Supplementary Table 1: Literature-reported cases of VADA involving PICA.

Author	Year	Citation	Total Cases reported	Case #	Age	Sex	Presenting symptoms	Hunt and Hess grade	Aneurysm location	Angiographic Characteristics	Operative treatment	Type of Treatment	Length of Follow-up	Outcome	Outcome classification	Complications
This case	2018	N/A	N/A	N/A	57	Male	SAH	5	Right vertebral artery, with the distal end involving the PICA origin	5 mm, fusiform, dissecting aneurysm involving a large right PICA, followed distally by a narrowing of the vertebral artery	Pipeline stent deployed across the aneurysm	Flow-diverting stent	28 days	Dramatic reduction in aneurysm size with preservation of flow through PICA after 2 days; death after 28 days	Death	Contralateral intraparenchymal hemorrhage
Hosogai *et al.*	2018	[1]	11	7	70	Female	SAH	WFNS 2, rebleeding to WFNS 5	Right vertebral artery involving PICA origin, hypoplastic left vertebral artery	Fusiform	Stent-assisted coil embolization (Neuroform Atlas)	Stent-assisted coiling	10 months	mRS 0, partial filling postoperatively, complete occlusion at 3 months	Good	None
Kanematsu *et al.*	2018	[2]	4	1	43	Male	SAH	3	Left PICA origin	Fusiform dilatation	Clip occlusion of proximal VA and PICA origin, OA-PICA bypass	Bypass	14 years	mRS 1 at 3 months, good graft patency, complete aneurysm obliteration, no rebleeding, ischemic lesion, procedural complication	Good	None
Kanematsu *et al.*	2018	[2]	4	2	52	Male	SAH	1	Right PICA origin	Pearl and string sign	Clip occlusion of proximal VA and PICA origin, OA-PICA bypass	Bypass	10 years	mRS 0 at 3 months, good graft patency, complete aneurysm obliteration, no rebleeding, ischemic lesion, procedural complication	Good	None
Kanematsu *et al.*	2018	[2]	4	3	60	Male	SAH	4	Left PICA origin	Not reported	Clip occlusion of proximal VA and PICA origin, OA-PICA bypass	Bypass	3 years	mRS 3 at 3 months, good graft patency, complete aneurysm obliteration, no rebleeding, ischemic lesion, procedural complication	Poor	None
Kanematsu *et al.*	2018	[2]	4	4	54	Male	SAH	4	Right PICA origin	Not reported	Clip occlusion of proximal VA and PICA origin, OA-PICA bypass	Bypass	1 year	mRS 4 at 3 months, good graft patency, complete aneurysm obliteration, no rebleeding, ischemic lesion, procedural complication	Poor	None
Cho *et al.*	2018	[3]	18	1	38	Female	Medullary infarction	0	At PICA origin	Fusiform, 14.9 mm 4.0 mm	Stent-assisted coil embolization	Stent-assisted coiling	39 months	mRS 1	Good	None
Cho *et al.*	2018	[3]	18	2	55	Male	SAH	Not reported	At PICA origin	Fusiform, 16.8 mm 7.5 mm	Vertebral artery trapping with vertebral artery-posterior inferior cerebellar artery stenting	VA-PICA stenting	97 months	mRS 0	Good	None
Cho *et al.*	2018	[3]	18	3	55	Male	Not reported	0	At PICA origin	Fusiform, 7.3 mm 3.9 mm	Stent-assisted coil embolization	Stent-assisted coiling	92 months	mRS 0	Good	None
Cho *et al.*	2018	[3]	18	4	53	Male	Not reported	0	At PICA origin	Saccular, 5.6 mm 4.8 mm	Stent-assisted coil embolization	Stent-assisted coiling	13 months	mRS 0	Good	Angiographic recurrence
Cho *et al.*	2018	[3]	18	5	37	Male	Not reported	0	At PICA origin	Fusiform, 23.1 mm 8.5 mm	Pipeline embolization device	Flow-diverting stent	9 months	mRS 0	Good	None
Cho *et al.*	2018	[3]	18	6	37	Male	Not reported	0	At PICA origin	Saccular, 7.9 mm 5.4 mm	Stent-assisted coil embolization	Stent-assisted coiling	7 months	mRS 0	Good	None
Cho *et al.*	2018	[3]	18	7	64	Female	Cerebellar infarction	0	At PICA origin	Fusiform, 13.1 mm 8.4 mm	Multiple stenting	Multiple stent	48 months	mRS 1	Good	VA occlusion at 22 months, cerebellar infarction
Cho *et al.*	2018	[3]	18	8	49	Female	Not reported	0	At PICA origin	Fusiform, 7.1 mm 5.7 mm	Multiple stenting	Multiple stent	15 months	mRS 0	Good	None
Cho *et al.*	2018	[3]	18	9	53	Male	Not reported	0	At PICA origin	Fusiform, 10.2 mm 15.4 mm	Multiple stenting	Multiple stent	14 months	mRS 0	Good	Incomplete occlusion
Cho *et al.*	2018	[3]	18	10	49	Male	SAH	Not reported	At PICA origin	Fusiform, 24.7 mm 9.5 mm	Vertebral artery trapping with vertebral artery-posterior inferior cerebellar artery stenting	VA-PICA stenting	72 months	mRS 3	Poor	Cerebellar infarction
Cho *et al.*	2018	[3]	18	11	73	Male	SAH	2	At PICA origin	Pearl and string, 11.1 mm 8.2 mm	Stent-assisted coil embolization	Stent-assisted coiling	0 month	mRS 6	Death	Postoperative VA occlusion and cerebellar infarction
Cho *et al.*	2018	[3]	18	12	37	Male	SAH	Not reported	At PICA origin	Fusiform, 35.6 mm 6.1 mm	Multiple stenting	Multiple stent	62 months	mRS 0	Good	None
