Rare Distal Anterior Choroidal Artery Aneurysm

Muhammad Zafrullah Arifin,[1] Julius July,[2] Bilzardy Ferry,[1] Ahmad Faried[1]

[1]Department of Neurosurgery, Faculty of Medicine, Universitas Padjdajaran-Dr. Hasan Sadikin General Hospital
[2]Department of Neurosurgery, Faculty of Medicine, Pelita Harapan University–Siloam Hospital, Tangerang, Indonesia

Abstract

Objective: To describe a rare patient with ruptur aneurysm case of distal anterior choroidal artery (AChA) and intraventricular hemorrhage. A 56-year old female came to our hospital with chief complaint sudden onset of severe headache and vomiting.

Methods: Head computed tomography (CT)-scan and angiography on the lesion was performed at the Department of Radiology, Siloam Hospital, Tangerang, Indonesia.

Results: Head CT-scan imaging revealed an intraventricular hemorrhage, primarily in the right lateral ventricle, with slight enlargement of both lateral, 3rd and 4th ventricles. Angiography examination revealed a round vascular lesion at the wall of the posterior cornu of the lateral ventricle and an occlusion of the M1 base segment of the left middle cerebral artery.

Conclusions: The lesion, distal AChA aneurysm, at the posterior cornu was reached using an infratemporal lobe approach with the help of neuronavigation. Microsurgical clipping was successfully performed.

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Introduction

Reports on aneurysm of the distal anterior choroidal artery (AChA) are very rare. There are only 49 cases are reported in the literature. Twenty cases were associated with moyamoya disease; 10 cases with unknown causes; 8 cases are idiopathic; 3 cases were each associated with atherosclerosis and middle cerebral artery (MCA) occlusion; 2 cases with arteriovenous malformation (AVM), 1 case each for posterior cerebral artery (PCA) occlusion, cavernous angioma and head trauma (Table 1).

Case

A 56-year old female experienced a sudden onset of severe headache and vomiting. She was brought to a local hospital near her house and was hospitalized for 2 days. She was later referred to our hospital, the Siloam Hospital because her symptoms did not disappear. She still complained of severe headache but was fully alert without any neurological deficits. Results from chest x-ray, laboratory examinations and electrocardiogram were normal. Head CT-scan revealed that there was intraventricular hemorrhage with most of it was found in the right lateral ventricle; the left lateral, 3rd and 4th ventricles were slightly enlarged; and an arachnoid cyst in the magna cistern (sized 3 x 2 x 2 cm). Angiography revealed the presence of a round, ruptured vascular lesion sized 5 x 5 mm at the wall of posterior cornu of right lateral ventricle. Digital substraction angiography examination presented a small aneurysm at the right distal AChA and total obstruction at the left MCA, with collaterals observed. Occlusion of the M1 base segment of the left MCA and stenosis of the P2 segment of PCA were also found (Fig. 1 and 2). A repeat CT angiography was performed only to obtain same result, except

Correspondence:
Bilizrdy Ferry, Department of Neurosurgery, Faculty of Medicine, Universitas Padjdajaran-Dr. Hasan Sadikin General Hospital
Jl. Pasteur No. 38, Bandung, Indonesia
e-mail: abilly_bfz@gmail.com

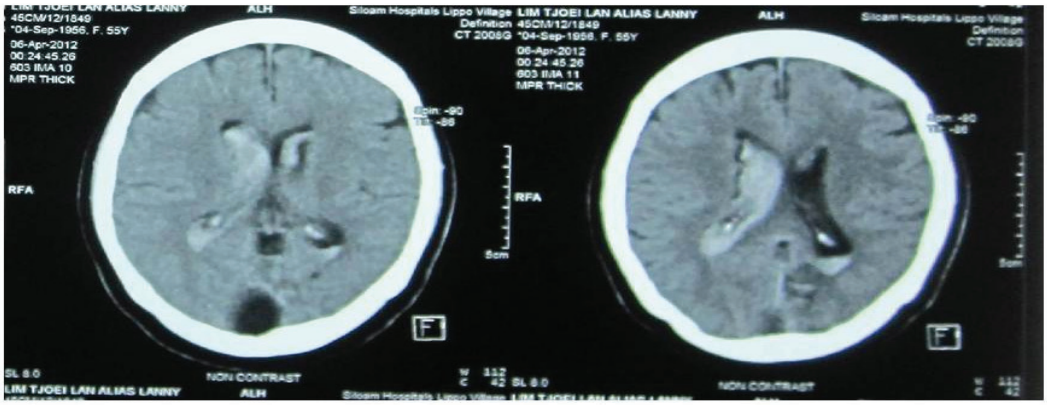

Fig. 1 Preoperative-axial Head CT-scan Showing an Intraventricular Hemorrhage on Both Side

