Case report

Unusual cerebral complication associated with ulcerative colitis

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Abstract: A case of ulcerative colitis complicated with convulsive seizure is reported. Magnetic resonance imaging studies strongly suggested cerebral vasculitis was the main cause of this episode.

Key words: ulcerative colitis, convulsion, vasculitis, MRI

Introduction

Patients with ulcerative colitis sometimes have extracolonic complications, such as arthritis, ankylosing spondylitis, uveitis erythema nodosum, and sclerosing cholangitis. However, there have been few reports on the complications caused by vasculitis associated with ulcerative colitis.¹⁻⁷ Here we report a case, in a young woman, of left-sided active colitis associated with convulsive seizure that occurred immediately after emergency operation for massive hematochezia.

Case report

On 5 January 1995, a 19-year-old Japanese woman was admitted to Kimitsu Hospital because of exacerbation of proctosigmoiditis (a condition of 3 years' duration). She had had bloody, mucous, loose stools eight times a day and complained of pain in the left lower quadrant of the abdomen. Her temperature was 37.2°C and heart rate was 130/min. Whole blood test showed leucocytosis [white blood count (WBC); 20200/mm³] and slight anemia [hemoglobin (Hb); 10.9g/dl]. Intensive i.v. prednisolone treatment, at an initial dose of 60 mg per day, failed to alleviate her symptoms. Two weeks later, 100 mg prednisolone was administered intra-arterially (via the superior and inferior mesenteric arteries). Although the abdominal pain was markedly reduced, massive hematochezia continued. Colonoscopy to the mid-sigmoid colon showed active inflammation with diffusely ulcerated mucosa and pseudopolyposis. From the end of January, methyl-prednisolone pulse therapy (500 mg per day i.v.) was given, but this had only a slight effect on the hematochezia. On 12 February, her symptoms exacerbated and her general condition rapidly deteriorated. She was transferred to Tokyo University Hospital on 21 February.

On admission, her blood pressure was 164/80mmHg. She had slight dysarthria and complained of numbness of the tongue and upper and lower extremities, with no laterality. Whole blood count and blood chemistry analysis results were; WBC 10100/mm3, red blood count 334×10^4 /mm³, Hb 10.6 g/dl, hematocrit 31.9%, platelets, 15.5×10^4 /mm³, total protein 6.0 g/dl, albumin 4.2 g/ dl, lactate dehydrogenase 447 IU/l, glutamic oxaloacetic transaminase 63 IU/l, glutamic pyruvic transaminase 62 IU/l, alkaline phosphatase 234 IU/l, C-reactive protein 0.3 mg/dl. Leukocytapheresis⁸ was performed on the day of admission, leading to a slight decrease of hematochezia; however, massive bleeding recurred on 23 February. Emergent total colectomy with ileostomy and mucus fistula was performed. Almost the entire mucosal surface of the left side of the colon and upper rectum was ulcerated and hemorrhagic (Fig. 1). Multiple pseudopolyps were also seen (Fig. 2). Macroscopically, the rest of the colon was normal.

The intraoperative course was uneventful until 2h, postoperatively, when she exhibited intermittent generalized convulsive seizures and disturbance of consciousness. Computed tomography of the brain showed an equivocal low-density area in the right parietal region. Cerebral angiography revealed faint staining in the parieto-occipital region (Fig. 3). More strikingly, mag-

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Fig. 1. Entire resected specimen. Most of the mucosal surface of the left side of the colon and upper rectum was ulcerated, with severe inflammation. The rest of the colon was macroscopically normal