Cho *et al.*	2018	[3]	18	13	49	Male	SAH	Not reported	At PICA origin	Fusiform, 25.1 mm 7.6 mm	Vertebral artery trapping with vertebral artery-posterior inferior cerebellar artery stenting	VA-PICA stenting	12 months	mRS 2	Good	None
Cho *et al.*	2018	[3]	18	14	39	Male	SAH	Not reported	At PICA origin	Fusiform, 6.8 mm 5.5 mm	Stent-assisted coil embolization	Stent-assisted coiling	50 months	mRS 0	Good	Recurrence at 5 months, retreated with stent-assisted coiling
Cho *et al.*	2018	[3]	18	15	50	Male	Not reported	0	At PICA origin	Pearl and string, 20.9 mm 6.5 mm	Vertebral artery trapping with vertebral artery-posterior inferior cerebellar artery stenting	VA-PICA stenting	72 months	mRS 0	Good	None
Cho *et al.*	2018	[3]	18	16	58	Female	Not reported	0	At PICA origin	Saccular, 5.0 mm 4.6 mm	Stent-assisted coil embolization	Stent-assisted coiling	5 months	mRS 0	Good	None
Cho *et al.*	2018	[3]	18	17	59	Female	Not reported	0	At PICA origin	Saccular, 10.9 mm 7.3 mm	Stent-assisted coil embolization	Stent-assisted coiling	49 months	mRS 0	Good	None
Cho *et al.*	2018	[3]	18	18	57	Male	Not reported	0	At PICA origin	Fusiform, 7.1 mm 6.2 mm	Pipeline embolization device	Flow-diverting stent	5 months	mRS 0	Good	None
Chen *et al.*	2018	[4]	22	Group 1-4	47	Male	SAH	5	At PICA origin	Not reported	Stent + coils + EVD	Stent-assisted coiling	72 months	mRS 2, GCS 15, no radiographic recurrence	Good	None reported
Chen *et al.*	2018	[4]	22	Group 1-5	41	Female	SAH	5	At PICA origin	Not reported	Stent + coils + EVD	Stent-assisted coiling	60 months	mRS 3, GCS 14, no radiographic recurrence	Poor	None reported
Chen *et al.*	2018	[4]	22	Group 1-7	66	Male	SAH	5	At PICA origin	Not reported	Endovascular trapping + EVD	Parent artery trapping	48 months	mRS 4, GCS 14, no radiographic recurrence	Good	None reported
Chen *et al.*	2018	[4]	22	Group 1-10	49	Female	SAH	5	At PICA origin	Not reported	Stent + coils + EVD	Stent-assisted coiling	0 month	death	Death	None reported
Chen *et al.*	2018	[4]	22	Group 2-2	46	Female	SAH	5	At PICA origin	Not reported	Endovascular trapping + EVD + posterior fossa decompression	Parent artery trapping	30 months	mRS 1, GCS 15, dizziness, no radiographic recurrence	Good	None reported
Chen *et al.*	2018	[4]	22	Group 2-4	44	Male	SAH	5	At PICA origin	Not reported	Endovascular trapping + EVD + posterior fossa decompression	Parent artery trapping	36 months	mRS 5, GCS 10, hemiplegic, no radiographic recurrence	Poor	None reported
Chen *et al.*	2018	[4]	22	Group 2-8	47	Female	SAH	5	At PICA origin	Not reported	Endovascular trapping + EVD + posterior fossa decompression	Parent artery trapping	15 months	mRS 3, GCS 10T, tracheostomy-dependent, right hemiparesis, no radiographic recurrence	Poor	None reported
Rennert *et al.*	2018	[5]	10	5	41	Female	SAH	4	Left vertebral artery involving PICA	Fusiform	PICA-PICA bypass; coil embolization/vessel sacrifice of L VA aneurysm	Bypass	2 years	mRS 0	Good	None
Rennert *et al.*	2018	[5]	10	6	41	Male	SAH	1	Right vertebral artery involving anterior medullary PICA	Fusiform	PICA-PICA bypass; coil embolization/vessel sacrifice of R VA aneurysm	Bypass	0 month	mRS 0	Good	None
Rennert *et al.*	2018	[5]	10	8	44	Male	SAH	1	Left vertebral artery involving anterior medullary PICA	Fusiform	DLCFA graft; left V3 to L tonsillar PICA bypass; coil embolization of VA aneurysm; secondary endovascular VA sacrifice after aneurysm expansion	Bypass	0 month	mRS 5	Poor	ASA stroke after vessel sacrifice
Rennert *et al.*	2018	[5]	10	10	48	Female	SAH	3	Right vertebral artery involving PICA origin	Fusiform	PICA-PICA bypass; coil/Onyx embolization/vessel sacrifice	Bypass	7 months	mRS 3	Poor	None
Lee *et al.*	2017	[6]	16	2	Not reported	Not reported	Not reported	Not reported	Right vertebral artery involving PICA, 16 mm	Fusiform	Trapping	Parent artery trapping	70 months	mRS 3, complete occlusion	Poor	None reported
Lee *et al.*	2017	[6]	16	3	Not reported	Not reported	Not reported	Not reported	Right vertebral artery involving PICA, 7 mm	Fusiform	Trapping	Parent artery trapping	61 months	mRS 5, complete occlusion	Poor	None reported
Lee *et al.*	2017	[6]	16	5	Not reported	Not reported	Not reported	Not reported	Right vertebral artery involving PICA, 9 mm	Fusiform	Stent-assisted coil embolization	Stent-assisted coiling	29 months	mRS 0, near complete obliteration postoperatively, complete occlusion at 5 months	Good	None reported
Lee *et al.*	2017	[6]	16	8	Not reported	Not reported	Not reported	Not reported	Left vertebral artery involving PICA, 13 mm	Fusiform	Trapping	Parent artery trapping	0 month	Complete occlusion postoperatively, death	Death	None reported
