

Supplemental Table 1. Baseline anatomical and procedural characteristics in CIE

Characteristics	CIE	Non-CIE	p value
No. of aneurysms	14 (3.3)	406 (97)	
Initial treatment	9 (64)	361 (89)	0.017*
Previously treated	5 (36)	45 (11)	
Aneurysm characteristics			
Aneurysm size, mm	5.3 [4.1, 9.0]	5.7 [4.5, 7.6]	0.92
Aneurysm neck, mm	3.9 [2.8, 9.0]	4.5 [3.5, 5.9]	0.91
Aneurysm volume, mm ³	55 [39, 296]	67 [36, 142]	0.89
Aneurysm location			0.47
ACA/ACoA	1 (7.1)	96 (24)	
MCA	3 (21)	68 (17)	
ICA	10 (71)	189 (47)	
PCA	0 (0)	4 (1.0)	
BA/SCA	0 (0)	29 (7.1)	
VA/PICA	0 (0)	20 (4.9)	
Posterior circulation aneurysm	0 (0)	53 (13)	0.23
Access site			0.069
Femoral	8 (57)	336 (83)	
Radial	6 (43)	61 (15)	
Brachial	0 (0)	6 (1.5)	
Carotid	0 (0)	3 (0.7)	
Sizes of catheters used for angiography			
Guiding catheter			0.13
5 Fr	0 (0)	2 (0.5)	
6 Fr	0 (0)	17 (4.5)	
7 Fr	0 (0)	141 (38)	
8 Fr	5 (63)	144 (38)	
9 Fr	3 (38)	71 (19)	
Intermediate catheter			0.3
5 Fr	1 (17)	1 (3.2)	
6 Fr	5 (83)	30 (97)	
Location of catheter used for			
Guiding catheter			1
CCA	0 (0)	3 (0.8)	
ICA			
C1	8 (100)	325 (87)	
VA			
V1	0 (0)	8 (2.1)	
V2	0 (0)	37 (9.9)	
Intermediate catheter			0.16
ICA			
C2	1 (17)	13 (39)	
C3	1 (17)	9 (27)	
C4	3 (50)	3 (9.1)	
M1	1 (17)	0 (0)	
VA			
V1	0 (0)	1 (3.0)	
V2	0 (0)	3 (9.1)	
V3	0 (0)	1 (3.0)	
V4	0 (0)	2 (6.1)	
BA	0 (0)	1 (3.0)	
Left side	9 (64)	203 (53)	0.43
Intradural placement	4 (29)	6 (1.5)	<0.001*
Contrast medium class			0.002*
Non-ionic monomeric	14 (100)	242 (60)	
Non-ionic dimeric	0 (0)	1 (0.2)	
Ionic dimeric	0 (0)	163 (40)	
Non-ionic	14 (100)	243 (60)	0.001*
Endovascular technique			0.026*
Coil embolization	12 (86)	400 (99)	
Primary coiling	2 (14)	134 (33)	
Balloon-assisted	2 (14)	64 (16)	
Double-catheter	0 (0)	75 (19)	
Stent-assisted	8 (57)	121 (30)	
Parent artery occlusion	0 (0)	6 (1.5)	
Flow diversion	2 (14)	6 (1.5)	
Procedure time, min	170 [155, 197]	162 [124, 213]	0.53
Fluoroscopy duration, min	130 [115, 172]	113 [84, 157]	0.09
Total contrast medium volume, mL	173 [131, 208]	155 [130, 190]	0.32
Embolization result (RROC)†			0.1
Class 1	3 (25)	138 (35)	
Class 2	4 (33)	191 (49)	
Class 3	5 (42)	65 (17)	
VER††, %	25 [24, 27]	26 [22, 30]	0.93
Hospitalization duration, days	9 [6, 11]	6 [5, 8]	0.028*

ACA = anterior cerebral artery; ACoA = anterior communicating artery; BA = basilar artery; CCA = common carotid artery; CIE = contrast-induced encephalopathy; C1 = extracranial segment; C2 = petrous segment; C3 = cavernous segment; C4 = supraclinoid segment; ICA = internal carotid artery; MCA = middle cerebral artery; M1 = horizontal segment; PCA = posterior cerebral artery; PICA = posterior inferior cerebellar artery; RROC = Raymond-Roy Occlusion Classification; SCA = superior cerebellar artery; VA = vertebral artery; VER = volume embolization ratio; V1 = pre-foraminal segment; V2 = foraminal segment; V3 = atlantic, extradural segment; V4 = intradural segment. †Embolization results were assessed by RROC as follows: Class 1, complete occlusion; Class 2, residual neck; and Class 3, residual aneurysm. ††VER was calculated by the following formula: VER (%) = (volume of coil for embolization) / (volume of aneurysm) x 100. *p<0.05. Unless otherwise indicated, values represent the number of

