

## 지방괴사와 동반된 지방육종 - 증례 보고 -

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종괴를 이루고 있는 지방괴사는 지방조직의 퇴행성 변성으로 지방육종과는 감별진단이 필요하다. 저자들은 하나의 피막으로 둘러 싸여진 종괴 안에 지방괴사와 지방육종이 격막으로 구획되어 발생한 예를 경험하였기에 보고 하고자 한다.

**색인 단어:** 지방괴사, 지방육종

Encapsulated fat necrosis is a degenerative process involving various mature adipose tissues. Liposarcoma may also occur in any body fat area but it is quite different from lipoma and fat necrosis. Moreover, sarcoma does not derive from lipoma. We present a case of liposarcoma accompanying extensive fat necrosis in an well-encapsulated mass.

### Case report

A 57-year-old woman was referred to our clinic from a regional general hospital with a palpable soft tissue mass that had gradually grown during the past 4 months below the medial joint line of the right knee. The oval shaped mass was firm, fixed, and was

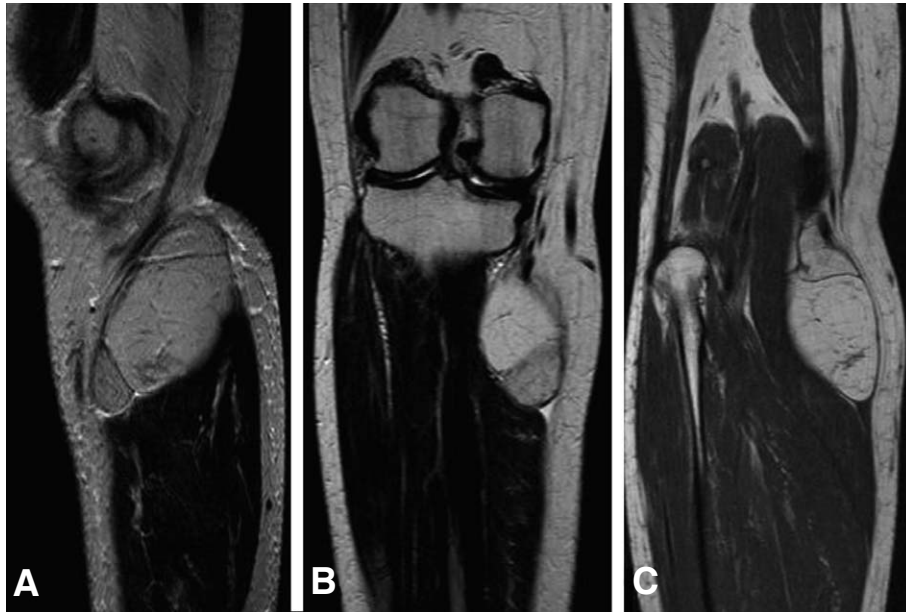
not transilluminated with light. She had received physical therapy and multiple acupunctures around the knee for the treatment of knee joint pain that had persisted for several months without the development of masses. After detection of the mass, she underwent aspiration 2 times in order to discriminate between cystic masses, which resulted in a dry tap. Magnetic resonance (MR) imaging demonstrated a 9-cm fat-density mass located between the medial head of the gastrocnemius muscle and the subcutaneous fat layer (Fig. 1). The mass was compartmentalized into 3 portions on the sagittal T2-weighted images and coronal T1-weighted images. The distinct anteroinferior lobular mass revealed a lower signal intensi-

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**Fig. 1.** (A) Sagittal T2-weighted MR image shows an oval-shaped mass which is compartmentalized into 3 areas by the septa. (B) Coronal T1-weighted MR image shows an anteroinferiorly located distinct lobular mass with lower signal intensity than the other 2 compartments. (C) The middle mass shows subcutaneous fat signal intensity and has focally low signal intensity areas. The most posterosuperiorly located corn-shaped mass has lower signal intensity than the middle mass, but it is homogenous.