Lee *et al.*	2017	[6]	16	13	Not reported	Not reported	Not reported	Not reported	Left vertebral artery involving PICA, 8 mm	Saccular	Stent-assisted coil embolization	Parent artery trapping	9 months	mRS 4, near complete obliteration postoperatively, complete occlusion at 9 months	Poor	None reported
Lee *et al.*	2017	[6]	16	15	Not reported	Not reported	Not reported	Not reported	Left vertebral artery involving PICA, 13 mm	Fusiform	Stent-assisted coil embolization	Parent artery trapping	7 months	mRS 0, complete occlusion postoperatively, recanalization at 7 months	Good	Recurrence at 7 months
Srinivasan *et al.*	2017	[7]	4	3	Middle-age	Not reported	Lightheadedness, headache, and worsened left hemiparesis	0	Right vertebral artery extending into right PICA	Fusiform, 35 mm	Three overlapping peds, spanning the origin of PICA	Flow-diverting stent	18 months	mRS 0, complete resolution of aneurysm, retrograde filling of PICA	Good	None
Urasyanandana *et al.*	2017	[8]	17	2	51	Male	SAH	2	PICA involved	Contralateral dominant vertebral artery	Coil trapping	Parent artery trapping	not reported	mRS 0, total occlusion	Good	None reported
Urasyanandana *et al.*	2017	[8]	17	3	49	Male	SAH	3	PICA involved	Contralateral dominant vertebral artery	Proximal balloon	Proximal occlusion	not reported	mRS 0, residual	Good	None reported
Urasyanandana *et al.*	2017	[8]	17	4	64	Male	SAH	1	PICA involved	Contralateral dominant vertebral artery	Coil trapping	Parent artery trapping	not reported	mRS 0, total occlusion	Good	None reported
Urasyanandana *et al.*	2017	[8]	17	6	46	Male	SAH	3	PICA involved	Ipsilateral dominant vertebral artery	Stent	Stent	not reported	mRS 6, residual	Death	None reported
Urasyanandana *et al.*	2017	[8]	17	8	81	Female	SAH	1	PICA involved	Contralateral dominant vertebral artery	Surgical clipping	Surgical clipping	not reported	mRS 0, total occlusion	Good	None reported
Urasyanandana *et al.*	2017	[8]	17	9	82	Female	SAH	4	PICA involved	Ipsilateral dominant vertebral artery	Stent-assisted coiling	Stent-assisted coiling	not reported	mRS 6, residual	Death	None reported
Urasyanandana *et al.*	2017	[8]	17	16	15	Female	SAH	1	PICA involved	Contralateral dominant vertebral artery	Coil trapping	Parent artery trapping	not reported	mRS 0, total occlusion	Good	None reported
Urasyanandana *et al.*	2017	[8]	17	17	50	Male	SAH	4	PICA involved	Ipsilateral dominant vertebral artery	Surgical trapping	Surgical trapping	not reported	mRS 5, total occlusion	Poor	None reported
Cerejo *et al.*	2017	[9]	8	1	Not reported	Not reported	SAH	Not reported	Right vertebral artery involving PICA	11.5 mm, co-dominant vertebral artery	Pipeline 1	Flow-diverting stent	25 months	mRS 0, incomplete occlusion	Good	None reported
Cerejo *et al.*	2017	[9]	8	7	Not reported	Not reported	SAH	Not reported	Right vertebral artery involving PICA	2.3 mm, contralateral dominant vertebral artery	Pipeline 1	Flow-diverting stent	7 months	mRS 1, complete occlusion	Good	None reported
Cerejo *et al.*	2017	[9]	8	8	Not reported	Not reported	SAH	Not reported	Right vertebral artery involving PICA	3 mm, codominant vertebral artery	Pipeline 1	Flow-diverting stent	8 months	mRS 1, complete occlusion	Good	None reported
Madaelil *et al.*	2016	[10]	12	1	Not reported	Not reported	SAH	2	Vertebral artery involving PICA origin	Not reported	Coil occlusion proximal and distal to an aneurysm in vertebral artery	Parent artery trapping	4.8 months	mRS 0, no radiographic regrowth	Good	Asymptomatic PICA territory infarct (27 days)
Byoun *et al.*	2016	[11]	15	7	52	Male	SAH	1	Right vertebral artery involving PICA	Fusiform, ipsilateral dominant vertebral artery	Double stent-assisted coiling (enterprise 2)	Stent-assisted coiling	0 month	mRS 6	Death	Rebleeding at 14 days followed by death
Byoun *et al.*	2016	[11]	15	12	52	Male	SAH	3	Right vertebral artery involving PICA	Fusiform, pearl and string, contralateral vertebral artery, good collaterals from ipsilateral AICA and contralateral PICA	Trapping with coiling	Parent artery trapping	6 months	mRS 0, complete resolution of aneurysm	Good	None
Ota *et al.*	2016	[12]	2	1	66	Male	SAH	WFNS 2	Right vertebral artery involving PICA	Fusiform dilatation	Endovascular coil occlusion proximal to PICA	Proximal occlusion	25 days	Not reported	Unknown	Enlargement of the dissection
Ota *et al.*	2016	[12]	2	2	35	Female	SAH	WFNS 2	Left vertebral artery involving PICA	Fusiform dilatation left PICA in middle of dissection	Endovascular coil occlusion proximal to PICA	Proximal occlusion	15 days	Not reported	Unknown	Enlargement of the residual dome
