Bilateral Cellulitis of Lower Extremities in a Diabetic: A Case Report

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Abstract

Case presentation: A 45-year-old male presented to the emergency room with complaints of right foot pain and a small wound at the anterior proximal foot with foul-smelling drainage. The patient had a past medical history of poorly controlled diabetes mellitus type 2, morbid obesity, and end-stage renal disease on hemodialysis. The patient has a surgical history of a right transmetatarsal amputation and a left big toe amputation. The patient was treated with intravenous Piperacillin/Tazobactam and Vancomycin for his cellulitis and given insulin to help lower his glucose level. The patient was instructed to keep his leg elevated and to wear Unna boots to help with the venous stasis. The patient was thoroughly educated on diabetes and how to maintain a healthy lifestyle.

Keywords: Diabetes; Cellulitis; Obesity; Venous stasis; Chronic skin changes

Case presentation

A 45-year-old male presented to the emergency room with complaints of right foot pain and a superficial wound at the anterior proximal foot with foul-smelling drainage. The patient had a past medical history of hypertension, hyperlipidemia, diabetes mellitus type 2, morbid obesity, and end-stage renal disease on hemodialysis. His personal medical history was also positive for a right trans-metatarsal amputation (TMA) and a left big toe amputation (Figure 1 and 2). The patient presented also with an arteriovenous fistula in the left upper extremity. He was allergic to acetylsalicylic acid and was known to be non-compliant with the therapeutic regimen for the management of the diabetes. The patient reported low grade fever at home but was afebrile during intake. Physical examination revealed bilateral leg and foot cellulitis with extreme chronic stasis changes and lymphedema. An anterior ankle wound was also present in his right lower extremity on the dorsum of the foot.

A complete metabolic panel revealed a fasting blood sugar level of 304 mg/dL (normal is 100 mg/dL). The liver enzymes on admission were as follows: alanine aminotransferase (ALT) was 487 U/L (normal is 10–40 U/L) and the aspartate aminotransferase (AST) was 899 U/L (normal is 7–56 U/L). A complete blood count revealed a normal white blood cell (WBC) count of 6.8 per L, hemoglobin of 6.8 g/dl (normal is 13.5–17.5 g/dl) and a hematocrit of 21.1% (normal is 40–54%). The patient had an elevated Erythrocyte Sedimentation Rate (ESR). Gram stain of the right foot wound smear displayed rare gram positive cocci in pairs, moderate gram positive rods, and many gram negative rods. No WBCs were seen on the stain. A culture of the wound showed moderate growth of Proteus hauseri, Enterobacter cloacae complex and Corynebacterium species. The culture also indicated light growth of Citrobacter braakii and Enterococcus faecalis. The Enterococcus faecalis showed susceptibility to Penicillin G and to Vancomycin. The Enterobacter cloacae complex showed susceptibility to Piperacillin/Tazobactam, Amikacin, Cephazolin, Cefepime, Ceftriaxone, Gentamicin, Meropenem and Trimethoprim-Sulfamethoxazole. The Proteus hauseri showed resistance to Ampicillin, and resistance to Cefazolin. Gram stain of the right foot chronic skin changes showed moderate gram positive rods and no WBCs. The culture showed moderate growth of Klebsiella oxytoca, Enterobacter cloaceae complex, and Corynebacterium species. The Klebsiella oxytoca showed resistance to Ampicillin and intermediate to Cefazolin and susceptibility similar to the Enterococcus cloaceae complex.
The incidence rate of type II diabetes mellitus (T2D) has almost quadrupled in the last few decades. The World Health Organization (WHO) projected an increase from 108 million in 1980 to 422 million in 2014 in the number of people with diabetes [1]. The steady increase in the occurrence rate of T2D has been linked to many factors such as decrease in physical activity, poor dietary habits, medication noncompliance, lack of familial and emotional support [2,3]. The management of T2D can be seen as a complex task to patients. The treatment regimen often includes regularly scheduled primary care visits, frequent home blood glucose monitoring, multiple oral hypoglycemic agents, exercise and dietary modification for weight loss [4]. Uncontrolled diabetes often advances to complications that greatly impact the quality of life of the patients. The most severe chronic complications are due to non-enzymatic glycosylation of the blood vessels leading to nephropathy which can progress to end-stage renal disease, retinopathy, neuropathy and atherosclerosis [2,4] as seen in this patient. Additionally, diabetic patients are at an increased risk for infectious diseases such as cellulitis. This increase risk is often linked to hyperglycemia related impairment of phagocytic action and abnormality in cell mediated immunity [5,6]. Cellulitis is an inflammatory condition that often involves the subcutaneous tissue and the dermis and commonly affects the lower extremities [7]. Skin breakage is often the mode of entry of the responsible bacteria; however, cellulitis can also happen on atraumatic skin. Multiple studies have shown that occurrence and the recurrence of cellulitis were more common among diabetics than non-diabetic patients [8–11]. Furthermore, patients with lymphedema and chronic skin changes are at an increased risk for soft tissue malignancy such as angiosarcoma. Previous literature has shown that approximately 10% of patients with chronic lymphedema develop angiosarcomas [12].

As seen in this case, the patient suffered from chronic advanced bilateral venous stasis with lymphedema in both lower extremities. The diagnosis of cellulitis in this patient was made base of the morphologic features of the lesions on his extremities which included swelling, warmth, pain and erythema and his elevated ESR. This combination added to his diabetes risk factor resulted in the bilateral venous stasis changes and cellulitis seen in his lower extremities. Aggressive antibiotic treatment is often warranted to prevent complications such as sepsis. Wound and blood cultures are often necessary in order to provide the patient with a targeted antibiotic therapy. Overall, physicians have to prioritize diabetic patient education and confirm understanding from the patients to promote diabetic treatment plan adherence and to prevent those unwanted sequelae.

**Patient Consent**

Written informed consent was obtained from the patient.

**Conflicts of Interest**

All the authors declared that they have no conflict of interests.

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