Mycotic aneurysms of the intracranial and peripheral circulation: A rare complication of bacterial endocarditis

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Case Report

A 16-year-old boy presented to us with 5 days history of sudden onset right hemiparesis with speech difficulty. There was also history of recurrent fever for last 6 months.

He was also a known case of rheumatic heart disease and was on penicillin prophylaxis for last 5 years.

On general physical examination, patient was pale and febrile. The neurologic examination showed spastic dysarthria along with right hemiparesis with medical research council (MRC) grade 4/5 power in right upper and lower limb.

Among the routine investigations, urine analysis revealed albuminuria, red blood cells, epithelial cells and hyaline cast suggestive of glomerulonephritis. Echocardiogram was carried out to look for vegetations, but none could be visualized other than severe mitral regurgitation and mild aortic regurgitation with enlarged left atrium and left ventricle. Blood cultures were repeatedly sent in view of history of longstanding recurrent fever and clinical suspicion of bacterial endocarditis, but were negative each time however still a diagnosis of possible infective endocarditis could be made from Duke's minority criteria[1] as there was predisposing heart condition, presence of persistent fever, evidence of vascular phenomenon in the form of mycotic aneurysm and intracranial hemorrhage (as detailed in discussion) and immunological phenomenon in the form of glomerulonephritis.

Discussion

Magnetic resonance imaging of brain showed acute hemorrhage in the left parietal lobe and microhemmorhage in the right occipital lobe [Figure 1].

Computed tomography (CT) angiogram done subsequently revealed large bilobed aneurysm in distal branch of left middle cerebral artery and one small aneurysm in distal branch of right posterior cerebral artery suggestive of mycotic aneurysm [Figure 2].

Meanwhile, patient was started on broad spectrum antibiotics as patient's family refused for any interventional treatment and follow-up angiogram was carried out after 2 weeks of antibiotic therapy, which revealed 40% reduction in the size of middle cerebral artery aneurysm. Clinically also, the hemiparesis recovered, fever subsided, and he became ambulatory with some residual dysarthria. Angiographic features that favour a diagnosis of mycotic aneurysm are multiplicity, distal location, fusiform shape, and change in size or appearance of new aneurysm on follow-up angiogram as was seen in our patient.[2]

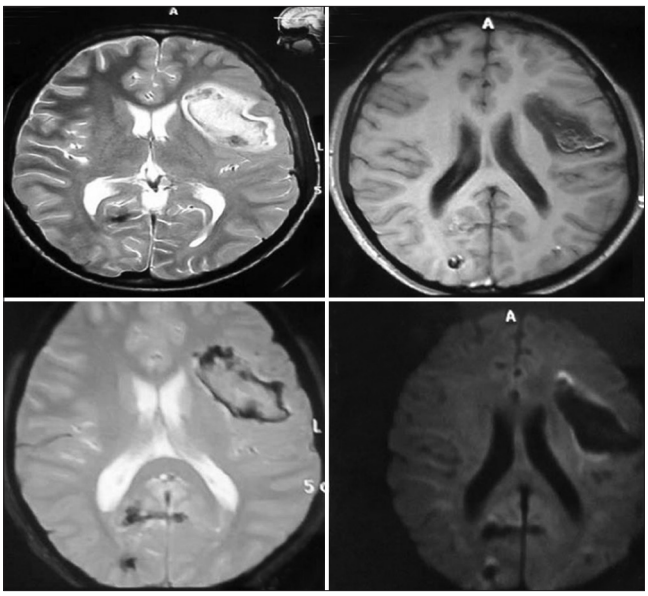

Figure 1: Magnetic resonance imaging brain T2, T1, GRE and DWI images showing acute hematoma in the left parietal lobe and microhemmorhage in the right occipital lobe

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After 4 weeks, when a follow-up angiogram was repeated expecting that middle cerebral artery aneurysm might have disappeared, but to our surprise it had increased 20% in size from baseline angiogram [Figure 3].