Mazur *et al.*	2016	[13]	11	4	Not reported	Not reported	Headache, retro-orbital pain	0	Right vertebral artery involving PICA	7 mm, fusiform, dissecting, ipsilateral dominant vertebral artery	Pipeline 1	Flow-diverting stent	6 months	Not reported	Unknown	None
Mazur *et al.*	2016	[13]	11	8	Not reported	Not reported	SAH	4	Right vertebral artery involving PICA	17 mm, fusiform, dissecting, ipsilateral dominant vertebral artery	Pipeline 2	Flow-diverting stent	6 months	Not reported	Unknown	In-stent thrombosis with PICA occlusion and transient PICA infarction contralateral vertebral artery occlusion
Mazur *et al.*	2016	[13]	11	11	Not reported	Not reported	Lateral medullary syndrome	0	Right vertebral artery involving PICA	10 mm, fusiform, dissecting, codominant vertebral artery	Pipeline 1	Flow-diverting stent	0 month	mRS 0	Good	Covered PICA patent
Bhogal *et al.*	2015	[14]	15	10	49	Male	SAH	Fisher 4	Right vertebral artery involving PICA	Not reported	Stent-in-stent procedure, 6 enterprise	Multiple stent	8 months	GOS 5, enlarging aneurysm requiring re-operation, stable CTA	Good	None
Bhogal *et al.*	2015	[14]	15	13	45	Female	SAH	Fisher 4	Right vertebral artery involving PICA	Not reported	Stent-in-stent procedure, 4 neuroform	Multiple stent	3 months	GOS 4, stable CTA	Poor	None
Bhogal *et al.*	2015	[14]	15	14	54	Female	SAH	Fisher 4	Left vertebral artery involving PICA	Not reported	Stent-in-stent procedure, 7 enterprise	Multiple stent	0 month	GOS 4	Poor	Rebleeding at 9 days, infected EVD
Nam *et al.*	2015	[15]	26	11	30	Not reported	SAH	2	Left vertebral artery involving PICA	Fusiform, stenosis, ipsilateral dominant vertebral artery	Modified semi-jailing technique	Stent-assisted coiling	21 months	mRS 1, regrowth at 6 months, stable occlusion at 21 months	Good	None
Nam *et al.*	2015	[15]	26	unruptured - 1	50	Not reported	Severe headache	0	Right vertebral artery involving PICA	Fusiform, stenosis, codominant vertebral artery	Proximal occlusion	Proximal occlusion	9 months	mRS 0, stable occlusion	Good	None
Nam *et al.*	2015	[15]	26	unruptured - 4	30	Not reported	Severe headache	0	Right vertebral artery involving PICA	Fusiform, stenosis, codominant vertebral artery	Stent-assisted coiling, balloon in stent	Stent-assisted coiling	60 months	mRS 0, stable occlusion	Good	None
Hamasaki *et al.*	2014	[16]	14	2	56	Male	SAH	5	PICA involved	Not reported	Proximal endovascular occlusion	Proximal occlusion	141 days	mRS 5	Poor	Rebleeding, vasospasm
Hamasaki *et al.*	2014	[16]	14	12	57	Male	SAH	5	PICA involved	Not reported	OA-PICA bypass/internal trapping of aneurysm	Bypass	345 days	mRS 1	Good	Asymptomatic occlusion of bypass
Park *et al.*	2014	[17]	7	2	45	Male	Enlarging, previously treated aneurysm	0	Right vertebral artery involving PICA	Fusiform, dissecting aneurysm at fourth segment of the right VA just below the VA-PICA junction, 19.2 mm 6.0 mm	OA-PICA bypass with far lateral approach, proximal occlusion of right PICA with surgical clip and trapping of VA with coils	Bypass	6 months	mRS 0, complete obliteration of aneurysm (immediate and at follow-up)	Good	None
Park *et al.*	2014	[17]	7	5	32	Female	Recanalization of previously treated aneurysm	0	Left vertebral artery involving PICA	Saccular aneurysm from left VA-PICA junction, 3.9 mm 2.5 mm	OA-PICA bypass with far lateral approach, coil embolization after partial clipping	Bypass	6 months	mRS 2, complete obliteration of aneurysm (immediate and at follow-up)	Good	Occluded graft
Park *et al.*	2014	[17]	7	7	42	Male	Not reported	0	Left vertebral artery involving PICA	Fusiform, dissecting aneurysm, 15.1 mm 5.3 mm	OA-PICA bypass with far lateral approach, trapping of aneurysm with surgical clips	Bypass	6 months	mRS 0, complete obliteration of aneurysm (immediate and at follow-up)	Good	None
Guo *et al.*	2014	[18]	2	1	36	Male	SAH	2	Left vertebral artery involving PICA	Not reported	Surgical trapping through far lateral approach + PICA reimplantation to V3	Bypass	10 months	disappearance of dissecting aneurysm and good filling of PICA	Unknown	None reported
Guo *et al.*	2014	[18]	2	2	39	Female	SAH	2	Right vertebral artery involving PICA	Not reported	Enterprise stent from contralateral VA to PICA followed by endovascular occlusion	Stent	6 months	mRS 0, good patency of PICA, occluded aneurysm	Good	None reported
Kubota *et al.*	2014	[19]	3	1	44	Male	Neck pain, silent cerebellar infarction	0	Left vertebral artery involving PICA	Pearl and string sign	Aneurysm excision, OA-PICA bypass, V3-V4 bypass with interposed OA graft	Bypass	0 month	mRS 0	Good	None