decreasing density of the aneurysm, meaning that thrombosis had already occurred. The patient underwent surgery on the next day. A right temporooccipital craniotomy was conducted and the inferior temporal gyrus was accessed through neuronavigation. A saccular aneurysm with 5 x 5 mm in the right lateral ventricle at the cornu posterior wall was found. The lesion was succesfully clipped, and an intraventricular drain was placed. One day after the operation, the patient's complaints were completely resolved and patient was discharged with no neurological deficit.

Discussion

Distal AChA aneurysm is a rare case. The first case of aneurysm of distal anterior choroidal artery was described by Strully in 1955. To the extend of our knowledge, there are only 50 cases have been found, including our case.[1] The latest report for this case before our report is described by Oishi *et al*.[2] in 2013. Shimizu *et al*.[3] in 2013 reported a 6 years old (yo) patient, who was the youngest patient diagnosed with AVM while the oldest patient (84 yo) was reported by Nishida *et al*.[4] in 2011.

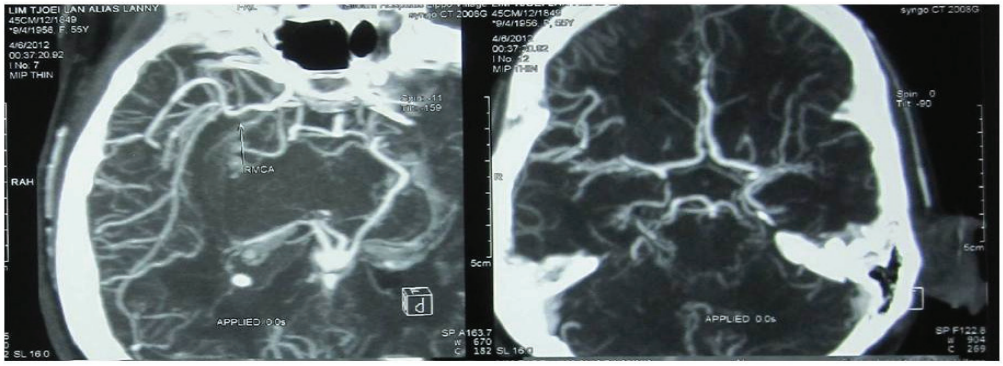

Fig. 2 Preoperative-axial CT-angiography Shows an Aneurysm at the Posterior Cornu Wall of Right Lateral Ventricle (with Diameter ±5.6 mm)

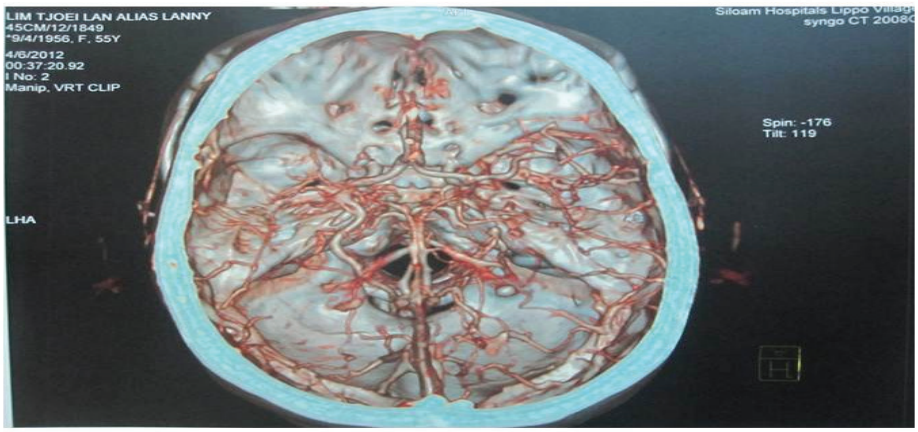

Fig. 3 Preoperative CT Angiography Showing an Aneurysm at the Distal Anterior Choroidal Artery

Fig. 4 Positioning of the Patient and Marking of the Operation Area for Neuronavigation