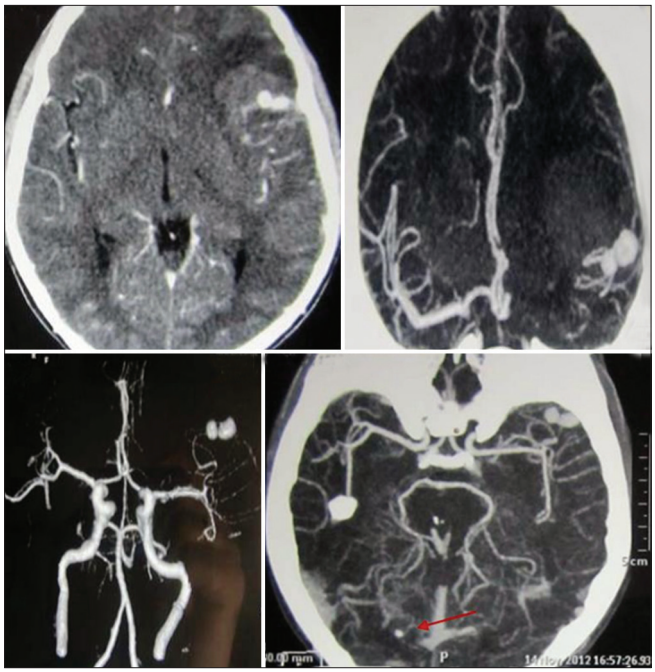

Figure 2: Computed tomography angiogram showing large bilobed aneurysm (14 × 6.5 × 7) in distal branch of middle cerebral artery and a small aneurysm (arrow) arising from distal branch of posterior cerebral artery

After 1 month, he developed a pulsatile painful swellling in left elbow region and in view of clinical suspicion of arterial aneurysm, upper limb angiogram was carried out along with brain angiogram, which revealed large pseudoaneurysm arising from left brachial artery while in CT angio brain there was the paucity of flow in left middle cerebral artery distal branches with complete disappearance of previously visible left MCA aneurysm [Figure 4] suggestive of complete thrombosis of that aneurysm. Infected aneurysms show a mixed response to medical therapy, and there are no predictive imaging features.[3] They can undergo complete thrombosis, decrease in size or enlarge or new infected aneurysms can develop. Intracranial mycotic aneurysms are rare and simultaneous occurrence of symtomatic mycotic aneurysms in intracranial and peripheral circulation as seen in our case, is even more rare and to the best of our knowledge, has not been described until now in the literature. The brachial artery is the most common site of infected aneurysms of the upper limb as seen in our case, and such cases have usually been described in patients with a history of intravenous drug abuse, catheterization procedures or endocarditis.[4]

Therapeutic options include open surgery, endovascular stent placement, endovascular embolization, medical therapy or a combination of these. Large, ruptured or symptomatic infected aneurysms require urgent open surgery in combination with antibiotic therapy as opposed to small, asymptomatic, and unruptured infected aneurysms, which can be managed with a trial of intravenous antibiotics for 4-6 weeks along with serial angiogram at 1-2 weeks interval.[3]

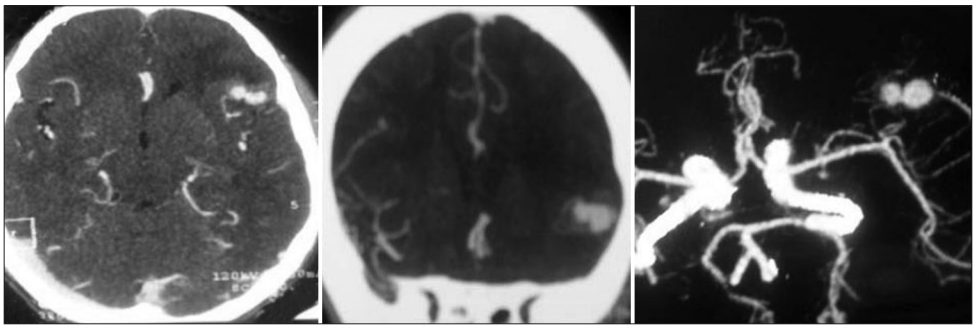

Figure 3: Follow-up computed tomography angiogram carried out after 4 weeks of antibiotic therapy showing 20% increase in middle cerebral artery aneurysm size (16 mm × mm 7 × 10 mm)

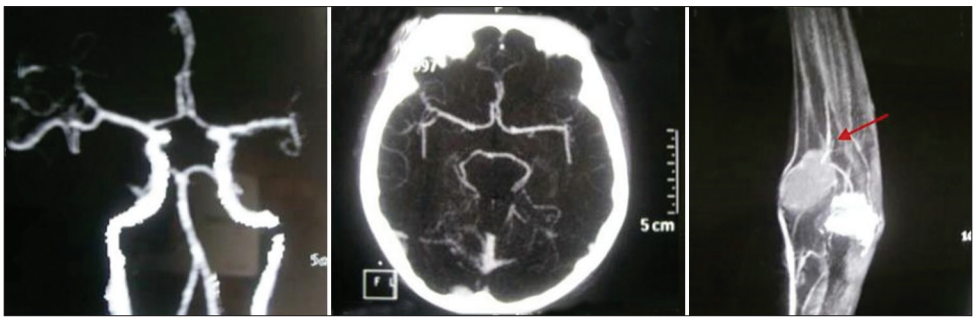

Figure 4: Computed tomography angiogram brain and left upper limb showing disappearance of left middle cerebral artery aneurysm with the paucity of flow in distal branches and large pseudoaneurysm (arrow) arising from left brachial artery

The key to a successful outcome in this uncommon, but difficult to manage entity is early diagnosis and aggressive treatment.

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