

Giant Lipoma with Fat Necrosis of the Back Mimicking Atypical Lipomatous Tumor in MRI Findings

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Abstract

Background: Although fat necrosis can be observed in several inflammatory adipose diseases, the occurrence of fat necrosis in lipomas is reported to be rare.

Method: A case report of fat necrosis in a lipoma mimicking atypical lipomatous tumor in MRI findings.

Result: A 63-year-old man presented with a 2-year history of a subcutaneous nodule in his back. MRI showed that a 20 × 15 cm well-circumscribed tumor was located beneath the latissimus dorsi muscle with high signal intensities on both T1- and T2- weighted images and signal attenuation on fat suppression sequences. Inside the tumor, there were multiple thickened septa with gadolinium enhancement, which was consistent with atypical lipomatous tumor. However, we diagnosed this case as a lipoma with fat necrosis from the findings of an incisional biopsy and enucleation of the tumor was performed.

Conclusion: A lipoma with fat necrosis may show similar imaging findings to atypical lipomatous tumor. Therefore, it is important to confirm the diagnosis histologically, when we encounter a lipomatous tumor that imaging findings indicate to be atypical lipomatous tumor. Also, we should plan to take samples of not just the adipose lesion, because the differential diagnosis may be difficult if only lipomatous regions are biopsied.

Introduction

Although fat necrosis can be observed in several inflammatory adipose diseases such as lupus panniculitis and dermatomyositis-associated panniculitis, the occurrence of fat necrosis in lipomas is reported to be rare [1]; therefore, there are few reports which mention imaging findings about it. Here, we present a case of fat necrosis in a lipoma of the back mimicking atypical lipomatous tumor in MRI findings.

Case Report

A 63-year-old man presented with a 2-year history of a subcutaneous nodule in his back. It had rapidly enlarged within the last six months. His past and family histories were unremarkable. A physical examination revealed a well-mobile, large, soft subcutaneous mass in the right side of his back (Figure 1). MRI showed that a 20 × 15 cm well-circumscribed tumor was located beneath the latissimus dorsi muscle with high signal intensities on both T1- and T2- weighted images and signal attenuation on fat suppression sequences, which indicated a lipomatous tumor. Inside the tumor, there were multiple thickened septa with gadolinium enhancement, which was consistent with atypical lipomatous tumor (Figures 2-4). An incisional biopsy including thickened septa was performed to make a definitive diagnosis. Microscopically, the lesion was composed of thickened fibrovascular septa and mature adipocytes with mild variation in size and shape. Most adipocytes around the thickened septa were necrotic and we could not find atypical lipoblasts. Some of the necrotic adipocytes showed pseudo-papillary projections composed of eosinophilic material into the fat cavity, which was consistent with membranous fat necrosis (Figures 5 and 6). We diagnosed this case as a lipoma with fat necrosis and enucleation of the tumor was performed. On gross examination of the resected tumor, multiple brown nodules were seen from the divided surface (Figure 7). Histologically, most of the lesions were composed of mature adipocytes without atypia. In the brown nodules, thickened fibrovascular septa and necrotic fat tissue were present as seen in the biopsy specimen. There was no recurrence 1 year after surgery.



Figure 1: A large subcutaneous mass in the right side of the back.

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Received May 13, 2013; Accepted May 23, 2013; Published May 28, 2013

Citation: Nakamura Y, Fujisawa Y, Obara S, Saito A, Nakamura Y, et al. (2013) Giant Lipoma with Fat Necrosis of the Back Mimicking Atypical Lipomatous Tumor in MRI Findings. J Clin Exp Dermatol Res S6: 013. doi:10.4172/2155-9554.S6-013

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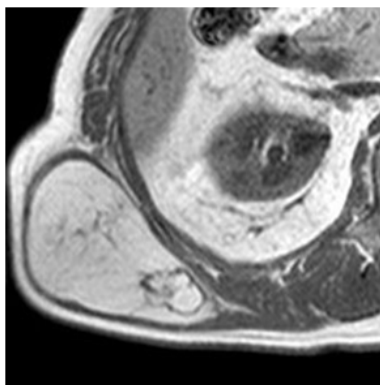


Figure 2: T1-weighted images showed well-circumscribed tumor located beneath the latissimus dorsi muscle with high signal intensities. Inside the tumor, there were multiple thickened septa.

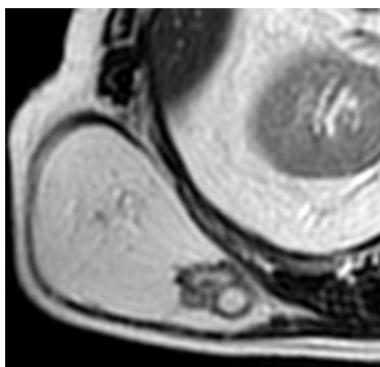


Figure 3: T2-weighted images showed similar findings to T1-weighted images.

