症例報告

真の後交通動脈瘤

今井 邦 英

True Posterior Communicating Artery Aneurysm: Case Report

by

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A 47-year-old male presented with a ruptured “true” posterior communicating artery aneurysm (Pcom AN) manifesting as semicoma and left hemiparesis. An open direct surgery could not be performed because his neurological state was critical in the acute stage. He died of rebleeding of the aneurysm before the intentional delayed operation was performed. In general, a “true” posterior communicating artery aneurysm is rare. Diagnosis and treatments of patients with this aneurysm, particularly those in a poor neurological state are discussed.

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Key words : posterior communicating artery aneurysm, rebleeding, intentionally delayed operation, open direct surgery, endovascular surgery

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Introduction

In general, a cerebral aneurysm is located at sites such as bifurcations of arteries where hemodynamic stress may have occurred⁷⁾²⁷⁾. The so-called true posterior communicating artery aneurysms (Pcom ANs) arise not in association with arterial branches and occur extremely rarely, constituting 0 to 3.3% of all cases of cerebral aneurysms according to some reports³⁾⁷⁾. To our knowledge, 19 cases of cerebral aneurysms were previously reported. To date, it is still not necessarily easy for us to treat patients with a poor grade of subarachnoid hemorrhage (SAH). Less invasive approach such as an endovascular procedure is recommended particularly for these patients rather than open direct surgery.

Case Report

A semicomatose 47-year-old male with left hemiparesis was transferred to our hospital by ambulance about 1 hour after the onset of symptoms. A history of hypertension was noted but not treated. On admission, SAH was at Hunt-Hess (H&H) grade IV. His electrocardiogram (ECG) revealed serious arrhythmia, such that is premature ventricular contraction (PVC) and it continued for about 4 days. Other tests of his cardiac functions were not performed. The initial conventional computed tomography (CT) revealed SAH (Fisher group 3) (Fig. 1). The distribution of clot was almost symmetrical. A cerebral angiogram revealed the right Pcom AN as the bleeding site but not the other lesions. This aneurysm seemed to arise not in association with arterial branches such as internal carotid artery (ICA), posterior cerebral artery (PCA)

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Fig. 1 CT scan performed on admission revealing thick subarachnoid hemorrhage and that the distribution of clot was symmetrical

A: Posteroanterior view

B: Lateral view

C: Lateral view in late arterial phase

Fig. 2 Right internal carotid angiography taken on admission showing an aneurysm at the middle portion of the posterior communicating artery

The pooling of the contrast medium is noted in the late arterial phase.

and other perforating arteries (Fig. 2, 3). Taking his poor neurological conditions into account, direct surgery under general anesthesia was considered to be risky²⁰⁾. Therefore, the intentionally delayed operation was planned by setting a spinal drainage. His consciousness and left hemiparesis improved gradually 6 days after the onset. However, 10 days after the onset his spontaneous respiration arrested. CT performed soon after this episode indicated rebleeding of the aneurysm (Fig. 4). His respiration was then supported with a ventilator. But he died 19 days after the onset. Autopsy was not permitted by his family.

Discussion

A true Pcom AN is defined as one which arises not in association with arterial branches such as ICA, PCA and other perforating arteries¹⁾⁷⁾. In general, hemodynamic stress for a long time is considered to contribute to the formation of most aneurysms⁶⁾. So it is possible that the formation of aneurysms is not induced at these regions except for the crotches with hemodynamic stress. For this reason, this type of aneurysm may be extremely rare constituting 0 to 3.3% of all cases of cerebral aneurysm according to some reports^{1)~3)6)~9)13)~16)19)23)~27)31)}. To our knowl-

Table 1 Summary of 19 cases of true Pcom AN

Author	Year	Age	Sex	Symptoms	H & H Grade	Side	Type	Location	Size
Yoshida, et al ³¹⁾	1979	46	M	IIIrd P, SAH	II	Lt	berry	3 mm from ICA	normal
Kamiyama, et al ⁸⁾	1980	28	F	IIIrd P, SAH	II	Rt	saccular	center	normal
Abiko, et al ¹⁾	1981	57	F	SAH	II	Lt	fusiform	near PCA	dilated
Tanizaki, et al ²⁵⁾	1982	69	F	SAH	I	Lt	saccular	center	normal
Miyazawa, et al ¹⁶⁾	1983	68	M	SAH	III	Lt	saccular	center	normal
Masuda, et al ¹³⁾	1984	45	F	IIIrd P, SAH	II	Rt	saccular	near ICA	normal
Waga, et al ²⁶⁾	1984	54	M	SAH	I	Rt	saccular	5 mm from ICA	normal
	1984	64	M	SAH	I	Lt	saccular	3 mm from ICA	normal
Takeda, et al ²⁴⁾	1985	73	F	VIth P, SAH	III	Lt	saccular	center	normal
Okada, et al ¹⁹⁾	1988	40	F	SAH	II	Rt	saccular	3 mm from ICA	normal
Kudo ⁹⁾	1990	57	M	SAH	II	Lt	saccular	3 mm from ICA	normal
Akimura ²⁾	1991	57	F	SAH	II	Lt	fusiform	distal portion	tortuous
	1991	45	F	SAH	III	Lt	saccular	center	normal
Takahashi, et al ²³⁾	1992	27	F	SAH	II	Lt	saccular	center	dilated
	1992	23	M	SAH	III	Rt	saccular	center	dilated
Matsumoto, et al ¹⁴⁾	1997	27	M	IIIrd P, SAH	IV	Lt	fusiform	center	normal
Matsumoto, et al ¹⁵⁾	1997	62	F	headache	II	Rt	fusiform	center	dilated
Baker, et al ³⁾	1998	29	F	SAH	II	Lt	saccular	near PCA	dilated
Present case	2001	47	M	SAH	IV	Rt	saccular	center	normal

