

Unanticipated Second Leg Bilateral Below Knee Amputation in a Diabetic Amputee: A Case Report

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ABSTRACT

Diabetes mellitus-related lower extremity amputation increases health burden and reduces patients' quality of life, mortality and morbidity rate in a country like India. The most common complication in DM patients is uncontrolled hyperglycemia and foot ulceration. We report an unpredicted occurrence of right leg amputation in diabetic amputee patients. A 46-year-old male patient developed a complication to his contralateral limb due to poor negligence even after his first above-knee amputation; the patient was again readmitted for the below-knee amputation and hyperglycaemia. Although all the major complications of DM like hyperglycemia, cataracts, diabetic foot and diabetic foot amputation were found in the same index patient. The risk of amputation is high in diabetic patients and the prevalence of amputation is even extremely high in diabetic smokers. Hence proper lifestyle modification is needed along with dietary approaches to prevent and manage diabetes related complications. Regular foot examination and patient education are necessary which alerts the patient and family members to avoid the major risk of DM complications.

Keywords: Endocrine system disease, Hyperglycaemia, General surgery, Bacterial drug resistance, Diabetic foot.

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INTRODUCTION

Foot disorders are a major cause of morbidity and mortality in diabetic patients and are the leading cause of hospitalization. Ulcers, infections, gangrene and amputations are serious complications of diabetes.^{1,2} Here, we are reporting the unpredicted contralateral leg below knee amputation in an uncontrolled hyperglycaemic diabetic amputee patient.

CASE HISTORY

A 46-year-old man from Hubballi, Karnataka, priorly a known case of Type II DM, which was managed on oral hypoglycaemic drug (Metformin 500 mg+Glimepiride 2 mg BD) as well as a short-acting type of insulin (Human Mixtard 50) for about 20 years. He has had other comorbidities such as hypertension for the past 20 years and is currently on a calcium channel blocker and a beta blocker (Amlodipine 5 mg+Atenolol 25 mg OD), CVA 5 years ago, eye cataracts (both eyes) 11 years ago due to which

he lost his vision and is complete blind. He had undergone left leg amputation (above the knee) 4 years ago he was a chronic smoker.

Clinical Characteristics

All the baseline characteristic test results were normal. He had sinus rhythm with 86 beats/min, body temperature of 37.8°C, NIBP 130/80 mmHg and SpO₂ 98% at room air. The localized assessment of the left lower leg revealed a recovered scar on the AKA stump. The patient presented with chief complaints of a wound over the right lower limb, pressure sore/ulcer over the lateral part of the right foot followed by the formation of a blister that eventually ruptured to form a wound of size 4x4 cm. Positive for blackish discoloration of the leg (Figure 1), pain in the right leg which was of score throbbing type aggravating while walking and relieves on taking medication. He had similar complaints in the past on the contralateral limb for which AKA was done 4 years ago. Local examination of his right extremity revealed necrotic patches that measured 15x10 cm over the dorsum of the foot extending up to the leg with irregular borders, blackish discoloration of surrounding skin with erythema, pitting type of edema and scar lesion present and very feeble pulsation of the right anterior tibial vein and posterior tibial vein on deep palpation hence, he was diagnosed with necrotizing fasciitis. Lab reports showed raised WBC counts (18700 cells/uL) and



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Figure 1: Blackish discoloration of right lower leg which led to BKA.

hemoglobin was 9.8 g/dL. The GRBS ranged between 160 mg/dL and 360 mg/dL and the fasting lipid profile was normal, while the HbA1C was 6.2%.

