Article published online: 2022-09-22

CASE REPORT

Recurrent artery of Heubner aneurysm

Yagnesh Vellore, Anoop Madan[1], Peter Yin Kai Hwang[2]
Departments of Neurosurgery, [1]Radiology, [2]Neurosurgery, The Alfred Hospital, Melbourne, Victoria, Australia

ABSTRACT

True Recurrent artery of Heubner (RAH) aneurysms are extremely rare and only three cases have been reported in the literature. We report a case of RAH aneurysm in a patient with World Federation of Neurosurgical Societies grade one subarachnoid hemorrhage (SAH), detected only on delayed cerebral angiography. We propose that an aneurysm in this location should be considered in the differential diagnosis of angiogram-negative SAH, and all vascular imaging studies be carefully scrutinized for RAH aneurysm

Key words: Aneurysm, Heubner, subarachnoid hemorrhage

Introduction

Aneurysms originating from the proximal segment of anterior cerebral artery (A1) and the distal segment of anterior cerebral artery (A2) are rare, forming less than 1% of intracranial aneurysms.[1] True Recurrent artery of Heubner (RAH) aneurysms are extremely rare and we report one such case, the fourth so far in the published literature.

Case History

The patient was a 58-year-old lady with a history of hypertension, who presented with an acute severe headache, one day after undergoing a routine colonoscopy under sedation. Her blood pressure was 120/70 upon arrival into hospital. Examination revealed Glasgow Coma Score of 15 with no focal neurological deficits. She demonstrated signs of photophobia, neck stiffness, and meningism. A computerized tomography (CT) scan demonstrated subarachnoid blood in the basal cisterns, predominantly on the right and in the right Sylvian fissure. A CT angiogram (CTA) did not reveal any aneurysms. This was followed by a formal six-vessel (internal and external carotid arteries, vertebral arteries) digital subtraction cerebral angiogram (DSA), which did not reveal any aneurysms, arteriovenous malformations, or vascular lesions to account for the subarachnoid hemorrhage (SAH). She was observed closely on the Neurosurgical ward with a plan to repeat the DSA in one week. During this time, she remained stable and conscious without any further headaches.

A repeat DSA the following week revealed a $2.7 \times 1.9 \times 2.2$ mm saccular aneurysm arising from the RAH, 10 mm from its origin [Figures 1 and 2]. It was felt that the initial angiogram was negative due to the extremely small size of the aneurysm, possible vasospasm of the cerebral vessels or thrombosis in the aneurysm. The patient underwent craniotomy and microsurgical clipping of the aneurysm. At operation, the RAH was identified at its origin from the A1 near the anterior communicating artery (ACoA) and traced along its length backward, toward the internal carotid artery (ICA) bifurcation. The aneurysm was seen arising from the RAH and found just above the ICA bifurcation [Figure 3]. Perforating arteries from A1 and ICA were preserved and a fenestrated right-angled Yasargil clip placed along the length of RAH to preserve the artery and clip the aneurysm [Figure 4]. Postoperatively, the patient woke up with no neurological deficit. Postoperative imaging revealed no brain infarct and complete occlusion of the aneurysm.

Discussion

The medial striate or RAH arises from the A2 segment in 78% of cases, A1 segment in 14%, and ACoA in 8% of cases.[2] In 95% of cases, it arises within 4 mm of the ACoA junction, either proximally or distally. Perlmutter and Rhoton found this artery to be absent (only on one side) in 2% of cases and duplicated (also only on one side) in 2% of cases.[3] The RAH courses anterior to the A1 segment in 60% of cases.[4] On average, the diameter of the RAH (mean, 1 mm; range, 0.2-2.9 mm) is one third the diameter of the A1 segment (mean, 2.6 mm) and its

Access this article online

Quick Response Code:

