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Case Report

The MRI Findings of Collagenous Fibroma (Desmoplastic Fibroblastoma) Arising in the Supraspinatus Muscle: A Case Report

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Collagenous fibroma (desmoplastic fibroblastoma) is a rare benign fibrous soft tissue tumor. This lesion commonly presents with painless, non-tender, mobile and slowly growing mass in subcutaneous tissue or skeletal muscle at various anatomic location. On magnetic resonance image (MRI), the mass shows area of low signal intensity on both T1- and T2-weighted pulse sequences. This low signal intensity presents areas of low cellularity in a background of abundant collagen. We describe the unique case of collagenous fibroma in the shoulder joint presenting with 4-years history of long-standing pain, which is unusual clinical manifestation of this benign soft tissue tumor without previous trauma history.

Index words : Collagenous fibroma · Desmoplastic fibroblastoma · Shoulder · Magnetic resonance imaging (MRI)

INTRODUCTION

Collagenous fibroma (desmoplastic fibroblastoma) is a rare fibrous soft tissue tumor, characterized by stellate- and spindle-shaped fibroblastic cells dispersed in densely fibrous to fibromyxoid matrix with hypocellularity (1, 2). This tumor classically presents a painless, firm and slowly growing mass (1, 3). It was first described by Evans (4) in a report of seven cases published in 1995 to classify a distinctive fibrous soft tissue tumor. One year later, this tumor was renamed "collagenous fibroma" by Nielsen et al. (5). This tumor has clinicopathologically distinct and completely benign feature in the previous reported cases (4–8). It is important to differentiate this tumor from other malignant soft tissue tumors before surgical excision to prevent overtreatment. Since its first description, only a few series have been reported its image features (9, 10). We report a case of collagenous fibroma with night pain in the shoulder and emphasize the MRI findings of collagenous fibroma with pathologic correlation.

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CASE REPORT

A 61-year-old previously healthy man presented with a 4-year history of aggravated night pain in the left shoulder. He had no history of trauma. A physical examination revealed no palpable mass and no pathological change to the overlying skin. He had moderate tenderness at the left greater tuberosity of humerus and mild tenderness at the medial and inferior aspect of left scapula without any neurologic problem. A plain radiograph of the left shoulder depicted an acromiolclavicular joint degeneration and subacromial spur change. The soft tissue calcification was not evident. An ultrasonography (US) (iU22, Philips Medical System, Bothell, WA, Germany) revealed a 6 × 4 cm sized homogenous low echoic,

avascular soft tissue mass located in the deep site of supraspinatus tendon and muscle. The differential diagnosis on US was fibromatous tumor or pigmented villonodular synovitis on shoulder joint. We performed MR imaging by using a 1.5 Tesla magnet MR unit (Signa HD, GE Medical system, Milkwaukee, WI, USA) to characterize the internal architecture and found well-marginated mass under the supraspinatus muscle and tendon extending to the spinoglenoid notch and joint capsule. This mass presents slightly indentation on the supraspinatus muscle and tendon. On T1-weighted MR images, the mass showed inhomogenous intermediate and hypointense signal intensity to muscle (Fig. 1a). On T2-weighted MR images, the mass showed hypointense signal intensity to muscle (Fig. 1b, c). On gadolinium-enhanced T1-weighted images, the majority of this lesion revealed no significant enhancement (Fig. 1d). US guided gun biopsy was performed. Microscopically, the tumor was composed stellate-shaped fibroblastic cells distributed in abundant collagen component (Fig. 1e). The cellularity was very low. Sarcomatous component was absent. Immunohistochemically, the tumor cells showed positive reactivity for vimentin. The tumor

