Hiroshima Journal of Medical Sciences
Vol. 32, No. 2, June, 1983
HIJM 32-23

A Case of Fenestrated Anterior Cerebral Artery with an Associated Aneurysm*)

Tetsuji INAGAWA[1], Tetsuji TAKEDA[1], Haruyoshi TAGUCHI[1] and Tohru YAMADA[2]

1) *Department of Neurosurgery, Shimane Prefectural Central Hospital, 116 Imaichi-cho, Izumo, Shimane 693, Japan*
2) *Department of Neurosurgery, Hiroshima University School of Medicine, Hiroshima 734, Japan*

(Received February 12, 1983)

Key words: *Cerebral vascular anomaly, Cerebral aneurysm, Anterior cerebral artery fenestration*

ABSTRACT

Fenestration of the anterior cerebral artery is rare. The authors describe a case of an aneurysm arising from the proximal end of a fenestration of the anterior cerebral artery demonstrated by angiography.

INTRODUCTION

Fenestration of the vertebrobasilar artery is well known, and recently aneurysms of fenestrated basilar artery are also being reported[1,4,5,8]. However, aneurysm of the fenestrated anterior cerebral artery is a very rare finding, and only 1 such case found on autopsy has been reported in the literature[1]. The purpose of this paper is to present the angiographic demonstration of a case with aneurysm at an anterior carebral artery fenestration.

CASE REPORT

A 70-year old female experienced a sudden onset of severe headache and vomiting, followed by consciousness disturbance, and was admitted to a local hospital on March 4, 1982. The next day, she was transfered to the Shimane Prefectural Central Hospital under the diagnosis of a subarachnoidal hemorrhage.

On admission the patient was slightly disoriented and her neck was stiff. Computed tomography (CT) revealed hydrocephalus and a high density area in the left insular cistern, but there were no findings in the suprasellar cistern (Fig. 1). Left carotid angiography disclosed the presence of aneurysms of the fenestrated anterior cerebral artery and the middle cerebral artery (Fig. 2). On the basis of the CT findings, it was considered that the aneurysm of the middle cerebral artery had ruptured, but the anterior cerebral artery had not. With the exception of megadolicobasilar anomaly, there were no other vascular deformities or

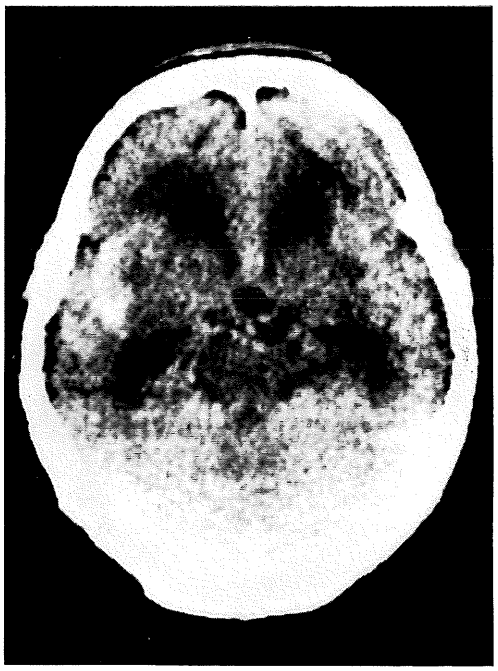

Fig. 1. CT scan shows hydrocephalus and a high density area in the left insular cistern.