Website: www.asianjns.org

DOI: 10.4103/1793-5482.146658

Address for correspondence:
Dr. Yagnesh Vellore, Department of Neurosurgery, The Alfred Hospital, Melbourne, Victoria, Australia.
E-mail: yagneshvb@yahoo.com

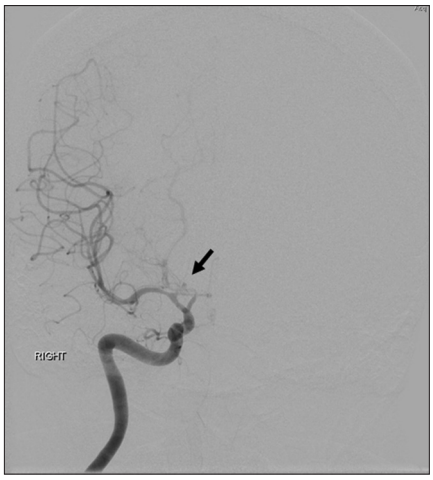

Figure 1: Cerebral angiogram demonstrating the aneurysm (solid arrow)

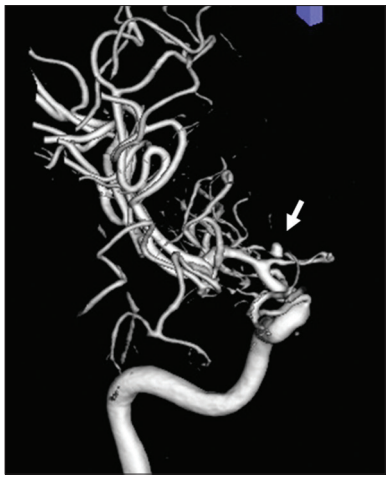

Figure 2: 3D rotation angiogram demonstrating the aneurysm (solid arrow)

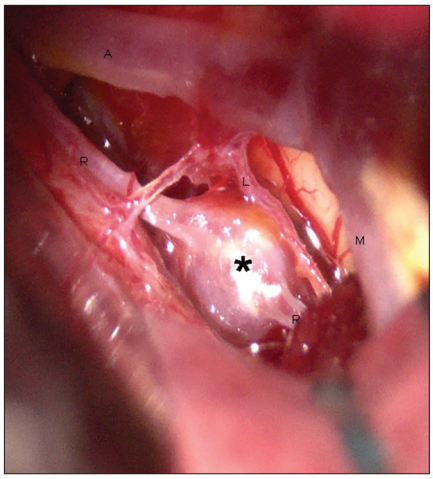

Figure 3: Intra-operative photograph of recurrent artery of Heubner aneurysm, M = middle cerebral artery; A = Anterior cerebral artery; R = Recurrent artery of Heubner; * = Aneurysm; L = Lenticulostriate

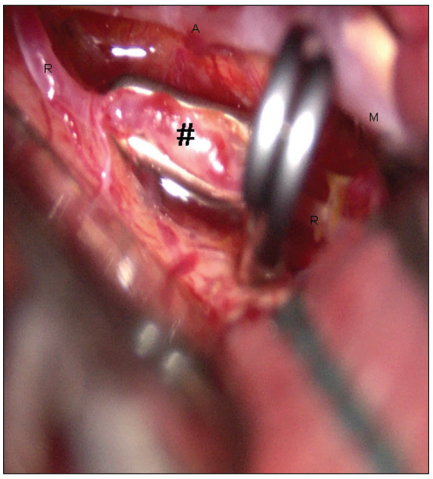

Figure 4: Intra-operative photograph post clipping of aneurysm, M = Middle cerebral artery; A = Anterior cerebral artery; R = Recurrent artery of Heubner; # = Clipped aneurysm

