



Case Report

Diabetic Myonecrosis, A rare complication of a common disease: A case report and Review of literature

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ABSTRACT

Diabetes Mellitus has many complications. Diabetic Myonecrosis, though rare, is one of them. The usual presentation is severe pain and swelling of the thigh muscles, particularly Quadriceps. More common in females than males, usually seen in long standing diabetes complicated with retinopathy, neuropathy, and/or nephropathy. Muscle biopsy is the most specific investigation but MRI is the investigation of choice. We report a case of severe pain and swelling of left thigh which was suspected to be DVT or cellulitis or abscess or lymphadenopathy. Investigated negated all the above possibilities, and finally diagnosis of diabetic Myonecrosis was made on the basis of clinical, laboratorial and characteristic MRI findings.

KEYWORDS: Diabetes, Diabetic Myonecrosis.

INTRODUCTION

Diabetic Myonecrosis was first described in 1965 by Angervall and Stener [1]. The mean age of onset since diagnosis of diabetes is fifteen years. The female: male ratio is 1.3:1. Its major symptom is the acute onset muscle pain, usually in the thigh, in the absence of trauma. Signs include exquisite muscle tenderness and swelling. Most patients have associated retinopathy, nephropathy, or neuropathy. It commonly affects the lower limb muscles, predominantly the quadriceps. The pathogenesis of this condition is less understood for which more physicians are identifying this uncommon entity, since the treatment for this particular manifestation of diabetes is watchful conservative management and strict glycaemic control and in most cases produces a good outcome. Diabetic Myonecrosis is an under-recognized and under-reported complication of longstanding diabetes. We should keep it a possibility of swelling with pain in a patient of long standing complicated diabetes.

CASE REPORT

Our case was a 21 year old female known case of type I diabetes mellitus for 9 years with poor blood glycaemic control. She presented to us as severe pain and swelling of left thigh for one month with painful movement of the limb. There was no history of fever, trauma, joint pains,

intravenous cannulations and/or pus discharge. On examination there was local tenderness and swelling of the left thigh with girth of 40cm against of 30 in other limb. There were painful movements both at knee and hip joint. There was no raised temperature, induration, crepitation or fluctuation. Other examination revealed puffiness of face, bilateral pedal oedema, micro aneurysms with blot haemorrhages on fundoscopy and diminished reflexes in lower limbs. The rest of the examination was normal. The possibilities of deep vein thrombosis, cellulitis, abscess, lymphedema were made and patient was evaluated on these lines. Meanwhile she was put on antibiotics (ciprofloxacin and amoxicillin/clavanic acid), analgesics and bed rest.

Investigations revealed normal complete blood count with Hb of 13gm/dl, TLC of 5000 with DLC =50%polys and 30% lymphocytes and Platelet count of 150000. kidney function test of 1.2 cratinine and 42 urea. Cratinine kinase (CPK) =170u/l, coagulogram was within normal range. Lipid profile done twice within a span of 5 days showed LDH of 508/497, Triglycerides of 294/204mg/dl and Cholesterol of 225/202mg/dl. Compression USG and Doppler of bilateral lower limbs was normal with no evidence of deep vein thrombosis. Ultrasonography of the limb showed an ill-defined hypoechoic area measuring 15 X12 cm² over the lateral aspect of the left mid- raised and D- dimer was positive. Liver function test showed total

bilirubin of 0.76mg/dl, AST of 35u/L, ALT of 40U/L, ALP of 76U/L, total Protein of 5.6gm/dl with low albumin (2.9/2.6g/dl). 24 hour urinary protein was 1.5 grams. Serial fasting blood sugars repeating every alternate days were 202/198/186/180/172mg/dl. HbA1c was 9.2 showing uncontrolled glycaemia. Erythrocyte sedimentation rate (ESR) was 56mm/hr. Nerve conduction velocity showed features of neuropathy.

With these investigations DVT, cellulitis, abscess, haemangioma, lymphedema were ruled out. We were not able to reach a diagnosis so it was decided to go for an MRI and if required biopsy. MRI was done which showed bulk of

the muscle necrosis in thigh involving vasti and adductor muscles with hypointense signals on T1W (Figure 1) and diffuse hyperintense signals on T2W imaging (Figure 2). Post contrast study with gadolinium showed few areas of rim type enhancement suggestive of myositis with few areas of Myonecrosis. So Biopsy was deferred and a final diagnosis of Type 1 DM complicated with tripathy with diabetic Myonecrosis was made. All the antibiotics were stopped and patient was managed with strict glycaemic control, analgesics and movement restriction. She responded well and was discharged after 3 weeks and is doing well.