*) 鰰川哲二, 武田哲二, 田口治義, 山田　徹：前大脳動脈窓形成に発生した動脈瘤の１例

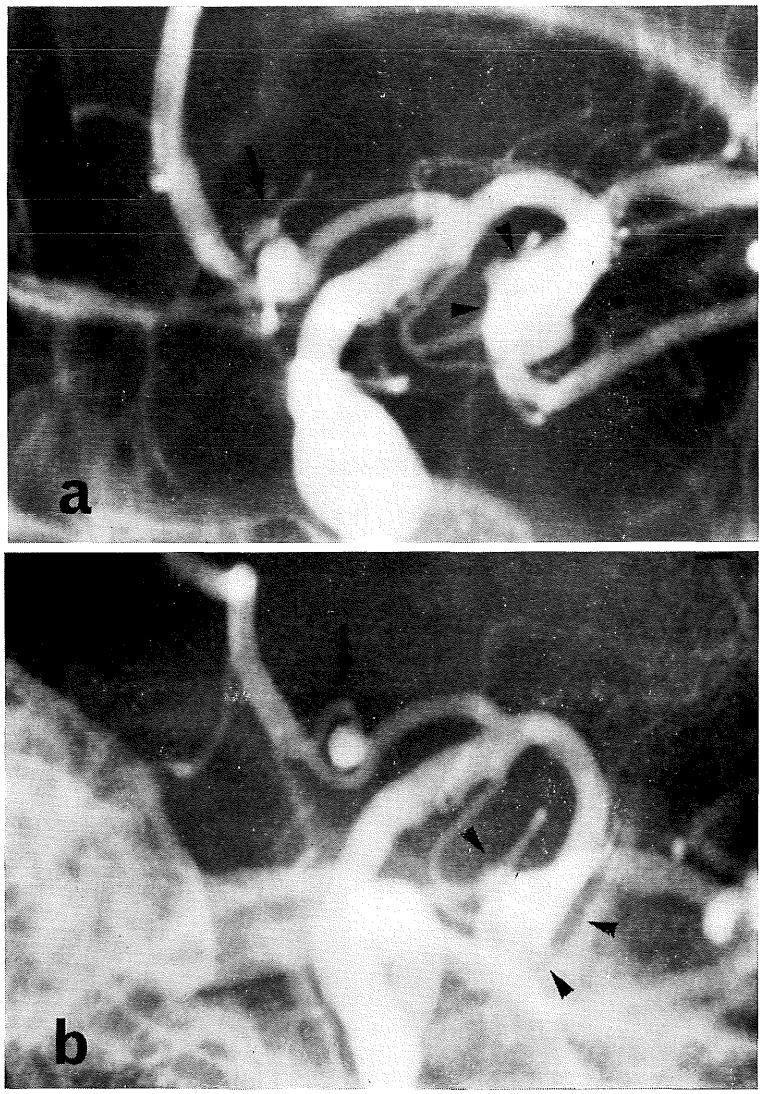

Fig. 2 a and b AP(a) and oblique(b) projections of left carotid angiogram demonstrate aneurysms of fenestration in distal half of horizontal segment of anterior cerebral artery (arrow) and middle carebral artery (arrowheads).

abnormalities. As the patient had such complications as cardiac insufficiency, diabetes and obse, surgery was not performed and she was transfered to another hospital on April 30, 1982. The patient continues to receive symptomatic treatment at the other hospital.

DISCUSSION

Fenestration of the anterior cerebral artery is a rare condition being reported in only 0.1–7.2% of autopsy cases[6]. The angiographic demonstration of this anomaly (all in the horizonal segment) is even more rare, with only 8 cases having been reported throughout the world[6,7,9,11]. Aneurysms on the fenestration of cerebral arteries, not only the anterior cerebral artery, but on other cerebral arteries as well, is a very rare finding, and only 6 cases have been reported so far[1,4,5,8]. Of these 6, 1 was an aneurysm on the anterior cerebral artery[1], while the other 5 were aneurysms on the fenestrations of basilar arteries[1,4,5,8], and all of the aneurysms had arisen from the proximal end of the fenestration.

Fenestration is considered to be an incomplete fusion of the precursor vascular network[10] of the anterior cerebral artery due to unknown reasons, but the true developmental mechanism is yet unknown[6]. Crompton[1] noted an aneurysm at the proximal end of a fenestration of the cerebral artery and reported histological examination revealed defect of the media at the proximal end of fenestrations in not only the anterior cerebral artery, but also in the middle cerebral artery and basilar artery as well. Most congenital saccular aneurysms arise at the site of arterial branching where a media defect is found[2]. Therefore, the mechanism involved in the development of aneurysms in the proximal end of a fenestration, is considered to closely resemble that of the saccular aneurysm from the histological[2] and hemodynamic[3] points of view.

To our knowledge, the case presented here is the first angioraphic demonstration of a saccular aneurysm arising from the fenestration of the anterior cerebral artery.

REFERENCES

1. **Crompton, M. R.** 1962. The pathology of ruptured middle-cerebral aneurysms with special reference to the differences between the sexs. Lancet **2** : 421-425.
2. **Eppinger, H.** 1887. Pathogenese (Histogenese und Aetiologie) der Aneurysmen einschliesslich der Aneurysma equiverminosum. Arch Klin. Chir. Suppl. **35** : 1-563.
3. **Ferguson, G. G.** 1970. Turbulence in human intracranial saccular aneurysms. J. Neurosurg. **33** : 485-497.
4. **Hemmati, M. and Kim, K. S.** 1979. A ruptured aneurysm at the basilar artery fenestration. Radiology **130** : 174.
5. **Hoffman, W. F. and Wilson, C. B.** 1979. Fenestrated basialr artery with an associated saccualr aneurysm. Case report. J. Neurosurg. **50** : 262-264.
6. **Ito, J., Washiyama, K., Kim, C. H. and Ibuchi, Y.** 1981. Fenestration of the anterior cerebral artery. Neuroradiology **21** : 277-280.
7. **Krayenbühl, H. A. and Yaşargil, M. G.** 1968. Cerebral angiography. 2nd ed. Butterworths, London.
8. **Matricali, B. and van Dulken, H.** 1981. Aneurysm of fenestrated basilar artery. Surg. Neurol. **15** : 189-191.
9. **Miyazaki, Y. and Tsuruta, J.** 1977. Clinical studies on the congenital anomalies of the intracranial arteries associated with cerebral aneurysm. Hokkaido J. Med. Sci. **52** : 111-123.
10. **Padget, D. H.** 1948. The development of the cranial arteries in the human embryo. Contrib Embryol (Carnegie Inst 212) **32** : 205-261.
11. **Teal, J. S., Rumbaugh, C. L., Bergeron, R. T. and Segall, H. D.** 1973. Angiographic demonstration of fenestrations of the intradural intracranial arteries. Radiology **106** : 123-126.