

## Buruli ulcer disease in a diabetic patient

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**Abstract:** This paper describes the case of a diabetic woman presenting with leg ulcer which was later diagnosed as WHO Category I Buruli ulcer. The ulcer predated her presentation to the hospital and she was subsequently referred to the Tuberculosis Unit of a tertiary healthcare for Buruli ulcer treatment alongside her medication for diabetes type 2.

**Keywords-** Buruli ulcer, *Mycobacterium ulcerans*, diabetes mellitus

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### I. Background

*Mycobacterium ulcerans* infection (Buruli ulcer) is an emerging neglected tropical disease characterized by extensive and severe destruction of the skin and soft tissue resulting in the formation of large ulcers [1]. This necrotizing infectious disease has been reported in over 33 countries in tropical and sub-tropical regions of the world particularly in Africa, Asia, Australia, South America and the Pacific. The disease is most prevalent in Central and West Africa while the latter is now regarded worldwide as the epicenter of the disease. Buruli Ulcer (BU) is now the third most common mycobacteriosis in immunocompetent humans after tuberculosis and leprosy [2,3]. Despite the increase in prevalence, it is one of the least studied neglected tropical diseases particularly in Nigeria where the disease was first described in 1967 [4].

Except in endemic areas, the diagnosis of BU could be challenging [5] particularly in its differential diagnoses from several other ulcers of similar presentations which, among others, include diabetic foot ulcer. By contrast, the differential diagnoses of diabetic foot ulcer does not include Buruli ulcer. In this report we present a case of Buruli ulcer in a diabetic patient.

### II. Case Presentation

A 50-year old woman and petty trader by vocation, though clinically stable, was diagnosed of Type 2 diabetes mellitus in 2017 at the General Hospital, Ede, Osun State, Nigeria. Her blood sugar level readings on two different occasions using the fasting plasma glucose (FPG) test were 147mg/dl and 149mg/dl respectively, aside a history of polyuria, fatigue and gradual weight loss. While undergoing treatment for diabetes, she presented with a multi-focal moderate-size ulcers on the anterior calf of her right leg. No attempt was made to link the ulcer to her health status. Her HIV status was unknown and was not determined. She had never had tuberculosis.

A research team on BU active case search from the Redeemer's University noted the painlessness and characteristic undermined edges of the ulcer (Fig 1) after which a clinical impression of Buruli ulcer was entertained.

There was no noticeable surrounding inflammation and no evidence of osteomyelitis deep to the lesions. Swab specimens were taken for PCR and microscopy. The result of IS2404 PCR was positive for *M. ulcerans* while the culture on Lowenstein-Jensen (LJ)slope incubated at 32°C for 8 weeks was also positive as Ziehl-Neelsen staining smear microscopy showed *M. ulcerans* extracellular acid-fast bacilli.



**Figure1.** Leg with multifocal ulcers before sample collection

### III. Discussion And Conclusion

Leg ulcers are an increasing problem worldwide and represent a major healthcare burden. Patients with leg ulcers are managed by clinicians in multiple specializations including primary healthcare, vascular surgery, plastic surgery, podiatry, wound care and dermatology [6]. A leg ulcer is a physical finding that can result from multiple aetiologies; thus, determination of the cause is essential for selecting appropriate treatment and determining the need for further evaluation [7].

Diabetes mellitus (DM), as a disease entity, is known to depress the immune response as a result of impairment of cellular immunity arising from damage to the neutrophil function leading to reduced chemotaxis and phagocytic activity [8]. It is believed that greater frequency of infections in diabetic patients is caused by the hyperglycemic environment that favors immune dysfunction. Some of the common diseases/complications associated with DM include foot infections, diabetic dermopathy, classic diabetic trophic ulcer, venous/arterial ulcer and pyodermagangrenosum, among others [9]

It is suggested that patients with diabetes are also at higher risk of contracting tuberculosis than individuals without DM and that persons with DM are more predisposed to skin and soft tissue infections such as folliculitis, furunculosis, and subcutaneous abscesses [10, 11]. Prior to this study, there has been no report linking BU with DM, thus making this case unique. While diabetic foot ulcer is usually considered in the differential diagnoses of Buruli ulcer, the converse is not the case in the diagnoses of diabetic foot ulcer. It may therefore be expedient from the result of this study to always consider BU as an option in the diagnoses of DM particularly in BU-endemic areas. The BU in this patient presents more as an opportunistic infection probably due to the lowered immunity caused by the DM. More research is, however, needed for clarification of the immunopathogenic mechanisms linking Buruli Ulcer and diabetes mellitus.

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