

DIABETIC MUSCLE INFARCTION IN A 59 YEAR OLD MALE: A CASE REPORTSidharth Kapoor¹, Himanshu Sharma²¹Associate Professor, Department of General Medicine, Acharya Shri Chander College of Medical Sciences, Sidhra, Jammu.²Postgraduate Student, Department of General Medicine, Acharya Shri Chander College of Medical Sciences, Sidhra, Jammu.**HOW TO CITE THIS ARTICLE:** Kapoor S, Sharma H. Diabetic muscle infarction in a 59 year old male: a case report. J. Evid. Based Med. Healthc. 2018; 5(27), 2087-2090. DOI: 10.18410/jebmh/2018/432**PRESENTATION OF CASE**

Diabetic muscular infarction (DMI) is a rare manifestation which can be seen in patients with long-standing diabetes mellitus. We present a patient with uncontrolled diabetes type 2 presented with pain, swelling. Clinical presentation and T2-weighted MRI of the leg helped in diagnosing DMI.

DMI is often misdiagnosed as cellulitis. This complication is usually associated with poor disease prognosis and high mortality with previous studies reporting a risk of 50% recurrence or another macro vascular complication occurring within one year. Thus, there needs to be greater awareness of this complication of diabetes.

59 year old non-obese man, shopkeeper by occupation, a known hypothyroid and with 12 year's history of uncontrolled type 2 diabetes presented to our hospital with 2 days history of walking difficulty. He reported that his symptoms started about 6 weeks ago, when one morning he felt sudden onset of pain and swelling in left thigh. He reported his complaints to a physician, who unsuccessfully treated him with various courses of antibiotics. The pain was gradually progressive to an extent that 2 days prior to hospitalization patient was unable to bear weight on his affected leg. He denied history of trauma, bite, muscle weakness or fever.

The patient had uncontrolled diabetes type 2 for over 12 years despite being on a maximum dose of oral hypoglycaemic agents.

On physical examination he had swelling in his left thigh with severe tenderness, 1+ non-pitting oedema and a 1.5 cm size difference compared with his right thigh. Proprioception and vibration were impaired in both lower extremities. There were multiple round/oval hyper pigmented macules on his both legs, that appeared recently during his problem course without any itching (Figure 1).

Erythrocyte sedimentation rate (ESR) was 95 mm/hr. Creatine phosphokinase was raised (316 U/L). HbA1C was his TLC was 11,500/ cmm. Spot urine albumin/creatinine ratio documented significant micro albuminuria. Urinary protein was 2.46 grams/ day. Patient's renal, liver function, calcium, phosphorus and uric acid were normal.

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Additional diabetic workup showed evidence of diabetic retinopathy. While in hospital, glycemic control was established with subcutaneous insulin therapy, pain was controlled with oral and injectable analgesics.

CLINICAL DIAGNOSIS

Diabetic muscle infarction (DMI), also known as diabetic myonecrosis, is a rare complication of diabetes mellitus (DM) and is usually associated with poor disease prognosis and high mortality.^{1,2}

DMI was first diagnosed by Angervall and Stenerin 1965, a very uncommon complication of Type1 DM (70% cases) or long standing poorly controlled Type 2 DM. (Angervall I, Stener B, Tumoriform muscular degeneration in two diabetic patients. *Diabetologica* 1965; 1:39-42).

It is often defined as spontaneous ischemic necrosis of skeletal muscle that is unrelated to athero embolism or occlusion of major arteries.^{2,3} The exact incidence of this condition is not known.

A systemic review of literature from inception to 2001 identified total 47 reports describing 166 episodes of DMI.¹ This disease presents with equal frequency in both male and females.¹ Established risk factors for acquiring a DMI include long-standing DM, poor control of glycemia and presence of micro vascular diabetic complications (neuropathy, retinopathy, nephropathy).^{1,2,4}

Though exact pathogenesis is not known but probably related to a diffuse microangiopathic process resulting in hypoxia reperfusion injury. (Trujillo Santos. Diabetic muscle infarction: An undiagnosed complication of long standing diabetes. *Diabetes Care* 2003; 26: 211-5, Grigoriadis, fam ag, staok m, ang lc. Reference number. Skeletal muscle infarction in diabetes mellitus. *Rheumatology* 2000;27:1063-8).