Kubota *et al.*	2014	[19]	3	2	41	Male	Not reported	0	Bilateral vertebral artery involving both PICA	Larger aneurysm on left, hypoplastic P1 segment of the right PCA	OA-PICA and VA-VA bypass with RAG on left, OA-PICA bypass on the right	Bypass	4 weeks	mRS 0	Good	None
Kubota *et al.*	2014	[19]	3	3	35	Male	SAH	WFNS 4	Right vertebral artery involving PICA	Giant aneurysm with second V2 aneurysm, hypoplastic left vertebral artery, and PComm	STA-SCA and OA-AICA bypass, ECA-V4 bypass with radial artery graft	Bypass	9 days	Death	Death	Epidural hemorrhage and brainstem infarction
Suma *et al.*	2013	[20]	10	1	38	Male	SAH	4	PICA involved	Not reported	Internal trapping	Parent artery trapping	0 month	Died from initial SAH	Death	None
Kim *et al.*	2012	[21]	6	2	49	Male	SAH	Not reported	PICA involved	Dissecting aneurysm	Vertebral artery occlusion + Enterprise stent	Proximal occlusion	23 months	GOS 5	Good	None reported
Kim *et al.*	2012	[21]	6	3	50	Male	Headache	0	PICA involved	Dissecting aneurysm	Vertebral artery occlusion + Enterprise stent to PICA from contralateral VA	Proximal occlusion	6 months	GOS 5	Good	Asymptomatic small PICA infarcts
Czabanka *et al.*	2011	[22]	2	1	56	Female	Recanalization of previously treated aneurysm	0	Right vertebral artery involving PICA	Fusiform	VA-PICA bypass with radial artery graft, clip occlusion of vertebral artery aneurysm, and PICA	Bypass	0 month	GOS 4	Poor	None
Czabanka *et al.*	2011	[22]	2	1	65	Male	SAH	3	Right vertebral artery involving PICA	Fusiform, 16 mm 8 mm aneurysm, hypoplastic contralateral vertebral artery distal to the aneurysm, small Pcomm	VA-PICA bypass with radial artery graft, clip occlusion of vertebral artery aneurysm, and PICA	Bypass	0 month	Neurological condition improved but died from initial SAH, retrograde flow through PICA supplying the posterior circulation	Death	None
Su *et al.*	2011	[23]	12	3	46	Male	SAH	1	Left vertebral artery involving PICA	PICA with second branch proximal to the aneurysm	Internal trapping	Parent artery trapping	14 months	GOS 5, complete occlusion	Good	None
Su *et al.*	2011	[23]	12	12	70	Male	Ischemia (left extremity numbness)	0	Right vertebral artery involving PICA	Indiscernible contralateral vertebral artery	Conservative treatment	No treatment	54 months	GOS 5, stable aneurysm	Good	None
Lv *et al.*	2010	[24]	22	1	53	Female	CN VI palsy, headache	0	PICA involved	10 mm 8 mm	Vertebral artery occlusion	Proximal occlusion	36 months	GOS 5, incomplete occlusion	Good	None reported
Lv *et al.*	2010	[24]	22	2	59	Male	Brainstem ischemia	0	PICA involved	6 mm 4 mm	Vertebral artery occlusion	Proximal occlusion	72 months	GOS 5, incomplete occlusion	Good	None reported
Lv *et al.*	2010	[24]	22	3	12	Male	Headache	0	PICA involved	15 mm 6 mm	Stent	Stent	72 months	GOS 5, incomplete obliteration	Good	None reported
Lv *et al.*	2010	[24]	22	4	40	Male	Brainstem ischemia	0	PICA involved	12 mm 7 mm	Stent	Stent	84 months	GOS 5, incomplete obliteration	Good	None reported
Lv *et al.*	2010	[24]	22	5	42	Male	Brainstem ischemia	0	PICA involved	7 mm 6 mm	Stent coil	Stent-assisted coiling	48 months	GOS 5, incomplete obliteration	Good	None reported
Lv *et al.*	2010	[24]	22	6	41	Male	Brainstem ischemia	0	PICA involved	13 mm 6 mm	Stent coil	Stent-assisted coiling	12 months	GOS 5, complete obliteration	Good	None reported
Lv *et al.*	2010	[24]	22	7	39	Female	SAH	Not reported	PICA involved	30 mm 30 mm	Vertebral artery occlusion	Proximal occlusion	84 months	GOS 5, incomplete occlusion	Good	None reported
Lv *et al.*	2010	[24]	22	8	45	Male	SAH	Not reported	PICA involved	12 mm 6 mm	Vertebral artery occlusion	Proximal occlusion	36 months	GOS 5, incomplete occlusion	Good	None reported
Lv *et al.*	2010	[24]	22	9	40	Male	SAH	Not reported	PICA involved	8 mm 8 mm	Vertebral artery occlusion	Proximal occlusion	12 months	GOS 5, incomplete occlusion	Good	None reported
Lv *et al.*	2010	[24]	22	10	34	Female	SAH	Not reported	PICA involved	10 mm 7 mm	Vertebral artery occlusion	Proximal occlusion	60 months	GOS 5, incomplete occlusion	Good	None reported
Lv *et al.*	2010	[24]	22	11	42	Female	SAH	Not reported	PICA involved	11 mm 6 mm	Vertebral artery occlusion	Proximal occlusion	5 months	GOS 5, subtotal occlusion	Good	None reported
Lv *et al.*	2010	[24]	22	12	59	Female	SAH	Not reported	PICA involved	12 mm 7 mm	Vertebral artery occlusion	Proximal occlusion	12 months	GOS 5, incomplete occlusion	Good	None reported
Lv *et al.*	2010	[24]	22	13	47	Male	SAH	Not reported	PICA involved	5 mm 4 mm	Stent	Stent	72 months	GOS 5, incomplete obliteration	Good	None reported
