Case Report

Ruptured Distal Middle Cerebral Artery Mycotic Aneurysm: A Rare, First Presentation of Infective Endocarditis

Abstract

Mycotic cerebral aneurysms are rare inflammatory aneurysms associated with high mortality and morbidity reaching up to 80% after rupture. We report a case of incidentally diagnosed infective endocarditis presenting with rupture of distal middle cerebral artery mycotic aneurysm and intracerebral hematoma. Aneurysmectomy with clip ligation of the terminal cortical branch and hematoma evacuation was done with good surgical outcome.

Keywords: *Aneurysm, cerebral mycotic aneurysms, middle cerebral artery aneurysm, mycotic*

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Introduction

Mycotic aneurysms are rare inflammatory neurovascular lesions accounting for 0.7–6.5% of all intracranial aneurysms.[1,2] These aneurysms are a challenge for neurosurgeon as they are associated with high mortality and morbidity in up to 80% of ruptured and 30% of unruptured cases.[3] The management of a mycotic aneurysm is controversial, and three treatment modalities medical, surgical, and endovascular are used. These rare types of aneurysms are common in immunocompromised, intraventricular (IV) drug abusers, infective endocarditis (IE), and chronic kidney disease patients. We present a rare case of ruptured distal middle cerebral artery (MCA) mycotic aneurysm as the first presentation of IE managed surgically by aneurysmectomy and clip ligation of parent vessel.

Case Report

An 18-year-old female patient presented to our department with complaints of sudden onset severe headache and nausea for the last 5 days. The patient also had a low-grade fever for the last 2 weeks. At the time of admission, her Glasgow coma score was 14/15 (eye 3, verbal 4, motor 5). A noncontrast computerized tomography of the head revealed a right parietal intracerebral hematoma of volume ~60 ml with IV hemorrhage (Fischer grade 4) [Figure 1].

On chest auscultation, a holosystolic murmur of grade 4/6 was heard in the mitral area in midclavicular line radiating to the axilla suggestive of mitral regurgitation. No other cutaneous stigmata of IE were detected. The patient did not have any cardiac complaints in the past. Laboratory parameters were within normal range except Frank leukocytosis (total leukocyte count 23,000/UL).

A digital subtraction angiography revealed a rounded 11.4 mm × 9.6 mm pseudoaneurysm arising from postcentral branch of the right distal MCA [Figures 2 and 3]. Echocardiography further revealed severe mitral regurgitation and large mobile vegetation attached to posterior mitral leaflet suggestive of severe mitral regurgitation, and IE. Blood cultures were positive persistently for *Streptococcus* viridans, and the patient received appropriate culture sensitivity based antibiotics.

A working diagnosis of a mycotic aneurysm of distal MCA was made. The patient was started on IV ceftriaxone 2 g/day and gentamycin 1 mg/kg thrice a day as per an IE protocol and prepared for surgical clipping.

The right parietal craniotomy with clip ligation of parent terminal cortical vessel, aneurysmectomy, and hematoma evacuation were done under general anesthesia. Craniotomy was fashioned, and hematoma was localized with high precision using intraoperative image guidance

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navigation. The aneurysm wall was friable and ruptured intraoperatively, but the parent vessel was identified early and clip ligated [Figures 4 and 5]. The aneurysm was rounded and involved the fusiform dilation of postcentral branch of distal right MCA with no clear neck. The sac of aneurysm was opened and excised; infective nidus was removed completely [Figure 6]. The patient tolerated the surgery well, and postoperative period was uneventful. IV antibiotics were continued for 6 weeks. The patient is healthy and does not suffer from any neurological deficits in follow-up. The patient has a good cardiac compliance at present but may require cardiac intervention for valvular disease at a later stage.

Discussion

Intracranial mycotic aneurysm usually occurs in the fourth and fifth decade and account for 0.7–6.5% of all aneurysms.[3] MCA aneurysms account for 50–70% of such cases. Due to the rarity of these aneurysms and lack of population-based studies and randomized control trials to date, there are no clear guidelines for management. The association of mycotic cerebral aneurysm with IE is well-known, and 10% patients of IE harbor mycotic aneurysm.[2-4] The clinical course and natural history of mycotic aneurysm are nearly impossible to predict. The treatment either in the form of surgical aneurysm clipping or endovascular embolus action is warranted as rupture rate may be as high as 80%. The mortality of unruptured mycotic aneurysm is up to 30%.[3,5] To the best of our knowledge, this case is extremely rare as a young patient presented with parenchymal bleed due to rupture of distal MCA mycotic aneurysm as the first presentation of IE.

Mycotic aneurysms develop in IE due to friable cardiac vegetation leading to septic emboli which lodge at branch points in distal vessels leading to infarction and nidus for infection. The vasa vasorum gets involved leading to inflammation, endarteritis, wall destruction, and aneurysm formation. These aneurysms are generally fusiform in morphology and fragile due to the destruction of adventitia and internal elastic lamina.