Figure 1: T1 Weighted MRI image showing post contrast enhancement (white arrow) and an area of nonenhancement (black arrow) showing Myonecrosis.

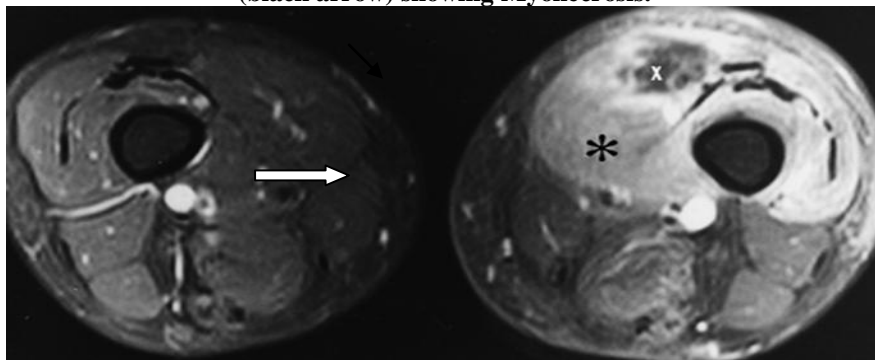
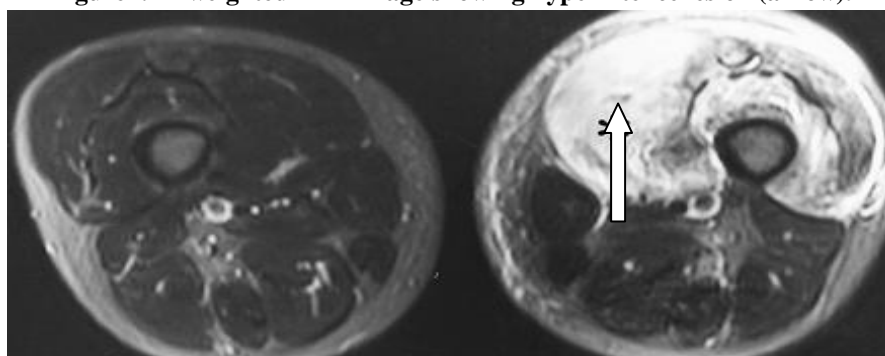


Figure 2: T2 weighted MRI image showing hyperintense lesion (arrow).



DISCUSSION

Diabetes Mellitus is a very common disease with significant morbidity and mortality. Retinopathy, neuropathy and neuropathy are its major and common micro vascular complications while as strokes, coronary artery disease and peripheral vascular diseases are its major macro vascular complications. Diabetic Myonecrosis is an uncommon muscular complication of diabetes with significant morbidity. Diabetic Myonecrosis is a complication of longstanding diabetes also known as spontaneous diabetic muscle infarction (DMI), aseptic Myonecrosis, ischemic Myonecrosis, and tumoriform focal muscular degeneration. Diabetic Myonecrosis is rare, and there is a relative lack of awareness about it compared to other complications of diabetes. Hence, there is often a delay in diagnosis, which in turn increases the morbidity associated with the disease [2]. Women with longstanding type 1 diabetes are the most common patients to develop this disease. In patients with type 2 diabetes, older individuals are more commonly affected [3]. Diabetic Myonecrosis is usually seen in patients

with longstanding diabetes who are on insulin therapy and have multiple micro- and macro vascular complications [4,5].

Clinical presentation of Myonecrosis typically includes an abrupt onset of diffuse painful swelling of involved muscles and occasionally a palpable mass without antecedent trauma or infection. Bilateral involvement is seen in 8–10% of cases. [4,5] An increase in the dimensions of the thigh may be the initial presenting feature. Fever and other signs of inflammation are usually absent. Thigh muscles are commonly affected, with the quadriceps being the most frequently involved muscle group [6]. Vastus laterals and vastus medialis are the most commonly affected muscle sites [7]. Involvement of calf and upper-extremity muscle groups has also been documented [7,8]. With time, the swelling localizes, and the predominant symptom may be pain with restriction of movement [9].

Criteria for diagnosis of diabetic myonecrosis: [10]

A. Clinical features:

1. Abrupt onset of severe pain and swelling.
2. Usually asymmetrical.
3. Absence of fever and other signs of inflammation.
4. Diabetes with end organ damage.
5. Absence of trauma.

