

Myxoid Liposarcoma: A Soft-Tissue Sarcoma Mimicking Hematoma in A Baseball Player

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There are multiple histological types of soft-tissue sarcomas (STS) that are associated with different prognoses. Liposarcoma (LPS) is the most frequent subtype of STS in extremities and trunk wall in Taiwan. The myxoid liposarcoma is the second most common subtype of LPS and is associated with an intermediate-grade malignancy.

STS and hematoma may be difficult to differentiate clinically. We report a case of a 35-year-old male presented with a mass lesion over the left thigh, which was initially misinterpreted as a hematoma on ultrasound. We also conducted a magnetic resonance imaging (MRI) study, which revealed the possible diagnosis of STS. After operation and histopathological examination, the diagnosis of myxoid liposarcoma was confirmed.

We conducted a literature review of the clinical presentation, ultrasonic, and MRI findings to assess characteristics that will help the physician differentiate between hematomas and STS. (*Tw J Phys Med Rehabil* 2021; 49(2): 205 - 211)

Key Words: soft tissue sarcoma, liposarcoma, myxoid liposarcoma, hematoma, ultrasound

INTRODUCTION

Soft-tissue sarcomas (STS) are rare and heterogeneous with various subtypes, and are associated with different prognoses. They account for <1% of the diagnosed malignancies, and are extensively found in the connective tissues in the human body. According to a population-based study in Taiwan, which was based on the data from the nationwide Taiwan Cancer Registry database from 2003 to 2011, the age-standardized rate of

STS over extremities and trunk wall was 1.63 per 100,000 person-years, and liposarcoma (LPS) was the most common subtype, which accounted for 23%.^[1]

Liposarcoma arises from the fatty tissue and commonly appears as a slowly enlarging mass. The prognosis of LPS was related to the location, and more particularly to the histological pattern of the tumor.^[2] The four subtypes of liposarcomas have been pathologically categorized as follows: well-differentiated, myxoid, dedifferentiated, and pleomorphic. The well-differentiated liposarcoma is the most common type, comprises approximately

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half of the liposarcomas, and exhibits relatively good prognosis. They often recur locally without metastatic potential. Nevertheless, the cases located in the retroperitoneum proved fatal due to the local effect. The myxoid liposarcoma is the second most common subtype, and is associated with an intermediate-grade malignancy. Dedifferentiated lesions have similar local effects as the well-differentiated liposarcoma. Pleomorphic liposarcoma is the least common subtype of aggressive systemic malignancy and is associated with the worst prognosis.^[3] Thorough clinical, radiological, and pathological assessments are important to direct appropriate therapy.

Soft-tissue sarcomas and hematoma may be difficult to differentiate clinically. We report a case of soft-tissue sarcoma with trauma history initially misinterpreted as hematoma. This case highlights the importance of soft-tissue sarcoma as a differential diagnosis.

CASE REPORT

A 35-year-old healthy man, a professional baseball player, with a height of 183 cm and a weight of 100 kg (body mass index (BMI): 29.8 kg/m²) was presented with a palpable mass on the anterolateral aspect of the left thigh for 11 years. He had a trauma history over the anterolateral aspect of his left thigh because he was hit by a pitch during a baseball game in 2009. He has been complaining of pain and swelling of the left thigh since then, and he has used analgesic medication for pain relief. Recently, the pain aggravated that restricted his ambulation performance. He visited the Department of Physical Medicine and Rehabilitation (PM&R) of the Chung Shan Medical University hospital in Taichung, Taiwan. Upon physical examination, this large bulging mass—which covered two-thirds of the antero-lateral aspect of the left thigh—had a hard consistency, was immobile, and was well circumscribed. It had a diameter of approximately 20 cm. The patient denied prior use of tobacco or alcohol abuse, and claimed no allergic history to medication or food. He had no operative history, and no personal or family histories of clotting disorders. Left femur X-rays showed no bony involvement. The laboratory blood tests were within normal limits. The blood coagulation test of the prothrombin time and activated partial thromboplastin time were normal. Musculoskeletal ultrasonic measure-

