



Case Report

Infundibular dilatation perforating vessel of anterior communicating artery

Jirapong Vongsfak^{1,2}, Jarudetch Wichaitum², Thaweesak Aurboonyawat^{2,3}

Department of ¹Surgery, Chiang Mai University, Chiang Mai, Departments of ²Radiology and ³Surgery, Mahidol University, Bangkok, Thailand.

E-mail: *Jirapong Vongsfak - jvongsfak@gmail.com; Jarudetch Wichaitum - oatwichaitum@gmail.com; Thaweesak Aurboonyawat - aurboonyawat@gmail.com



*Corresponding author:

Jirapong Vongsfak,
Department of Surgery, Chiang
Mai University, Chiang Mai,
Thailand.

jvongsfak@gmail.com

Received : 01 October 2022

Accepted : 01 November 2022

Published : 11 November 2022

DOI

10.25259/SNI_905_2022

Quick Response Code:



ABSTRACT

Background: Infundibular dilatation at cerebral arteries is primarily located at the posterior communicating artery. This report describes a rare case of infundibular dilatation perforating the branch of an anterior communication artery (AcomA) which mimicked an AcomA aneurysm.

Case Description: The 54-year-old female presented with acute headache in the left temporal area with the right hemianesthesia. The magnetic resonance imaging and magnetic resonance angiography of the brain revealed a small outpouching lesion arising from the medial wall of the proximal A2 of the left ACA presenting as a suspected AcomA aneurysm. The cerebral angiogram showed a funnel-shaped dilatation of the anterior communicating artery with a single perforating branch arising from a dome size 1.4×1.1 mm, compatible with an infundibular dilatation perforating a branch of the AcomA.

Conclusion: The infundibular dilatation perforating vessel of AcomA is a rare condition and can mimic an AcomA aneurysm. Three-dimensional angiography helps to evaluate differentiation of the characteristics enabling accurate diagnosis.

Keywords: Anterior communicating artery, Cerebral aneurysm, Infundibular, Perforating branch

INTRODUCTION

An infundibular dilatation is defined as funnel or conical shaped widening at the origin of a cerebral artery. The infundibular origin is most commonly found at the origin of the posterior communicating artery (7–25%).^[2] However, one can find at the origin of an anterior communicating artery (AComA) or ophthalmic artery.

In this paper, we are reporting on a rare case of infundibular perforating branch of anterior communicating aneurysm that was misinterpreted as a cerebral aneurysm.

CASE PRESENTATION

A 54-year-old female with dyslipidemia presented with acute right hemianesthesia with headache in the left temporal area. The physical examination revealed impaired sensation of the left side of the face (ophthalmic branch of the trigeminal nerve). The patient was sent for a magnetic resonance imaging (MRI) scan of the brain (May 26, 2022). The brain MRI showed a small outpouching lesion arising from the medial wall of the proximal A2 of the left ACA, pointing

This is an open-access article distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 License, which allows others to remix, transform, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

©2022 Published by Scientific Scholar on behalf of Surgical Neurology International

in the superomedial direction and measuring about 2 mm in neck width and height, and presenting as a suspected saccular aneurysm [Figure 1]. One month later, the patient underwent cerebral angiography for evaluation of the suspected cerebral aneurysm enabling planning for further management.

A four vessels cerebral angiogram was performed on July 6, 2022 and revealed a funnel-shaped dilatation of the anterior communicating artery with a single perforating branch arising from a dome sized 1.4×1.1 mm. The images from the three-dimension angiography are shown in Figure 2. The findings were compatible with infundibular perforating

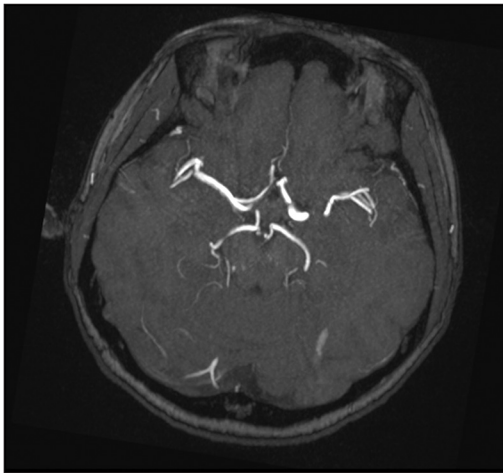


Figure 1: MRA of the brain demonstrates a small outpouching lesion arising from the medial wall of the proximal A2 segment of the left ACA, pointing in a superomedial direction and measuring about 2 mm in neck width and height.

