



## OLGU SUNUMU / CASE REPORT

# Multilobuled high basilar artery aneurysm causing hydrocephalus

Yüksek yerleşimli multilobüle baziller arter anevrizmasına bağlı hidrosefali

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### Abstract

This report describes an obstructive hydrocephalus caused by the mass effect of a basilar artery aneurysm which is a rare condition. A giant multilobed aneurysm that developed in the high basilar tip causing hydrocephalus was treated successfully through clipping and lamina terminalis fenestration. The method of treating hydrocephalus caused by aneurysm is controversial. Ventriculoperitoneal shunt and endoscopic third ventriculostomy are among treatment options. Microsurgical clipping and lamina terminalis fenestration of a high basilar tip aneurysm causing hydrocephalus is a safe and effective method for treating both aneurysm and hydrocephalus in appropriate patients.

**Key words:** basilar artery aneurysm, hydrocephalus, microsurgery.

### Öz

Bu yazıda nadir bir durum olan basiller arter anevrizmasının kitle etkisinin yol açtığı obstrüktif hidrosefali bir olgu bildirilmiştir. Hidrosefaliye yol açmış yüksek yerleşimli basiller tepe de gelişen dev multilobüle anevrizma, kliplleme ve lamina terminalis fenestrasyonu ile başarılı bir şekilde tedavi edilmiştir. Anevrizmaya bağlı gelişen hidrosefali tedavisinin yönetimi tartışmalıdır. Ventriculoperitoneal shunt ve endoskopik third ventrikülostomi tedavi seçenekleri arasındadır. Hidrosefaliye yol açan yüksek yerleşimli basiller tepe anevrizmasının mikrosirürjikal olarak anevrizmanın klipajı ve lamina terminalis fenestrasyonu hem anevrizma hem de hidrosefali tedavisinde en güvenli ve fizyolojik yöntemdir.

**Anahtar kelimeler:** Baziller arter anevrizması, hidrosefali, microcerrahi.

## INTRODUCTION

Basilar artery aneurysm is not very common, 5-8% of all intracranial aneurysms are located by the basilar artery bifurcation<sup>1</sup>. The symptoms and findings of a basilar artery aneurysm depend on the occlusion of the parent artery and perforators, rupturing of aneurysm or mass effect<sup>2,3</sup>. The obstructive hydrocephalus caused by the mass effect of a basilar artery aneurysm is a rare condition.

The choice for treating this hydrocephalus caused by aneurysm is controversial. The ventriculoperitoneal (VP) shunt procedure may lead to bleeding in or widening of aneurysm. Although the endoscopic third ventriculostomy is the ideal treatment option, it has the disadvantage of technical difficulty in the presence of th

hydrocephalus with basilar tip aneurysms<sup>2,4</sup>. We explain in this report how a giant multilobed ruptured aneurysm that developed in the high-location basilar tip causing hydrocephalus was treated successfully through clipping and lamina terminalis fenestration.

## CASE

A female patient aged 73 who complained headache and sudden blackout was hospitalized after being diagnosed with Fisher grade 4 subarachnoid hemorrhage (SAH) and acute hydrocephalus on the computed tomography (CT). The patient who was Glasgow Coma Scale (GCS) grade was 12 (E2, V5, M5) and Hunt&Hess grade 3 was stabilized hemodynamically in the intensive care unit and was

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administered a CT angiography. A high located (Fig. 1a, b) and multilobed (Fig. 2a, b) aneurysm was found during the CT angiography, which caused an obstructive hydrocephalus by growing toward the inside of 3<sup>rd</sup> ventricle. After a left frontotemporal orbitozygomatic craniotomy, the high-location basilar tip aneurysm was clipped and a lamina

terminalis fenestration was administered. The patient, whose clinical condition and radiological hydrocephalus improved (Fig. 3) in the post-operative period, was discharged on the 10<sup>th</sup> day without any need for an additional surgical procedure (VP shunt, Endoscopic third ventriculostomy(ETV)).

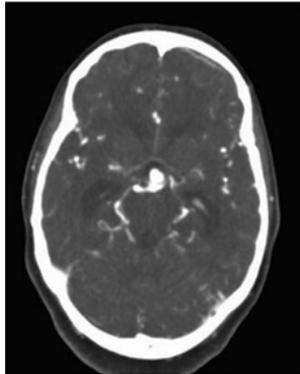


Figure 1 a: Hydrocephalus on axial CT, formation within the 3<sup>rd</sup> ventricle on axial CT

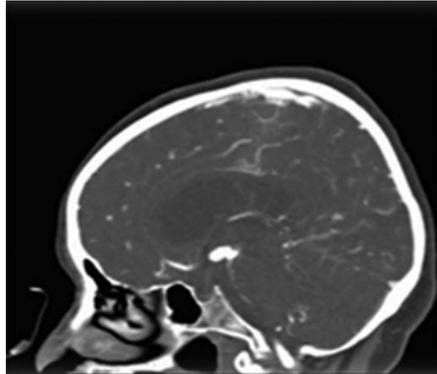


Figure 1.b. High-riding basilar tip aneurysm.

