Case Report

Diabetic muscle infarction: A case report

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Abstract

Diabetes muscle infarction (DMI) is a rare complication of diabetes in which patients who present with DMI more commonly have some form of kidney disease in addition to diabetes mellitus. DMI typically presents with muscle pain and swelling. Diagnosis typically requires imaging (MRI with gadolinium contrast is the gold standard) and a variety of laboratory studies may aid in the diagnosis. Treatment of DMI varies depending on the severity of the case. In general patients recover quickly, though there is a risk of recurrence. This particular case report is a 36 year old female who presented with right lower extremity pain and chronic kidney disease. Case reports like this are important to highlight DMI as it is likely to become more common as diabetes continues to become more prevalent.

Keywords: Complications of Diabetes, Diabetes, Muscle Infarction

Introduction

Diabetic muscle infarction (DMI) is a rare complication of diabetes occurring equally in both type one diabetes mellitus (T1DM) and type two diabetes mellitus (T2DM). It is so rare that prevalence is difficult to determine given most reports of DMI are case reports.[1,2] A systematic review done in 2015 described that there were less than 200 cases reported and described a bulk of those cases with the following information:[2] The mean age of diagnosis is 44.6 years, although DMI tends to present at a younger age in patients with T1DM (35.9 years) as compared to patients with T2DM (52.2 years).[2] It frequently occurs in patients with a long history of diabetes (the average duration of diabetes mellitus (DM) at diagnosis of DMI is 18.9 years for T1DM and 11.0 years for T2DM).[2] The majority of patients have other comorbid conditions such as retinopathy, nephropathy, and neuropathy.[2] Of all the microvascular complications, diabetic nephropathy is the most common complication to be present when patients present with DMI—up to 71–75% of cases have some form of kidney disease.[2,3]

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Received: 08-06-2022 **Revised:** 12-07-2022
Accepted: 07-02-2023 **Published:** 30-09-2023

Access this article online

Quick Response Code:

Website: http://journals.lww.com/JFMPC

DOI: 10.4103/jfmpc.jfmpc_1228_22

Case History

A 36-year-old female presented to the emergency department with a one-week history of severe right leg pain and lower extremity numbness. She has a history of T1DM (diagnosed in 1997), chronic kidney disease (CKD) stage V (on hemodialysis), and heart failure (with a preserved ejection fraction of 50–55% in 2019). On examination, there was severe pain to light palpation of her right posterior leg without crepitus or overlying erythema. She was afebrile and hypertensive with a blood pressure of 198/89 mmHg. Her laboratories were notable for white blood count of 29.7 K/cmm (4.00–12.40 K/cmm), an anion gap of 22, creatinine (Cr) of 3.59 mg/dL, proBNP of 114,000 pg/mL, CRP of 261 mg/L, a lactate of 0.8 mmol/L, and an alkaline phosphatase of 302 U/L. Her blood glucose was 364 mg/dL and her HbA1c was 12.1%.

An ultrasound of the right lower extremity was unremarkable and did not show a deep vein thrombosis. Magnetic resonance imaging (MRI) of the spine did not show nerve root compression

How to cite this article: Emma CL, Sara KB, Gregory PJ, Matthew PG. Diabetic muscle infarction: A case report. J Family Med Prim Care 2023;12:2161-3.

or other acute processes. A subsequent computerized tomography (CT) scan demonstrated a mottled appearance of the musculature in the right thigh region with fluid tracking into the myofascial planes, most notably between the adductor magnus and semimembranosus muscle in the poster thigh. Further imaging—an MRI of the leg also suggested DMI [Figures 1–3]. No discrete organizing or drainable fluid collection was identified. Given her longstanding, poorly controlled T1DM, clinical presentation, and imaging studies, the patient was admitted to the hospital with the suspected diagnosis of diabetic myonecrosis.

On admission she started on hydromorphone 2–4 mg every four hours, aspirin 81 mg daily, celecoxib 100 mg twice daily, and gabapentin 300 mg nightly. Pain was difficult to control and the patient required a ketamine drip for three weeks. Electromyography suggested mononeuritis which was suspicious for vasculitis or sciatic nerve compression. Later, an MRI of her right thigh demonstrated multiple abscesses in the fascial planes of her right hamstring, which required her to be started on IV antibiotics (Vancomycin) and eventually require serial incision and drainage by the acute care surgery team. She was discharged home four months later with the assistance of home health nurses, physical therapists, and occupational therapists.