Supplemental Table 2. Characteristics of patients with CIE

Case	Age (years), sex	Aneurysm location	Recurrent aneurysm	Catheter used for angiography	Catheter size, Fr	Location of catheter used for angiography, side	Contrast medium	Total contrast medium volume, mL	Previously reported risk factors	Clinical presentation	CT findings	MRI findings	Treatment for CIE	Time from neurointervention to CIE onset (h)	Time from CIE onset to recovery (days)	Pre-/postoperative 1-month outcome (mRS)
1	65/M	ICA	No	Optimo	8	ICA C1/left	Omnipaque 300	180	None	Motor aphasia, finger agnosia, dyscalculia	No imaging studies	No abnormal findings	Hydration	7	2	0/0
2	79/M	ICA	No	Destination	6	ICA C2/left	Iopamiron 370	230	Hypertension, diabetes mellitus, hemodialysis	Generalized seizure, disturbance of consciousness	Cortical and subcortical contrast enhancement throughout left hemisphere	No abnormal findings	Hemodialysis, anticonvulsant	1	21	0/5
3	79/F	ACA	No	Optimo	9	ICA C1/right	Omnipaque 300	270	Hypertension	Lethargy, left hemiparesis	No imaging studies	No abnormal findings	Hydration	1	2	0/0
4	76/M	ICA	Yes	Optimo	9	ICA C1/left	Omnipaque 300	350	History of stroke	Agitation, disorientation, memory impairment, right hemiparesis	Cortical and subcortical contrast enhancement in left frontal and parietal lobes	No imaging studies	Hydration, anticonvulsant	0.5	6	2/2
5	68/M	ICA	Yes	Optimo	9	ICA C1/left	Omnipaque 300	160	History of stroke	Motor aphasia, perseveration	No imaging studies	No abnormal findings	Hydration, anticonvulsant	19	1.5	0/0
6	66/F	MCA	No	Asahi Fubuki	8	ICA C1/right	Omnipaque 300	165	Hypertension	Stupor, hemispatial neglect, asomatognosia, cortical blindness, dysarthria, left hemiparesis	No imaging studies	Cortical gyrforn hyperintensity in right frontal, parietal, and occipital lobe on FLAIR	Hydration	0.5	3	0/1
7	78/M	ICA	Yes	Asahi Fubuki	8	ICA C1/left	Omnipaque 300	150	Diabetes mellitus, history of stroke	Agitation, motor aphasia, disorientation	No imaging studies	Cortical gyrforn hyperintensity in left temporal lobe on FLAIR	Hydration	1	2	2/2
8	78/F	ICA	No	Asahi Fubuki	8	ICA C1/left	Omnipaque 300	120	Hypertension	Coma, global aphasia, right hemiparesis	Cortical and subcortical contrast enhancement throughout left hemisphere	No abnormal findings	Hydration, anticonvulsant	1	1	0/0
9	82/F	ICA	Yes	Axcelguide	8	ICA C1/right	Omnipaque 300	120	Hypertension	Stupor, disorientation, generalized seizure, left hemiparesis	Cortical and subcortical contrast enhancement throughout right hemisphere	Cortical gyrforn hyperintensity in right frontal lobe on FLAIR	Hydration, anticonvulsant	1	5	1/1
10	70/M	MCA	No	Sofia	6	MCA M1/right	Omnipaque 300	120	Hypertension, diabetes mellitus, hemodialysis	Stupor, disorientation, left hemiparesis	Cortical and subcortical contrast enhancement in right frontal, temporal, and parietal lobes	No abnormal findings	Hemodialysis, anticonvulsant	0.5	6	0/0
11	66/F	ICA	No	Sofia	6	ICA C4/right	Omnipaque 300	125	None	Agitation, seizure, hemispatial neglect, asomatognosia, left hemiparesis	No abnormal findings	No abnormal findings	Hydration, anticonvulsant	20	5	0/0
12	80/F	MCA	No	Sofia	6	ICA C4/left	Omnipaque 300	210	Hypertension	Stupor, global aphasia, right hemiparesis	Cortical and subcortical contrast enhancement throughout left hemisphere	Cortical gyrforn hyperintensity in left frontal and parietal lobe on FLAIR	Hydration, anticonvulsant	0.5	5	0/0
13	54/F	ICA	Yes	Sofia	6	ICA C3/left	Omnipaque 300	200	Hypertension, history of stroke	Stupor, disorientation, retrograde amnesia, sensory aphasia, right hemiparesis, left lower extremity paresis	Cortical and subcortical contrast enhancement throughout left hemisphere and in right frontal lobe	No abnormal findings	Hydration, anticonvulsant	0.5	8	1/1
14	59/F	ICA	No	Navien	5	ICA C4/left	Omnipaque 300	190	Hypertension	Lethargy, generalized seizure, right hemiparesis	Cortical and subcortical contrast enhancement throughout left hemisphere	Cortical gyrforn hyperintensity in left frontal lobe on FLAIR	Hydration, anticonvulsant	1	1	0/0

M = male; F = female; ACA = anterior cerebral artery; CIE = contrast-induced encephalopathy; CT = computed tomography; C1 = extracranial segment; C2 = petrous segment; C3 = cavernous segment; C4 = supradinoid segment; FLAIR = fluid-attenuated inversion recovery; ICA = internal carotid artery; MCA = middle cerebral artery; MRI = magnetic resonance imaging; mRS = modified Rankin Scale; M1 = horizontal segment.