B. Laboratory features:

1. Normal leukocyte count.
2. Normal or mildly elevated ESR.
3. Normal or mildly elevated muscle enzymes.

C. Radiological Features:

1. Well marginated, hypoechoic lesion with no signs of abscess.
2. Increased signal intensity from the affected muscle area in T2-weighted, inversion recovery, and gadolinium-enhanced images and isointense or hypointense areas on T1-weighted images.

Our patient was fulfilling almost all criteria. There was pain, swelling, absence of fever, trauma, normal leucocyte count, normal CPK levels, diabetes with tripathy and radiological evidence.

Exact Pathogenesis is not clear. The possible explanations revolve around diabetic microangiopathy, vacuities with thrombosis, hypoxia-reperfusion injury, and atherosclerotic occlusion [11,12]. Patients generally have end-organ complications of diabetes, suggesting the role of small vessel disease and atherosclerosis as an underlying pathology. Diabetes is a proinflammatory state, with increased activity of factor VII, plasminogen activator inhibitor-1, and thrombomodulin. This in turn creates a hypercoagulable state [13]. Diabetic Myonecrosis is seen increasingly in patients of cirrhosis and antiphospholipid antibody syndrome which are both procoagulant states.

Laboratory evaluation shows a mildly elevated ESR [3]. Leucocytosis is generally absent. Serum levels of muscle enzymes such as CPK and LDH are usually normal or mildly elevated [14]. Serum levels of Aspartate and Alanine transaminases are generally normal. Planar X-ray reveals soft tissue swelling and bone scan shows nonspecific uptake. Our patient had mildly elevated ESR and LDH but no leucocytosis or raised CPK.

Imaging studies are quite useful in the diagnosis of diabetic Myonecrosis. Ultrasonography is the first-line imaging diagnostic modality in diabetic Myonecrosis. It shows well-marginated, hypoechoic, intramuscular lesion [15]. The advantages of ultrasonography include easy availability, non-invasiveness, early diagnosis, and exclusion of other causes such as soft-tissue abscess. MRI studies show increased signal intensity from the affected muscle area in T2-weighted, inversion recovery, and gadolinium-enhanced images and isointense or hypointense areas on T1-weighted images [16].

Other findings include diffuse enlargement of affected muscles, ill-defined borders secondary to loss of the normal

fatty intramuscular septa, and haemorrhagic foci [17]. Computed tomography (CT) scans show diffuse muscular enlargement with diminished attenuation of the affected muscle, increased attenuation of the subcutaneous fat, and thickening of subcutaneous facial planes and skin [18]. MRI is usually preferred over CT. Biopsy is the gold standard but is not usually required and is usually avoided in view of reports which suggest that biopsy may be associated with hematoma formation, infection, and an extended recovery period. [19,20]. Findings on muscle biopsy depend on the stage of the Myonecrosis. Early on, light microscopy shows large areas of muscle necrosis and oedema, phagocytosis of the necrotic muscle fibres, and variable presence of granular tissue and collagen.

At a later stage, there is a fibrous replacement of the necrotic tissue, myofibril regeneration, and mononuclear cell infiltration [21]. Small vessel walls are often hyalinised and thickened with evidence of atherosclerosis. Other conditions that may mimic Myonecrosis include deep venous thrombosis (DVT), soft-tissue abscess, necrotizing fasciitis, pyomyositis, benign muscle tumors, lymphomas, sarcomas, drug-induced myositis, osteomyelitis, muscle rupture, hematoma, ruptured Baker's and thrombophlebitis. These can be easily excluded with proper history, clinical examination, laboratory and imaging features. Biopsy should be reserved for cases in which the clinical presentation is atypical or the diagnosis uncertain or when appropriate treatment fails to elicit clinical improvement.

We diagnosed our case with clinical, laboratory and MRI findings. Treatment is usually conservative. Strict glycaemic control, NSAID use, bed rest are the treatment options. Anticoagulants can be used in case of APLA syndrome. Antibiotics have no role in un complicated Diabetic Myonecrosis but should not be held back in case of a doubt of diagnosis or unresponsiveness.

Surgical procedures should be avoided as far as possible [22]. Some authors propose the use of antiplatelet therapy to treat the underlying micro-vasculopathy, but this is not a strict recommendation [10]. Generally, the short-term prognosis is good for diabetic Myonecrosis. The swelling and pain lessen, and patients become mobile in 1–2 months. Patients are known to have recurrences, and most events occur within a period of 2 months after the initial presentation. Our patient became symptom free after 3 weeks and did not have recurrence till now. He is on strict glycaemic control.

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