Usually, patients present with an acute onset of painful swelling of the thigh (80%), or less commonly the calf (20%), that then evolves over days or weeks.^{1,2}

Bilateral involvement may occur in 1/3 of all patients. (Trujillo Santos. Diabetic muscle infarction: An undiagnosed complication of long standing diabetes. *Diabetes Care* 2003; 26:211-5, Aboulafia AJ, monsoon DK, Kennon re. *Clinica*; I and radiological aspects of idiopathic diabetic muscle infarction. *J bonejoint surg br* 1999; 8:323-6.) Reference number Rarely a patient may exhibit an involvement of an upper extremity. Fever may be present in 10% cases.^{1,2}

In these patients, even if a DMI is suspected it is critical to rule out pyomyositis, spontaneous gangrenous myositis, clostridial myonecrosis, necrotizing fasciitis and venous thrombosis. It is of notice that diabetic patients are believed to be at increased risk for many of the above conditions.^{5,6}

DIFFERENTIAL DIAGNOSIS

A diagnosis of intramuscular hematoma should be considered in patients taking anticoagulation therapy and a possibility of calciphylaxis should be entertained in patients with underlying renal failure. Finally, even though a tumor of the muscle is unlikely to be mistaken for DMI.

DMI is a diagnosis of exclusion that can be supported by imaging and muscle biopsy.

On MRI, one often sees on T2-weighted sequences high intensity signal in the involved muscle, subcutaneous oedema and subfascial fluid.^{1,7-10} Loss of the normal fatty intramuscular septa is also a common sign of a DMI.^{1,7-10} Use of gadolinium in imaging may help distinguish non-enhancing infarcted muscle from surrounding inflammation or edema.^{1,7-10} Other imaging modalities including, computer tomography or arteriography are often non-diagnostic and have limited use in confirming diagnosis.

Exploration or core muscle biopsy is often performed to support the diagnosis of a DMI and usually shows muscle necrosis, oedema and/or occlusion of arterioles and capillaries by fibrin.² Few studies have attempted to investigate possible treatment and secondary prevention options for DMIs.^{1,11} Unfortunately, currently no unified consensus exists.

One retrospective analysis evaluated three possible therapies, which included bed rest and analgesia vs. antiplatelet agents and/or anti-inflammatory medications with rest and analgesia vs. surgical excision of necrotic tissue.¹

The authors report that time to recovery was the shortest when antiplatelet / non-steroidal anti-inflammatory (NSAID) agents were used (5 weeks to recovery), while surgical excision correlated with the longest time to recovery (13 weeks).

PATHOLOGICAL DISCUSSION

Overall, based on the reviewed literature, there appears to be a trend towards use of small dose of aspirin (80 mg per day) to prevent recurrence of a DMI or other macro vascular complications.

NSAIDs are often avoided in these patients due to high risk of precipitating acute kidney injury.

Finally, the benefits of physiotherapy were examined in one study that suggested that straining the involved leg may prolong recovery.¹² However, regular daily activity did not lead to disease exacerbation.¹²

Unfortunately, the prognosis for this rare complication of diabetes remains grim with only few patients surviving longer than a year free of another major macro vascular event such as myocardial infarction or a stroke.¹³ Furthermore, many patients develop a recurrence of a DMI, with ~50% of cases occurring on a contralateral side.^{1,2}



Figure 1. Multiple Non Itchy Round - Oval Hyper Pigmented Macules on his Both Legs in Case of DMI

Colour Doppler sonography of his left leg veins was normal. Soft tissue sonography revealed moderate swelling and inflammation with no sign of cellulitis or abscess. MRI showed a heterogeneous enhancement in left vasti muscles in T2-weighted images with musculofasciitis of anteromedial (Vasti muscles) compartment of left thigh with mild subcutaneous oedema over antero medial aspects of left thigh and inflammation of subfascial and intermuscular, (Figures 2, 3, 4, 5, 6).



Figure 2. T2-Weighted MRI Images with Musculo Fasciitis of Anteromedial (Vas muscles) Compartment of Left Thigh with Mild Subcutaneous Edema over Antero Medial aspects of Left Thigh and Inflammation of Subfascial and in Intermuscular Areas. (Longitudnal View)



Figure 3. Gadolinium Enhanced T2 -Weighted MRI Images with Musculo Fasciitis of Anteromedial (Vas muscles) Compartment of Left Thigh with Mild Subcutaneous Edema Over Antero Medial Aspects of Left Thigh and Inflammation of Subfascial and Intermuscular Areas. (Longitudnal View)

