

## CASE REPORT

# Recurrent diabetic muscle infarction in end-stage renal disease

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### ABSTRACT

Diabetic muscle infarction is a rare complication of long-standing diabetes mellitus (DM) with multiple-organ microvascular sequels. This report covers sixty-year old male with a history of DM for 12 years and an experience of hemodialysis for one year with acute onset of pain in the right calf. The diagnosis of diabetic muscle infarction needs increasing awareness of clinicians. The main aim of this case report is to draw attention to this condition, so that unnecessary invasive diagnostic test, biopsy and surgical debridement which could be avoided.

**Key words:** muscle infarction, diabetes mellitus, end-stage renal disease

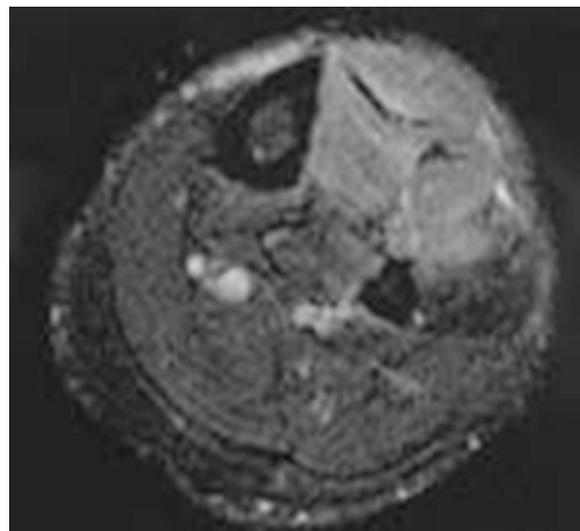
### INTRODUCTION

Diabetic muscle infarction (DMI) is a rare complication of long-standing and poorly controlled diabetes mellitus (DM) especially type I. DMI was first described in 1965 by Angervall & Stener and was termed as tumoriform focal muscular degeneration.<sup>1, 2</sup> Diabetic muscle infarction is a distinct entity with characteristic clinical & radiological findings more common than that thought before. This condition is less diagnosed mainly because of the unfamiliarity of the clinicians with this rare condition.<sup>3</sup> DMI is used to refer to spontaneous ischemic necrosis of skeletal muscle, unrelated to atheroembolism or occlusion of major arteries. Affected patients are faced with acute or subacute onset of painful swelling and tenderness of the thigh (80%) and less common in the calf (20%) that evolves over days or weeks. There is no history of trauma or preceding infection. Swelling may be mildly or extremely tender with mild fever. Definite diagnosis is made by biopsy. The primary pathologic findings in muscle biopsy include muscle necrosis, edema, occlusion of arterioles, and capillaries by fibrin.<sup>4</sup> MRI imaging may show high intensity in the involved muscle as well as subcutaneous edema and sub facial fluid. Loss of normal fatty inter muscular contour is a relatively common finding in T1 weighted images.<sup>1</sup>

### CASE REPORT

We report a sixty-year old male referred to the inter-

nal emergency department with a history of DM, hypertension and Hyperlipidemia for 12 years, chronic renal failure (CRF) and hemodialysis for one year complaining of pain in the right calf for 3 days. Pain was exaggerated with walk. There was no preceding history of fever and trauma. He was receiving Insulin, Losartan, Aspirin, and Atorvastatin. On examination, there was tenderness, warmth in palpation, swelling, and induration in the right medial calf. There was restriction of movement, while muscle power was normal. The difference between the two calves



**Figure 1,** Axial fat-suppressed T2-weighted image shows diffuse edema of tibialis anterior and extensor digitorum longus muscles.

was 2.5 cm. This patient had two similar attacks in the right and left calves during the last year that were treated for deep vein thrombosis despite of normal Doppler sonography. This patient had two similar