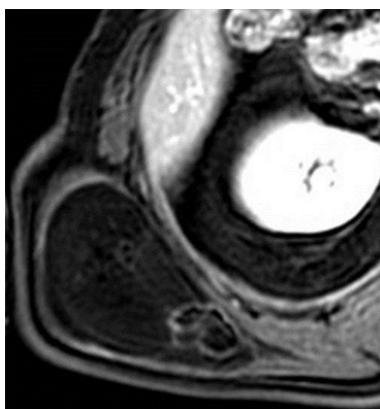


Figure 4: Fat-saturated T1-weighted images. The multiple prominent thick septa showed enhancement by gadolinium.

Discussion

The occurrence of fat necrosis in lipoma is uncommon, and few cases have been reported [1]. Most of the reported cases of lipoma with fat necrosis were large as in the present case. In view of their large size, the main cause of fat necrosis in lipoma might be ischemia induced by trauma or tumor enlargement.

There are some imaging studies including MRI, CT and ultrasonography (US). Although MRI is expensive, it has much higher soft tissue detail compared to CT. The advantage of US includes its wide availability and its ability to perform a dynamic and color Doppler scan at the time of the investigation, but its limitations arise when the mass is large or deep [2]. Therefore, MRI has been largely used in the diagnosis of such soft tissue tumors, as in this case. In general, a lipoma shows a homogeneous small mass composed of adipose tissue in MRI. A benign lipoma sometimes has intrinsic thin septa (<2 mm) that usually do not show enhancement by gadolinium [3]. In contrast, atypical lipomatous tumor usually shows large heterogeneous mass and often includes thick septa (>2 mm) as well as nodular or globular regions of nonadipose tissue with enhancement [4]. Kransdorf et al. [5] described features favoring a diagnosis of a typical lipomatous tumor rather than lipoma as a lesion larger than 10 cm, presence of thick septa, globular and/or nodular nonadipose area or mass, and decreased percentage of fat composition. And they showed the statistically significant radiologic predictors of atypical lipomatous tumor as male sex, presence of thick septa, and associated nonadipose masses. However, these findings have also been reported in pathologically proven cases with necrotic

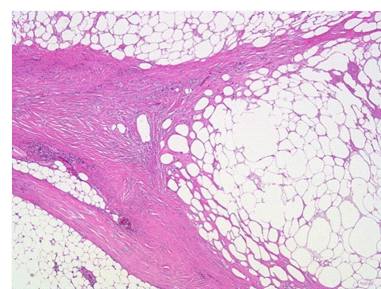


Figure 5: (HE stain, ×40) The biopsy specimen was composed of thickened fibrovascular septa and mature adipocytes without atypia.

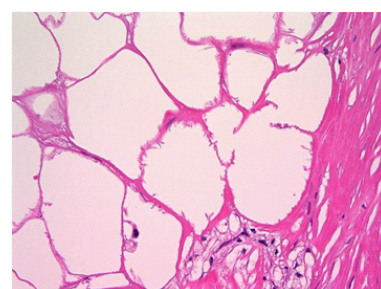


Figure 6: (HE stain, ×200) Most of the adipocytes were necrotic.

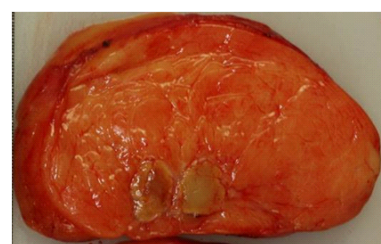


Figure 7: Multiple brown nodules were seen in the lipomatous tumor.

lipoma as seen in the present case [3,5,6]. And, because of its rarity, it is not well known that a lipoma with fat necrosis may show similar MRI findings to atypical lipomatous tumor. In addition, CT and US in case reports with necrotic lipoma also showed circumscribed fatty mass containing irregular nonadipose areas that suggest the possibility of atypical lipomatous tumor [7,8]. Therefore, it is important to confirm the diagnosis histologically, when we encounter a lipomatous tumor that the imaging findings indicate to be atypical lipomatous tumor. However, we should be careful when harvesting tissue samples because atypical lipomatous tumor sometimes appears very similar to mature adipose tissue in lipomatous regions [9]. Therefore, the differential diagnosis may be difficult if only lipomatous regions are biopsied. Such insufficient biopsy may lead us to overperform surgery, and in fact, there were some cases which received wide excision based on MRI findings that were consistent with atypical lipomatous tumor although the preoperative biopsies suggested lipoma [10,11]. On the other hand, irregular hyperchromatic stromal cells are often present in the thickened septa, an important key to diagnosis of atypical lipomatous tumor [12]. Thus, when we perform incisional biopsy of lipomatous tumors which are indistinguishable in the imaging findings, we should plan to take samples of not only the adipose lesion, but also the thickened septa in order to reach the correct diagnosis.

Acknowledgements

We thank Brian K. Purdue for his editorial assistance.

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