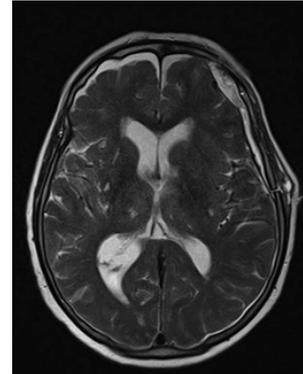


Figure 3. Post-op MRI: Hydrocephalus removed.

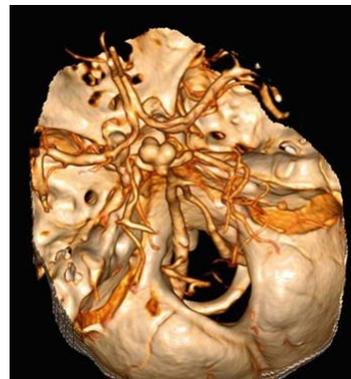


Figure 2a, b: CT angiography: High-riding, multilobe basilar tip aneurysm

**DISCUSSION**

The hydrocephalus complication that develops after an aneurysm-related subarachnoid hemorrhage (SAH) is very well known. Occurrence of an acute hydrocephalus and intraventricular hemorrhage after a rupture is more common in posterior circulation aneurysms than in anterior circulation aneurysms<sup>5</sup>. We think that the mass effect on the 3<sup>rd</sup> ventricle caused by the hemorrhagic giant aneurysm that

occurred at the high basilar tip and the SAH both contributed to the development of a hydrocephalus in our patient. Perioperative lamina terminalis fenestration, endoscopic third ventriculostomy and VP shunt procedure are the treatment options for this complication<sup>3,4,6</sup>. Endovascular intervention is a widely used method as an alternative to surgery in the treatment of posterior circulation aneurysms<sup>1,4,7</sup>. However, clipping of aneurysms through the microsurgical method should be preferred

particularly in giant aneurysms that have a mass effect. Treating high-location basilar tip aneurysms with endovascular intervention remains ineffective in the presence of hydrocephalus complications. Due to hydrocephalus, a second surgical process such as ETV or VP shunt procedure is required<sup>3,4,7</sup>.

Sato et al. reported that they successfully treated a basilar tip aneurysm involving a hydrocephalus using ETV after a coil embolization. However, on a magnetic resonance image they also showed that the same patient had an edema-related intensity in the brainstem and thalamus region due to a mass effect after the embolization of the giant aneurysm<sup>4</sup>. It has been reported that there is a technical difficulty and rebleeding in an ETV procedure because the aneurysm blocks the floor of the third ventricle<sup>4</sup> and the VP shunt has the risk of rebleeding or widening of the aneurysm dome<sup>3</sup>.

Clipping the aneurysm in our patient through the microsurgical method enabled removal of the mass effect and the flow of the cerebrospinal fluid. Additionally, the hydrocephalus was treated by enabling drainage using the lamina terminalis fenestration. Microsurgical clipping and lamina terminalis fenestration of a high-location basilar tip aneurysm causing hydrocephalus is a safer and effective method for treating both aneurysm and hydrocephalus in appropriate patients.

## REFERENCES

1. Dănăilă I. Microsurgery for the aneurysms of the basilar artery apex. *Chirurgia (Bucur)*. 2012;107:631-9.
2. Gelal F, Vidinli BD, Yurt A, Cakir Y, Uygur M. Giant fusiform basilar artery aneurysm causing obstructive hydrocephalus. *Skull Base*. 2002;12:197-200.
3. Kaptan H, Koktekir E, Recber F, Akdemir G. Obstructive hydrocephalus caused by giant basilar artery aneurysm. *Neurosciences (Riyadh)*. 2013;18:173-5.
4. Sato M, Nakai Y, Takigawa T, Takano S, Matsumura A. Endoscopic third ventriculostomy for obstructive hydrocephalus caused by a large upper basilar artery aneurysm after coil embolization. *Neurol Med Chir (Tokyo)*. 2012;52:832-4.
5. Graff-Redford NR, Torner JC, Adams HP, Kassell NF. Factors associated with hydrocephalus after subarachnoid hemorrhage. a report of the cooperative aneurysm study. *Arch Neurol*. 1989;46:744-52.
6. Tomasello F, d'Avella D, de Divitiis O. Does lamina terminalis fenestration reduce the incidence of chronic hydrocephalus after subarachnoid hemorrhage? *Neurosurgery*. 1999;45:827-32.
7. Tsutsumi S, Kondo A, Abe Y, Yasumoto Y, Ito M: Basilar apex aneurysm manifesting as third ventricular mass and obstructive hydrocephalus—case report. *Neurol Med Chir (Tokyo)*. 2008;48:451-4.