

Diabetic Muscle Infarction

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Diabetic muscle infarction was first described in 1965 by Angervall and Stener and was termed tumoriform focal muscular degeneration. It is a rare, but an upcoming complication of diabetes seen in patients on longstanding insulin therapy. It is also seen on patients with multiple end-organ microvascular complications. Diabetic muscle infarction is a distinct entity with characteristic clinical and radiological findings, more common than has been previously recognized. The typical clinical presentation includes abrupt onset of thigh pain and nontraumatic swelling. Here, we report a case of thigh involvement in an insulin-dependant diabetic with typical radiological and pathological correlation.

KEY WORDS: Insulin-dependant diabetes, muscle infarction

Case Report

A 39-year-old man, a known diabetic, on mixed insulin twice daily (12 U morning and 10 U night) for the past 10 years, presented to the Orthopedic Outpatient Department with complaints of swelling and pain of acute onset in the anterior aspect of the right thigh. There was no history of fever, recent injury to the thigh or restriction of movements. There was no history of muscle wasting, weakness or numbness of the feet ruling out peripheral neuropathy. There was history of diabetic retinopathy. Routine laboratory investigations were within normal limits, except for ESR, which was 83 mm/h. Clinical diagnosis of deep vein thrombosis was made and the patient was referred to us for venous Doppler, which was normal.

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A radiograph was taken to rule out osteomyelitis. Ultrasonogram of the thigh revealed thickened rectus femoris muscle with hypoechoic texture - suggestive of muscle edema [Figure 1]. No anechoic area with internal motion seen to suggest an abscess. MRI of the right thigh showed predominantly high-signal intensity of rectus femoris muscle and adductor group of muscles on T2-weighted images in coronal and axial planes [Figures 2 and 3].

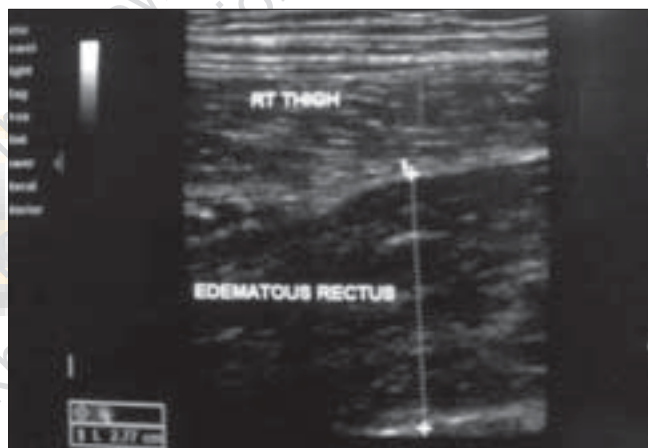


Figure 1: Ultrasonography of the right thigh showing thickened and edematous right rectus femoris muscle

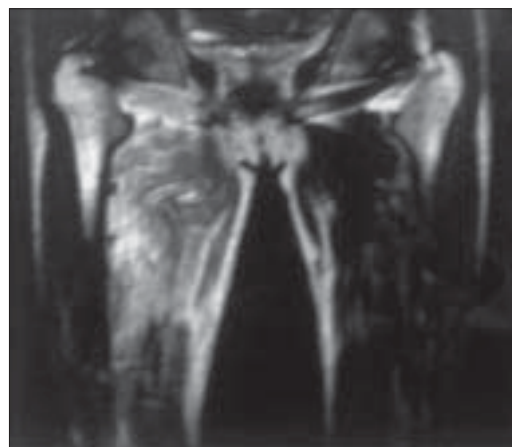


Figure 2: Coronal MRI showing high-signal intensity of right rectus femoris and adductor group of muscle on T2-weighted images

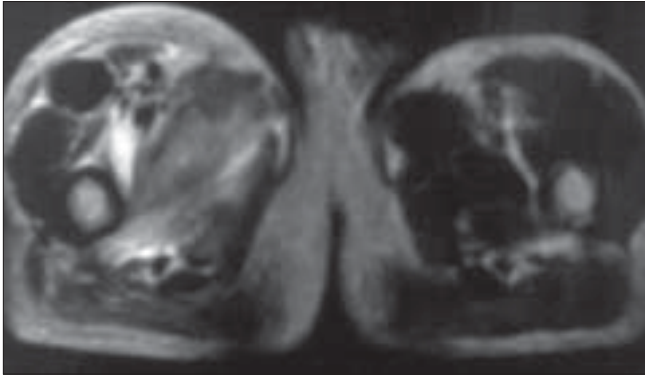


Figure 3: Axial MRI showing increase in the bulk of the muscle on the medial aspect of the right thigh when compared to the left

Fine needle aspiration cytology of the swelling revealed large area of muscle necrosis and edema. Lymphocytic interstitial infiltrates were noted, confirming muscle infarction.

Discussion

Diabetic muscle infarction, also known “tumoriform focal muscular degeneration,” is a rare but an upcoming complication of diabetes mellitus.^[1] It is seen in patients with longstanding insulin-dependant diabetes mellitus and multiple end-organ microvascular complication.^[1] The disease can be bilateral in more than one-third of the patients.^[2] Risk factors included long duration of diabetes mellitus (mean 15.2 years), poor control (20%) and microvascular diabetic complication (neuropathy, retinopathy and nephropathy; 94%) and insulin-dependant diabetes mellitus (77%).^[3] Muscles commonly involved are the adductors of the thigh, vastus lateralis and biceps femoris. Predilection is in the decreasing order of quadriceps (62%), hip adductors (13%) and leg muscles (13%).^[3]

Plain radiograph of the involved area showed only one instance of bony change.^[4] Sonographic findings in diabetic muscle infarction include a well-marginated hypoechoic intramuscular lesion with internal linear echogenic structures coursing through the lesion, an absence of internal motion or swirling of fluid transducer pressure and a lack of a predominantly anechoic area.^[5] We believe these characteristics may help differentiate diabetic muscle infarction from an abscess or necrotic tumor.^[5]

CT was considered a less sensitive test, as only 83% of patients with muscle infarction have abnormal CT

findings. MRI reveals edematous muscle, which is a nonspecific finding.^[6] MRI examination reveals well-defined region with iso-low signal intensity (relative to muscle) on T1-weighted images and predominantly high-signal intensity on T2-weighted STIR or PD weighted with fat saturation images.^[6] MRI, after contrast administration, reveals central areas of nonenhancement surrounded by enhancing muscle indicative of muscle infarction of the nonenhancing areas.^[7]

A histological feature of diabetic muscle infarction is consistent with edematous necrotic tissue.^[1,2] The differential diagnosis for diabetic muscle infarction includes DVT, acute exertional compartment syndrome, muscle rupture, abscess, hematuria and inflammatory myositis.^[8] Management includes avoidance of weight bearing and simple analgesics. After acute phase, physical therapy and rehabilitation are useful.

Thus, increase in clinical awareness is important for early recognition, particularly in diabetic patients presenting with painful thigh or leg swelling. MRI is the diagnostic study of choice and in the appropriate clinical setting may obviate the need for muscle biopsy.

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