Lv *et al.*	2010	[24]	22	14	30	Male	SAH	Not reported	PICA involved	12 mm 10 mm	Stent	Stent	36 months	GOS 5, incomplete obliteration	Good	None reported
Lv *et al.*	2010	[24]	22	15	51	Male	SAH	Not reported	PICA involved	14 mm 7 mm	Stent	Stent	10 months	GOS 5, incomplete obliteration	Good	None reported
Lv *et al.*	2010	[24]	22	16	41	Male	SAH	Not reported	PICA involved	15 mm 6 mm	Stent	Stent	60 months	GOS 5, incomplete obliteration	Good	None reported
Lv *et al.*	2010	[24]	22	17	46	Male	SAH	Not reported	PICA involved	10 mm 10 mm	Stent coil	Stent-assisted coiling	11 months	GOS 5, complete obliteration	Good	None reported
Lv *et al.*	2010	[24]	22	18	44	Female	SAH	Not reported	PICA involved	12 mm 8 mm	Stent coil	Stent-assisted coiling	12 months	GOS 5, complete obliteration	Good	None reported
Lv *et al.*	2010	[24]	22	19	44	Female	SAH	Not reported	PICA involved	12 mm 8 mm	Stent coil	Stent-assisted coiling	6 months	GOS 5, incomplete obliteration	Good	None reported
Lv *et al.*	2010	[24]	22	20	37	Male	SAH	Not reported	PICA involved	7 mm 7 mm	Stent	Stent	9 months	GOS 5, complete obliteration	Good	None reported
Lv *et al.*	2010	[24]	22	21	45	Male	SAH	Not reported	PICA involved	9 mm 11 mm	Stent coil	Stent-assisted coiling	6 months	GOS 5, complete obliteration	Good	None reported
Lv *et al.*	2010	[24]	22	22	53	Male	SAH	Not reported	PICA involved	23 mm 10 mm	Stent coil	Stent-assisted coiling	36 months	GOS 5, complete obliteration	Good	None reported
Lee *et al.*	2010	[25]	25	7	40	Male	SAH	3	PICA involved	Not reported	Trapping	Parent artery trapping	Not reported	Good recovery	Good	Incomplete occlusion
Lee *et al.*	2010	[25]	25	24	48	Male	SAH	3	PICA involved	Not reported	Stent	Stent	Not reported	Good recovery	Good	None
Lee *et al.*	2010	[25]	25	25	43	Female	SAH and lateral medullary syndrome, sudden headache, left hemiparesis, sensory changes	3	PICA involved	Not reported	Stent	Stent	Not reported	Death	Death	Rebleeding at 1 h
Takemoto *et al.*	2010	[26]	14	9	52	Male	Left Wallenberg syndrome progression of aneurysm	0	Left vertebral artery involving PICA	Passed balloon test occlusion	OA-PICA bypass/internal trapping of aneurysm	Bypass	Not reported	mRS 0, good recovery	Good	None
Jin *et al.*	2009	[27]	42	1	55	Male	SAH	3	Right vertebral artery involving PICA	Codominant vertebral artery	Proximal occlusion	Proximal occlusion	Not reported	GOS 1, initial complete occlusion	Poor	None reported
Jin *et al.*	2009	[27]	42	9	55	Female	SAH	5	Right vertebral artery involving PICA	Codominant vertebral artery	Trapping	Parent artery trapping	Not reported	GOS 5, initial incomplete occlusion	Good	None reported
Jin *et al.*	2009	[27]	42	11	32	Male	SAH	3	Right vertebral artery involving PICA	Codominant vertebral artery	Proximal occlusion	Proximal occlusion	Not reported	GOS 1, initial incomplete occlusion	Death	Rebleeding after 1 day, followed by death
Jin *et al.*	2009	[27]	42	15	39	Male	SAH	3	Right vertebral artery involving PICA	Contralateral dominant vertebral artery	Trapping	Parent artery trapping	Not reported	GOS 4, initial complete occlusion	Poor	None reported
Jin *et al.*	2009	[27]	42	22	52	Female	SAH	2	Left vertebral artery involving PICA	Codominant vertebral artery	Trapping	Parent artery trapping	Not reported	GOS 5, initial complete occlusion	Good	None reported
Jin *et al.*	2009	[27]	42	25	33	Male	SAH	4	Left vertebral artery involving PICA	Contralateral dominant vertebral artery	Trapping	Parent artery trapping	Not reported	GOS 3, initial complete occlusion	Poor	None reported
Jin *et al.*	2009	[27]	42	29	37	Male	SAH	2	Left vertebral artery involving PICA	Codominant vertebral artery	Stent with coil	Stent-assisted coiling	Not reported	GOS 5, initial successful coiling	Good	None reported
Jin *et al.*	2009	[27]	42	unruptured - 8	45	Female	Headache	0	Right vertebral artery involving PICA	Contralateral dominant vertebral artery	Trapping	Parent artery trapping	Not reported	GOS 5, initial complete occlusion	Good	None reported
Jin *et al.*	2009	[27]	42	unruptured - 9	46	Female	Ischemia	0	Right vertebral artery involving PICA	Codominant vertebral artery	Stent with coil	Stent-assisted coiling	Not reported	GOS 5, initial successful coiling	Good	None reported
Shibukawa *et al.*	2009	[28]	26	9	47	Male	SAH	5	PICA involved	Not reported	Proximal occlusion with detachable coils	Proximal occlusion	Not reported	Moderate disability	Poor	None reported
Shibukawa *et al.*	2009	[28]	26	24	74	Female	SAH	4	PICA involved	Not reported	Proximal occlusion with detachable coils	Proximal occlusion	Not reported	Death	Death	None reported