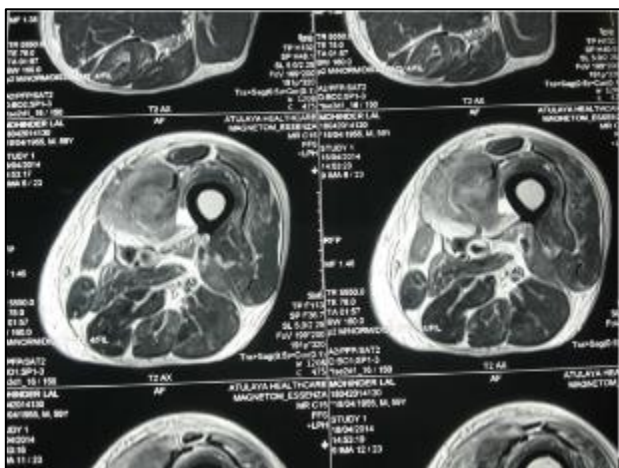


Figure 4. T2-Weighted MRI Images with Musculo Fasciitis of Anteromedial (Vasculocles) Compartment of Left Thigh with Mild Subcutaneous Edema over Antero Medial Aspects of Left Thigh and Inflammation of Subfascial and Intermuscular Areas. (Cross Sectional View)

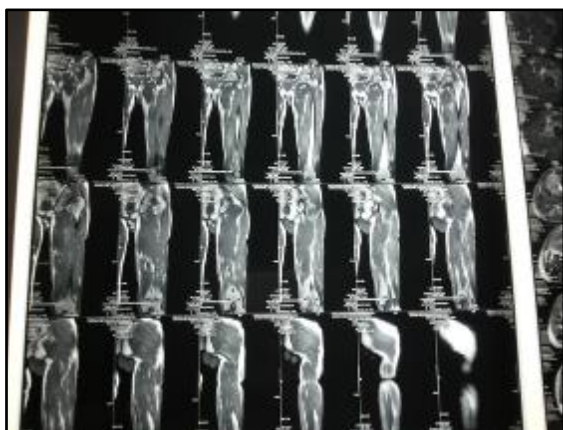


Figure 5. T2-Weighted MRI Images with Musculo Fasciitis of Anteromedial (Vasculocles) Compartment of Left Thigh with Mild Subcutaneous Edema over Antero Medial aspects of Left Thigh and Inflammation of Subfascial and Intermuscular Areas. (Longitudnal View)

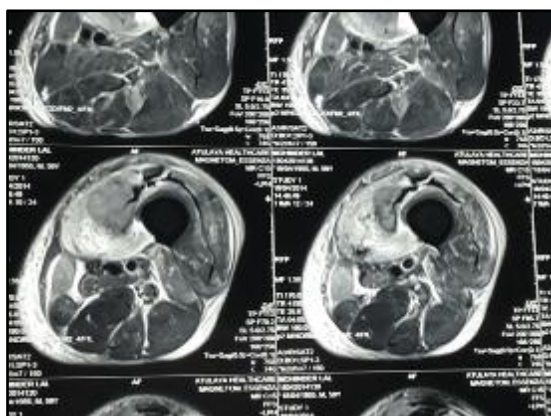


Figure 6. T2-Weighted MRI Images with Musculo Fasciitis of Anteromedial (Vasculocles) Compartment of Left Thigh with Mild Subcutaneous Edema over Antero Medial aspects of Left Thigh and Inflammation of Subfascial and Intermuscular Areas. (Cross Sectional View)

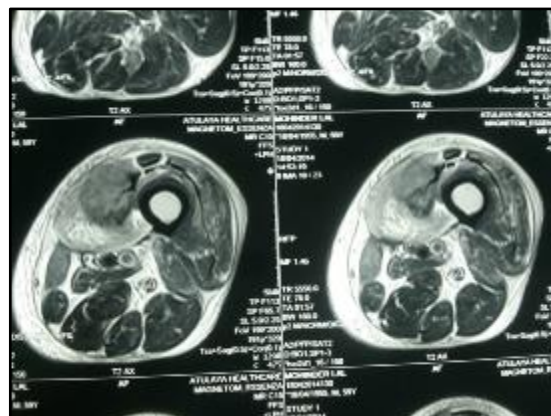


Figure 7. Gadolinium Enhanced T2-Weighted MRI Images with Musculo Fasciitis of Anteromedial (Vasculocles) Compartment of Left Thigh with Mild Subcutaneous Edema over Antero Medial Aspects of Left Thigh and Inflammation of Subfascial and Intermuscular Areas. (Cross Sectional View)

FINAL DIAGNOSIS

DMI is an uncommon complication of long-standing uncontrolled diabetes of both type 1 and 2. The pathogenesis is not clear. The most likely hypothesis is vascular diseases like arteriosclerosis and diabetic microangiopathy. Thigh muscles are the most commonly affected and reports of lower leg involvement are very rare. Upper extremity involvement has also been reported.⁵

Clinical features usually consist of local swelling, limitation and pain on motion, tenderness, and a palpable painful mass, usually without fever and severe induration. Muscle enzymes are usually elevated and an elevated ESR was seen in about 50%.