M : male F : female IIIrd P : oculomotor palsy VIth P : abducens palsy SAH : subarachnoid hemorrhage Lt : left Rt : right ICA : internal carotid artery PCA : posterior cerebral artery OP : open direct surgery Angio : angiography *Outcome based on Glasgow Outcome Scale GR : good recovery MD : moderately disabled

Fig. 3 Left vertebral angiography taken on admission not opacifying the aneurysm **Fig. 4** CT scan performed after rebleeding demonstrating the hematoma around the aneurysm

edge, only 19 cases of cerebral aneurysm were previously reported (Table 1). In this report, we describe a case of true Pcom AN.

Since angiograms may not always be helpful in identifying true Pcom AN, a definite diagnosis should be essentially confirmed by intraoperative findings if possible in our case¹⁶⁾. However, the poor neurological state of our patient

did not allow the performance of the open direct surgery. Therefore, we could only make the diagnosis mainly based on CT findings and angiograms instead of intraoperative ones. Other bleeding sites except for this aneurysm were not revealed by angiography, and the pattern of distribution of SAH which was determined by CT performed after the rebleeding was highly indicative of a ruptured aneurysm^{3) 7) 10) 18)}. In fact, the angiography on admission clearly demonstrated the presence of Pcom AN in this

Diagnosis	Treatment	Outcome*
OP	clipping	GR
OP	trapping	GR
OP	trapping	GR
OP	clipping	GR
OP	clipping	GR
OP	clipping	GR
OP	clipping	GR
OP	clipping	GR
OP	clipping	GR
OP	clipping	GR
OP	clipping	GR
OP	clipping	GR
OP	clipping	GR
OP	clipping	GR
OP	clipping	GR
OP	clipping	GR
OP	clipping	GR
OP	trapping	GR
OP	clipping	GR
OP	clipping	GR
OP	clipping	MD
OP	trapping	GR
OP	clipping	GR
Angio		dead

patient, particularly in the lateral view (Fig. 2B) and that it was different from those that arose directly from ICA.

It is worth noting that the contrast medium was pooled in this aneurysm in the late arterial phase. This finding was typical of a pseudoaneurysm such as a dissecting aneurysm rather than a saccular one²¹⁾²⁹⁾³⁰⁾. Initially we diagnosed it as a saccular aneurysm, but it might have been a pseudoaneurysm.

Several reports in the literature have described many approaches to successfully treat a relatively difficult type of aneurysm of this portion²⁾³⁾⁵⁾¹²⁾¹³⁾¹⁵⁾¹⁹⁾. However, it is still not necessarily easy for us to treat a patient with this aneurysm, particularly in a poor one who is in the grade of SAH today because significant perforating arteries irrigating important areas such as the thalamus, hypothalamus, internal capsule, optic tract and the brain stem are the origin of posterior communicating artery²⁾⁹⁾¹⁵⁾²²⁾²⁶⁾³¹⁾. Indeed, our patient was not elderly and might be able to undergo direct surgery. However, we were afraid of delayed vasospasms because his systemic and neurological conditions improved almost completely 6 days after the onset. On the other hand, in neurologically poor cases such as ours, endovascular surgery is considered to be the appropriate strategy rather than the open direct surgery⁹⁾. In some reports, various critical cases of H&H grade IV or V were successfully treated with endovascular pro-

cedure⁹⁾¹¹⁾¹²⁾¹⁷⁾²⁸⁾. This procedure is also applicable to patients with serious vasospasm and the elderly exceeding 80 years old⁴⁾¹⁷⁾²⁸⁾. Even if the neurological states of the patients on admission are poor and they have vasospasms, less invasive strategies such as the endovascular procedure may improve not only the neurological conditions but also systemic ones¹²⁾.

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要 旨

真の後交通動脈瘤の1例

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クモ膜下出血で発症した右後交通動脈瘤の1例を報告した。症例は47歳、男性で、突然の頭痛、意識障害で発症した。来院時のCTにて、クモ膜下出血と診断され、Hunt & Hessの分類ではGrade IVであり、重篤な不整脈もみられたため、腰椎ドレナージを留置後、意図的晩期手術を予定した。その後、意識レベルは徐々にアップし、神経学的な改善を認めたものの、発症後10日目に再出血を起こし、19日目に死亡した。内頸動脈とは解剖学的関連のない、いわゆる真の後交通動脈瘤は稀であり、渉猟し得るかぎり、本例を含め19例であった。一方、本例のように神経学的に重篤な症例においても、血管内手術等の非侵襲的な治療を積極的に行っていくべきであると考えられた。

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