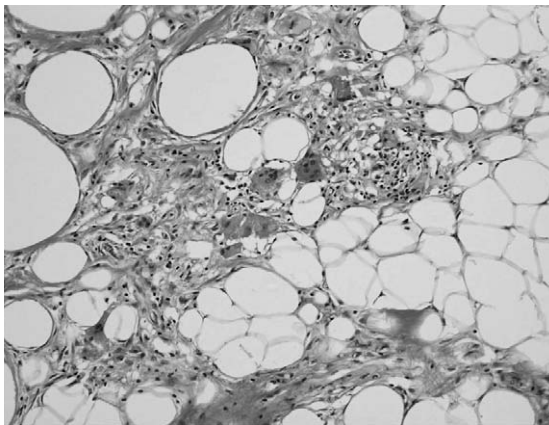
ty and a 2.5×2 cm mass with thick septa. Signal intensity of the 6×5 cm middle mass was the same as the density of the subcutaneous fat, but there were several lower-signal intensity areas focally inside the mass. The 1.5×3.5 cm posterosuperior mass was homogeneous but had a lower signal intensity than the middle mass. Sonography-guided needle biopsy which was carried out at the regional hospital revealed necrotic fat with fibrosis. Positron emission tomography (PET) showed hyper-metabolic uptake in the mass but no visible evidence of metastasis.

In spite of the benign pathologic result, the patient underwent a wide resection because the mass was divided into 3 compartments by the septa and showed a heterogeneous MR signal intensity which was suggestive of malignancy. Total removal of the mass, partial resection of the adherent

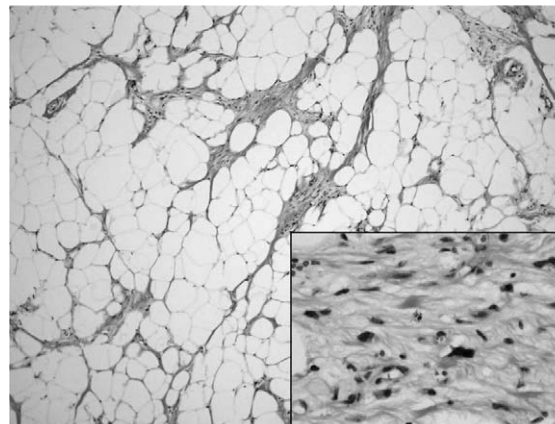
muscle and segmental resection of the semi-membranous tendon were performed. Macroscopically, a well-demarcated and lobulated mass of 8.4 cm in diameter, with 3 distinct compartmentalized areas was observed. The cut surface was firm to soft and yellow to white. The middle compartmentalized area contained focal hemorrhage probably due to the previous sonography-guided needle biopsy and multiple focal dark areas probably due to acupuncture (Fig. 2). The microscopic findings of the yellowish lobular compartment area which was separated from the main mass by a thin fibrous band and anteroinferior distinct area on MR images confirmed a well-differentiated liposarcoma (Fig. 3). Fat necrosis was observed markedly in the middle and superior compartmentalized areas on MR image (Fig. 4). The clinical course was uneventful



**Fig. 2.** Macroscopically, a well-demarcated and lobulated mass of 8.4 cm in diameter with 3 distinct compartmentalized areas is seen. The cut surface is firm to soft and yellow to white, and the middle compartmentalized area contains focal hemorrhage (arrowhead) due to the previous sonography-guided needle biopsy. The microscopic findings of the yellowish lobular compartmentalized area (arrow) which is separated from the main mass by a thin fibrous band and an anteriorinferior distinct area on MR images are consistent with concurrent well-differentiated liposarcoma and extensive fat necrosis (\*).



**Fig. 3.** Light microscopy shows fat necrosis in about 70% of the mass lesion (\* in Fig. 2). Scattered foreign body giant cells, various-sized fat vacuoles and inflammatory cells are shown in the sclerotic background (hematoxylin and eosin stain, original magnification  $\times 200$ ).



