

Balo Concentric Sclerosis

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CASE

A 13-year-old female presented with a left hemiparesis. Her family history was unremarkable, and her parents stated that she complained of headaches, sensory disturbances and general weakness in the past few weeks. Physical examination showed an obese patient but was otherwise unremarkable. A brain MRI study was ordered and showed multiple high signal lesions in the white matter with the largest in the right centrum semiovale having a multilayered concentric with alternating rings of higher and lower signal intensity in all sequences (Figure 1).

MR spectroscopy (MRS) was also done and showed elevated choline peak, a finding in keeping with the diagnosis of acute Balo concentric sclerosis (BCS) due to increased number of inflammatory cells (Fig. 2). N-acetyl aspartate was low indicating an alteration of neurons and their axons. The patient underwent treatment with intravenous methylprednisolone and had complete resolution of her neurologic deficits.

BCS is a rare variant of acute multiple sclerosis first described in 1928 by the Hungarian neuropathologist, Joseph Balo. Histopathology reveals alternating bands of myelinated and demyelinated axons corresponding to the concentric rings of higher and lower signal intensity present in various MRI sequences (1).

Higher T2 signal intensity rings represent demyelinated and swollen axons with lymphocytic and macrophage infiltration as well as activated microglia (all explaining the increased choline on MRS) producing cytokines and other substances. Lower T2 signal intensity rings correspond to preserved myelination (2, 3). Historically, most of these patients were diagnosed post-mortem but nowadays MRI reveals distinctive features that enable early diagnosis, avoid biopsy and guide adequate treatment.

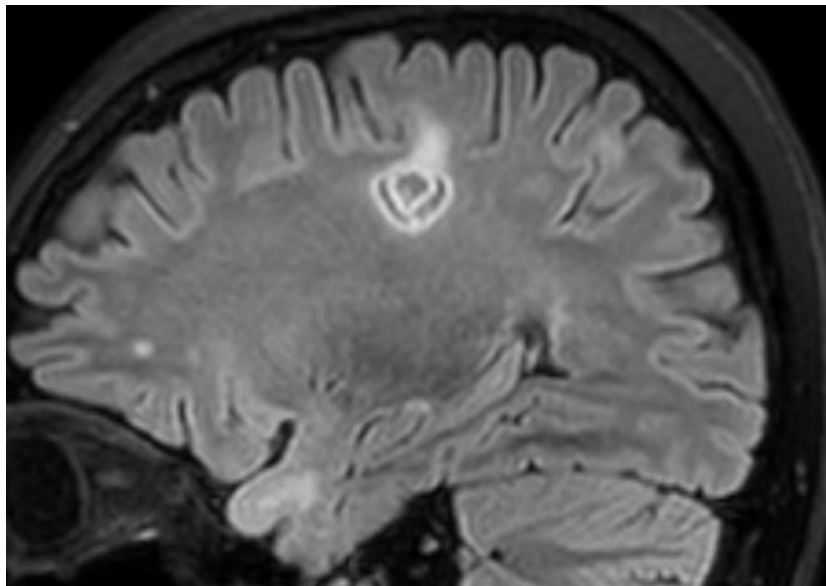


Figure 1. Parasagittal FLAIR image through the right centrum semiovale shows a multilayered lesion harboring concentric rings of high signal intensity interspersed with ones of lower signal intensity. There are additional and non-specific smaller high intensity lesions in the lower frontal and anterior temporal lobes.

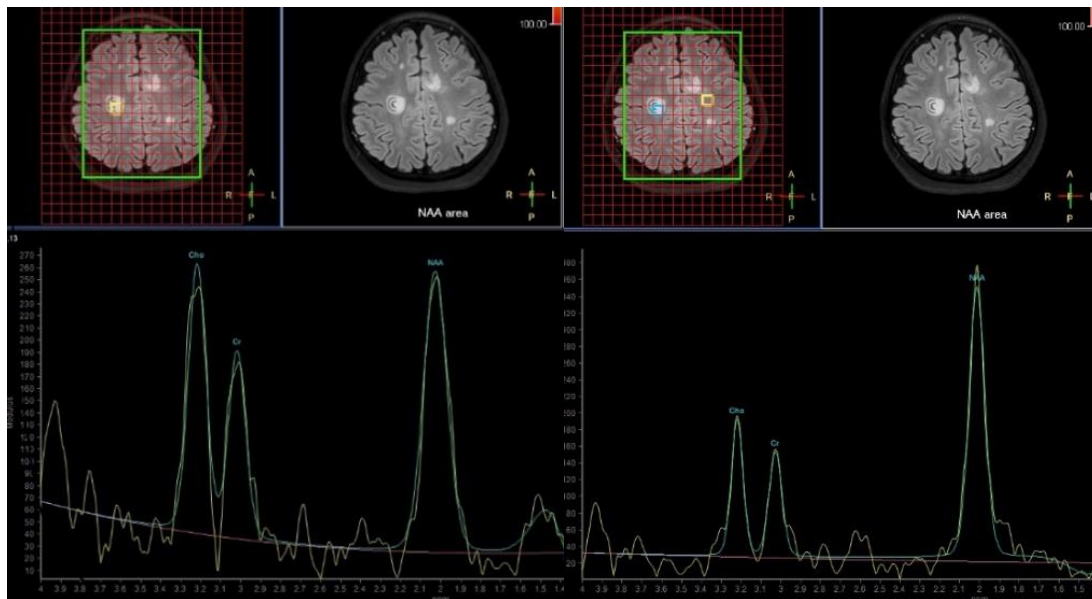


Figure 2. Multivoxel MRS of the lesion (A) shows increased choline and low n-acetyl aspartate when compared to control voxel on the opposite side (B) which shows a normal spectroscopic pattern.

Acknowledgments:

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Conflict of interest:

None declared.

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