



Coma in an alcoholic: Marchiafava-Bignami disease

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Coma can be a challenging diagnosis for the critical care doctor, especially in alcoholic patients.

We report a case of a 55-year-old male patient in whom the diagnosis of the coma was initially unclear and only discovered with magnetic resonance imaging (MRI).

Case report

A 55-year-old man with chronic alcohol abuse was found at home with altered consciousness and dysarthria.

Initially he was considered to be “just drunk again”. However, the emergency medical service was eventually called in after 24 hours because the patient did not wake up.

His medical history revealed a non-insulin dependent diabetes mellitus and hypertension. Alcohol abuse was known for 12 years. He used to drink several litres of beer a day. He was on the following medications: losartan 100 mg once daily (OD) and glimepiride 2 mg OD.

On admission, neurological examination showed a Glasgow Coma Scale (GCS) of E₁M₁V₁, pupil reactions were symmetrical. Slight diverging strabismus was noticed. The oculo-cephalic reflex was normal. There was no lateralisation or pathological reflex present and no neck stiffness was found. Vital signs were as follows: temperature 37.4°C, blood pressure 120/80 mmHg, pulse 100 beats per minute, and oxygen saturation 97% on room air.

Further physical examination was unremarkable.

Laboratory results showed a Hb of 7.4 mmol/L (8.5–11.0 mmol/L), MCV 108 f/L (80–100 f/L), leucocytes 9.7/nL (4–11/nL), platelets 41/nL (150–400/nL), γ -glutamyltransferase 562 U/L (0–50 U/L), ASAT 113 U/L (0–45 U/L), ALAT 68 U/L (0–45 U/L), LD 942 U/L (0–450 U/L), ammonia 40 μ mol/L (0–35 μ mol/L), Ca 1.74 mmol/L (2.20–2.65 mmol/L), Mg 0.64 mmol/L (0.7–1.2 mmol/L), glucose 11.2 mmol/L (4–10 mmol/L). Serum thiamine concentration was 43 mmol/L (70–185 mmol/L) and folic acid level 15.2 nmol/l (5–55 nmol/L). The ethanol level was <0.1 promille. Toxicological screening proved to be negative.

A lumbar puncture yielded clear colourless cerebrospinal fluid that contained no red cells and six leucocytes per cubic millimetre (3–15/mm³). Glucose level was 6.0 mmol/L and total protein level 0.55 g/L (0.29–0.67 g/L). A stain smear showed no micro-organisms and cultures did not show any growth.

Computer tomography (CT) of the brain, which was performed immediately on the emergency department, showed no significant abnormalities. The patient was intubated, ventilated, and transferred to the ICU.

Electroencephalogram (EEG) revealed slow background activity with minimal irregularities and abundance of theta-activity occipito-temporal and no seizure activity suggesting a metabolic cause of coma.

MRI of the brain showed a high signal lesion in the corpus callosum and internal capsule in the T2-weighted sagittal (Figure 1) and axial view (Figure 2), as a sign of demyelination and oedema.

Figure 1. T2-weighted sagittal image in Marchiafava-Bignami disease demonstrating a small, well-defined, and hyperdense lesion in the genu of the corpus callosum (arrowed)