ments were performed using an Aplio 300 ultrasound system (Canon Medical Systems Corporation, Tochigi, Japan), with the combination of a 3.5 MHz convex-array transducer. Examination was performed by the second author of this study who had more than 15 years of musculoskeletal ultrasound experience. The convex-array transducer was placed parallel to the fascicle direction in the longitudinal plane of the ultrasound image. The ultrasound revealed a well-defined oval mass lesion over the muscular part of the left anterolateral thigh which had a thickness of 8.97 cm. The mass had a heterogeneous echogenicity (Figure 1) with minimally increased blood flow signal on Doppler sonography. These features most likely represented a chronic hematoma given the overall clinical history and imaging characteristics.

Magnetic resonance imaging (MRI) of the left thigh was obtained for further investigation, and revealed a heterogeneous, well-defined enhancement mass over the muscular part of the left thigh with an approximate size of 25.8 × 11.6 cm. The well-circumscribed tumor had a heterogeneously low-signal intensity on T1-weighted images (Figure 2A), and marked heterogeneous high-signal intensity on T2-weighted images compared with the adjacent muscle (Figure 2B). The gadolinium-enhanced fat-suppressed T1-weighted images revealed marked heterogeneous enhancement of the tumor (Figure 2C). Additionally, there was no evidence of bony destruction. The radiologist and the attending physician interpreted the MRI as a soft-tissue sarcoma. Therefore, the patient underwent surgical resection of the tumor.

During operation, the encapsulated tumor was completely excised without rupture. The gross specimen yielded a size of 22 × 15 × 8 cm and a thin capsule was observed on the outer layer of the tumor (Figure 3A). The cut surface of the gross specimen showed foci of necrosis and hemorrhage in the scattered area (Figure 3B). Histopathological examination revealed the presence of myxoid liposarcoma (Figure 4). The histopathological grade of the French Federation of Cancer Centers Sarcoma Group (FNCLCC) system was grade 2 (tumor differentiation: 1 point, mitotic count: 2 points, and tumor necrosis: 2 points). Following immunohistochemical staining, the tumor was positive for vimentin and S-100 proteins, and was negative for cyclin-dependent kinase 4 (CDK4) and murine double minute 2 (MDM2).

After consultation with the oncologist, the patient received adjuvant, concurrent chemoradiotherapy treatment. Chest computed tomography scans were performed regularly. These did not reveal documented metastases at the time of this report.

DISCUSSION

We report a case of STS with a history of trauma initially misinterpreted as hematoma on ultrasound. MRI presented a suspicious soft-tissue sarcoma, and post-operative histopathology revealed the presence of myxoid liposarcoma.

STS are rare and account for less than 1% of the diagnosed malignancies. STS prognoses are different for different subtypes. LPS was the most common subtype of STS over the extremities and trunk wall in Taiwan.^[1] The peak prevalence of LPS occurred between the ages of 40 to 60 years. LPS are typically presented as large painless masses, but painful LPS accounts for 10 to 15%. These tumors most frequently involve the extremities, which particularly occur in the lower limb, which is predominantly at the thigh in 40 to 65% of the cases.^[4]

The prognosis of slowly enlarging LPS is highly related to the histological pattern compared with the anatomical location. The myxoid liposarcoma, which exceeded only de-differentiated and pleomorphic liposarcoma, is the second most common subtype, and is associated with intermediate-grade malignancy.

