighted image are initially mistaken for areas of hemosiderin deposition. Based on the imaging finding, it seems reasonable to consider the diagnosis of intra-articular giant cell tumor connecting to synovium with bleeding.

The MRI patterns of the intra-articular angiolipofibroma-like tumor can be correlated with the histological findings. The intermediate to high signal intensity on T1- and high signal intensity on T2-weighted images indicate fatty tissue. Dark spots on T2-weighted image with enhancement following intravenous contrast injection correspond to the vascular component. It is difficult to distinguish angiolipofibroma from angiolipoma by MRI images, because both are composed of fatty tissue. The histological findings demonstrate a tumor appearance, including well-defined peripheral fibrosis, proliferative well-formed blood vessels, adipose cells and mixed acute and chronic inflammation components. Chronic trauma of lacerated fat pad from the infra-patellar pouch with reattachment can mimic the similar histological picture. However, no traumatic history can be traced and the supplying vessels are identified in the stalk. The entire histological appearance resembles angiolipofibroma. Moreover, the central hypocellular area indicated a secondary infarction area. The possible mechanism may be the supplying vessels are strangulated in the stalk by the knee movement. Because angiolipofibroma has never been reported before, this extremely rare condition of angiolipofibroma-like tumor is difficult to diagnose preoperatively.

In conclusion, we report a rare case of intra-articular angiolipofibroma-like tumor with a stalk connecting to the synovium in a middle-age male's right knee who was suffering from knee pain and interruption of normal motion. Vascular strangulation in the stalk might have

caused central hypocellular infarction area in this tumor. To our knowledge, this appearance of angiolipofibroma-like tumor has never been clearly demonstrated by MRI and histological correlation. Therefore, intra-articular angiolipofibroma-like tumor should be considered in the differential diagnoses of an intra-articular nodule with fat content in the knee, especially one with lower signal dots on T2-weighted images.

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