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attacks in the right and left calves during the last year that were treated for deep vein thrombosis despite of normal Doppler sonography. In laboratory test, complete blood counts, creatin kinase (CK), Lactate dehydrogenase (LDH), and erythrocyte sedimentation rate (ESR) were normal. The serum creatinine, fasting blood sugar, and low density lipoprotein were 6.5 mg/dl, 220mg/dl and 118mg/dl, respectively. The levels of serum calcium, vitamin D3, and parathyroid hormone (PTH) were 8.8 mg/dl, 7.5 ng/ml, and 156 ng/ml (normal= 15-65), respectively. The liver function test was normal. The antiphospholipid and anticardiolipin tests were negative. Ultrasound of the right calf showed subcutaneous soft tissue and intramuscular edema in poster medial aspect of the calf with no evidence of abscess or collection. Colors Doppler Sonography did not show evidence of deep vein thrombosis. MRI of the right calf showed altered signal intensity involving the tibialis anterior and extensor digitorum longus muscles (Fig. 1). It was iso- to hypo-intense on T1 and hyperintense on T2 and fat-suppressed images. There was no evidence of collection or abscess and osteomyelitis. Diagnosis of DMI was made bases on these findings. The patient was treated with meloxicam, rest and thermal modality. The improvement was complete after two weeks.

## DISCUSSION

Pathogenesis of DMI is still unclear, but a diffuse micro-angiopathic process possibly associated with hypoxia-reperfusion injury may contribute to this complication.<sup>5</sup> Occlusive arteriosclerosis has been postulated to have a major role in DMI. However, some authors have shown an alteration on the form of hypercoagulability and impaired response to tissue plasminogen activator.<sup>6</sup>

Spontaneous infarction of the muscle is a rare condition which usually affects patients with long-standing and poorly controlled diabetes mellitus. It is more common in type I diabetes and the majority of patients have multiple microvascular complication including retinopathy, nephropathy, and neuropathy.<sup>3</sup>

Most patients with DMI are young with a mean age of 37 years. They usually have diabetes mellitus for 5 to 30 years and are on insulin therapy. The female-male ratio is 1.7:1. Usual site of occurrence include quadriceps (62%), hip adductors (13%), hamstrings (8%), and hip flexor (2%) muscles. Rarely, the calf and anterior tibia muscles are involved.<sup>5</sup>

It causes acute or sub-acute pain, swelling and tenderness typically in the thigh or calf found in 98% of the cases.<sup>1,3</sup> A palpable mass of indurated area is felt in 44% of the cases. Our patients had a painful indurate swelling of the calf.<sup>7</sup> The diagnostic choice for the condition is MRI scan. In the T2 weighted sequences, it shows high intensity in the involved muscle with diffuse enlargement of the muscle group and partial loss of normal fatty intermuscular septa. The

T1 weighted sequences show iso- to hypo-intense images. Other features seen in the MRI are diffuse enlargement with ill-defined border and tiny foci of hyper intense signal consistent with foci hemorrhage.<sup>1</sup> The MRI of our patient showed the same findings as above.

Needle biopsy may provide diagnostic tissue. Histological feature of DMI is necrosis of myocyte with generation and atrophy of surrounding fibers and edema, but occlusion of arterioles and capillaries by fibrin and vessel wall thickened and hyalinised may also be detected.<sup>3,5</sup>

Differential diagnosis for DMI includes DVT, acute exertional compartment syndrome, muscle rupture, abscess, and inflammatory myositis.<sup>2</sup>

Management of diabetic muscle infarction involves rest, avoidance of weight bearing and simple analgesic or nonsteroidal anti-inflammatory drugs (NSAIDs). Those with sever muscle pain may require use of narcotic.<sup>2,3</sup> DMI resolves spontaneously over a few weeks to months in most patients. The recovery can last for more than 6 weeks with a recurrence rate of 50%.<sup>3,8</sup> As in this case, the patient's symptoms improved remarkably after treatment with meloxicam for 5 days and complete recovery was gained after 2 weeks of treatment.

## CONCLUSION

DMI is a rare complication of long-standing diabetes. Clinical awareness is important for early diagnosis particularly in the diabetic patients with painful thigh or leg swelling. MRI is a diagnostic choice which in appropriate clinical setting may obviate the need for muscle biopsy.

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