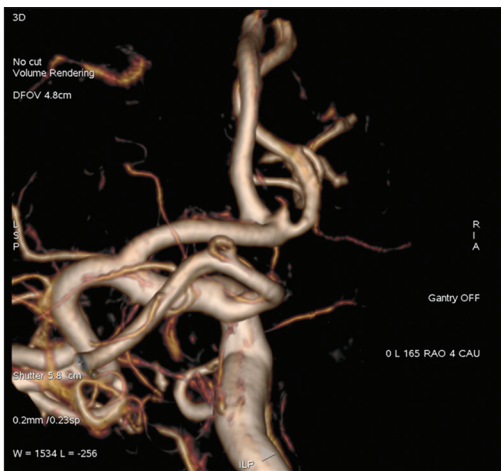


Figure 2: Cerebral angiogram reveals a funnel-shaped outpouching lesion at the anterior communication artery (AcomA) with a perforating branch arising from the dome of lesion, leading to a suspected diagnosis of an infundibulum dilatation perforating a branch of the AcomA measuring 1.4×1 mm.

branch of an anterior communicating artery. Follow-up of the neurological symptoms at the outpatient department was planned.

DISCUSSION

Infundibular dilatation of cerebral arteries presents as a conical, round dilated shape, <3 mm in size with a vessel arising from apex of the dome. An infundibulum is found in 5–25% of cerebral angiograms.^[3] The most common location is at the posterior communicating artery and differentiation from a saccular aneurysm is essential.^[7]

An infundibular dilatation can also be found at the origins of the anterior choroidal artery and ophthalmic artery.^[5] However, an infundibular perforation of the anterior communicating artery is very rare. To the best of our knowledge, from an extensive literature review, our report is only the third documented case.^[6,7]

Human cadaveric studies have demonstrated branches of the AComA that divide into small and large branches. The small branches supply the lamina terminalis and the hypothalamus at the preoptic region. The large branches are the medial artery of the corpus callosum and subcallosal artery. In our study, the perforating artery that arose from the infundibular dilatation of the AComA was suspected to be the subcallosal artery due to the shorter segment supply in the medial hemispheric surface shown by the three-dimension angiography.^[4]

The natural history of the infundibular dilatation has been considered to be an anatomical variant which is not associated with pathological significance. However, there are reports of infundibular dilatation developing in aneurysms in the posterior communicating artery and subsequently rupturing.^[1,2] Therefore, some authors consider an infundibular dilatation as a preaneurysmal lesion, especially in the case of patients with the risk factors of female gender, young age, presence with concurrent aneurysm, or a history of hypertension.

CONCLUSION

The occurrence of infundibular perforating vessel of AcomA is a rare condition and as described above can mimic an AcomA aneurysm. Three-dimensional angiography needs to be performed to evaluate the lesion and enable differentiation of the characteristics enabling accurate diagnosis. However, the natural history of these lesions is still not well understood and there is a need for more detailed follow-up and more reports in the future.

Declaration of patient consent

Patient's consent not required as patient's identity is not disclosed or compromised.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Epstein F, Ransohoff J, Budzilovich GN. The clinical significance of junctional dilatation of the posterior communicating artery. *J Neurosurg* 1970;33:529-31.
2. Karekezi C, Boutarbouch M, Djoubairou B, Melhaoui A, Arkha Y, El Ouahabi A. Are infundibular dilatations at risk of further transformation? Ten-year progression of a prior documented infundibulum into a saccular aneurysm and rupture: Case report and a review of the literature. *Neurochirurgie* 2014;60:307-11.
3. Kihira S, Fifi JT, Doshi AH, Xuan D, Belani P. Infundibulum at the origin of an accessory middle cerebral artery. *Clin Imaging* 2021;72:19-21.
4. Marinković S, Milisavljević M, Marinković Z. Branches of the anterior communicating artery. *Acta Neurochir (Wien)* 1990;106:78-85.
5. Morris P. *Practical Neuroangiography*. United States: Lippincott Williams and Wilkins; 2007.
6. Narducci A, Ronchetti G, Nannucci F, Vaudano GP, Griva F. Infundibulum of accessory anterior cerebral artery: Rare, likely benign malformation of anterior communicating artery complex to keep in mind. *World Neurosurg* 2019;132:399-402.
7. Park J, Kang DH. Infundibular widening mimicking anterior communicating artery aneurysm: Report of 2 cases. *J Neurosurg* 2013;119:243-6.

How to cite this article: Vongsfak J, Wichaitum J, Aurboonyawat T. Infundibular dilatation perforating vessel of anterior communicating artery. *Surg Neurol Int* 2022;13:525.

Disclaimer

The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the Journal or its management. The information contained in this article should not be considered to be medical advice; patients should consult their own physicians for advice as to their specific medical needs.