

Case report on necrotising fasciitis with myiasis in lower extremity

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Introduction

Necrotizing fasciitis (NF) is a severe soft tissue infection characterized by rapidly progressing necrosis, mainly the fascia and subcutaneous tissues but can also extend to include muscles and skin. It is a rare, life-threatening condition with a mortality rate of 25% to 35% despite of surgical debridement and antibiotic therapy.¹ Although rare, it is frequent enough that surgeons will likely have to manage at least one patient with NF during their practice.

Hope first proposed myiasis as an infestation of fly larvae.² Wound myiasis occurs when fly larvae infiltrate open wounds of a host. This type of infestation may be the result of facultative or obligatory parasites. The clinical findings of myiasis vary according to the fly species, the number of larvae, and the invaded area's location.

Case Report



Fig 1: Clinical image of dorsum surface of left foot (1st visit)

A 54yrs old female patient with a history

of diabetes mellitus for the past six years visited the hospital with swelling for the past two weeks in the left foot and uncontrolled diabetes. She accidentally hit her left foot by stone a week back during barefoot walking. On examination of the left foot revealed a deep wound located at the left forefoot involving the lateral plantar surface, filled with myiasis larvae and emitting a fetid odor. The skin surrounding the ulcer was dry on the dorsum surface, erythematous with mild edema on the plantar surface; the fourth and fifth toe showed gangrene features. (Fig 1 & 2). She was normotensive with mild remittent fever.



Fig 2: Clinical image of plantar surface of left foot (1st visit)

Laboratory findings revealed that all the hematological and biochemistry panel was normal, except for leucocyte (50/ ul) and platelets – (457 thousands/cmm). The glycated hemoglobin

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was 8.1%, hemoglobin was 8.9 gm/dL, Serum creatinine was 1.0mg/dl, and eGFR was 51ml/min/1.73m². A special investigation like Doppler revealed normal blood circulation in both the legs, Biothesiometry revealed significant neuropathy; Monofilament test showed Protective sensation partially present, Ultrasound showed normal liver, gall bladder, pancreas, kidney. Depending on the clinical features of the wound it was diagnosed as necrotizing fasciitis with myiasis and wet gangrene of the fourth and fifth toe. She has undergone wide debridement with amputation of 4th and 5th toes on emergency basis. Later the wound was skin grafted after 3 weeks and she was rehabilitated with locoregional offloading footwears and silicone gelsocks. (Fig 3, 4 and 5)



Fig 3: After debridement and toe amputation

Discussion:

Patients with diabetes are susceptible to numerous foot complications, including peripheral neuropathies, advanced atherosclerosis (leading to gangrene formation), and infection. Necrotizing fasciitis is characterized by quickly spreading infection in the subcutaneous tissues. Microbial invasion of the subcutaneous tissues occurs either through external trauma or direct spread from a

perforated viscus. Invaded bacteria produce endo and exotoxins that cause thrombosis, ischemia, necrosis, and often systemic illness leading to death.

There are two groups of necrotizing fasciitis, depending on microbiology.³

1. Type-I NF is polymicrobial.
2. Type-II NF are monomicrobial

Early diagnosis of NF is not always likely due to the lack of cutaneous findings early in the disease. Although necrotizing fasciitis is often described as pain disproportionate to the clinical findings, diabetes patients may not localize symptoms. Instead, they seek medical attention because of fatigue or elevated blood glucose levels. In addition neuropathy a common accompanying ailment in diabetic patients contributes to the significant blunting of local inflammatory response. When patients with diabetes present with foot ulceration accompanied by leukocytosis, fever, malaise, and hyperglycemia, necrotizing fasciitis should be considered. Wong et al. created a score (laboratory risk indicator for necrotizing fasciitis score) to discriminate between NSTI and non-necrotizing soft-tissue infection.⁴

The diagnosis is based on both clinical and radiographic findings. Soft tissue gas may be noticed on clinical examination or imaging, but this classic sign should not delay aggressive management if it is suspected.⁵ Likewise, an elevated WBC count, hyperglycemia, and acidosis may be present in laboratory testing, but their absence should not be used to rule out the diagnosis. Radiographs of the affected extremity may show gas due to clostridial, *Escherichia coli*, *Peptostreptococcus*, and *Bacteroides* infections, but often are normal. To differentiate necrotizing soft tissue infections from non-necrotizing cellulitis, magnetic resonance imaging (MRI) is the gold standard, with a sensitivity as high as 100%.⁶

Management of a diabetic foot infection depends on the infectious etiology. Patients with diabetes typically have type 1 infections, with Gram-positive cocci and Gram-negative rods.

This polymicrobial infection in diabetics is also known as “fetid foot”. The Mortality rates are high (20%–30%), and successful outcomes are more likely with broad-spectrum antibiotic administration and immediate surgical debridement.⁷ Our patient initially received intravenous antibiotic and started on a basal-bolus regimen and OHA (Vildagliptin with metformin combination twice daily) for better glycaemic control. After fluid resuscitation and a tetanus booster, she was immediately transferred to the operating room, where she underwent Left fourth and fifth toe amputation with fasciectomy under the nerve block.



Fig 4: After 3 weeks

Pus Culture grew *Enterococcus* spp. scanty grown at the aerobic condition, which was sensitive to Amoxycillin / Clavulanic Acid, Ampicillin, Gentamycin, Penicillin-G, Vancomycin etc. She was successfully treated with Clindamycin, ciprofloxacin, and metronidazole added for broad-spectrum coverage. Adjunctive necrotizing fasciitis management includes serial debridement of necrotic and infected tissue, vacuum-assisted closure therapy, and hyperbaric oxygen therapy. After ENT concern, she was given HBOT therapy as it is thought to promote

healing by increasing tissue oxygen tension in infected areas and may be associated with a decreased need for amputation.⁸ After three weeks, the surgeon performed a wound closure procedure using split-thickness skin grafting, followed by an antibiotic regimen and dressing with appropriate offloading.



Fig 5: After Skin grafting

These patients are at higher risk of dying from other infectious events due to a preexisting immune function fault. Thus, the patient was counseled about the importance of reducing modifiable risk factors, including obesity, diabetes, smoking, and atherosclerotic disease, and ensuring routine influenza and pneumococcal vaccinations to minimize infection risk.⁹

Wound myiasis is most often began when flies oviposit in necrotic, hemorrhaging, or pus-filled lesions. Wounds with alkaline discharges are more prone to attract blowflies.¹⁰ The most vital predisposing factors for human wound myiasis are lack of hygiene, low socioeconomic status, and adequate care of the elderly, psychiatric patients, alcoholics, and other helpless patients.¹¹ Local destruction, invasion into deeper tissues, and

secondary infection are possible complications of myiasis.

Maggot therapy is an artificially induced myiasis performed in a controlled environment by skilled medical practitioners. The most suitable species for maggot therapy is *L. sericata*. Maggot therapy has three main beneficial effects on a wound: debridement, disinfection, and enhanced healing.¹²

Summary

Diabetes Mellitus (DM) is the leading predisposing underlying medical condition because of peripheral neuropathy, peripheral vascular disease, and immunosuppression. Hence, early recognition, aggressive management, and ongoing diabetes control are the cornerstones of successful management. Our patient underwent left fourth & fifth-foot toe amputation with fasciectomy and split-thickness skin grafting followed by broad-spectrum antibiotic coverage with an appropriate offloading device.

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