Hematomas and STS can be difficult to differentiate clinically. Patients usually complain for lumps or growths of masses with or without pain. Traumatic hematomas and STS are usually observed at the thigh. Thus, these cases are very challenging to diagnose and could mask the underlying tumor. Niimi et al. reported that large hematomas can form within the lesions of angiogenic tumors (e.g., hemangioma and angiosarcoma), synovial sarcoma, epithelioid sarcoma, extraskelatal Ewing's sarcoma, leiomyosarcoma, liposarcoma, rhabdomyosarcoma or malignant fibrous histiocytoma.^[5] Previous STS studies often led to misdiagnoses as hematomas owing to their similarities in clinical presentation and imaging, especially when the patient was presented with an apparent history of trauma.^[5-8] However, traumatic hematomas may gradually reabsorb and decrease in size. When the

typical findings of hematoma do not match the clinical course, such as a nonresolving heterogeneous soft-tissue mass, physicians should be concerned of the differential diagnosis of malignancy.^[5]

A prospective study identified ultrasound as the initial imaging examination for suspicious soft-tissue lesions.^[9] Sonographic findings of the appearance of hematomas are variable. In acute phases, ultrasound may be homogeneous; as hematomas coagulate and develop differing areas of density, they can appear heterogeneous and similar with sarcoma.^[6] If lesions are present with any of the following elements on ultrasound, further investigation with MRI may be necessary: pain, enlarging lesion(s) larger than 5 cm along any axis, localization in deep-muscle fascia regions, heterogeneous texture, distortion of the surrounding anatomy, or disorganized, internal vascularity on Doppler flow. The advantages of ultrasound include its noninvasiveness, convenience, and lower cost. Ultrasound may be useful as a screening examination in the initial evaluation of hematoma and/or suspicious soft-tissue masses. Using this approach, ultrasound showed high sensitivity for the diagnosis of sarcoma.^[9] This case showed a thickness > 5cm mass with heterogeneous texture and minimally increased blood flow signal on Doppler sonography, which was compatible with the findings mentioned above. Therefore, further investigation of MRI was indicated.

MRI is the gold standard for diagnosing STS, and is a reliable diagnostic tool for distinguishing hematomas and sarcomas. STS, with or without intratumoral hematoma, has a solid part which shows low-to-intermediate signal intensity on T1-weighted images, and a high-signal intensity on T2-weighted images, with heterogeneous enhancement following contrast administration.^[5] Acute hematoma on MRI showed low-to-intermediate signal intensities on T1-weighted images and low-signal intensities on T2-weighted images. Chronic hematoma demonstrates higher signal intensity than the surrounding muscle tissue on both T1- and T2-weighted images. Thus, MRI has become a powerful tool for diagnosing soft-tissue masses. It is usually not difficult to distinguish STS and hematoma.

This case illustrates its value in confirming prior trauma, and its capacity to investigate the clinical history in the extremities, especially in cases in which the initial

diagnosis is uncertain. If there is any suspicion, accurate radiological investigation should be performed to evalu-

ate the possibility of the presence of STS.