Park *et al.*	2009	[29]	27	1	42	Male	SAH	3	left vertebral artery involving PICA	Not reported	Balloon-expandable coronary stent 2	Multiple stent	42 months	mRS 0, complete obliteration	Good	None reported
Park *et al.*	2009	[29]	27	2	69	Female	SAH	3	Right vertebral artery involving PICA	Not reported	Balloon-expandable coronary stent 2	Multiple stent	24 months	mRS 0, partial obliteration	Good	None reported
Park *et al.*	2009	[29]	27	3	49	Male	SAH	3	Right vertebral artery involving PICA	Not reported	Balloon-expandable coronary stent 3	Multiple stent	12 months	mRS 1, complete obliteration	Good	None reported
Park *et al.*	2009	[29]	27	4	55	Male	SAH	3	Right vertebral artery involving PICA	Not reported	Balloon-expandable coronary stent 2	Multiple stent	31 months	mRS 0, complete obliteration	Good	None reported
Park *et al.*	2009	[29]	27	5	71	Male	SAH	4	Right vertebral artery involving PICA	Not reported	Neuroform stent 2	Multiple stent	12 months	mRS 4	Poor	None reported
Park *et al.*	2009	[29]	27	6	54	Female	SAH	4	Left vertebral artery involving PICA	Not reported	Balloon-expandable coronary stent 1	Multiple stent	28 months	mRS 3, complete obliteration	Poor	None reported
Park *et al.*	2009	[29]	27	7	52	Male	SAH	3	Right vertebral artery involving PICA	Not reported	Balloon-expandable coronary stent 2	Multiple stent	24 months	mRS 0, complete obliteration	Good	None reported
Park *et al.*	2009	[29]	27	10	46	Female	SAH	3	Bilateral vertebral artery involving both PICA	Not reported	Neuroform stent 2, each side	Multiple stent	28 months	mRS 0, complete obliteration (right), partial obliteration (left)	Good	None reported
Park *et al.*	2009	[29]	27	12	44	Male	Headache	0	Right vertebral artery involving PICA	Not reported	Balloon-expandable coronary stent 1	Multiple stent	18 months	mRS 0, partial obliteration	Good	None reported
Park *et al.*	2009	[29]	27	13	63	Female	Headache	0	Right vertebral artery involving PICA	Not reported	Balloon-expandable coronary stent 2	Multiple stent	17 months	mRS 0, partial obliteration	Good	None reported
Park *et al.*	2009	[29]	27	14	60	Male	Headache	0	Right vertebral artery involving PICA	Not reported	Balloon-expandable coronary stent 2	Multiple stent	17 months	mRS 0, complete obliteration	Good	None reported
Park *et al.*	2009	[29]	27	15	56	Male	Headache	0	Right vertebral artery involving PICA	Not reported	Balloon-expandable coronary stent 1, neuroform stent 1	Multiple stent	15 months	mRS 0, partial obliteration	Good	None reported
Park *et al.*	2009	[29]	27	16	54	Female	Headache	0	Right vertebral artery involving PICA	Not reported	Balloon-expandable coronary stent 2	Multiple stent	7 months	mRS 0, partial obliteration	Good	None reported
Park *et al.*	2009	[29]	27	17	41	Female	Headache	0	Right vertebral artery involving PICA	Not reported	Balloon-expandable coronary stent 1	Multiple stent	47 months	mRS 0, stable obliteration	Good	None reported
Park *et al.*	2009	[29]	27	18	39	Female	Headache	0	Left vertebral artery involving PICA	Not reported	Balloon-expandable coronary stent 2	Multiple stent	48 months	mRS 0, partial obliteration	Good	None reported
Park *et al.*	2009	[29]	27	19	43	Female	Stem infarct	0	Right vertebral artery involving PICA	Not reported	Balloon-expandable coronary stent 2	Multiple stent	49 months	mRS 1, complete obliteration	Good	None reported
Park *et al.*	2009	[29]	27	20	45	Male	Stem infarct	0	Right vertebral artery involving PICA	Not reported	Balloon-expandable coronary stent 2	Multiple stent	40 months	mRS 0, complete obliteration	Good	None reported
Park *et al.*	2009	[29]	27	22	36	Male	Headache	0	Bilateral vertebral artery involving both PICA	Not reported	Balloon-expandable coronary Stent 2 on the left, 1 on right	Multiple stent	40 months	mRS 0, partial obliteration bilaterally	Good	None reported
Park *et al.*	2009	[29]	27	23	43	Male	Stem infarct	0	Left vertebral artery involving PICA	Not reported	Balloon-expandable coronary stent 1	Multiple stent	35 months	mRS 0, complete obliteration	Good	None reported
Park *et al.*	2009	[29]	27	24	36	Male	Stem infarct	0	Left vertebral artery involving PICA	Not reported	Balloon-expandable coronary stent 2	Multiple stent	30 months	mRS 0, complete obliteration	Good	None reported
Park *et al.*	2009	[29]	27	25	40	Male	Headache	0	Left vertebral artery involving PICA	Not reported	Neuroform stent 2	Multiple stent	24 months	mRS 0, partial obliteration	Good	None reported
Park *et al.*	2009	[29]	27	27	40	Male	Headache	0	Left vertebral artery involving PICA	Not reported	Balloon-expandable coronary stent 1	Multiple stent	18 months	mRS 0, enlarging aneurysm	Good	None reported
