

Tropical Diabetic Hand Syndrome: A Case Report

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ABSTRACT

Tropical Diabetic Hand Syndrome (TDHS) is a rare but dreadful complication of diabetes mellitus affecting patients across the tropics. It is characterized by complex hand sepsis with variable presentation and often results from trivial trauma. It can lead to permanent disability as well as death if the presentation is delayed, diagnoses is missed timely or late surgical management. Our case report will further enlighten the healthcare workers to the existence of this rare complex hand sepsis.

KEYWORDS: Diabetes; Sepsis; Debridement; Amputation

INTRODUCTION

Hand complications of diabetes mellitus are rare. Compared to foot complications in patients with diabetes mellitus, hand complications are very rare occurring in a ratio of 20:1 respectively.^[1] Tropical Diabetic Hand Syndrome (TDHS) describes a constellation of acute complex hand sepsis seen in patients with diabetes following a trivial trauma to the hand.^[2] The clinical spectrum of TDHS is variable and ranges from cellulitis, with or without ulceration of the hand to progressive fulminant hand sepsis leading to gangrene affecting the entire limb which may be lethal.^[3] Primarily this infective pathology is seen in diabetic patients living around tropical or coastal areas.^[3] The end result of TDHS is variable and may range from temporary or permanent limb deformity to amputation or even death.^[4] Poorly controlled blood sugar, prolonged duration of diabetes mellitus, low socioeconomic status, and preceding unnoticed trivial hand trauma are the known risk factors.^[5] Amongst the well-known diabetic complications, TDHS is not well recognized and usually goes under-reported. As a result, many primary healthcare workers fail to diagnose it timely.^[3,6] In this case report, we have tried to briefly discuss the presentation of this rare but life-threatening diabetic complication, its management, and the inherently bad prognosis associated with it despite the best possible treatment.

CASE REPORT

A 45-year-old Bangladeshi male who is a known case of diabetes mellitus type II presented to our center as a case of painful erythematous swelling of his left hand. In addition, small pus-discharging ulcers over the palm covered with slough were found on examination (Figure 1). The pain was severe, continuous, throbbing in nature, and relieved partially by hand elevation without any aggravating factors. The pus was creamy-colored and foul-smelling. Two weeks back, the patient had accidentally sustained a minor scald burn over the dorsum of the same hand for which he had not sought any medical consultation. The patient had a history of uncontrolled diabetes mellitus type II for the last 10 years on erratic treatment with no proper endocrinology follow-up. The patient had no other comorbidity. The patient had poor socioeconomic status. A general physical examination revealed a healthy middle-aged male with no pallor or icterus and a healthy body mass index. All vital parameters, including body temperature, were in the normal range. Clinical examination of the left hand after cleaning with normal saline showed a swollen hand involving both the dorsum and the palmar aspects, small ulcerations over the mid-palm area, minimal tenderness, and diminished sensations over the fingertips. Investigations conducted included Random Blood Sugar (RBS) which was 456mg /dl, and White Blood Cell (WBC) count was 38.9 thousand with 93% neutrophils. C-Reactive Protein (CRP) level was 115 mg/liter. Hemoglobin was 13 gm/dl and albumin was 3.5 gm/dl. Electrolytes, urea, and creatinine were within normal range. Urinalysis showed the presence of sugar with no ketone bodies. A diagnosis of left TDHS with Lawal group II was made. After proper counseling and consent, bedside incision drainage with wound irrigation was done (Figure 2) followed by optimal surgical debridement the next day in the operating theatre. Pus and tissue were sent for culture and sensitivity isolating Methicillin-sensitive Staphylococcus (MSSA) and Klebsiella pneumoniae both sensitive to cotrimoxazole and gentamicin. Initially, the patient was put on empirical parenteral antibiotics (Clindamycin 600mg 8 h and Ciprofloxacin 400 mg 12 h) which was later changed to definitive antibiotic therapy based on culture sensitivity results. Tight glycaemic control (using sliding-scale soluble insulin) and pain control was ensured. Assessment of the wound was done twice a day and it was noticed that wet gangrene of the hand progressed to the forearm involving space of Parona and the patient underwent further debridement of the hand and the forearm (Figure 3). After a few days the patient developed gangrenous changes involving 2nd, 3rd and 5th digits which progressed till metacarpophalangeal joints changing the diagnosis from Lawal group II to group III (Figure 4). The patient was operated on again. He underwent another session of debridement, amputation of the gangrenous digits, Split-Thickness Skin Grafting (STSG) of the raw palmar area, and closure of the dorsal wounds. The skin graft was harvested from the left thigh. The first graft dressing was done on the 3rd postoperative day and the graft was well taken on the palm (Figure 5) and the wounds on the dorsum were healthy (Figure 6). The patient was discharged after a second dressing change concluding a hospital stay of 18 days and was advised to follow up in the outpatient department.