Diagnosis can be made combining clinical presentation and radiologic imaging. MRI is one of the best methods. Electromyography has been shown to help in some cases.⁶ Biopsy confirms the diagnosis in over 90% of cases,⁷ but since it has potential complications, it should be reserved for atypical cases where diagnosis is hard to make. The main reason why biopsies are not performed regularly is that those who have biopsies also have a longer course of pain and associated problems.

The most common differential diagnoses are deep venous thrombosis and polymyositis, although soft-tissue abscess, necrotizing fasciitis, dermatomyositis, proliferative myositis, focal myositis, nodular myositis, primary lymphoma of muscle, benign tumours or sarcomas of the muscle, diabetic amyotrophy, osteomyelitis, exertional muscle rupture, and ruptured Baker’s cyst were also noted.^{8,9}

In our patient the presentation was localized muscle involvement and skin lesions in an uncontrolled diabetic patient, which DMI along with a provisional diagnosis of diabetic dermopathy had been made. As the rate of diabetes mellitus is rising, we might be seeing these patients more often and we should be concerned about them. Treatment is controversial, but trials of anti-platelets, anticoagulation, analgesics, off-loading, rehabilitation methods, and anti-depressants have been used.

In final diagnosis DMI is an uncommon complication of long-standing uncontrolled diabetes presenting with swelling and severe pain usually in lower extremity and usually prompts an extensive diagnostic workup to find aetiology of localized myositis which might be unnecessary if the physician has a high level of suspicion, and a T2-weighted MRI images can be a good diagnostic help.

REFERENCES

- [1] Kapur S, Brunet JA, McKendry RJ. Diabetic muscle infarction: case report and review. *J Rheumatol* 2004;31(1):190-194.
- [2] Trujillo-Santos AJ. Diabetic muscle infarction: an underdiagnosed complication of long-standing diabetes. *Diabetes Care* 2003;26(1):211-215.
- [3] Pamoukian VN, Rubino F, Iraci JC. Review and case report of Idiopathic lower extremity compartment syndrome and its treatment in diabetic patients. *Diabetes Metab* 2000;26(6):489-492.
- [4] Grigoriadis E, Fam AG, Starok M, et al. Skeletal muscle infarction in diabetes mellitus. *J Rheumatol* 2000;27(4):1063-1068.
- [5] Aragon-Sanchez J, Quintana-Marrero Y, Lazaro-Martinez JL, et al. Necrotizing soft-tissue infections in the feet of patients with diabetes: outcome of surgical treatment and factors associated with limb loss and mortality. *Int J Low Extreme Wounds* 2009;8(3):141-146.
- [6] Lipsky BA, Tabak YP, Johannes RS, et al. Skin and soft tissue infections in hospitalised patients with diabetes: culture isolates and risk factors associated with mortality, length of stay and cost. *Diabetologia* 2010;53(5):914-923.
- [7] Sharma P, Mangwana S, Kapoor RK. Diabetic muscle infarction: atypical MR appearance. *Skeletal Radiol* 2000;29(8):477-480.
- [8] Miller JW, Fleckenstein J, Nodera H, et al. MRI in diabetic muscle infarction. *Neurology* 2003;60(6):1019.
- [9] Delaney-Sathy LO, Fessell DP, Jacobson JA, et al. Sonography of diabetic muscle infarction with MR imaging, CT, and pathologic correlation. *AJR Am J Roentgenol* 2000;174(1):165-169.
- [10] Jelinek JS, Murphey MD, Abouafia AJ, et al. Muscle infarction in patients with diabetes mellitus: MR imaging findings. *Radiology* 1999;211(1):241-247.
- [11] Suh JW, Kim CH, Oh IY, et al. Effect of tailored antiplatelet therapy on periprocedural myonecrosis in patients with diabetes mellitus (from the DM-Verify Now Trial). *Am J Cardiol* 2012;110(12):1749-1755.
- [12] Chester CS, Banker BQ. Focal infarction of muscle in diabetics. *Diabetes Care* 1986;9(6):623-630.
- [13] Rocca PV, Alloway JA, Nashel DJ. Diabetic muscular infarction. *Semin Arthritis Rheum* 1993;22(4):280-287.