Suh *et al.*	2009	[30]	11	2	55	Female	SAH	1	Left vertebral artery involving PICA	Not reported	Stent-assisted coiling followed by stent-within-a-stent technique	Stent-assisted coiling	19 months	GOS 5, immediate near-complete obliteration, follow-up complete obliteration	Good	None
Suh *et al.*	2009	[30]	11	3	50	Male	SAH	3	Right vertebral artery involving PICA	Not reported	Stent-assisted coiling followed by stent-within-a-stent technique	Stent-assisted coiling	17 months	GOS 5, immediate near-complete obliteration, follow-up complete obliteration	Good	None
Suh *et al.*	2009	[30]	11	7	41	Female	SAH	3	Left vertebral artery involving PICA	Not reported	Stent-assisted coiling followed by stent-within-a-stent technique	Stent-assisted coiling	13 months	GOS 5, immediate near-complete obliteration, follow-up complete obliteration	Good	None
Suh *et al.*	2009	[30]	11	8	45	Male	SAH	3	Left vertebral artery involving PICA	Not reported	Stent-assisted coiling followed by stent-within-a-stent technique	Stent-assisted coiling	11 months	GOS 5, immediate near-complete obliteration, follow-up complete obliteration	Good	None
Suh *et al.*	2009	[30]	11	9	39	Male	SAH	3	Right vertebral artery involving PICA	Not reported	Stent-assisted coiling followed by stent-within-a-stent technique	Stent-assisted coiling	10 months	GOS 5, immediate near-complete obliteration, follow-up complete obliteration	Good	None
Suh *et al.*	2009	[30]	11	10	40	Male	SAH	4	Right vertebral artery involving PICA	Not reported	Stent-assisted coiling followed by stent-within-a-stent technique	Stent-assisted coiling	0 month	Death, immediate complete obliteration	Death	None
Suh *et al.*	2009	[30]	11	11	50	Female	SAH	3	Left vertebral artery involving PICA	Not reported	Stent-assisted coiling followed by stent-within-a-stent technique	Stent-assisted coiling	8 months	GOS 5, immediate near-complete obliteration, follow-up complete obliteration	Good	None
Peluso *et al.*	2008	[31]	14	5	51	Male	SAH	1	Right V4 over PICA	Codominant vertebral artery	Stent only	Stent	6 months	GOS 5, complete occlusion, PICA open	Good	None reported
Peluso *et al.*	2008	[31]	14	6	49	Female	SAH	1	Left V4 over PICA	Ipsilateral dominant vertebral artery	Internal coil trapping over PICA	Parent artery trapping	6 months	GOS 5, complete occlusion, no infarction	Good	None reported
Peluso *et al.*	2008	[31]	14	7	55	Male	SAH	3	Left V4 over PICA	Codominant vertebral artery	Internal coil trapping over PICA	Parent artery trapping	6 months	GOS 5, complete occlusion, no infarction	Good	None reported
Suzuki *et al.*	2008	[32]	6	1	43	Male	SAH (sudden onset of headache, altered consciousness)	5	Left vertebral artery involving PICA	Hypoplastic contralateral vertebral artery	Stent-assisted coiling (radius)	Stent-assisted coiling	3 months	Good recovery obliterated aneurysm	Good	None
Suzuki *et al.*	2008	[32]	6	3	57	Male	SAH (loss of consciousness)	5	Left vertebral artery involving PICA	Not reported	Stent-assisted coiling (radius)	Stent-assisted coiling	5 days	Death after vasospasm and rebleeding leading to brainstem infarction, immediate obliterated aneurysm	Death	Rebleeding
Suzuki *et al.*	2008	[32]	6	4	54	Male	SAH (headache, loss of consciousness)	5	Right vertebral artery involving PICA	Not reported	Stent-in-stent (DRIVER)	Multiple stent	8 weeks	Severe disability due to brain infarction due to vasospasm, complete obliteration of aneurysm	Poor	None
Suzuki *et al.*	2008	[32]	6	6	70	Male	SAH	1	Right vertebral artery involving PICA	Not reported	Stent-assisted coiling (DRIVER)	Stent-assisted coiling	Not reported	Moderate disability	Poor	None
Chong	2008	[33]	14	2	38	Female	SAH	Not reported	Right vertebral artery involving PICA	Not reported	Coils and stents 2	Stent-assisted coiling	24 months	No new infarcts, immediate 80% aneurysm obliteration, follow-up aneurysm stable	Unknown	Bilateral cerebellar infarcts
Chong	2008	[33]	14	3	66	Female	SAH	Not reported	Right vertebral artery involving PICA	Not reported	Coils and balloon	Proximal occlusion	6 months	Immediate partial parent artery occlusion, follow-up near-total parent artery occlusion	Unknown	Coil migration (asymptomatic), cerebellar infarct
Chong	2008	[33]	14	6	58	Female	Incidental	0	Right vertebral artery involving PICA	Not reported	Coils and stent 1	Stent-assisted coiling	4 months	No new infarcts, immediate 80% aneurysm obliteration, follow-up aneurysm stable	Unknown	Coil in parent artery

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SAH: Subarachnoid hemorrhage, PICA: Posterior inferior cerebellar artery, VA: Vertebral artery, EVD: External ventricular drain