Hepatic myelopathy after splenorenal shunting : report of one case and review of the literature

Patrick Yengue[1], Michael Adler[1], Hassan Bouhdid[1], Nicolas Mavroudakis[2], Michel Gelin[1], Nadine Bourgeois[1]

(1) Medico-surgical Department of Gastroenterology ; (2) Department of Neurology, hôpital Erasme, Université Libre de Bruxelles, Brussels, Belgium.

Abstract

Hepatic myelopathy is a rare complication of cirrhosis, usually associated with surgical or spontaneous porto-systemic shunts. Its pathophysiology is unknown. It is characterized by a motor involvement of the lower limbs without clinical sensory abnormality, leading to spastic paraparesis. These neurological features are related to a symmetric loss of myelin in the lateral corticospinal tracts. Usefulness of liver transplantation in this setting is not yet determined.
We describe here the case of a 29-year-old male who presented with progressive spastic paraparesis of the lower limbs 3 years after a spleno-renal shunt. (Acta gastroenterol. belg., **2001**, 64, **231-233**).

Key words : liver disease, portal hypertension, porto-systemic shunt, myelopathy, paraparesis.

Hepatic myelopathy, characterized by a spastic paraparesis without clinical sensory involvement, may rarely complicate chronic liver disease associated with porto-systemic shunting of blood. We report a patient with cirrhosis of viral origin, who developed symptoms of hepatic myelopathy 3 years after a surgical spleno-renal shunt.

Case report

A 26-year-old black medical student with cirrhosis was referred to our department in February 1996 because of progressive difficulty in walking and lethargy.

He lived in Cameroon, where he was born, from 1969 to 1988 ; he suffered from yaws when he was 10 and received penicillin ; he had a drepanocytic trait and developed 3 episodes of malaria from 1980 to 1987. Diagnosis of cirrhosis had been made in 1988, when he arrived in Belgium. The liver disease was attributed to chronic hepatitis B virus infection. He never drank alcohol. In 1992, a splenectomy was performed because of painful spleen enlargement and severe anemia related to hypersplenism. The splenectomy was associated with a spleno-renal shunt, to avoid splenic vein thrombosis which could preclude liver transplantation. During operation, a liver biopsy was performed, which confirmed the diagnosis of cirrhosis. In September 1995, he developed encephalopathy for the first time, which was easily managed by oral lactulose and a low-protein diet. In December 1995, he complained of cramps and weakness in both lower limbs, which made his gait unsteady. Quadriceps muscles were stiff. Two months later, he was unable to walk without crutches. He was again admitted to the hospital because of spastic paraparesia and signs of mild encephalopathy (drowsiness), which rapidly resolved with adequate treatment. No problems with sexual activity or sphincter control were noted.

Physical examination revealed normal cranial nerve function, absence of asterixis or foetor hepaticus. He was slighty jaundiced and had no ascites. He had hyperkeratotic lesions on both soles, known unchanged for years, considered as scars of yaws acquired during childhood. The upper extremities were normal but in the legs, the muscular tone was considerably increased, with bilateral brisk tendon reflexes and ankle clonus. Bilateral Babinski's sign was present. Sensation and proprioception were normal. No muscle atrophy was noted.

Laboratory testing showed moderate anemia (hemoglobin 11 g/dl) and a drepanocytic trait (HbSS : 42 %). Renal function and electrolyte balance were normal. The liver tests were as following : ALT 92 UI (N < 35), total bilirubin 3.5 g/dl, albumin 3.6 g/dl (N > 3.5), arterial ammonia 280 µg/dl (N < 75), PT 60% of normal value. Vitamin B12 and folate levels were within the normal range. Syphilitic serology was positive (TPHA 1/1280, FTA ++, VDRL +). There were no antibodies against Schistosoma mansoni or japonicum. HbsAg was present ; no HBV DNA was detectable by hybridization. They were no antibodies against HIV or hepatitis C virus.

EEG showed a diffuse slow rythm, suggesting metabolic encephalopathy. Lumbar puncture yielded a transparent liquid, with 3 cells/ml and 18 mg proteins/ml ; electrophoresis was normal. FTA was negative on the cerebrospinal fluid. Opening pressure was normal (25 cm H2O). Nuclear magnetic resonance of the brain was normal ; nuclear imaging of the thoracolumbar spine showed no abnormality of the spinal cord. Somatosensory evoked potential, nerve conduction speed and electromyography were in favour of an anterior lesion of the medulla. Sural muscle biopsy was normal.

Diagnosis of hepatic myelopathy was established by excluding other possibilities.

Correponding author : Nadine Bourgeois, M.D., Department of Gastroenterology, Hôpital Erasme, 808 route de Lennik, Brussels 1070, Belgium.

The opportunity of liver transplantation was discussed and not retained because, in 1996, improvement in the neurological disease was judged unlikely after this procedure.

Even with Tizanidine, spasticity worsened ; the patient became totally unable to walk and was confined to his wheelchair. In January 1997, he went back to his family in Cameroon and died 6 months later from hepatic coma.

Discussion

Our patient developed spastic paraplegia 36 months after surgical spleno-renal shunt. The mean interval between surgical shunt and onset of paraparesis is 32 months (1). Lower limb motor dysfunction was prominent, as always reported in patients with hepatic myelopathy ; clinical sensory impairment and sphincteric involvement were lacking. Electrophysiological examinations suggested an anterior lesion of the spinal cord, compatible with hepatic myelopathy.

