Senegal, a new potential endemic country for Buruli ulcer?

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ABSTRACT

Mycobacterium ulcerans is the causal agent of Buruli ulcer, a neglected tropical disease with cutaneous tropism. We report a case of Buruli ulcer in a patient who travelled in Senegal, a country not identified by the World Health Organization as being endemic for this disease. This case is the third case of Buruli ulcer reported as having been contracted in Senegal, showing the urgent need to develop data collection in this country by having an active community-based surveillance–response system.

Case report

A 69-year-old man was hospitalized in the University Hospital of Rouen, France, due to large ulcerations of the left leg that had progressed over the past 3 weeks (Figure 1A, B). This Senegalese patient, who lived in France, had travelled to the southern region of Ziguinchor in Senegal during the rainy season from May to August 2018. He denied walking barefoot, having a wound, and living near or swimming in a watercourse during his stay. He had not noted any insect bites. The patient reported no previous medical problems and was not taking any treatment.

He described an initial papular lesion, discreetly squamous, at the level of the third left inter-toe space, which had evolved over the course of 3 weeks into three vast ulcers that extended to the back of the foot and the front and inner sides of his left leg (Figure 1A, B). He was first hospitalized for a week in the regional hospital in Ziguinchor, where treatments had been given, but he could not recall the treatments used. The ulcers had progressed for an additional 3 weeks before he presented to the Department of Dermatology in Rouen on August 14, 2018.

The patient was apyretic and was in little pain. He presented expansive ulcers with a fibrinous base that had mildly exudative and undermining edges. There was major oedema of the leg. Blood chemistry results showed a moderate inflammatory syndrome (C-reactive protein 64 mg/l, procalcitonin 0.11 ng/ml, no hyperleukocytosis), but no liver or kidney damage. Serology results for HIV, hepatitis B virus, hepatitis C virus, filariasis, bilharzia, and leishmaniasis were negative. Arterial Doppler echography did not find any abnormalities.

Given the extent and severity of the lesions, a bacterial superinfection of the leg was first suspected. This was treated with amoxicillin–clavulanic acid, 1 g three times a day for 10 days, without any significant clinical improvement. Skin samples were obtained and sent to the laboratory of bacteriology, and results indicated a polymicrobial flora.

In view of the lack of improvement and the appearance of the lesions, Buruli ulcer was rapidly suspected. Skin biopsies and swabs were performed under the edges of the ulcers, and the presence of *Mycobacterium ulcerans* was confirmed by real-time PCR assay targeting the IS*2404* putative transposase and the mycolactone polyketide synthase genes. Furthermore, acid-fast bacilli were seen on direct smear examination with Ziehl–Neelsen staining. Cultures on Löwenstein–Jensen medium at 32 °C remained negative. A labelled leukocyte scan showed no osteitis or osteomyelitis.

The patient was placed on rifampicin 300 mg/day and clarithromycin 450 mg/day for 2 months, associated with local care and local debridement of the ulcers. No skin graft was performed. The patient's clinical course was favourable with a decrease in the leg oedema and with slow healing of the ulcers, probably due to the extent of the lesions, his age, and the fact that he received antibiotic treatment alone, without surgery (O'Brien et al., 2018) (Figure 1C–F).

Discussion and conclusions

Buruli ulcer is a necrotizing skin disease caused by *M. ulcerans* and characterized by skin and soft tissue damage that can lead to disabilities (Guarner, 2018; Yotsu et al., 2018). The mode of

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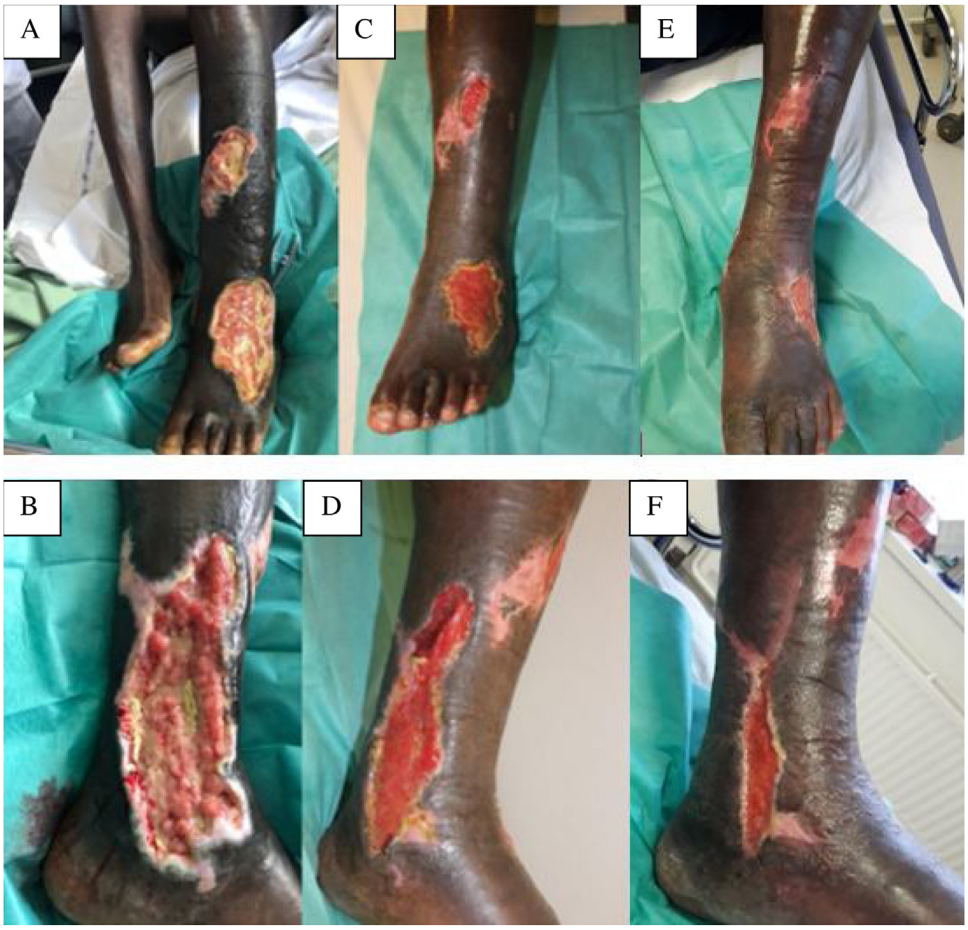

