Plantar Abscess: An Unusual Initial Presentation of Diabetes Mellitus

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Abstract:

A 56-year-old male presented with left heel pain, redness, swelling, without any fever, with a background history of hypertension. There was no history suggestive of diabetes or heart disease. Ultrasound imaging revealed a thickened plantar fascia with inflammatory changes and fat pad thickening. Magnetic resonance imaging (MRI) of the foot confirmed subcutaneous pus collection. Routine investigations revealed very markedly uncontrolled blood sugar levels. Drainage of pus with incision and debridement was carried out, and antibiotics, along with diabetic medications, were administered. Culture was suggestive of methicillin-resistant *Staphylococcus aureus* (MRSA), for which appropriate antibiotics were initiated, bringing the infection under control. The patient with high blood sugar presented with a plantar infection without any prior symptoms of diabetes mellitus. In this case, the first symptom of diabetes was an infection/abscess in the plantar fascia - a rare site of infection.

Key words: Plantar Abscess, Diabetes Mellitus, USG, MRI of foot.

Introduction

Diabetes mellitus is a chronic condition caused by either inadequate insulin production or by insulin resistance in the body, which leads to a long-term metabolic disorder. It is known to target approximately 537 million adults aged between 20-79 years globally. Further studies have predicted that by the year 2030, there will be 643 million people who will be affected.[1] India is known to be the epicentre of the global pandemic of diabetes mellitus. There is an increased prevalence seen mainly in the past four decades.[2] This is mainly due to an increase in development, demographic shifts, environmental factors, higher living standards, obesity, as well as the increased susceptibility observed in Indians due to genetic factors.[3] The most commonly affected population in developing countries is aged between 45 and 64 years.[4] Diabetes is a disease of individual cells, it is not just about hyperglycaemia and its complications – it causes multi-system involvement.

The most common diabetes-related cause of recurrent hospitalisation is foot wounds. Individuals with diabetes are known to have a tenfold increased risk of being hospitalised for soft tissue and bone infections of the foot compared to individuals without diabetes.[5] The major microvascular complications seen are peripheral neuropathy, nephropathy, and retinopathy. Peripheral neuropathy is seen in almost 70% of patients with diabetes and may be one of the presenting features in certain cases, thus causing foot wounds and infections.[6]

Evidence suggests that hyperglycaemia can accelerate non-enzymatic glycosylation and collagen deposition in abnormal periarticular regions of the connective tissues, which causes alterations in the structural matrix and mechanical properties of the tissues. This results in widespread arthrofibrosis.[7]

Case Report

A 56-year-old male presented with a sudden onset, progressive left heel pain for two weeks, which was aggravated by walking. The pain gradually worsened during this period and was associated with redness, swelling, and blister formation over the plantar surface of the left foot. There was no known history of trauma or injury. He had a history of hypertension. He was afebrile, with a pulse rate of 112/min, respiratory rate of 18/min, blood pressure of 110/70 mmHg, and the peripheral oxygen saturation (SpO_2) of 98% on room air. Physical examination revealed localised tenderness over the calcaneum and the plantar aspect (sole) of the foot, with significant erythema and swelling. All his peripheral pulses were palpable, and sensory examination was normal.

Initial laboratory tests were suggestive of raised blood sugar level of 455 mg/dL and fasting blood sugar (FBS) of 174 mg/dL. His C-reactive protein (CRP) was elevated at haemoglobin was 12 g/dL, total leukocyte count (TLC) was 14,340/µL, and platelet count was 284000/µL. Serum creatinine was 0.7 mg/dL, and electrolytes were 134/4.5/99. Urinalysis was normal.

The patient was initially started on broad-spectrum antibiotics (piperacillin-tazobactam and linezolid). Ultrasound imaging revealed a thickened plantar fascia with inflammatory changes and fat pad thickening. Magnetic resonance imaging (MRI) confirmed subcutaneous pus collection, but there was no evidence of osteomyelitis. A multiloculated T2 hyperintense and T1 slightly hyperintense lesion was seen in the abductor hallucis longus muscle, measuring 1.4 x 5.3 x 1.2 cm (transverse x anteroposterior x craniocaudal), with surrounding muscle oedema and thin peripheral enhancement. A similar curvilinear and lobulated T2 hyperintense subcutaneous signal was noted in the plantar aspect of the hind foot medially extending over 2.7 x 5.8 x 2.6 cm, without significant enhancement on post-contrast images. These findings were concerning for cellulitis, with an evolving abscess or, less likely, areas of necrosis (Figure 1-4).

Figure 1: Axial T2 view with blue arrow localising the plantar abscess.

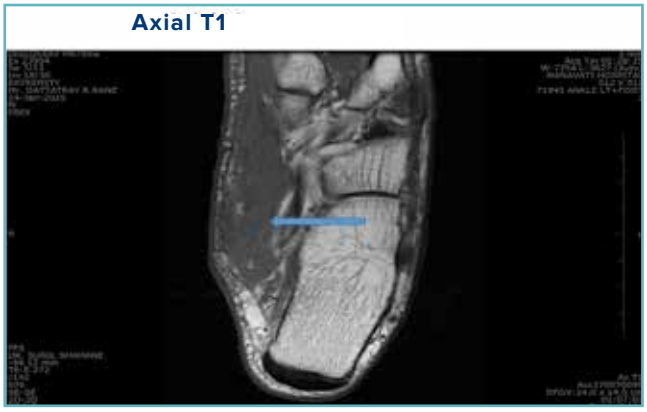

Figure 2: Axial T1 view with blue arrow localising the plantar abscess.

