Short report

Recovery from rheumatoid cerebral vasculitis

JOSÉ M GOBERNADO, CARLOS LEIVA, JORGE RÁBANO,
JOSÉ C ALVAREZ-CERMEÑO, A FERNÁNDEZ-MOLINA

From the Service of Neurology, Ramón y Cajal Center, Madrid, Spain

SUMMARY A 48-year-old woman with the classical features of longstanding rheumatoid arthritis acutely developed a diffuse cerebral disease. Angiograms showed extensive cerebral vasculitis, and CT scan demonstrated cerebral oedema and haemorrhage. Her clinical state, EEG and CT scan rapidly returned to normal following treatment with corticosteroids.

Cerebral involvement associated with rheumatoid arthritis is a rare but well documented entity.¹⁻⁹ Occasionally the brain and meninges display vasculitis. Review of the literature has revealed only ten cases of cerebral vasculitis in rheumatoid arthritis,¹⁻¹⁰⁻¹⁶ usually with a fatal course. We have recently studied a patient with rheumatoid disease, acute haemorrhagic encephalopathy and extensive cerebral vessel damage, with complete clinical recovery.

Case report

A 48-year-old woman with seropositive rheumatoid arthritis since the age of 26, was admitted to hospital for evaluation of a sudden loss of consciousness with generalised convulsion followed by complete improvement with supportive care only. Previous therapy had included aspirin, gold salts, and indomethacin. On admission she was conscious and afebrile and complained of right fronto-parietal headache. The vital signs were normal. Restricted passive motion of the shoulder, elbow, wrist, metacarpophalangeal, proximal interphalangeal, hip, and knee joints, was noted. Neurological examination showed a symmetrical decrease in muscle mass with depressed tendon reflexes. The examination was otherwise normal. Laboratory studies showed a haemoglobin of 14.3 mg/dl, leukocyte count of 10 000/cu mm, and erythrocyte sedimentation rate of 30 mm/hr (Westergren). Cerebral computed tomography (CT) was normal. Rheumatoid factor activity was not detected in the serum. A serological

test for syphilis (VDRL) was nonreactive. Antinuclear antibody determination was positive to 1/40. A test for antibodies to native DNA was negative. Levels of IgG (1200 mg/dl) and IgM (230 mg/dl) globulins were normal, and IgA (360 mg/dl) slightly diminished. Serum soluble immunocomplexes and cryoglobulins were not detected, CH 50 (240 U/ml), C 3 (142 mg%), and C 4 (23 mg%) complement constituents in serum were normal. The HLA typing was A2, A29, Bw45, B18, Cw6, 4b. Lumbar cerebrospinal fluid showed 11 white cells/cmm, CSF glucose value was 56 mg/dl and the protein level was 40 mg/dl. Gram stain of the CSF, routine culture, fungal culture, India ink preparation and acid-fast culture and smear were subsequently negative. Cryptococcal antigen on latex agglutination was negative. Results of cerebrospinal fluid cytology were negative for malignant cells.

During the first week of hospitalisation she showed an acute neurological picture with double vision, left internuclear ophthalmoplegia, bilateral pyramidal tract involvement with asymmetrical weakness of the four extremities and generalised hyperreflexia, as well as a progressive confusional state. An EEG showed a dominant rhythm at 7 Hz and a fluctuating delta rhythm anteriorly, more marked on the right. A second CT scan (fig 1A) revealed a small haemorrhage in the right temporal lobe and diffuse loss of density in cerebral white matter. After contrast infusion there was extensive enhancement of previously normal zones in both cerebral hemispheres near the surface. Perforal bilateral carotid and vertebral angiograms showed multiple discrete areas of segmental narrowing of many medium sized arteries. Maximum involvement was seen in the middle cerebral arteries, posterior cerebral arteries, and posterior inferior cerebellar arteries distribution (fig 2).

On the eighth hospital day she was treated with dexamethasone (16 mg/day iv). During the second week the patient gradually improved with recovery of level of consciousness and increase in muscle strength. The dexamethasone was tapered to 8 mg/day in the third week. She continued to improve with nearly complete return of

Address for reprint requests: Dr Gobernado, Service of Neurology, Ramón y Cajal Center, Carret, Colmenar, Km 9,100, Madrid-34, Spain.