Physical and neurophysiological examinations were unremarkable and ECG, 2D echo, hematological biochemistry and X-ray of the chest were normal. A-V Doppler scan showed a monophasic wave pattern with low resistance flow in the right PTA and DPA arteries. He was initiated with insulin treatment promptly on admission, broad-spectrum intravenous antibiotic therapy (ceftriaxone 1 g, 12th hourly along with metronidazole 500 mg 6th hourly) tramadol 100 mg in 100 mL NS was initiated to manage pain, combination therapy of calcium channel blocker and a beta blocker (Amlodipine 5 mg+Atenolol 25 mg) was initiated to manage BP. The patient underwent emergency debridement (Figure 2). The microbiology report of wound swabs revealed ESBL producers (*Klebsiella*) which are resistant to penicillins, 1st, 2nd and 3rd generation cephalosporins and monobactam except cephamycin. The patient had a transfusion of one pint of O-positive blood. He subsequently underwent right leg BKA. The daily sterile wound dressing was continued, but the patient developed surgical site infection (Figure 3) which was identified at an early stage the wound was flushed and cleaned with broad-spectrum antibiotic wash along with intravenous antibiotic therapy.

Outcome and follow-up

After a week the patient was stable and was managed with a combative post-amputation rehabilitation plan and was discharged on the 20th post-operative day. The patient is on a low diabetic indexed diet, oral hypoglycaemic regimen along with



Figure 2: Wound after emergency debridement.



Figure 3: Patient developed surgical site infection on 8th post operative day.

insulin therapy. The routine follow-up visits by patients at the 1st, 3rd and 7th week in the postoperative period showed satisfactory outcomes.

DISCUSSION

In the present case study, the subject showed a notable risk of BKA due to chronic hyperglycemia associated with poorly uncontrolled diabetes. Many studies showed that the most common complication of uncontrolled diabetes is diabetic foot syndrome.³⁻⁶ Diabetes causes nerve damage leading to neuropathy which leads to foot ulceration and/or wounds with or without infections.⁷ Foot amputation due to DM may lead to loss in quality of life as well as cost of providing health care increases drastically.⁸ The main course of treatment for DFS such as necrotizing fasciitis is early debridement of necrotic tissues along with effective broad-spectrum antibiotics.⁹ It is found in

several studies that many uropathogens such as *E coli* are found in diabetic patients and other organisms include *Enterococcus faecalis*, *Klebsiella* spp., *Enterobacter* spp., *Proteus* spp. and Group B *Streptococci*.¹⁰ The histopathology report of our patient showed the presence of *Klebsiella* spp., hence he was resistant to many of 1st, 2nd and 3rd generation cephalosporins, penicillin and monobactam except cephamycin. The immune system of DM patients is highly compromised due to hyperglycemia.^{11,12} As the immune system of DM patients is compromised, they develop various medical conditions such as ocular problems and blindness, cardiovascular problems, lower extremity amputation and renal diseases as compared to non-diabetic patients.^{7,13} Once the foot ulcer is developed the risk of wound progression increases profoundly and may lead to foot amputation. Various studies have shown that diabetes influences surgical site infections and the intensity of infection is enhanced due to hyperglycemia.¹⁴ The morbidity and mortality rate in diabetic patients is high as they develop antimicrobial resistance against infections, therefore there is a high risk of developing surgical site infections.¹⁵ Cigarette smoking increases the risk of developing peripheral vascular disease and delays wound healing,¹⁶ the patient was a chronic smoker for more than 20 years, as indicated in various studies a history of smoking for 20 years or more is the key factor that leads to amputation.¹⁶ Infection is a primary cause of amputation in India¹⁷ hence, It is important to maintain appropriate hygiene conditions for patients with DM in the hospital as they are prone to develop infections.

CONCLUSION

Proper lifestyle modification along with dietary approaches is extremely needed to prevent and manage DM. We suggest routine foot examination and proper comfortable footwear are important preventive steps that should be taken by people with diabetes to control foot trauma and infections.

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INFORMED CONSENT

A written informed consent was obtained from the patient for publication of this case report along with accompanying images.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ABBREVIATIONS

DM: Diabetes mellites, **CVA:** Cardiovascular accidents, **NIBP:** Noninvasive blood pressure, **AKA:** Above knee amputation, **BKA:** Below knee amputation, **PTA:** Posterior tibial artery, **DPA:** Dorsalis pedis artery, **DFS:** Diabetic foot syndrome.

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