**Fig. 4.** In a well-differentiated liposarcoma area (arrow in Fig. 2), the tumor cells are surrounded by the fibrotic septa under low-power field (hematoxylin and eosin stain, original magnification  $\times 100$ ). Significant variation in cell size is noted, and bizzare pleomorphic and hyperchromatic cells and multivacuolated lipoblasts are found in fibrous septa (inset, hematoxylin and eosin stain, original magnification  $\times 400$ ).

for 23 months by ultrasonography, MRI, computed tomography of chest and PET.

## Discussion

Well-circumscribed fat necrosis was described in German literature by Schmidt-Hermes and Loskant in 1975 as multiple calcified nodules in the breasts of a woman<sup>1)</sup>. Localized subcutaneous fat necrosis in the legs was reported as “nodular-cystic fat necrosis” by Przyjemski<sup>2)</sup>. There have been several reports using other terms, such as “mobile encapsulated lipoma”<sup>3)</sup>, “nodular fat necrosis and post traumatic fat degeneration and herniation”<sup>4)</sup>, “encapsulated necrosis”<sup>5,6)</sup>, and “a form of traumatic panniculitis”<sup>7)</sup> for describing fat necrosis as a distinct disease entity. Most of the aforementioned reports have described small sized multiple subcutaneous nodules, but a few reports have presented large fatty masses mimicking liposar-

coma in the abdomen<sup>8,9)</sup>, pelvis<sup>10)</sup> and chest wall<sup>11)</sup>.

Preoperative workup of large fatty masses is important to rule out liposarcoma or other malignancies. Liposarcoma may occur in any area of the body which has fat-like encapsulated fat necrosis. Canteli et al<sup>12)</sup> reported a subcutaneous fat-necrotic mass which was located in the medial aspect of the knee joint and clearly different from meniscal cyst, ganglion, hematoma, lipoma, and liposarcoma on MR T1-weighted images. There have been few reports in which liposarcoma and extensive fat necrosis were simultaneously diagnosed in a large well-encapsulated mass. Lopez Soriano et al<sup>11)</sup> reported a case of fat necrosis in a chest wall lipoma which had a central non-adipose nodular area. This case did not have areas separated by the septa, whereas our case showed three obviously separated areas by two thick septa in a well-capsulated oval mass which were confirmed by MR imaging and macroscopic findings of the cut surface. Pathogenetic mechanisms of encapsulated fat necrosis are still unknown, but frequent minor traumas and subsequent interruption of blood supply have been implicated as etiologic factors<sup>8)</sup>. The lower extremity is the most commonly affected site<sup>5)</sup>. Our patient had received acupuncture around the involved knee for one month prior to this presentation. Based on this past medical history, it is conceivable that the multiple necrotic areas in a fat necrotic mass could be attributed to previous acupuncture and that a superficial hemorrhagic area could be attributed to the recently performed sonography-guided biopsy. Well-differentiated liposarcoma is not easily distinguished from benign fatty masses by computed tomography and MR imaging<sup>13)</sup>. Clinical features

that suggest malignancy include the patient's age, lesion size, presence of thick septa, presence of nodular, globular or non-adipose mass-like areas, and percentage of fat composition<sup>10)</sup>. Our patient's MR imaging showed lower signal intensity in a well-differentiated liposarcoma area than in fat necrotic areas, which was similar to that of the subcutaneous fat layer.

We report herein a case of concurrent well-differentiated liposarcoma and extensive fat necrosis in a well-capsulated mass. It is suggested that radiologically non-homogeneous masses should be histologically confirmed through sonography-guided biopsy.

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## Abstract

### Concurrent Liposarcoma and Fat Necrosis in an Encapsulated Mass: Report of a Case

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**Key Words:** Fat necrosis, Liposarcoma

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