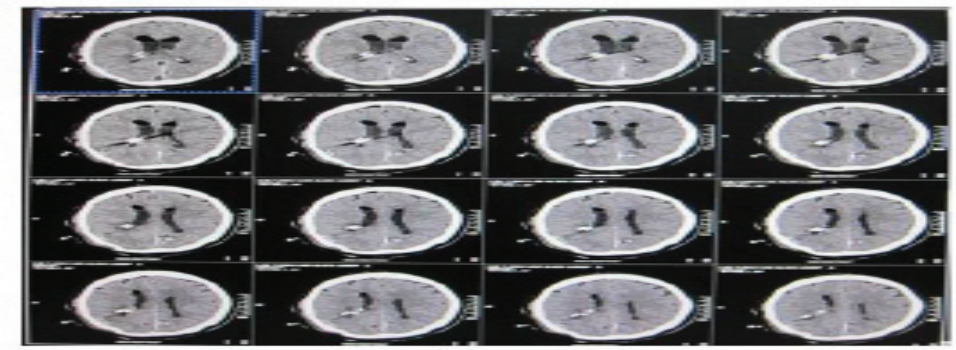

Fig. 5 Postoperative-axial Head CT-scan Showing an Intraventricular External Drainage Device and the Clip for AChA Aneurysm

Table 1 List of Authors Reporting Patients with Distal Anterior Choroidal Artery Aneurysm

No	Author	Location	Cause	Treatment	Outcome	Age/ Sex	CT-scan Result	Pathologic Result
1	Strully (1955)	LTH	Idiopathic	Excision	Severe disability	27/F	NR	TGA
2	Caram *et al*. (1960)	RBG	Cavernous angioma	NR	Death	34/M	IVH	UTA
3	Cressman *et al*. (1966)	LTH	Traumatic	(–)	Death	34/M	ICH	(-)
4	Butler *et al*. (1972)	Trigone	Unknown	Trapping	Mild disability	15/F	ICH + SAH	NR
5	Papo *et al*. (1973)	RTH	Atheros.	Resection	Death	57/M	IVH	FA
6	Takeyama *et al*. (1976)	Left trigone	Moyamoya	(–)	Good	43/M	SAH	(–)
7	Tanaka *et al*. (1978)	RTH	Moyamoya	(–)	Death	57/F	IVH	(–)
8	Takahashi *et al*. (1980)	LTH	Moyamoya	NR	NR	59/M	IVH	NR
9	Yamada *et al*. (1981)	Right side	Moyamoya	NR	NR	42/F	ICH	NR
10	Furuse *et al*. (1982)	RBG	Moyamoya	Resection	Good	67/M	ICH	FA
11	Kasamo *et al*. (1984)	RTH	Moyamoya	(–)	Death	55/F	SAH	(–)
12	Konishi *et al*. (1985)	Right side	Moyamoya	(–)	NR	18/F	IVH	SD
		Right side	Moyamoya	(–)	Good	13/M	IVH	SD
		Right side	Moyamoya	(–)	Death	34/F	IVH	(–)
13	Knuckey *et al*. (1988)	LTH	Atheros.	Resection	Good	46/F	IVH	DAW
14	Sugiura *et al*. (1988)	RBG	Moyamoya	Endov.	Severe disability	47/M	IVH	(–)
15	Onda *et al*. (1988)	Left trigone	Moyamoya	(–)	Good	43/M	SAH	SD
16	Inagawa *et al*. (1990)	LTH	Idiopathic	(–)	Death	75/F	IVH + SAH	TA
17	Nakai *et al*. (1992)	Right trigone	Moyamoya	Resection	Mild disability	42/M	ICH	TA
18	Nishihara *et al*. (1993)	RTH	Idiopathic	Resection	Good	34/F	IVH	TA
19	Hamada *et al*. (1994)	Lateral ventricle	Moyamoya	Trapping	Good	48/F	IVH	NR
20	Hung *et al*. (1996)	Cisternal segment	Idiopathic	Trapping	Good	35/F	SAH	NR