Figure 1: Showing right hand multiple abscesses and ulcerations involving mainly the palm and covered with slough.



Figure 2: Showing bedside incision drainage of the multiple abscesses.

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Figure 3: Showing soft tissue defect involving palm and the distal forearm following surgical debridement of the devitalized tissue.



Figure 4: Showing development of the Meleyne's gangrene involving index, middle and little fingers.



Figure 5: Showing well taken split skin graft (SSG) and amputated index, middle and little fingers.



Figure 6: Showing delayed primary closure of the dorsal incisions

DISCUSSION

Tropical Diabetic Hand Syndrome (TDHS) is a well-known but rare and dreadful complication of diabetes mellitus defined by cellulitis, tissue necrosis, and fulminant sepsis of the hands. Poor diabetic control, prolonged duration of diabetes mellitus, malnutrition, and fissures in the hand are the intrinsic risk factors associated with TDHS.^[5] The prevalence of the disease is reported to be up to 3.2% and the bulk of the reported cases are from tropical nations and coastal regions, with a morbidity of 52 % and mortality of up to 19%.^[4,7] Accidental sharp cuts, thorn pricks, insect bites, and blunt trauma are identified as triggering factors in some of the cases.^[8] In our patient, the duration of the diabetes mellitus was around 10 years with no proper follow-up and the blood sugar at presentation was 456 mg/dl. Although there were no signs of any malnutrition and his body mass index was normal, he belonged to a poor family. Due to poor socioeconomic status and its consequence of inaccessibility to healthcare facilities, delayed presentation in these cases is a rule rather than an exception. The patients usually present with advanced disease with autoamputation of digits due to inappropriate treatment.^[6] Our patient reported to our hospital after a delay of 14 days following the minor burn on his hand and during this interval he didn't seek any medical advice because of his unawareness of this life-threatening problem which led to a delayed presentation and poor outcome. For patients who present at the stage of cellulitis, broad-spectrum empirical antibiotics with

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anaerobic coverage should be started without a delay. Staphylococcus aureus is the commonest organism found in these cases,^[1,5] followed by Methicillin-Resistant Staphylococcus Aureus (MRSA), Klebsiella, Pseudomonas aeruginosa, Coliform and Enterococcus sp.^[6,8-11] For our patient, the purulent culture was positive for Staphylococcus aureus and Klebsiella pneumoniae. We were in constant communication with the infection control department regarding the antibiotic treatment for this patient. The antibiotic therapy in TDHS is not guided by wound swabs and therefore should be avoided in health centers with restrained laboratory facilities.^[12] Gill et al. reported single bacterial species in over 75% of tissue culture specimens whereas in swab cultures the growth was polymicrobial in the majority of cases probably due to contamination.^[13] So the initiation of broad-spectrum antibiotic therapy should not be delayed because of the unavailability of culture results. As the delay in management can worsen the condition by leading to septicemia, septic shock, and eventual death. As soon as the patient develops any abscess, immediate drainage is needed. Debridement of the nonviable tissue is the sine qua non in the management of these patients and usually these patients require multiple surgical debridement sessions. We performed daily bedside debridement in our case besides four major debridement sessions in the operation theatre under regional/general anesthesia. For TDHS presently, there is no universal classification system to enable early decision-making and guide the treatment of these patients to optimize the results.^[1] Based on the disease severity and the expected prognosis, Lawal et al. 2013 classified TDHS into three groups (I-III).^[1] Since this classification failed to guide the treatment for each individual Lawal group this was not widely adopted. Our patient at admission was Lawal group II which worsened to group III with the development of synergistic gangrenous changes involving the palm and the fingers (Meleney's gangrene). Though the patient survived, he needed debridement of the palm with amputation of multiple fingers leading to a permanent hand deformity.

CONCLUSIONS

Tropical diabetic hand syndrome is a rare but lethal complication of diabetes mellitus. Patient awareness, timely diagnosis, and optimal management in the form of intravenous broad-spectrum antibiotics, multiple sessions of debridement, control of the primary pathology and post-surgical vocational rehabilitation can yield better results. Classification of TDHS will guide the healthcare workers to optimize the management by early diagnosis, timely decision making and ensuring proper treatment for each classified group.

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