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Case Report

General Surgery Section

Diabetic Muscle Infarction: A Case Study

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ABSTRACT

Diabetic muscle infarction is a rare complication of diabetes that occurs in patients with type 1 diabetes or in patients with poorly controlled type 2 diabetes. It presents with sudden onset of a painful swelling, often in the thigh, which is bilateral in up to a third of patients, and it occurs spontaneously without a history of trauma or features of infection. Diabetic muscle infarction is under-recognized and often misdiagnosed. A high index of suspicion is needed to make a timely diagnosis and to avoid the use of steroids or surgical intervention. This report highlights the clinical investigations, laboratory tests, and imaging scans needed to establish the clinical diagnosis in a timely fashion to avoid unnecessary and possibly harmful interventions.

Key Words: Muscle infarction, Diabetes mellitus, Thigh swelling, Sonography, MRI

CASE REPORT

A 58-year-old man with a 22-year history of type 2 diabetes mellitus(DM) presented with sudden and spontaneous onset of right anteromedial thigh pain and swelling. He also gave history of chronic kidney disease since 3-years. On examination, firm swelling on the right medial aspect of thigh measuring 10 × 5 cm with area of induration, erythema, warmth, and tenderness was revealed [Table/Fig-1]. Patient also had restricted movement around the right knee joint. Peripheral pulses were palpable with no bruits.

Laboratory data showed white blood cell count of 10.8×10^9/l (normal range 4.0-11.0), with a normal eosinophil count, low haemoglobin of 8.4 g/l (12-16), normal platelets of 371×10^9/l (normal range 150-400) and raised erythrocyte sedimentation rate of 78 mm/hr (normal range 10-20). serum creatinine at 6.8mg/dl (0.5-1.5), electrolytes were normal, with a serum potassium of 4.4 mmol/l. Glycated haemoglobin was 7.7%. Creatine kinase was 428 U/l (0-190 U/l), Urinalysis showed ≥3.0 g/l of protein (normal–negative).

Ultrasonography of the right thigh revealed altered echo-texture with hyperechoic areas within the vastus medialis along the lower third of thigh. Superficial and deep veins were normal.

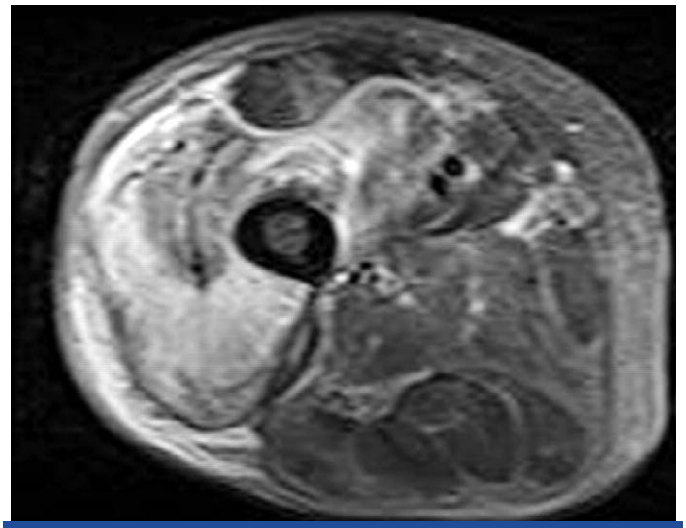
Magnetic resonance imaging showed increased signal intensity on T_2-weighted images of his right quadriceps, with diffuse subcutaneous and fat edema. There was extensive swelling of the quadriceps, vastus medialis and rectus with inter-muscular edema [Table/Fig-2].

He was treated with intravenous antibiotics and analgesics. Diabetic status was controlled with sub-cutaneous insulin and he also underwent two cycles of hemodialysis.His condition gradually improved with improvement in knee mobility and decreased pain. He was discharged with the advice of regular follow-up.

DISCUSSION

About 100 cases of diabetic muscle infarction have been reported since the first report in 1965 [1, 2]. Thus, idiopathic muscle infarction

[Table/Fig-1]: Right anteromedial aspect of thigh



[Table/Fig-2]: MRI-T_2 weighted image of right quadriceps

is rare and occurs specifically among patients with diabetes mellitus. Most affected patients have a long history of diabetes (either type 1 or type 2) and about 97% have other microvascular complications, most often being diabetic nephropathy [2]. Affected patients present with the acute onset of painful swelling of the thigh, or less commonly the calf, that then evolves over days or weeks. Bilateral involvement occurs in nearly one-third of cases and recurrence at the same or different site(s) in nearly one-half of patients [3]. Creatinine kinase levels may be normal or increased, probably depending upon the stage of the condition when sampling is undertaken. Ultrasonography and magnetic resonance imaging have been used to assess patients with diabetic muscle infarction. Magnetic resonance imaging with intravenous contrast enhancement appears to be the most useful diagnostic technique. Since MR imaging clearly identifies the location of muscle involvement, it may be useful to guide prebiopsy assessment [3]. For patients with longstanding diabetes, known microvascular complications, no fever and no leukocytosis, the finding on MRI of increased T2 signal, muscle enlargement, subcutaneous and sub-fascial edema may avoid muscle biopsy [4].

Among other causes of acute muscle pain and tenderness, bacterial infections such as pyomyositis, spontaneous gangrenous myositis, non-traumatic clostridial myonecrosis, and necrotizing fasciitis must be excluded expeditiously. Early pyomyositis may be difficult to distinguish from ischaemic muscle necrosis, however, fever, leukocytosis, and a well defined intramuscular fluid collection is commonly noted at a more advanced stage of bacterial muscle infection. Necrotizing fasciitis should be considered in diabetic patients with cellulitis who also have systemic signs of infection such as tachycardia, leukocytosis, marked hyperglycaemia, or acidosis. Pain, swelling, and skin discoloration in the involved extremity are common symptoms of venous thrombosis and these may be accompanied by the presence of a palpable cord (reflecting a thrombosed vein), ipsilateral edema, warmth, and/or superficial venous dilation. Non-invasive studies, particularly compression ultrasonography may distinguish venous thrombosis from muscle infarction. Intra-muscular bleeding due to low energy blunt trauma or in patients with a heritable or acquired coagulopathy causes pain, swelling, and muscle tenderness. A history of trauma, bleeding disorder, or use of an anticoagulant is suggestive.Ultrasonography, CT, or MR imaging of the hematoma is usually diagnostic [1].

No evidence based recommendations are available about the management of this condition. However, a retrospective analysis supports conservative management with bed rest, leg elevation, and adequate analgesia [5]. Increased pain and swelling after stretching or exercise can occur, so these activities should be avoided during the acute phase. Tight diabetic control is important because poor control may prolong the episode. There is no evidence to support the use of steroids or surgery. Surgery may in fact worsen the outcome [5]. The short term prognosis is good, but the recurrence rate is high (40%), and recurrences may not necessarily affect the same muscle group. Diabetic muscle infarction portends a poor prognosis with 10% mortality over two years [5].

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