length (mean, 23.4 mm; range, 12-33 mm) is twice the length of the A1 segment (mean, 12.7 mm). It supplies the anterior striatum (caudate nucleus and putamen), a portion of the outer segment of globus pallidus, anterior hypothalamus, and anterior limb of internal capsule. Injury to this vessel results in moderate paresis of the contralateral upper extremity and mild paresis of the contralateral face. Injury also causes dysfunction of the tongue and palate, which can be documented during a careful swallowing evaluation. Involvement of the dominant hemisphere may result in expressive dysphasia. In the majority of patients, the deficits tend to resolve completely over weeks to months. Aneurysms originating from the proximal segment of anterior cerebral artery (A1) and the A2 segment are rare, forming less than 1% of intracranial aneurysms. A PubMed and Medline literature search, using the terms "Heubner," "aneurysm," and "medial lenticulostriate artery" revealed three cases of RAH aneurysm found within a case series of 418 anterior cerebral artery aneurysms.[1] The extreme small caliber of the RAH makes it difficult to treat with current endovascular technology. In all cases in the published literature, the aneurysm was treated with surgical clipping. In the former series, one aneurysm had ruptured and two unruptured. The aneurysm was saccular in all cases, with the ruptured one measuring 5.0 mm, whereas the unruptured aneurysms measured 2.5 mm and 2.7 mm, respectively. Outcome was good in all cases.

Wakabayashi *et al*. reported eight cases of A1 aneurysms with SAH in which all aneurysms were less than 6.5 mm in diameter.[5] In Wanibuchi *et al*.'s series, the average diameter of ruptured aneurysms was only 3.6 mm.[1] It is therefore hypothesized that A1 aneurysms tend to rupture at a smaller size. In our case, the aneurysm was also small, measuring 2.7 mm. It was also deemed unsuitable for endovascular treatment because of the low possibility of preservation of flow in the RAH. We concur with these authors, in that aneurysms arising from the medial lenticulostriates, RAH in particular, should be surgically eliminated even when they are relatively small.

Conclusion

We report the rare entity of an aneurysm arising from the RAH. Aneurysms originating from the proximal segment of anterior cerebral artery (A1) and the A2 segment are rare, forming less than 1% of intracranial aneurysms. True RAH aneurysms are even rarer. In cases of SAH in this location, where the CTA and DSA do not reveal a cause, a high level of suspicion must be exercised for RAH aneurysm. Delayed repeat imaging of cerebral vessels is warranted with careful review, scrutinizing this area for aneurysms. As these aneurysms tend to be relatively small and the parent vessel (RAH) is of small caliber, surgical clipping is the preferred option, should treatment be required, to avoid iatrogenic obliteration of the RAH. Furthermore, we recommend treatment of these aneurysms, even when they are relatively small.

References

1. Wanibuchi M, Kurokawa Y, Ishiguro M, Fujishige M, Inaba K. Characteristics of aneurysms arising from the horizontal portion of the anterior cerebral artery. Surg Neurol 2001;55:148-54.
2. Haroun IR, Rigamonti D, Tamargo RJ. Recurrent artery of Heubner: Otto Heubner's description of the artery and his influence on paediatrics in Germany. J Neurosurg 2000;93:1084-8.
3. Perlmutter D, Rhoton AL Jr. Microsurgical anatomy of the anterior cerebral-anterior communicating-recurrent artery complex. J Neurosurg 1976;45:259-72.
4. Zunon-Kipre Y, Peltier J, Haidara A, Havet E, Kakou M, Le Gars D. Microsurgical anatomy of distal medial striate artery (recurrent artery of Heubner). Surg Radiol Anat 2012;34:15-20.
5. Wakabayashi T, Tamaki N, Yamashita H, Saya H, Suyama T, Matsumoto S. Angiographic classification of aneurysms of the horizontal segment of the anterior cerebral artery. Surg Neurol 1985;24:31-4.

How to cite this article: Vellore Y, Madan A, Hwang PK. Recurrent artery of Heubner aneurysm. Asian J Neurosurg 2014;9:244-5.

Source of Support: Nil, **Conflict of Interest:** None declared.