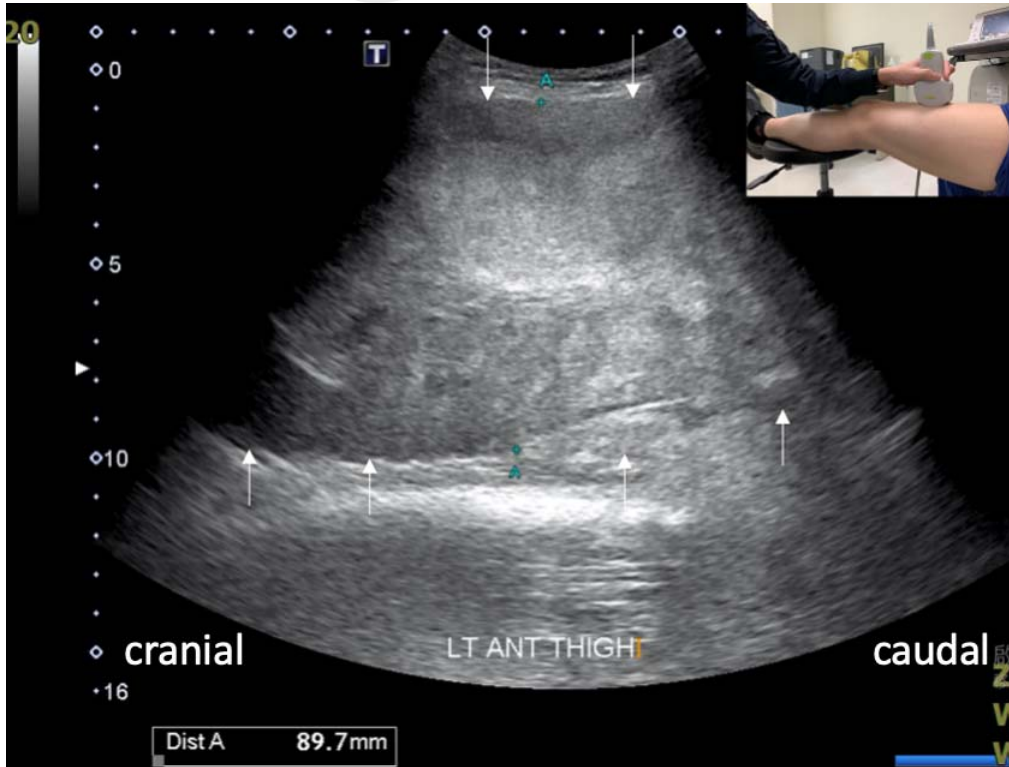


Figure 1. The longitudinal view of the anterolateral aspect of left thigh at sitting position with knee extension (the body position in this figure only for illustration). The mass presents as a heterogeneous echogenicity. Arrow in this figure presented the thickness, measuring was 8.97cm (Dist A) on ultrasound examination.

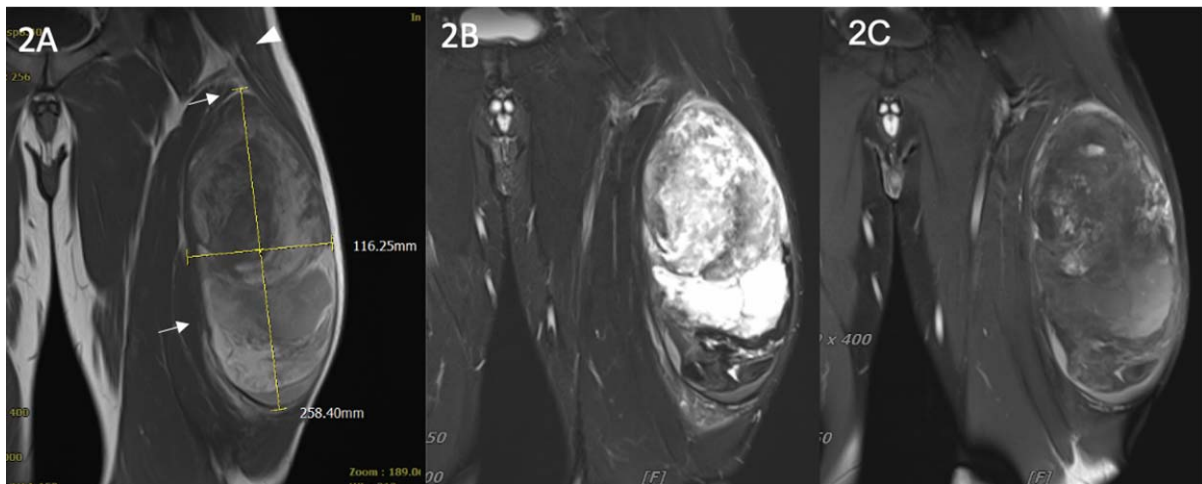


Figure 2. The coronal MRI findings of the mass over the left anterior thigh, measuring an approximate size was 25.8 × 11.6 cm. 2A.T1-weighted images showed heterogeneous low signal intensity mass between rectus femoris (RF, arrows) and tensor fasciae latae (TFL, arrowhead) muscle. 2B.T2-weighted images displayed marked heterogeneous high signal intensity compared with the adjacent muscle. 2C.The gadolinium-enhanced fat-suppressed T1-weighted images revealed well-circumscribed tumor with marked heterogeneous enhancement.