Figure 3: Post-contrast T1 axial view with blue arrow localising the plantar abscess.

Figure 4: Post-contrast T1 coronal view with blue arrow localising the plantar abscess.

The patient underwent prompt surgical incision and drainage of the abscess, along with debridement of necrotic tissue. Tissue cultures were suggestive of methicillin-resistant *Staphylococcus aureus* (MRSA). Linezolid injection was continued for the patient. Oral hypoglycaemic agents, along with insulin therapy, were initiated to control the hyperglycaemia. After achieving adequate control of the blood sugar levels with diabetic diet, diabetic medications, antibiotic therapy, and regular wound dressing, the patient started improving and was subsequently discharged.

Discussion

Plantar fasciitis is typically an inflammatory disease. In this case, it presented as a bacterial infection that further progressed to an abscess. Hyperglycaemia is likely to impair wound healing and immune function, making diabetic individuals more susceptible to infections, including plantar fasciitis complicated by abscess formation or deeper tissue involvement. There has been an increase in the incidence of early-onset diabetes mellitus recently and diabetes-related complications. Early detection of diabetes is essential, especially in the pre-diabetic stages, where lifestyle modifications can prevent the progression to full-fledged diabetes. A major step is controlling the glycaemic levels, thus preventing the complications. Appropriate oral hypoglycaemic agent use and, if necessary, the initiation of insulin should be done if required. Strict monitoring should be ensured to avoid the morbidity and mortality associated with diabetes.[3]

As per recently conducted studies, it has been observed that the prevalence of foot-related complications in diabetics is almost 25% throughout the average lifespan.[8]

In this case, the patient presented with a red, swollen, painful heel, which was, on further investigation, detected to be a plantar abscess. Raised blood glucose serves as an important nutrient for underlying organisms, which started multiplying rapidly in the affected areas and led to abscess formation. In this case, the patient presented to us with a plantar abscess without any symptoms of diabetes like polyuria, polyphagia, polydipsia, or generalised weakness despite having very high sugar levels. The necessary surgical assistance with antibiotics and blood sugar medications was started, which led to prompt recovery.

Conclusion

Diabetes has been known as the "silent disease" for ages, without exhibiting any clinical features until it progresses to involve the target organs of the body.[9] In many cases, it is observed that due to delayed or untimely diagnosis of diabetes mellitus in middle-aged and elderly individuals, patients tend to present to the hospital directly with various diabetes-related complications. Hence, early, active surveillance is a must. Conducting routine investigations/health checkups for diabetes is essential for preventing such complications. Patient education remains a cornerstone of diabetic foot management. This case highlights the need for regular foot care practices, such as daily inspections, proper footwear, and early intervention in case of minor injuries. Patients should self-monitor their blood sugar levels at regular intervals. They should also be informed regarding the various complications and risks associated with raised blood sugar levels.[10]

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References

1. Kumar A, Gangwar R, Ahmad Zargar A, *et al.* Prevalence of diabetes in India: A review of IDF diabetes atlas 10th edition. *Curr. Diabetes Rev.* 2024;20(1):105-14.
2. Unnikrishnan R, Anjana RM, Mohan V. Diabetes mellitus and its complications in India. *Nat Rev Endocrinol.* 2016;12(6):357-70.
3. Kaveeshwar SA, Cornwall J. The current state of diabetes mellitus in India. *Australas Med J.* 2014;7(1):45-8.
4. Mohan V, Shah SN, Joshi SR, *et al.* DiabCare India 2011 Study Group. Current status of management, control, complications and psychosocial aspects of patients with diabetes in India: Results from the DiabCare India 2011 Study. *Indian J Endocrinol Metab.* 2014;18(3):370-8.
5. Lawrence A Lavery, David G Armstrong, Robert P Wunderlich, et al. Lipsky. Risk factors for foot infections in individuals with diabetes. *Diabetes Care.* 2006; 29 (6): 1288-1293.
6. Ricciardi D, Galiero R, Todisco V, *et al.* Neurophysiological assessment of peripheral neuropathy through whole plantar nerve conduction in type 2 diabetes mellitus and healthy control subjects. *Metab Target Organ Damage.* 2024;4(3):N-A.
7. Aydeniz A, Gursoy S, Guney E. Which musculoskeletal complications are most frequently seen in type 2 diabetes mellitus? *J Int Med Res.* 2008;36(3):505-511.
8. Singh N, Armstrong DG, Lipsky BA. Preventing foot ulcers in patients with diabetes. *JAMA.* 2005;293(2):217-28.
9. Anjana RM, Ali MK, Pradeepa R, *et al.* The need for obtaining accurate nationwide estimates of diabetes prevalence in India - rationale for a national study on diabetes. *Indian J Med Res.* 2011;133(4):369-80.
10. Kumar A, Goel MK, Jain RB, *et al.* India towards diabetes control: Key issues. *Australas Med J.* 2013;6(10):524-31.