Discussion

Physical exam findings which may indicate DMI are acute muscular pain and swelling, most frequently in the lower extremities.[2,3] Fever may rarely be reported[3] and there is generally no history of trauma.[1] Patients with a long history of DM with additional complications should undergo further imaging if they present with these symptoms.[1-4]

Next, the imaging study of choice is an MRI with gadolinium contrast. Imaging will show the increased signal intensity of T2-weighted images.[4] MRI may also show subcutaneous edema and subfascial fluid.[1] If sonography is used, DMI will appear as a well-marginated, hypoechoic, intramuscular lesion.[4]

In addition, though laboratories are not required for diagnosis, there are some laboratory findings that may be suggestive of DMI. Laboratory findings that may support the diagnosis of DMI include elevated creatine kinase, leukocytosis, increased erythrocyte sedimentation rate, elevated CRP, increased alanine aminotransferase, aspartate transaminase, and lactic dehydrogenase.[1,5]

Once a diagnosis is made, treatment of DMI includes pain management with analgesics, optimized glycemic control, and low-dose aspirin.[1,2,5] Patients may also require immobilization for a short period of time.[5]

Following treatment, DMI will resolve spontaneously over weeks to months. Patients tend to recover faster with antiplatelet and anti-inflammatory drugs and longer when they undergo surgical excision.[1] The patient may be at risk of recurrence (recurrence rate of 47.82%).[5]

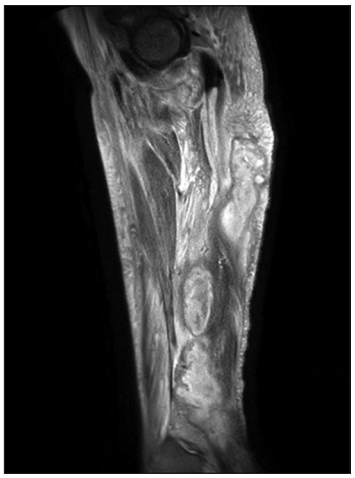

Figure 1: T2-weighted axial image of right thigh demonstrating an edematous, swollen, and atrophic appearance of the hamstrings and adductor muscles, compatible with myonecrosis. Posterior to hamstrings muscles, there is an organizing fluid collection that was drained and consistent with abscess

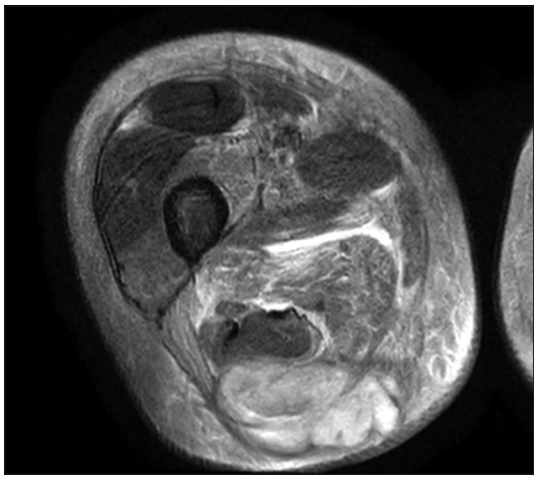

Figure 2: Sagittal STIR image demonstrating the craniocaudal extent of the organizing fluid collection in the posterior thigh

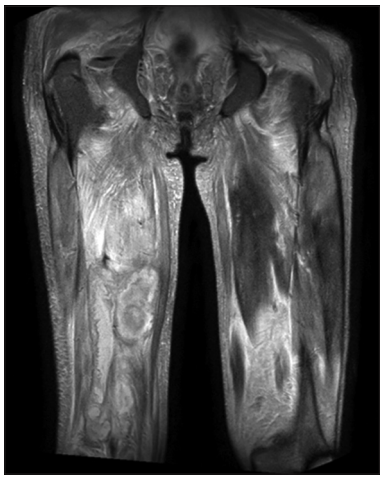

Figure 3: Coronal STIR image demonstrating organizing fluid collection and atrophic, edematous appearance of the posterior muscles of the thigh, with a contralateral comparison to the normal left thigh

As diabetes continues to become more prevalent, it can be expected that cases of DMI become more common. Therefore, clinicians need to be able to recognize and treat this rare complication of both T1DM and T2DM. The key findings that may indicate DMI are an MRI with increased signal intensity of T2-weighted images and a patient with the symptoms of acute muscular pain and swelling.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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