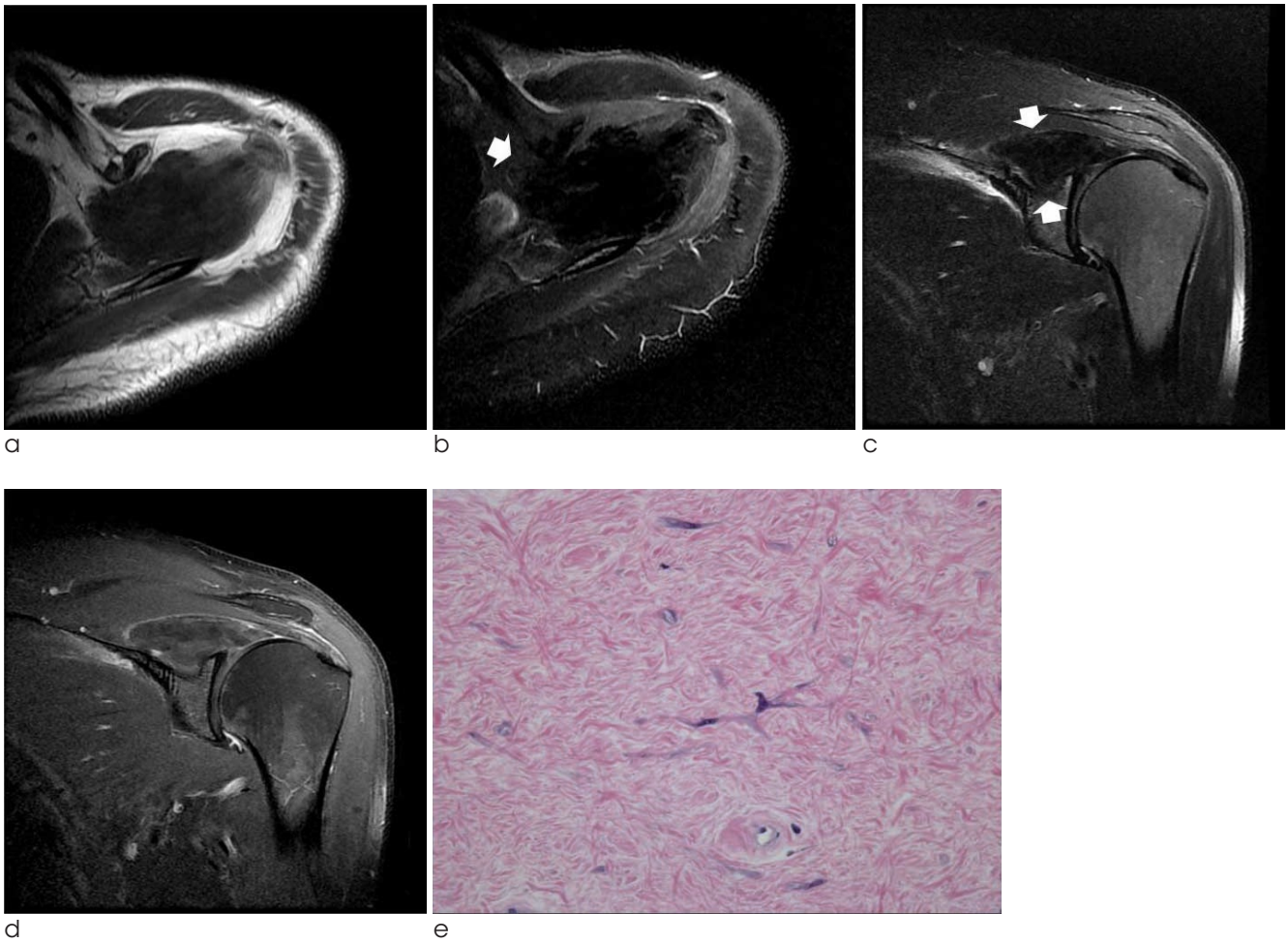

Fig. 1. A 62-year-old man with collagenous fibroma of the left supraspinatus muscle.
a. Axial T1-weighted MR image of left shoulder shows a well-circumscribed and multilobulated soft tissue mass of intermediate to low signal intensity in the left supraspinatus muscle.
b. Axial fat suppressed T2-weighted MR image shows heterogenous hypointensity to muscle with partial infiltration to supraspinatus muscle.
c. Coronal fat suppressed T2-weighted MR image shows a low signal intensity mass (arrows) deep to the left supraspinatus muscle.
d. Coronal fat suppressed T1-weight MR image after gadolinium administration shows no significant enhancement in the left supraspinatus muscle.
e. Photomicrograph of the histopathologic specimen shows scattered stellate-shaped fibroblasts in abundant collagenous matrix (H & E stain, ×400).

was negative for smooth muscle actin (SMA), desmin, epithelial membrane antigen (EMA), S-100 protein, CD34 and CK (AE1/AE3). The original diagnosis of this tumor was collagenous fibroma. The patient had not treated with surgical resection.