Figure 1. Leg infected with *Mycobacterium ulcerans* (Buruli ulcer) with undermining edges. Images A and B show the lesions at the time of presentation to the Department of Dermatology; images C and D show the lesions after 6 months of treatment; images E and F show the lesions after 9 months of treatment.

transmission to humans remains unclear, but likely involves inoculation into the subcutaneous tissues, potentially though aquatic insects, other arthropods, or other various routes (Marsollier et al., 2002; Merritt et al., 2010). Risk factors commonly associated with *M. ulcerans* infection include all activities in contact with fresh water (Merritt et al., 2010). The mean incubation period is of 4.5 months (Trubiano et al., 2013).

Upon presentation to the Department of Dermatology, Buruli ulcer was rapidly suspected in this patient even though Senegal is not known to be a country endemic for *M. ulcerans* (World Health Organization, 2017). However, the disease has been reported in many other West African countries.

Two previous cases contracted in Senegal have been described in the literature. The first concerned a French traveller to Senegal who stayed in Casamance during the rainy season. He had been working on the construction of wood dugouts and had been in contact with stagnant water (Ezzedine et al., 2009). The second concerned a patient living first in Dakar and then in the semi-arid area of Diourbel. He only reported occasional insect bites (Ezzedine et al., 2009). In the case presented here, the mode of transmission of the disease is unknown. The patient did not report having been in contact with standing water or a river in Senegal. However, the Ziguinchor region is close to the border with Guinea, a country endemic for *M. ulcerans*, where 98 new cases were reported in 2017 (World Health Organization, 2017). Moreover, Ziguinchor is located near the Casamance River, a potential reservoir of the bacterium (Ezzedine et al., 2009).

This is the third case of Buruli ulcer reported as having been contracted in Senegal, showing the urgent need to develop data collection in this country by having an active community-based surveillance–response system that systematically collects, analyses, and interprets data on the disease. Indeed, it is important to identify the potential reservoir in this country in order to take preventive measures. Finally, this case once more illustrates the importance of training healthcare workers in the detection and treatment of *M. ulcerans* (Turner et al., 2019).

Ethics approval and consent to participate

Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

Consent for publication

All the named authors have seen and agreed the final version of the manuscript.

Conflict of interest

The authors declare that they have no competing interests.

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References

Ezzedine K, Pistone T, Cottin J, Marsollier L, Guir V, Malvy D. Buruli ulcer in long-term traveler to Senegal. Emerg Infect Dis 2009;15:118–9.
Guarner J. Buruli ulcer. Review of a neglected skin mycobacterial disease. J Clin Microbiol 2018;56:01507–17.
Marsollier L, Robert R, Aubry J, Saint André JP, Kouakou H, Legras P, Manceau AL, et al. Aquatic insects as a vector for *Mycobacterium ulcerans*. Appl Environ Microbiol 2002;68:4623–8.
Merritt RW, Walker ED, Small PL, Wallace JR, Johnson PD, Benbow ME, et al. Ecology and transmission of Buruli ulcer disease: a systematic review. PLoS Negl Trop Dis 2010;4:e911.
O'Brien DP, Friedman ND, McDonald A, Callan P, Hughes A, Walton A, et al. Wound healing: Natural history and risk factors for delay in Australian patients treated with antibiotics for *Mycobacterium ulcerans* disease. PLoS Negl Trop Dis 2018;12:e0006357.
Trubiano JA, Lavender CJ, Fyfe JA, Bittmann S, Johnson PD. The incubation period of Buruli ulcer (*Mycobacterium ulcerans* infection). PLoS Negl Trop Dis 2013;7:e2463.
Turner GA, Seck A, Dieng A, Diadie S, Ndiaye B, van Imeerzeel TD, et al. Confirmed case of Buruli ulcer, Senegal, 2018. Emerg Infect Dis 2019;25:600–1.
World Health Organization. Global health observatory data 2017. Available from:. 2017. http://apps.who.int/neglected_diseases/ntddata/buruli/buruli.html.
Yotsu RR, Suzuki K, Simmonds RE, Bedimo R, Ablordey A, Yeboah-Manu D, et al. Buruli ulcer: a review of the current knowledge. Curr Trop Med Rep 2018;5:247–56.

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