Hypertrophic Cranial Pachymeningitis Associated with Mixed Connective Tissue Disease; A Comparison with Idiopathic and Infectious Pachymeningitis

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This is the first report describing hypertrophic cranial pachymeningitis which developed in association with mixed connective tissue disease (MCTD). A 56-year-old man with a two-year history of MCTD gradually developed symptoms of headache and blurred vision. Bilateral papilledema and increased opening pressure and mild pleocytosis of the cerebrospinal fluid were noted. Magnetic resonance imaging of the brain revealed a diffuse thickening and a gadolinium-enhancement of the cranial dura mater. While five previous patients, diagnosed as idiopathic or infectious hypertrophic cranial pachymeningitis in our department, had either otitis media or sinusitis and showed multiple cranial nerve involvement, the present patient had neither otitis media nor sinusitis and did not show any cranial nerve involvement other than papilledema. (Internal Medicine 32: 510-512, 1993)

Key words: MRI, thickening of dura mater, papilledema

Introduction

Hypertrophic cranial pachymeningitis is a chronic progressive inflammation of the cranial dura mater. In most cases, the etiology is unspecified. But several cases have been reported, which were caused by either fungal infections or bacterial infections (1-5) or were associated with autoimmune diseases (6-8). To our knowledge, this is the first report of hypertrophic cranial pachymeningitis associated with a mixed connective tissue disease (MCTD).

Case Report

A 56-year-old man developed pain in bilateral elbow and knee joints, a low grade fever, Raynaud phenomenon and a malar rash in May 1985. Antinuclear antibodies (ANA) and anti-RNP antibodies were strongly positive, but an LE-test was negative. MCTD was diagnosed and administration of corticosteroids alleviated his symptoms. In January 1991, a frontal headache developed and persisted with some fluctuations. Nine months later, he gradually developed blurred vision bilaterally. On admission to our hospital, a general physical examination revealed malar rash, limitation of the elbow joint motility and crepitant rales on the bilateral lower chest. Neuro-

logically, he had decreased visual acuity and papilledema bilaterally.

Complete blood counts, blood chemistry and urinalysis were all normal. The erythrocyte sedimentation rate (ESR) was 31 mm/hr and CRP was 4.8 mg/dl. ANA was detected at 1:160 (speckled type) and anti-RNP antibody was positive at 1:1,600 in sera, but other autoantibodies and LE-test were negative. A lumbar puncture yielded a clear, colorless cerebrospinal fluid (CSF) with an opening pressure of 290 mmH₂O. CSF showed 12 mononuclear cells/mm³, protein level of 98 mg/dl and glucose 61 mg/dl. A culture of CSF and anti-viral antibodies in CSF were both negative. Strand shadows were noted in the bilateral lower lung fields on the chest X-ray. A respiratory function test showed a restrictive pattern (%VC was 67% and FEV_{1.0%} 83%). Magnetic resonance imaging (MRI) of the brain showed a diffuse thickening and marked gadolinium enhancement of the dura mater in the cranial convexity, skull base and posterior fossa (Fig. 1). Gallium scintigraphy revealed an abnormal accumulation in the left temporal convexity and bilateral lower lung fields.

Hypertrophic cranial pachymeningitis was diagnosed. Oral prednisolone and intravenous concentrated glycerin alleviated his symptoms and CSF pleocytosis (Fig. 2). However, MRI of the brain three months after the first scan showed practically no

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changes. Although azathioprine was added during the tapering period of prednisolone, both the headache and blurred vision recurred.

Discussion

The present patient met the current diagnostic criteria of MCTD (9). A diffuse thickening and marked gadolinium enhancement of the cranial dura mater shown by brain MRI, abnormal accumulation in the left temporal convexity on gallium scintigraphy and mild CSF pleocytosis strongly suggested hypertrophic cranial pachymeningitis. A diagnosis of hypertrophic cranial pachymeningitis in living patients has been difficult. However, recently reports of hypertrophic cranial pachymeningitis have increased in which MRI is used to help determine the diagnosis (10).

Several etiologies of hypertrophic cranial pachymeningitis have been reported, such as syphilis (1, 2), tuberculosis (3), fungus (4, 5), rheumatoid arthritis (6, 7), Wegener's granulomatosis (8), otolaryngological disease (11), and injury (12). In the present patient, we found no specific cause except for MCTD. Although hypertrophic cranial pachymeningitis has never been reported in MCTD, MCTD is well known to have several neurologic complications, such as aseptic meningitis, transverse myelitis, trigeminal neuritis and cerebellar dysfunction (13). Most of these are thought to be associated with an inflammatory process of MCTD.

Therefore, we compared the clinical features of the present patient with those of five other patients who were diagnosed as idiopathic or infectious hypertrophic cranial pachymeningitis in our department (Table 1). The following differences were noted. 1) Otitis media or sinusitis was present in the five other patients, but not in the present patient. 2) Multiple cranial nerve involvement was seen in the five other patients, but the present patient showed no cranial nerve involvement other than papilledema. 3) Although oral prednisolone alleviated the clinical symptoms in all administered patients, the symptoms recurred more easily when tapering the drug in the present patient than in the other patients. Together with the frequent occurrence of neurologic complications in MCTD, these differences may suggest the unique association between hypertrophic cranial pachymeningitis and MCTD. We therefore propose that the relationship between autoimmune diseases and hypertrophic cranial pachymeningitis should be carefully noted and that MRI examination increases the possibility of finding similar cases.

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Fig. 1. Sagittal T1-weighted MR image of the brain (TR400/TE20) shows a diffuse thickening of the dura mater in the cranial convexity and posterior fossa (a). Sagittal and coronal T1-weighted gadolinium-enhanced MR images (TR600/TE20) shows a diffuse enhancement of the dura mater (b, c).

Fig. 2. The clinical course of the present patient. After a gradual tapering of prednisolone, headache and blurred vision recurred and CSF again showed a mild pleocytosis. CSF pressure remained practically unchanged, regardless of the type of treatment.

Table 1. The Clinicoradiological Features of Six Cases of Hypertrophic Cranial Pachymeningitis

Case	1	2	3	4	5	6 (present case)
Age, Sex	59F	54M	70F	63M	36M	56M
Cranial nerve involvement	+	+	+	+	+	-
Otitis media/sinusitis	+	+	+	+	+	-
Etiology	Aspergillosis	idiopathic	idiopathic	idiopathic	idiopathic	MCTD
Therapy	Anti-fungal drug	cortico-steroid	cortico-steroid	-	cortico-steroid	cortico-steroid
Efficacy of therapy Clinical	+	+	+	ND	+	±
CT/MRI/Ga scinti	+	ND	+	ND	+	-

ND: not determined.

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