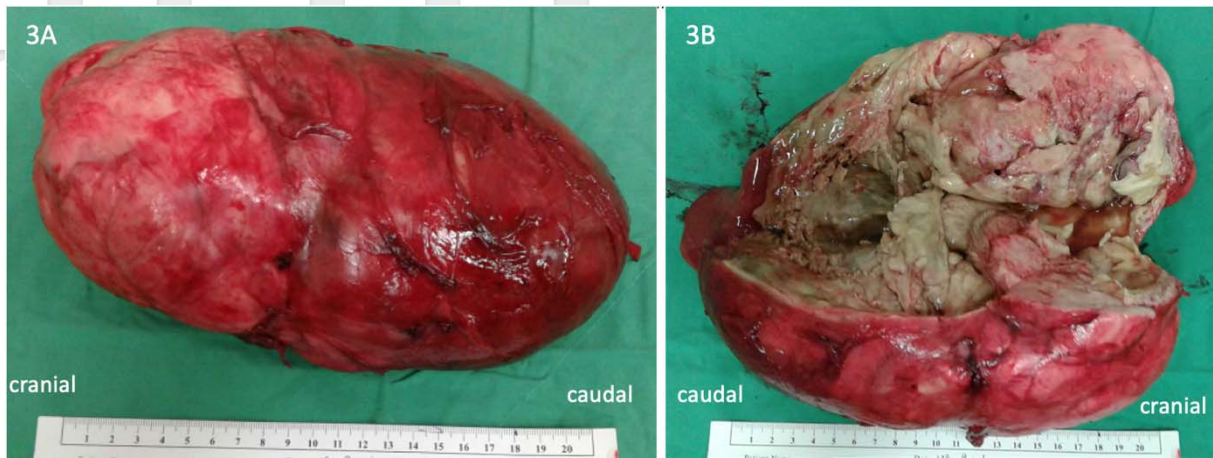


Figure 3. Operative finding of the gross specimen. 3A. The gross specimen showed 22x15x8 cm in size and thin capsule over the outer layer of the tumor. 3B. The cut surface of the gross specimen showed foci of necrosis and hemorrhage in scattered area.