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Fig 1 (A) CT scan before treatment showing a small haemorrhage in right temporal lobe (arrow), and multiple areas of low density in both hemispheres. (B) CT scan, three weeks later showing a moderate enlargement of lateral ventricles, with resolution of the haemorrhage and oedema.

neurological function except for persistent ocular abnormality. Dexamethasone was withdrawn and replaced by prednisone 40 mg/day by mouth. One week later there was notable improvement of the ocular dysfunction. The prednisone was tapered to 20 mg/day. A second EEG was normal. A new CT scan showed resolution of the haemorrhage and oedema, as well as moderate enlarged ventricles (fig 2B). Electromyographic studies were normal except for delayed distal latency in the left median nerve. Muscle biopsy specimen of the right gastrocnemius was studied with indirect fluorescent antibody stains for immunoglobulins (IgG, IgM, IgA, and IgE), fibrin and complement (C3) on frozen sections. Blood vessels were normal, there was no evidence of immunoglobulin, fibrin or complement deposition. A rectal biopsy was negative for investigation of amyloid. Acute and convalescent sera were negative for antibodies to mycoplasma, toxoplasma, influenza A, mumps, rubella, coxsackie, echo, herpes virus, and cytomegalovirus. A slide test for heterophil antibody of infectious mononucleosis and an assay for the hepatitis B surface antigen (HBsAg) were negative.

The patient was discharged six weeks after admission with normal neurological status. Six months later she was hospitalised again for a hip prosthesis operation. Neurological examination including ocular motility was normal. Moderate enlargement of the lateral ventricles persisted on a CT scan.

Discussion

Few cases with diffuse involvement of the CNS in rheumatoid arthritis have been described. Most of these manifestations resulted from rheumatoid

nodules,¹³⁻⁷ others were due to a hyperviscosity syndrome,^{8,9} and some of the neurological complications appeared to be related to vasculitis.¹⁰⁻¹⁶ Cerebral angiitis in rheumatoid arthritis is similar to that of other collagen diseases but acute fibrinoid necrosis has been encountered less commonly.^{15,17} This form of neuropathological change seems to appear typically in patients with well-stabilised disease. Clinically, abnormal mentation or alterations in the level of consciousness were noticed in seven cases,^{10,11,13-16} focal motor deficits in four,^{11,13,14,16} seizures in three,^{5,13,14} and peripheral neuropathy signs in two cases.^{13,14}

Our patient had long-standing (22 years) severe rheumatoid polyarthritis. The seizures, and acute confusional state with internuclear ophthalmoplegia and bilateral pyramidal tract dysfunction were the major clinical neurologic manifestations. Both electrophysiologic and histopathologic studies showed no evidence of peripheral nerve lesion or denervation. The diagnosis of central nervous system vasculitis was established by cerebral angiography. Other causes of cerebral vasculitis¹⁸⁻²⁰ were eliminated as far as possible by clinical data, laboratory studies and response to steroids. In the encephalopathic state a CT scan showed a small haemorrhage and diffuse cerebral oedema. Intracranial haemorrhage is a known complication of cerebral vasculitis²¹⁻²⁷ although its incidence is low. In the context of rheumatoid arthritis intracranial

Fig 2 Cerebral angiogram. Alterations in the arterial lumen with segments of narrowing and dilatation of varying length involving the entire wall of the vessels. The changes are demonstrated in: (A) branches of the middle cerebral artery and posterior cerebral artery; and (B) posterior inferior cerebellar artery (arrows).

haemorrhage due of vasculitis has only been reported in two instances.^{1 28}

It has been suggested that cerebral vasculitis in rheumatoid arthritis may be related to steroid treatment.^{12 13} However, neither Ramos and Mandybur's¹⁵ patient nor ours had received corticoids. These data suggest the possibility that the cerebral vasculitis is primarily rheumatoid. The published experience about this condition suggests a poor prognosis with a fatal outcome. We believe that this case is particularly important, therefore, because of the successful induction of remission with steroids.

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