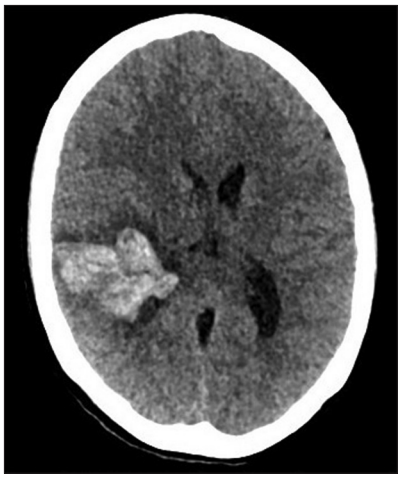

Figure 1: Preoperative noncontrast computed tomography of a head showing right parietal hematoma

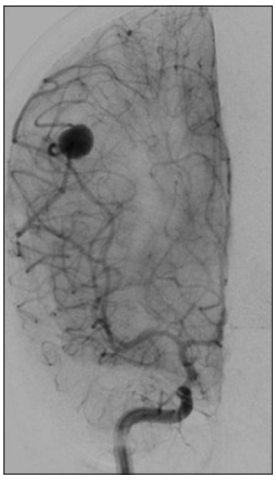

Figure 2: Digital subtraction angiography, anteroposterior view showing aneurysm in the right terminal middle cerebral artery

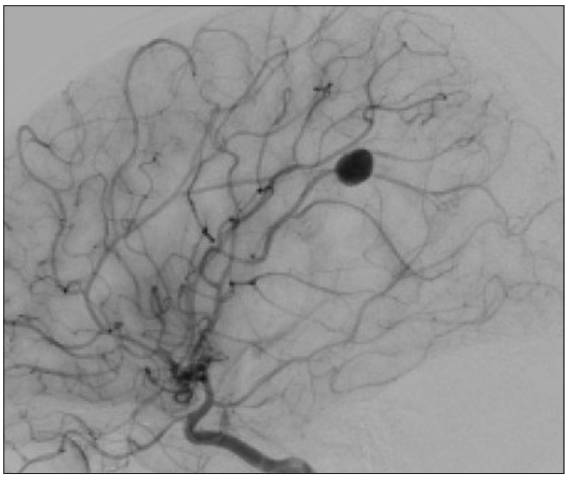

Figure 3: Digital subtraction angiography, lateral view showing aneurysm in the right terminal middle cerebral artery

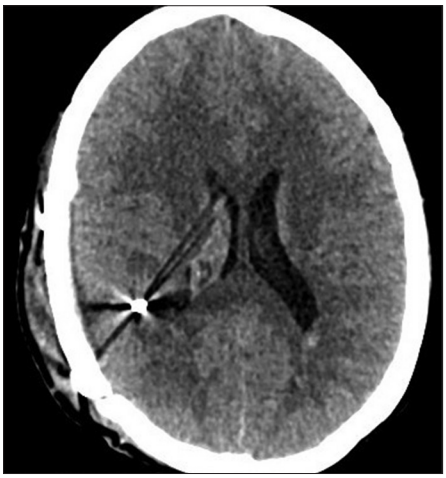

Figure 4: Postoperative noncontrast computed tomography of a head showing clip artifact and operative cavity

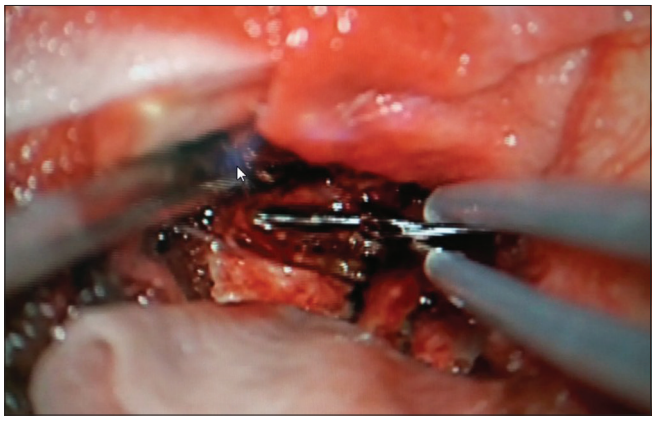

Figure 5: Intraoperative photo showing aneurysm clip on terminal cortical branch

The treatment depends on the patient's clinical profile, rupture status, and volume of associated parenchymal hematoma. A ruptured aneurysm should be secured immediately by either open microsurgical or endovascular surgery in combination with antimicrobial therapy. Surgical clipping is technically challenging, in view of, the friable nature of the aneurysm and lack of a well-defined neck.

Unruptured aneurysms may be managed with antimicrobial therapy and serial angiography monitor any change in size, but there always remains a risk of rupture. Endovascular approach is increasingly replacing open transcranial surgery because of its minimally invasive nature.[6]

The surgical clipping was favored over endovascular treatment in the current case, in view of, the associated parietal hematoma with mass effect and the young age of a patient with good cardiac profile. Long-term antibiotic prophylaxis for 4–6 weeks is recommended even after surgery.[2,3,5]

Conclusion

Authors recommend early surgery after cardiac status evaluation for securing a ruptured mycotic aneurysm associated with a significant parenchymal hematoma. The diagnosis of mycotic aneurysm should always be considered in the case of peripherally placed cerebral aneurysms with or without risk factors.

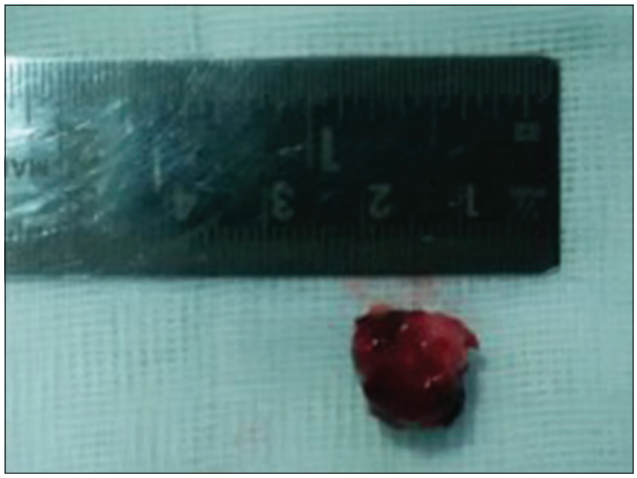

Figure 6: Specimen of resected aneurysm

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Nil.

Conflicts of interest

There are no conflicts of interest.

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