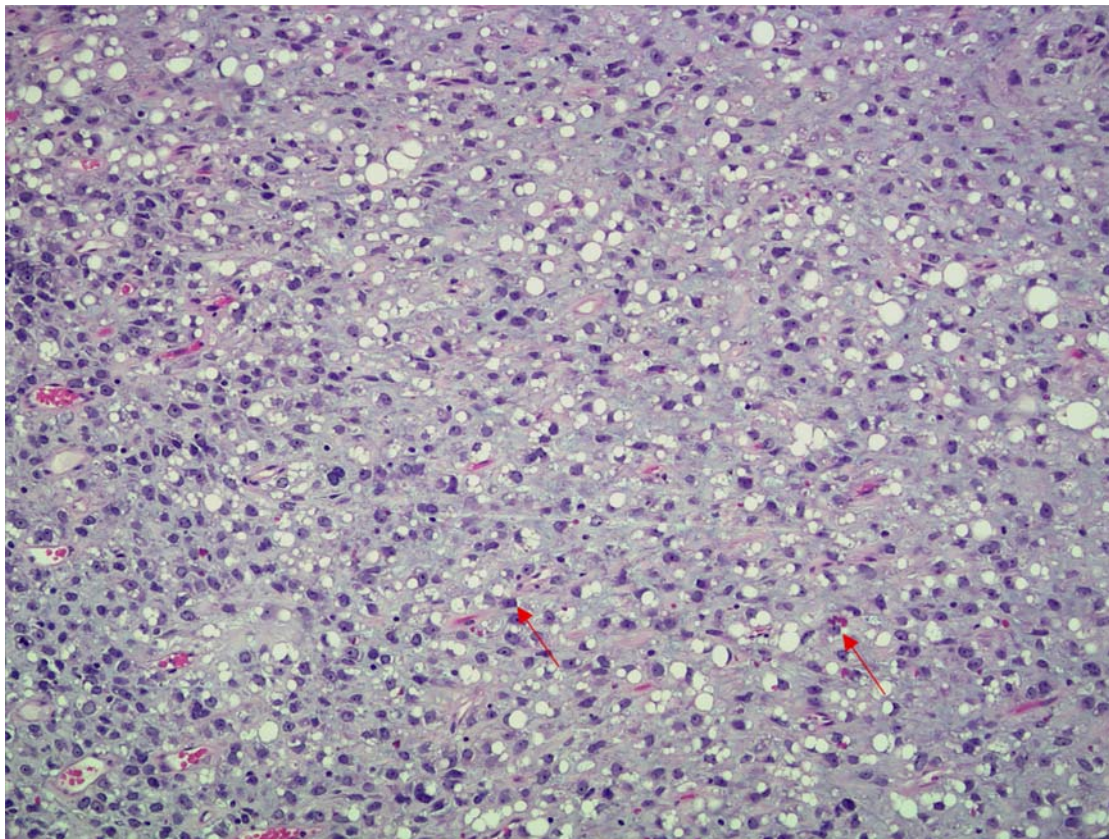


Figure 4. Photomicrograph of histopathologic aspect of myxoid liposarcoma showed proliferation of fusiform to ovoid cells (arrows) associated with adipocytes in a myxoid stroma of plexiform capillary network (hematoxylin and eosin stain, 100X).

CONCLUSION

We highlighted the importance of soft-tissue sarcoma in the differential diagnosis. Ultrasound may be useful as a screening examination owing to its convenience, noninvasiveness, and lower cost in the initial evaluation of hematoma and/or suspicious soft-tissue masses. When atypical cases are suspected, an important diagnostic tool is MRI that is considered as the gold standard for diagnosing STS. Comprehensive clinical, radiological, and pathological assessments are important to guide appropriate therapy.

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黏液型脂肪肉瘤：於棒球員發現類似血腫之軟組織肉瘤

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軟組織肉瘤有多種型態之組織病理亞型及分型，各亞型有各種不同的預後。一篇以台灣人口作為研究之報告顯示位於四肢及軀幹的軟組織肉瘤中，脂肪肉瘤是最常見的亞型，而脂肪肉瘤中第二常見的亞型為中度惡性的黏液型脂肪肉瘤。

臨床上，軟組織肉瘤及血腫可能很難作鑑別診斷。本文中，我們報導了一位 35 歲男性，因為左側大腿疼痛而求診，理學檢查發現一顆位於左側大腿腫塊，經骨骼肌肉超音波檢查後一開始認為是血腫，安排核磁共振影像顯示左側大腿腫塊懷疑為軟組織肉瘤，經手術切除後，病理組織學檢查報告確診為黏液型脂肪肉瘤。

本文將討論軟組織肉瘤相關臨床徵象、骨骼肌肉超音波及核磁共振影像，根據評估疾病的特徵，期望能幫助醫師於臨床上鑑別血腫及軟組織肉瘤。(台灣復健醫誌 2021; 49(2): 205 - 211)

關鍵詞：軟組織肉瘤(soft tissue sarcoma)，脂肪肉瘤(liposarcoma)，黏液型脂肪肉瘤(myxoid liposarcoma)，血腫(hematoma)，超音波(ultrasound)