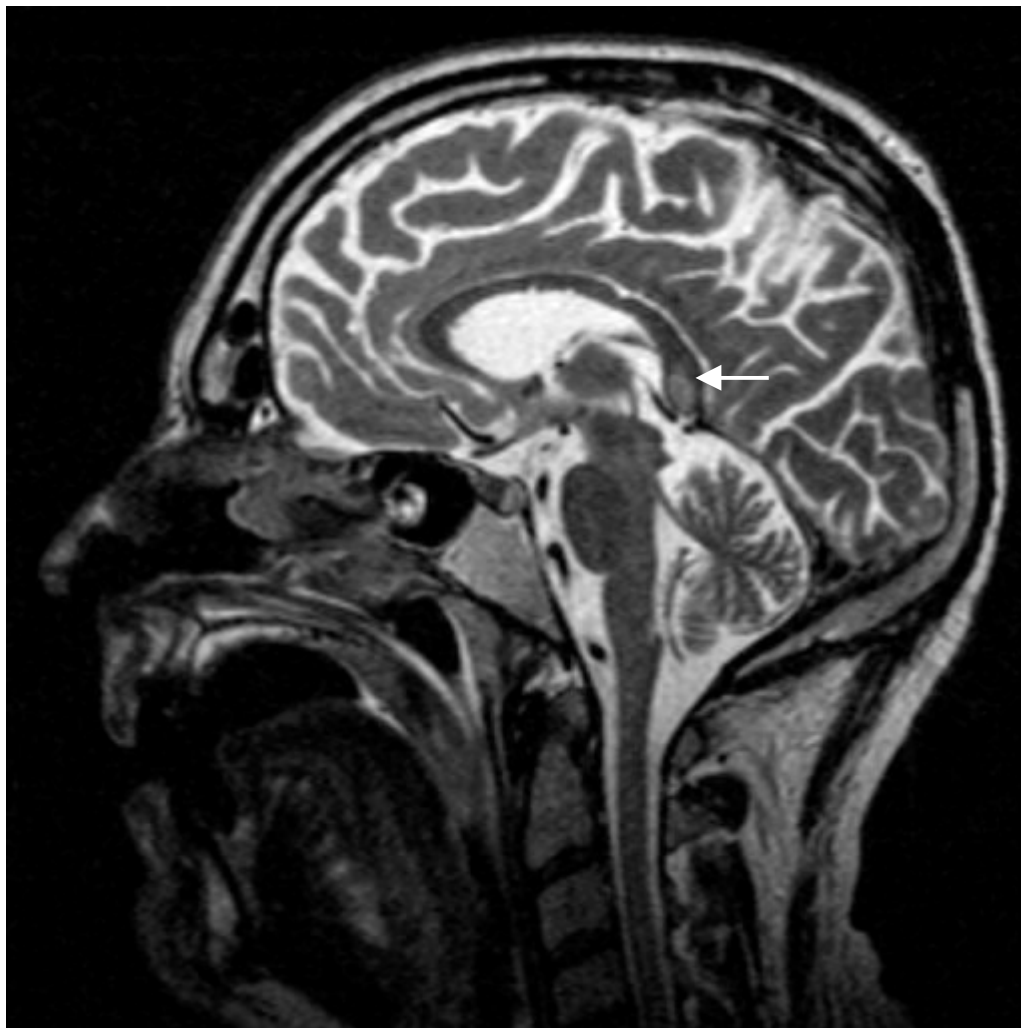
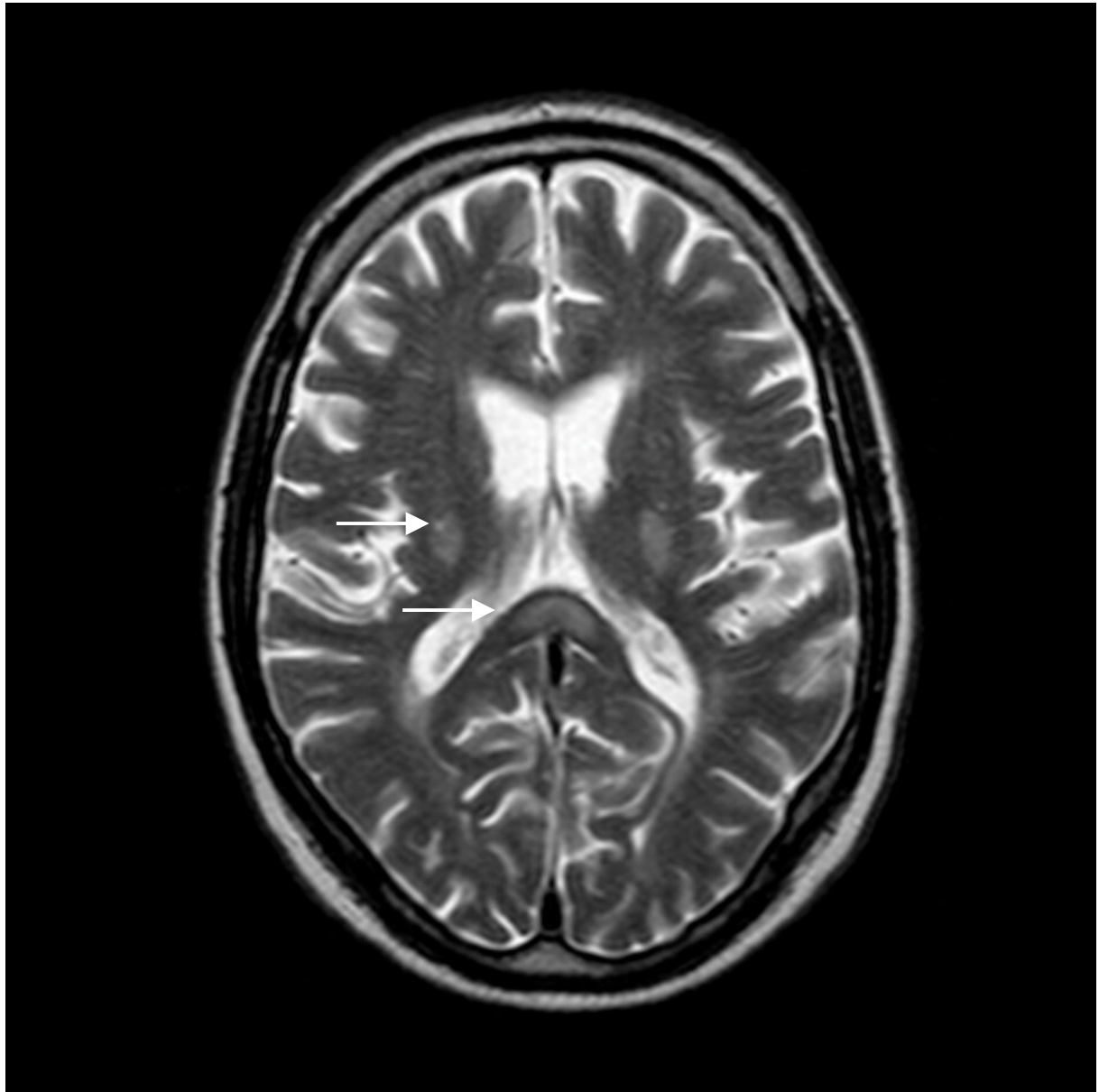


