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# *Borrelia spielmanii*–Associated Neuroborreliosis in Patient Receiving Rituximab, Belgium

## Appendix

**Appendix Table**. Comparison between reported cases of neuroborreliosis in patients on Rituximab*

| Study | Country/age/sex | Previous hemopathy | Previous treatment; date of last rituximab treatment | Symptoms | Additional tests | CSF data | *Borrelia* serology | CXCL13 | *Borrelia* PCR | Treatment/ outcome |
|---|---|---|---|---|---|---|---|---|---|---|
| (*1*) | Germany/63 y/M | Chronic lymphocytic leukemia | Fludarabine/cyclophosphamide/ prednisone/rituximab; ongoing at onset | Neuropathic pain in the left upper arm and both upper legs, with hyperesthesia and slight facial paresis. | Brain MRI N/R; Spine MRI negative; EMG negative; whole-body CT scan negative; brain $^{18}$F-FDG PET/CT negative | 63 leukocyte/mm$^3$, lympho-monocytoid; 155 mg/dL proteins | Negative in blood, N/R in CSF | N/R | Positive in CSF for *B. garinii* | Ceftriaxone 2g 1x/d for 21 d/total recovery |
| (*2*) | Netherlands/66 y/F | Extranodal marginal zone B cell lymphoma stage IVB with extensive localizations (complete remission) | R-CHOP and maintenance with rituximab; ongoing at onset of borreliosis | Severe shooting pains in the back and both legs, followed by deafness, nausea, vertigo and headache. No paresis. | Brain/Spine MRI negative; whole-body $^{18}$F-FDG PET/CT negative | 492 leukocyte/mm$^3$ (89% mononuclear); hyperproteinorachia (142 mg/dL proteins) | Negative in blood and in CSF. | N/R | Skin culture: negative; negative on serum; positive on CSF for *B. burgdorferi* s.l.. | Ceftriaxone IM 2g 1x/d for 21 d/total recovery |
| (*3*) | France/64 y/F | Follicular lymphoma (complete remission) | Vincristine /cyclophosphamide and Rituximab; 7 y before borreliosis | Tetraparesis, predominantly proximal | Brain MRI negative; spine MRI showed meningeal contrast enhancement; EMG was negative; whole-body $^{18}$F-FDG PET/CT was negative | Lympho-mononuclear pleiocytosis; hyperproteinorachia; oligoclonal bands. | Negative in blood, positive in CSF | N/R | N/R | Ceftriaxone for 21 d/total recovery |
| (*4*) | Netherlands/70 y/M | Mantle cell lymphoma. | R-CHOP, autologous stem cell transplantation, rituximab maintenance; ongoing at the onset of borreliosis | Intermittent fever, myalgia, headaches, tinnitus and hearing loss, exanthema, left facial palsy, unsteady gait, dysphagia, 6kg loss. | Brain MRI showed periventricular white matter lesions, pathological enhancement of multiple cranial nerves; whole-body CT scan was negative; whole-body $^{18}$FDG PET/CT was negative | 279 leukocyte/mm3 (60% lymphocytes); 255 mg/dL, proteins. | Negative in blood and in CSF initially. IgG p41 weakly positive in blood | N/R | CSF negative for *B. myamotoi*, weakly positive for *B. burgdorferi* s.l. on 2nd sample (negative on 1st sample) | Ceftriaxone IV 2g 1x/d for 21 d/kept mild dysphagia and dysarthria |

| Study | Country/age/sex | Previous hemopathy | Previous treatment; date of last rituximab treatment | Symptoms | Additional tests | CSF data | *Borrelia* serology | CXCL13 | *Borrelia* PCR | Treatment/ outcome |
|---|---|---|---|---|---|---|---|---|---|---|
| Current study, 2024 | Belgium/58 y/F | Follicular lymphoma | R-CHOP and rituximab maintenance; rituximab was ongoing at the onset of borreliosis | Progressively worsening sensory-motor deficit in the distal right lower limb, intense neuropathic pain in the same area and hyperesthesia | Positive GM1 antibodies at a low titer; EMG: axonal lumbar plexus involvement of the right lower limb; brain MRI negative; spine MRI showed subtle intradural contrast enhancement; plexus MRI showed infiltration of the right adductor muscle compartment; Whole-body $^{18}$FDG PET negative | 33 leukocyte/mm$^3$ (30% neutrophils, 45% lymphocytes, 25% macrophages); hyperproteinorachia (84 mg/dLproteins); several oligoclonal bands but none were specific to the CSF (“mirror pattern”) | Negative in blood and in CSF | Highly positive (>350pg/mL) | Positive in CSF for *B. spielmanii* | Ceftriaxone IV 2g 1x/d for 21 d/total recovery |

*18F-FDG, $^{18}$F-fluorodeoxyglucose; CSF, cerebrospinal fluid; CT, computed tomography; EMG, electromyography; MRI, magnetic resonance imaging; N/R, not reported; PET, positron emission tomography; R-CHOP, rituximab, cyclophosphamide, hydroxydaunorubicin, vincristine, and prednisolone.

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