Differential diagnosis had to be made between hepatic myelopathy and other possible causes of chronic spastic myelopathies, such as spinal cord degeneration due to folate deficiency, neurosyphilis, retroviral myelopathies, bilharziosis, progressive sclerosis and amyotrophic lateral sclerosis.

Folates and vitamine B12 levels were normal, excluding the diagnosis of neuro-myelopathy associated with pernicious anemia ; moreover, this kind of myelopathy provokes prominent sensitive disturbances.

Spinal cord infarction, as sometimes observed in patients suffering from sickle cell anemia (2) could be excluded by magnetic resonance imaging.

Analysis of the cerebrospinal fluid was not in favour of a neurosyphilis ; indeed, in such a disease, total proteins and cells are increased, and FTA is positive in the cerebro-spinal fluid. The positivity of syphilitic tests has to be attributed to yaws. Yaws (also called pian) (3) is an endemic non-venereal treponematose, usually acquired during childhood in the environment of rain forests (like on the shores of Cameroon, where our patient was born), where sanitation is poor. It is due to *Treponema pertenue*, which is morphologically identical to *Treponema pallidum*, the agent of syphilis. They share the same antigens, so that infection by one species produces cross-immunity to the other. No existing serological test differentiates the antibodies produced. The only means of differentiating yaws and syphilis is their epidemiological characteristics and the pattern of infection produced by the respective treponemas. Clinical findings suggestive of old yaws (medical history, scars) and the absence of stigmata of syphilis support the diagnostic of inactive (or treated) Pian. Yaws does not provoke neurological complications.

The etiology of tropical spastic paraparesia, often diagnosed in patients with positive treponemal serology and yaws infection in childhood, is a retrovirus like HTLV-1 (4,5), and not the treponeme. The symptoms of tropical spastic paraparesia begin in middle-aged individuals ; they associate motor and often sensitive lower limb dysfunction to constipation, urinary frequency, impotence and transient episodes of blurred vision, never reported by our patient. There were thus no arguments in favour of a retroviral myelopathy in the case of our patient.

No stigmata of bilharziosis were found.

In progressive sclerosis, oligoclonal bands are found on electrophoresis of the cerebrospinal fluid.

Amyotrophic lateral sclerosis is a slowly progressive disease, which involves not only the legs but also the arms and the cranial nerves.

In our patient, the diagnosis of hepatic myelopathy seemed thus the most probable.

Permanent neurological alterations in chronic liver diseases are unfrequent ; they can appear as acquired hepato-cerebral degeneration or hepatic myelopathy.

Hepato-cerebral degeneration combines tremor, dyskinesia, dysarthria and limb ataxia with impairment of intellectual function ; it may improve after liver transplantation (6).

Hepatic myelopathy provokes walking difficulties leading to paraplegia. Arms are spared. Sensory and sphincteric functions are clinically unaffected. Fifty-four cases of hepatic myelopathy have been reported. In all the cases described but one (7) it occurs after porto-systemic shunting (see table 1) (1,8,9,10,11,12,13,14, 15,16). These shunts are most often surgically performed, to treat the consequences of portal hypertension, in relation with cirrhosis or even non-cirrhotic liver diseases (12), but may also occur spontaneously (1,9,13, 15).

A male predominance is observed. The mean interval between surgical shunting and the beginning of neurological symptoms is 32 months (4-120). However, in 1 case, the reported delay was much more longer : 33 years (14). The shunt had been performed during childhood for idiopathic portal hypertension.

Mean age for the clinical manifestations of hepatic myelopathy is 47 years (23-68) (1) if we exclude the oldest, 76 years, who developed myelopathy without shunt (7).

The first signs of spasticity often coincide with an episode of encephalopathy. The only patient who developed hepatic myelopathy without porto-systemic shunting had clinical manifestations of encephalopathy only

Table 1. — **Hepatic myelopathy : analysis of the reported cases**

number of cases	54
men/women	47/7
mean age at onset of paresis	47 years (23-76)
spontaneous shunt	10
surgical shunt	43
no shunt	1
interval shunt-paresis	32 months (4-120) (1 case excluded)

after the onset of the neurologic disease, which is uncommon (7).

EEG remains normal or suggests metabolic disturbances when hepatic encephalopathy is obvious.

Pathologically, hepatic myelopathy is characterized by a symmetrical demyelinisation of the lateral cortico-spinal tracts, beginning in the cervical cord (7,9). Its pathogenesis remains poorly understood ; a relation must exist between portal-systemic shunting and corti-co-spinal tract pathology. Toxins inappropriatively delivered to the general circulation might play a role in the disease. Alterated spinal hemodynamics have also be suggested. Absence of a substance normally synthesized by the liver is less probable, as some patients with myelopathy did not suffer from cirrhosis.

The spinal damages seem until now irreversible. No therapeutic measures, such as protein restriction or lactulose, are effective. At the time our patient was managed, liver transplantation was not reported to be useful in improving the neurological situation, even if the hepatic function returned to normal (13). However, a recent publication (16) suggests that hepatic myelopathy can be reversed by liver transplantation.

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