Multiple Intracranial Aneurysms from Syphilitic Infection in a Patient with Acute Ischemic Stroke

Min-Jeong Wang, MD, Sang-Won Yoo, MD, Dong-Woo Ryu, MD, Young-Min Shon, MD, PhD, Beum Saeng Kim, MD, PhD and A-Hyun Cho, MD, PhD
Department of Neurology, The Catholic University of Korea College of Medicine, Yeouido St. Mary’s Hospital, Seoul, Korea

Background: Multiple intracranial aneurysms from syphilitic infection have been rarely reported. In this context, we aimed to report a case of multiple intracranial aneurysms incidentally found in a patient with confirmed syphilis and acute ischemic stroke.

Case Report:
An 62-year-old woman presented with right sided weakness and dysarthria. The brain MRI and CT angiography revealed acute left middle cerebral arterial territory infarction and incidentally found multiple intracranial aneurysms. On coronary CT angiography, minimal aneurysmal dilatation of right proximal coronary artery was also observed. Blood tests were positive for rapid plasma reasin (RPR) test and fluororescence treponemal antibody absorption test (FTA-ABS) IgM, whereas the cerebrospinal tests for syphilis were negative. She was diagnosed with latent syphilis.

Conclusion:
This case shows a rare case of central nervous system manifestation from syphilitic infection, presented as multiple intracranial aneurysms which were incidentally found in a patient with acute ischemic stroke.

KEY WORDS: Intracranial aneurysm · Syphilis · Stroke.

Introduction

The well-known causes of multiple intracranial aneurysms are polycystic kidney disease, Ehlers-Danlos syndrome, connective tissue disease, fibromuscular dysplasia and vasculitis. Among these, secondary vasculitis by syphilis infection can also be the cause of multiple intracranial aneurysms. However, multiple intracranial aneurysms from syphils have been rarely reported, whereas the thoracic aortic aneurysm from syphils has been reported. In this context, we aimed to report a case of multiple intracranial aneurysms incidentally found in a patient with confirmed syphilis and acute ischemic stroke.

Case

A 62-year-old woman was admitted because of sudden onset of dysarthria and right sided weakness. She had hypertension and gastric ulcer which was treated one year ago and experienced right arm weakness 4 years ago which had spontaneously resolved in a few days. In addition, she has a previous history of spontaneous abortions at over 10 weeks of gestational age about five times. On physical examination, blood pressure was 120 over 80 mm Hg and pulse rate was 83 per minute with regular heart beat on admission. Neurological examination revealed right sided weakness of grade 4, right sided facial palsy, and mild dysarthria. Electrocardiogram and chest-X-ray were unremarkable. Blood tests showed anemia (hemoglobin 9.5 g/dL) and thrombocytopenia (platelet counts 102×10⁹ per liter). Diffusion-weighted MRI of brain revealed acute infarction in the left precentral gyrus and fluid attenuated inversion recovery MRI and T2-weighted MRI showed multifocal encephalomalacic change at left frontal lobe, both parietal lobes and right occipital lobe, probably due to previous old infarctions (Fig. 1A-F). The CT angiography of brain showed multiple intracranial aneurysms without significant arterial stenosis (Fig. 1G, H). Hypokinesia in basal inferior wall of myocardium was observed on cardiac echocardiography. On coronary CT angiography, minimal aneurysmal dilatation of right proximal coronary artery and suspicious focal stenotic lesion in proximal left circumflex artery were observed.

Further blood tests showed positive results of anticardiolipin and lupus anticoagulant.
pin antibody IgG, antiphospholipid antibody IgG, M, anti-
β2-glycoprotein I antibody, lupus anticoagulant antibody and
antinuclear antibody. Considering her previous medical his-
tory of vascular thrombosis (stroke) and late-term spontane-
ous abortions, she was diagnosed with antiphospholipid anti-
body syndrome. The current stroke might be caused by an-
tiphospholipid syndrome. She was treated with hydroxychloro-
quione and steroid. Antithrombotic agents were not used be-
cause of anemia and bleeding tendency at the time of dischar-
ge. Her blood tests were positive for rapid plasma reasin (RPR)
test and fluorescent treponemal antibody absorption test (FTA-
ABS) IgM. The cerebrospinal fluid (CSF) tests for syphilis
were negative for RPR and FTA-ABS without significant leu-
kocytosis nor high protein level. The other autoimmune se-
rologic tests suggesting vasculitis including rheumatoid ar-
thritis, antinuclear cytoplasmic antibody, and anti-Ro/La
antibodies showed negative results. Accordingly, we con-
cluded that the most probable cause of intracranial aneu-
rysms in this case might be syphilitic infection of cerebral
vessels. She was treated with penicillin G Benzathin 2.4 mil-
lion unit IM once a week for 3 weeks.

Discussion

This case showed multiple intracranial aneurysms in an is-
chemic stroke patient with seropositive syphilis. The confirm-
ation of syphilis through serologic tests, the exclusion of other
causes for multiple intracranial aneurysms and the coexist-
ence of coronary arterial aneurysm all support the diagnosis.
The process of aortic aneurysm from syphilitic infection
begins from inflammatory infiltrate around the vasa vasorum
of adventitia, followed by endarteritis obliterans leading to
ischemic injury of the media destructing smooth muscle and
elastic tissue of the media.3 We assume that the mechanism of
development of intracranial syphilitic aneurysms wo-
uld be similar to that.3 To date, a case about intracranial sy-
philitic aneurysms has been rarely reported. We think it is due
to their low probability of rupture, remaining as asymptomat-
ic case.4

The serological findings in this case are insufficient to di-
agnose neurosyphilis (e.g., meningoovascular syphilis)5 be-
cause the CSF study was normal.5 However, we cannot exclu-
de neurosyphilis only with nonreactive CSF FTA-ABS tests.6
Clinical diagnosis of neurosyphilis can refer to an infection in-
volving the central nervous system. There are two possible
explanations for the negative results of CSF study. First, over several decades may have passed after aneurysmal change from primary infection. Late neurosyphilis occurs 4-25 years after the initial infection. Therefore, the regressed activity of syphilitic infection may show sero-negativity. In one previous study, 11% of individuals with a first episode of primary syphilis were sero-negative with the FTA-ABS test at 1 year post-treatment, and 24% were negative by 3 years. Secondly, the syphilitic infection involving selectively inner portion of vessel wall not disrupting blood-brain barrier might be the reason why we cannot find the inflammatory infectious evidence in the CSF.

In summary, this report shows a rare case of CNS manifestation from syphilitic infection, presented as multiple intracranial aneurysms which were incidentally found in a patient with acute ischemic stroke.

Acknowledgments

This research was supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education, Science and Technology (No.2012R1A1B5000477).

REFERENCES