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Borrelia burgdorferi mimicking central nervous system relapse in diffuse large B cell lymphoma

Marcel Nijland¹ · Martijn Bakker¹ · Kees Meijer² · Wouter Plattel¹

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Dear editor,

A 61-year-old male was successfully treated with 6 cycles of rituximab, cyclophosphamide, doxorubicin, vincristine, and prednisolon because of an intermediate risk diffuse large B cell lymphoma (DLBCL). Shortly after completion of treatment, he experienced progressive weight loss, muscle strains, and diminished strength of both legs. ¹⁸F-FDG positron emission tomography showed no signs of relapse. A magnetic resonance imaging of the brain showed diffuse white matter enhancement, most prominent at the trigone of the lateral ventricle (Fig. 1a). Spinal fluid showed pleocytosis with suspicious lymphocytes (Fig. 1b: green arrow indicating normal lymphocytes, red arrow indicating enlarged

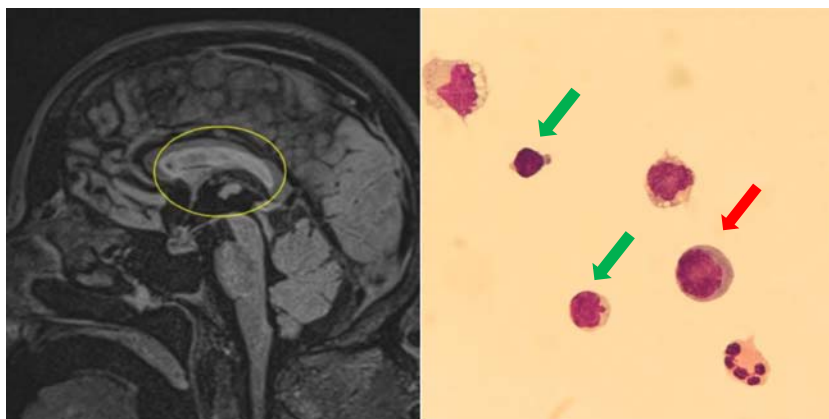
lymphocytes). Flowcytometric analysis indicated 0.3% large CD19 positive, CD20 negative B cells, and thus, leptomeningeal DLBCL relapse was considered and the patient was scheduled to receive high-dose methotrexate chemotherapy. However, several days later *Borrelia burgdorferi*-specific antibodies and *Borrelia burgdorferi* polymerase chain reaction (PCR) in the spinal fluid were positive. It was only then realized that the leptomeningeal B cells were reactive. Retrospectively the patient had experienced an erythema migrans earlier that year. The patient was treated with ceftriaxone for 30 days, after which he fully recovered. Repeated liquor analysis after completion of ceftriaxone was normal. In Europe Lyme borreliosis is caused by an infection with the spirochete *Borrelia burgdorferi* which is transmitted by the bite of the infected tick *Ixodes ricinus*. A minority of patients develops neuroborreliosis estimated at 6.5 per million inhabitants. Facial nerve palsy and radiculoneuritis are the most common manifestations. Only a few cases have been described in immunocompromised patients [1]. In patients treated with chemo-immunotherapy who present with neurological symptoms and pleocytosis of the cerebrospinal fluid, one should consider not only CNS relapse but also infectious diseases like neuroborreliosis.

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Fig. 1 a Magnetic resonance imaging of the brain showing diffuse white matter enhancement, most prominent at the trigone of the lateral ventricle. **b** Spinal fluid showing pleocytosis with suspicious lymphocytes (green arrow indicating normal lymphocytes, red arrow indicating enlarged lymphocytes)



Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval This article does not contain any studies with human participants performed by any of the authors.

Informed consent Informed consent was obtained from the participant included in the study.

Reference

1. Furst B, Glatz M, Kerl H, Mulleger RR (2006) The impact of immunosuppression on erythema migrans. A retrospective study of clinical presentation, response to treatment and production of *Borrelia* antibodies in 33 patients. *Clin and Exp Dermatol* 31:509–514

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