DISCUSSION

Collagenous fibroma (desmoplastic fibroblastoma) is a benign fibrous soft tissue tumor with distinct clinicopathologic features (4–6). These tumors show predilection for male patients (5:1) and have a peak incidencein the fifth and sixth decades of life. The lesion has been reported in the arm (24%), shoulder (19%), posterior neck or upper back (14%), abdominal wall and hip joints (6%) (5, 6). Most tumors were located in the subcutaneous tissue or in skeletal muscle same as our case (1, 10). Clinically, the lesion is characteristic slowly growing, painless mass that has increased in size for over a year in approximately one-third of case (6). Collagenous fibroma typically infiltrates subcutaneous fat and skeletal muscle, and this has been observed in up to 51% of cases (6). To our knowledge, presentation with ongoing pain or neurologic deficit is rare feature, despite nerve entrapment. Miettinen and Fetsch (6) have described nerve entrapment on histological finding in up to one-third of cases without any neurologic symptoms. Fong F, et al. (3) has reported a case with neurological symptom combined previous trauma history and described that preceding trauma may induce pain. Particularly in the shoulder area, rotator cuff impingement or joint instability may rarely result from the specific location of the tumor around rotator cuffs or bursal spaces (7). In our case, the patient presented night pain without any neurologic deficit and that is due to tumor infiltration into supraspinatus muscle and tendon.

Histologically, the lesion consists of stellate- and spindle shaped fibroblastic cells sparsely distributed in collagenous and fibromyxoid matrix (1–10). Cellularity is very low and mitotic figures are absent (4–6). According to Miettinen and Fetsch (6), its hypocelluarity represents a benign neoplasm or persistent reactive process.

A few case reports describe the MRI features of this tumor (1, 2, 8, 10). On MRI, the lesion shows a mass with low signal on both T1- and T2-weighted images. Gadolinium-enhanced T1-weighted images shows non-enhancing areas within the mass. The areas of low signal intensity on both T2- and contrast enhanced T1-weighted images correspond with a hypocellular component with abundant collagen fiber (1, 2, 8, 10). In a soft-tissue tumor, decreased signal on T2-weighted pulse sequence is attributed to abundant collagen and marked hypocellularity. Soft-tissue tumors with low signal intensity on T2-weighted images include neurofibroma, cicatricial fibroma, malignant fibrous histiocytoma, aggressive fibromatosis, calcified lesions (myositis ossificans, extraskeletal osteosarcoma or chondrosarcoma, and synovial sarcoma) (2, 3).

The radiological differential diagnoses includes nodular fasciitis, fibroma of the tendon sheath, neurofibroma, calcifying fibrous pseudotumor, sclerotic fibroma, desmoid tumor (extraabdominal fibromatosis), and other malignant neoplasm such as low grade fibromyxoid sarcoma (1, 2, 6, 10). The most important differential diagnosis to be considered is desmoid tumor. The similarity in imaging findings between collagenous fibroma and desmoid tumor is because of the collagen content in both lesions. Desmoid tumor is more cellular, more vascular and more infiltrative at its periphery than collagenous fibroma. On imaging study, desmoid tumor would not be clearly circumscribed and have larger areas showing high signal intensity on T2-weighted image representing more cellularity than collagenous fibroma (1–3, 10). Treatment of collagenous fibroma is surgical resection (1–3, 8, 10). Neither local recurrence nor metastasis after resection has occurred, wherase the high local recurrence rate (29–65%) of desmoids tumor has been reported (8).

In conclusion, we report a case of a collagenous fibroma of the supraspinatus muscle presented with a night pain. Although it is a rare soft tissue tumor, collagenous fibroma should be included in the differential diagnosis of low signal intensity soft tissue mass on T2-weighted MR images.

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견관절에 발생한 교원성 섬유종 (결합조직형성 섬유모세포종): 증례 보고

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교원성 섬유종 (결합조직형성 섬유모세포종)은 드문 양성 섬유성 연조직 종양이다. 이 병변은 다양한 해부학적 위치의 피하조직이나 골격근에서 보통 서서히 자라는 무통성의 움직이는 종괴로 나타난다. 자기공명영상에서 이 종괴는 T1, T2 강조영상 모두에서 저 신호강도를 보인다. 이 저 신호강도는 풍부한 교원질 배경하의 낮은 세포질 성분을 반영하는 것이다. 저자들은 선행된 외상의 전력이 없고, 양성 연조직 종양에서는 드문 임상 징후인 4년간의 통증을 동반한, 견관절에 생긴 교원성 섬유종의 증례를 보고하고자 한다.

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