Acute sarcoid myositis with unusual radiologic findings

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ABSTRACT
A 59-year-old man presented with bilateral calf pain and swelling for two weeks. Ultrasound and magnetic resonance imaging examination showed multiple bilateral, nodular, and spindle-shaped lesions in the gastrocnemius and soleus muscles. On physical examination, hyperpigmented, papular lesions were noticed; biopsy of the skin of his right elbow showed granulomatous inflammation. His angiotensin converting enzyme level was markedly elevated. Computed tomography showed diffuse interstitial thickening, miliary nodules, and traction bronchiectases throughout the lung parenchyma. Ophthalmologic examination showed uveitis in his left eye. Based on the lung, eye, and skin findings, a clinical diagnosis of sarcoidosis was made. After two months of corticosteroid treatment, his muscle lesions largely resolved.

Key words: • radiology • myositis • sarcoidosis

Sarcoidosis is a granulomatous inflammatory disease of unknown origin affecting multiple organ systems. It mostly affects the hilar lymph nodes, eyes, and heart. Symptomatic muscle disease is rare and is seen in less than 0.5% of cases. There are three types of symptomatic muscle disease: chronic myopathy, palpable nodules, and acute myositis (1–4). Herein we report the ultrasound (US) and magnetic resonance imaging (MRI) findings of a patient with sarcoidosis who initially presented with acute myositis.

Case report
A 59-year-old man with a two-week history of bilateral calf pain and swelling was referred to our radiology department for the evaluation of his lower extremities. Presumptive clinical diagnosis was deep vein thrombosis in his lower extremities. Doppler US findings were normal. In the axial US examination, there were multiple bilateral, hypoechoic nodular lesions in the gastrocnemius and soleus muscles. Some of these lesions were spindle-shaped and were seen along the muscle fibers in sagittal US examination. They were avascular in the color and power Doppler US (Fig. 1). The creatine kinase (CK) level was 58 U/L (normal, 22–240), aspartate aminotransferase (AST) was 21 IU/L (normal, 8–40 IU/L), alanine aminotransferase (ALT) was 10 IU/L (normal, 4–40 IU/L), lactate dehydrogenase (LDH) was 33 IU/L (normal, 124–232 IU/L), C-reactive protein (CRP) was 10.8 mg/dL (normal, 0–10), and the erythrocyte sedimentation rate (ESR) was 1 mm/hr. Serum calcium level was within normal limits. For further examination of muscle lesions, we performed extremity MRI. There were multiple nodular and spindle-shaped lesions in the gastrocnemius and soleus muscles bilaterally. When compared with muscle fibers, these lesions were isointense on T1-weighted images and hyperintense on T2-weighted images. They showed diffuse enhancement after contrast medium was injected (Fig. 2). On physical examination, we noticed hyperpigmented papular lesions measuring 2 mm to 3 cm in the skin of his elbow and both calves. The biopsy of the skin of his right elbow showed granulomatous inflammation. There was no necrosis. Because of his complaint of mild productive cough, high resolution computed tomography (HRCT) of the lung was performed. This showed diffuse interstitial thickening, miliary nodules, and traction bronchiectases throughout the lung parenchyma. Angiotensin-converting enzyme (ACE) level was 115 U/L (normal, 7–25). Ophthalmologic examination showed uveitis in his left eye. Based on the lung, eye, and skin findings, the presumed clinical diagnosis was sarcoidosis. Prednisolone was administered at 12 mg/day. Afterwards, azathioprine (Imuran) 100 mg/day was given. After two months, muscle weakness was significantly decreased. ACE level (20 U/L) returned to normal, and uveitis regressed. On US examination, his muscle lesions had largely resolved.
Acute sarcoid myositis

According to recommendations of Baughman et al., a diagnosis of sarcoidosis can be established by means of the following criteria (5): (i) the presence of granuloma in a biopsy specimen without evidence of tuberculosis, fungus, malignancy, or other cause of granuloma, together with clinical features suggesting sarcoidosis, such as bilateral hilar adenopathy on chest radiography, erythema nodosum, uveitis, and maculopapular skin lesions; (ii) in the absence of biopsy material, the presence of previously mentioned clinical features and additional features highly consistent with sarcoidosis, such as raised concentra-

**Figure 1.** a, b. Axial color Doppler US (a) and sagittal US (b) images show multiple hypoechoic lesions in the gastrocnemius and soleus muscles which are avascular in Doppler examination (a).

**Figure 2.** a–d. Extremity MRI shows multiple lesions which are isointense on axial T1-weighted (a) and hyperintense on axial T2-weighted (b) MR images compared to muscle. The lesions show homogenous contrast enhancement on T1-weighted fat-suppressed axial (c) and coronal (d) MR images and are nodular and spindle shaped on the coronal image (d).

**Discussion**

According to recommendations of Baughman et al., a diagnosis of sarcoidosis can be established by means of the following criteria (5): (i) the presence of granuloma in a biopsy specimen without evidence of tuberculosis, fungus, malignancy, or other cause of granuloma, together with clinical features suggesting sarcoidosis, such as bilateral hilar adenopathy on chest radiography, erythema nodosum, uveitis, and maculopapular skin lesions; (ii) in the absence of biopsy material, the presence of previously mentioned clinical features and additional features highly consistent with sarcoidosis, such as raised concentra-
tion of ACE, bronchoalveolar lavage fluid lymphocytosis, abnormal gallium scan, and lupus pernio. Evidence of multiple organ system involvement has also been emphasized (5, 6). Sarcoïd myopathy was first described in 1908 by Licharew, who discussed the case of a 17-year-old girl with lupus pernio, splenomegaly, and multiple nodules in muscles (7).

Symptomatic muscle involvement in sarcoidosis has three clinical types: chronic myopathy, palpable nodulosis and acute myositis (3). The most common type is chronic myopathy, characterized by slowly progressive weakness and disability over months or years. It is usually found in chronic stages of the disease. Patients with chronic myopathy are usually middle-aged women with symmetrical proximal muscle disturbance. The trunk and neck muscles may be involved. Palpable nodulosis is an unusual type. These nodules are initially soft and small, but they increase in size and become painful. The most commonly involved site is the lower extremity (90%), followed by the upper extremity (43%). Masses vary in size from several centimeters to 22 cm in length (8). The rarest form of muscle involvement in sarcoidosis is acute myositis (9). Patients with this form have tenderness, myalgias, and proximal muscle weakness. Additional findings may include acute polyarthritis or erythema nodosum. Acute myositis is seen in patients younger than those with palpable nodulosis and chronic myopathy, with onset typically before 30 years of age (3). Acute myositis may be the initial manifestation of sarcoidosis or be part of the chronic progressive form. The patients with acute myositis usually have elevated CK and ESR, but normal levels have also been reported. Patients with palpable nodulosis also have nonspecific laboratory parameters (e.g., there have been several reports of normal serum calcium and CK; others have had high ESR, peripheral blood eosinophil counts and hypergammaglobulinemia). However, in most cases, chest radiographs were abnormal. Laboratory studies in chronic sarcoid myopathy may be normal, but ESR and serum immunoglobulins are usually increased (10).

The age of our patient is older than defined in the literature (3). Generally, sarcoidosis is identified clinically in patients with foggy vision or medias-