Figure 2. T2-weighted axial image in Marchiafava-Bignami disease showing a high signal lesion in the corpus callosum and internal capsule (arrowed)



Intravenous thiamine (100mg OD) was started and in 2 days the neurological condition showed gradual neurological improvement (E₄M₄V₁). After 72 hours, patient was successfully extubated and discharged from the ICU.

Discussion

Extrapontine myelinolysis in chronic alcoholism are typical findings of Marchiafava-Bignami disease (MBD). It is characterised by demyelination or necrosis of the corpus callosum and adjacent subcortical white matter. Necrosis of the corpus callosum is pathognomic for MBD.

MBD is a rare, severe, and usually fatal neurological disorder associated with chronic alcoholism. It is first described by Carducci in 1898 in Italian red wine drinkers and by Marchiafava and Bignami in 1903.^{1,2} It occurs predominantly in malnourished alcoholics and is reported more often in male than female drinkers.^{3,4} About 250 cases have been reported in the medical literature, but it is likely that its incidence is higher, since this diagnosis might easily be missed.

The underlying mechanism of the disease is still not understood. It is probably caused by the combination of alcohol abuse and malnutrition, leading to metabolic, toxic and vascular disturbances.³

Brion observed that the disease occurred in patients who consumed at least 2 litres of red wine for more than 20 years.⁵ Cases of MBD in non-alcoholic, but malnourished patients have also been reported but are extremely rare, thus suggesting a causative relation with alcohol toxicity.⁶

Patients with severe alcoholism who have this syndrome frequently have other problems such as alcoholic intoxication and hallucinosis, Wernicke encephalopathy, alcoholic liver disease, and sometimes subdural haemorrhage. Therefore, the diagnosis is often unclear.

Until recently, the definite diagnosis was confirmed at autopsy. However, in the era of modern imaging technology, diagnosis could be based on clinical profiles, history of alcoholism, and specific localisations of pathological lesions in the corpus callosum demonstrated by CT and MRI.⁷

Findings on CT scan may confirm the diagnosis. However, if callosal damage is mild or the lesion is small, it may not be obvious and easily missed on CT, as in our patient. MRI is currently the most sensitive diagnostic tool. It also has the advantage of sagittal imaging. Lesions appear as hypodense areas in portions of the corpus callosum on CT and as discrete or confluent areas of decreased T1 signal and increased T2 signal on MRI.

In a review of acute and chronic cases, Heinrich observed that the worst case had the most significant MRI lesions suggesting a prognostic role for MRI. CT and MRI lesions seemed to regress in patients who improved.

There are no characteristic clinical presentations of MBD. However, involvement of the corpus callosum may lead to various clinical symptoms, such as: altered mentation, depression, mania, paranoia, or dementia. It may progress into seizures, hemiparesis, aphasia, ataxia, tremor, dysarthria, or dyskinesia and spasticity.

The course of the disease may be acute, subacute or chronic and may lead to death within weeks to months.⁸ Death usually results from cardiorespiratory failure or from the complications of alcohol abuse. Patients typically have severe neuropsychological deficits before they die. Some patients survive for many years in a demented condition or occasionally even show some recovery.⁹ An interhemispheric disconnection syndrome has been reported in survivors.¹⁰

Because the aetiology of the disease is uncertain, a specific therapy is not available. Cessation of alcohol intake is mandatory and early supplementation of thiamine and folic acid might favourably improve the outcome. Seizures and coma are treated symptomatically.

Patients who survive should receive rehabilitation and, if appropriate, alcohol and nutritional counselling. A favourable response has been reported after the use of corticosteroids in some cases.

Conclusion

We presented a case of MBD in a comatose alcoholic.

Neurological examination and radiological imaging did not reveal an initial diagnosis, nor did laboratory and toxicological screening. Only MRI revealed the high signal lesion in the corpus callosum and internal capsule, which are typical for MBD.

Our patient improved after thiamine administration and supportive care.

Although rare, this case suggests that MBD should be considered in patients with chronic alcoholism and unexplained neurological deterioration, and MRI might be warranted in the absence of other causes for coma. The diagnosis might otherwise easily be missed if not considered.

In patients with chronic alcoholism and mental confusion, this uncommon diagnosis should be considered.

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