21	Morgenstern *et al*. (1996)	Temporal horn	Idiopathic	Conservative	Good	33/M	Ischemic Symptoms	NR
22	Kawai *et al*. (1997)	RTH	Moyamoya	(–)	Mild disability	19/M	IVH	TA
23	Yoneoka *et al*. (1998)	Right side	Unknown	Clipping	NR	69/M	IVH	TA
24	Yanaka *et al*. (2000)	Right side	AVM	Resection	Good	8/F	IVH	TA
25	Matsuura *et al*. (2000)	Cisternal segment	Idiopathic	Conservative	Good	42/M	Ischemic Symptoms	NR
26	Lee *et al*. (2001)	Right trigone	Moyamoya	Resection	Good	48/M	ICH + IVH	TA
27	Kuroda *et al*. (2001)	NR	Unknown	Rev.	Good	F	IVH	NR
28	Wong *et al*. (2003)	Temporal horn	Moyamoya	Clipping	Good	62/F	ICH + IVH	NR
29	Ali *et al*. (2004)	NR	Unknown	Clipping	Good	26/M	ICH + IVH	TA
30	Nishio *et al*. (2004)	NR	Unknown	Embolization	NR	47/F	SAH	NP
31	Ahn *et al*. (2006)	Left side	Unknown	(–)	Death	60/F	NR	NR
32	Inci *et al*. (2007)	Temporal horn	Idiopathic	Resection	Good	19/F	ICH + IVH	NR
		Temporal horn	Idiopathic	Resection	Death	37/F	ICH + SAH	NR
33	Gandhi *et al*. (2008)	NR	Unknown	Clipping	NR	M	SAH	NP
34	Yurt *et al*. (2009)	Right side	Unknown	Clipping	Good	NR	ICH + IVH	NP
35	Kim *et al*. (2009)	NR	Moyamoya	Vegetative state	NR	43/F	IVH	NR
36	Yang *et al*. (2010)	NR	Moyamoya	Endov.	Good	56/F	IVH	NP
		NR	Moyamoya	Endov.	Good	38/F	IVH	NP
37	Choulakian *et al*. (2010)	NR	Moyamoya	Endov.	Good	NR	IVH	NP
38	Nishida *et al*. (2011)	RTH	MCA Occlusion	Endov.	Mild disability	84/F	IVH	NP
39	Leveque *et al*. (2011)	Left side	Moyamoya	Endov.	Good	50/F	IVH	NP
40	Dolati *et al*. (2012)	NR	PCA Occlusion	Endov.	Good	55/M	IVH	NP
41	He *et al*. (2013)	Left side	Unknown	Clipping	Good	M	IVH	NP
		Right side	Unknown	Conservative	Good	M	IVH	NP

42	Shimizu *et al*. (2013)	Lateral posterior	Atheros.	Endov.	Good	43/F	ICH	NP
		NR	AVM	Endov.	Good	6/F	ICH	NP
43	Oishi *et al*. (2013)	RTL	MCA occlusion	Endov.	Mild disability	75/F	ICH	NP
44	Our case (2014)	RTH	MCA occlusion	Clipping	Good	56/F	IVH	NP

Notes:
Atheros.: Atherosclerotic
DAW: Degenerated artery wall
Endov.: Endovascularization
FA: False aneurysm
NR: Not reported
NP: Not performed
ICH: Intracerebral haemorrhage
IVH: Intraventricular haemorrhage
LTH: Left temporal horn
RBG: Right basal ganglia
RTH: Right temporal horn
RTL: Right temporal lobe
Rev.: Revascularization
SAH: Subarachnoid haemorrhage
SD: Spontaneus disappearance
TGA: Thrombosed giant aneurysm
TA: True aneurysm
UTA: Unruptured true aneurysm

No differences between gender were found. In terms of cause, most of the cases, i.e. 20 cases , were caused by moya-moya disease.[5]

In the case presented here, on the opposite side from the location of aneurysm, an occlusion of M1 segment of left MCA and narrowing or stenotic of P2 segment of left PCA were found; hence, it can be concluded that the cause of the aneurysm was MCA occlusion. In this case, the location of aneurysm is on the right lateral intraventricular at the temporal horn, known as plexal segment, while almost all patients had the aneurysm located in temporal horn (Table 1) eventhough most authors did not mention the location of the aneurysm in their case report. In this report, our patient was discharged from the hospital uneventfully. It is so unfortunate that most studies did not mention the outcome of their case.

Direct micosurgical intervention through a transtemporal or ventricular approach is one of the options for managing distal AchA aneurysm with somehow additional damage to the brain and its collateral circulation may not be avoidable.[6] Several reported cases of the distal AChA show that the cases were successfully treated using coils and n-butyl cyanoacrylate (nBCA) liquid embolization, arguing that the endovascular technique is a promising modality for this rare case.[2–9]

In conclusion, in the present case, aneurysm of distal choroidal anterior artery can be managed. Timing of surgery with great caution may be an advantage to improve the prognosis of the patient. The choice of treatment depends on the available expertise and equipment; the latest report has argued that the endovascular technique is a promising modality for this rare case.

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