Disseminated gonococcal infection in a patient with paroxysmal nocturnal haemoglobinuria receiving eculizumab

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A 19-year-old woman presented with fever, pharyngeal pain, malaise, polyarthralgia, and lower leg muscle pain at a university hospital. Her medical history included paroxysmal nocturnal haemoglobinuria managed with periodic eculizumab, and she had received the meningococcal vaccine 2 years before presentation.

On examination, the patient had 5–10 mm scattered erythematous lesions. Some lesions showed central vessel dilation and central purpura (figure). Meningococcal infection was initially suspected; however, multidrug-resistant *Neisseria gonorrhoeae* was isolated from blood cultures (appendix), and disseminated gonococcal infection was diagnosed. No pharyngitis, meningitis, or infectious endocarditis were observed. She had one male partner, and they had unprotected sexual intercourse and oral sex. He had received treatment with a single 2 g dose of extended-release azithromycin for urethritis at a urology clinic 6 days after she visited the university hospital. She was treated for 14 days with meropenem 1 g every 8 h and discharged after confirmation of blood culture conversion.

23 days later, she redeveloped fever, pharyngeal pain, and systemic sporadic erythema (figure). Despite previous safe sex instruction, the patient and her partner resumed unprotected sexual activity. Blood culture, vaginal secretion, and spinal fluid PCR again detected *N gonorrhoeae*. A reinfection of disseminated gonococcal infection was diagnosed and treated successfully with 2 g of ceftriaxone every 24 h for 14 days. Her partner was treated with a single intravenous 1 g dose of ceftriaxone at a university hospital, as his previous treatment was suspected to be insufficient. Both the patient and her partner received further safe sex instruction. The patient's infection completely resolved after the second treatment, and the partner is still being followed up.

Eculizumab, a humanised anti-C5 monoclonal antibody, is used to treat patients with paroxysmal nocturnal haemoglobinuria and other diseases including atypical haemolytic uraemic syndrome, myasthenia gravis, and neuromyelitis optica spectrum disorder. Eculizumab increases the infection risk of capsule-forming bacteria such as *Neisseria* spp. Invasive meningeal infection and disseminated gonococcal infection must be suspected in patients with fever and skin lesions receiving eculizumab. Disseminated gonococcal infection is characterised by skin lesions such as papules, erythema, and blisters, whereas petechiae and fulminant purpura are seen with meningococcal infection. Multidrug-resistant gonococci have become a serious issue (eg, resistance to azithromycin and ceftriaxone), and antibiotic options might be minimal, as with this patient. It is essential to treat both the patient and their partner, and provide sexual education to prevent disseminated gonococcal infection in patients receiving eculizumab.

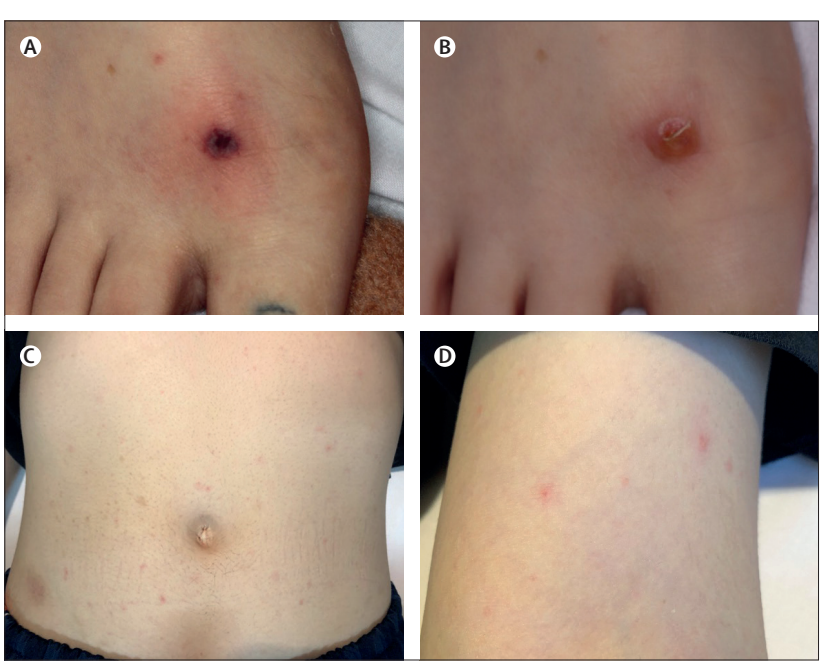

Figure: **Cutaneous manifestations of disseminated gonococcal infection**
(A) Erythema with central purpura on the top of the left foot at first presentation. (B) The erythematous lesion 6 days later. The purpura on the top of the left foot evolved into blisters. (C) Erythematous lesions scattered over the patient's abdomen at reinfection, similar to those found during the first infection. (D) Erythema with central vessel dilation on the forearm at reinfection, similar to the lesions observed during the first infection.

Contributors
IN-S and HK equally contributed to the writing of this Clinical Picture. All authors contributed to the clinical management of the patient and reviewed this report. IN-S obtained written consent from the patient.

Declaration of interests
We declare no competing interests.

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