Fig. 3. Cerebral angiography, showing faint staining in the parieto-occipital region (*arrowheads*)

netic resonance imaging (MRI) fluid-attenuated inversion recovery (FLAIR) image showed multiple highintensity lesions in the cortico-medullary junction of the right fronto-parietal and bilateral temporo-occipital lobes (Fig. 4). Gadolinium-diethylenetriaminepentaacetic acid (DTPA) enhancement was positive. Lumbar puncture revealed normal cerebrospinal fluid (CSF) pressure (180 mmH₂O; normal 60–180 mg/dl), normal cell counts, elevated total protein (74 mg/dl, normal 15–45 mg/dl) and elevated glucose (125 mg/dl; normal 50–80 mg/dl). CSF culture was negative. Anti-nuclear antibodies (ANA), cytoplasmic and perinuclear antineutrophil cytoplasmic antibodies (c-ANCA, p-ANCA) were negative and serum immunoglobulin (Ig) A, IgM, C3, and C4 were within normal limits. Serum IgG level



Fig. 2. Macroscopic view of the sigmoid colon with pseudopolyps

was 396 mg/dl (normal; 739-1649 mg/dl). Cardioechography showed no abnormalities. The localization pattern of the intracranial lesions suggested vasculitis with ischemic change rather than multiple infarctions. Daily doses of methyl-prednisolone (200mg), glyceol (400 ml), low molecular-weight dextran (250 ml), and phenytoin (250mg) were administered i.v. for 1 week postoperatively. She had several seizures 1 week postoperatively. Symptoms such as somnolence, experience of illusions, dysarthria, numbness of the tongue or upper extremities, and dysesthesia of the lower extremities waxed and waned. By 4 March, her general condition had completely recovered. MRI on 20 April showed remarkable improvement with negative enhancement (Fig. 5). She was discharged on 1 May and had no seizures during a 10-month follow-up period, during which time she had oral anticonvulsant therapy.

Discussion

Nelson et al.⁷ reported the case of a 19-year-old man who had generalized tonic-clonic seizures while he was being treated with prednisolone 20 mg/day for chronic ulcerative colitis. A brain biopsy was undertaken and acute necrotizing vasculitis, involving meningeal and cortical blood vessels, was shown histologically. Although a brain biopsy was not performed in our patient, vasculitis was considered the most probable cause of the seizures, since she had no underlying diseases, such as heart disease, hyperlipidemia, or diabetes mellitus, and because her cerebral symptoms occurred as the bowel symptoms became exacerbated. Vasculitis was also suggested because her symptoms were various and fluctuated daily, and the intracranial lesions were multiple and located mainly in cortico-medullary junctions. Successive MRI studies

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Fig. 4a,b. a Right; b left; magnetic resonance imaging (MRI) on 24 February, showing multiple high-intensity lesions in the cortico-medullary junction of the right fronto-parietal and bilateral temporo-occipital lobes. Mass effect was negligible

showed rapid resolution of these intracranial lesions. All these features are atypical of cerebral infarction.

Vasculitis of the skin¹⁻³ and lung^{4,5} has also been reported, although rarely, in association with ulcerative colitis. The etiology of these conditions is still unclear. Circulating immune complex is assumed to play some role. However, in our patient, ANA, c-ANCA, and p-ANCA were all negative and serum complement levels were normal. This is strikingly different from such vasculitic disorders as Wegener's granulomatosis, systemic necrotizing vasculitis, and necrotizing crescentic glomerulonephritis, in which the ANCA titer correlates well with disease activity.9 Because of the rarity of cerebral vasculitis and its variable clinical course, treatment is empirical. Moore and Cupps¹⁰ have recommended a therapeutic regimen of cyclophosphamide (2mg/kg per day; together with prednisone (1 mg/kg per day, tapered to alternate-day dosage) for the treatment of progressive active cerebral vasculitis. The patient reported by Nelson et al.⁷ was treated with this regimen, with good results. Although we did not use cyclophosphamide to treat our patient, she made a good recovery. It is strongly possible that surgical resection of the severely inflamed colon could help to abolish the autoimmune reaction in the pathogenesis of cerebral vasculitis in patients with ulcerative colitis.

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Fig. 5. MRI on 20 April, showing solitary high-intensity lesion in the right occipital lobe. Note that the intensity is markedly reduced compared with that on 24 February

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