

Online Table: Patient demographics

Subject	Sex	Age	CBF	Arteriopathy	Brain Parenchyma/Other	Hemangioma
1	M	13 yr	Decreased flow in left ICA territory	Absence of the petrous and cavernous segments of the left ICA; reduced caliber of the M1 segment of the left MCA, with extensive intracranial collateral formation and areas of aneurysmal dilation; tortuosity of the right ICA; right vertebrobasilar junction fenestration	Hypoplasia of the left aspect of the midbrain and medulla	Left-sided facial hemangioma, left orbital and periorbital hemangioma (clinical notes)
2	F	8 yr	Delayed flow in all vascular territories; prior ASL 4 years earlier showed low signal in posterior aspect of both cerebral hemispheres	Tortuous right VA that terminates in a meshwork of collaterals; tortuous left VA; right cervical ICA not visualized; enlarged right internal maxillary artery; no flow seen in the right petrous ICA, minimal flow in the right cavernous ICA; tortuous and ectatic left cavernous carotid artery; persistent right trigeminal artery	Periventricular white matter volume loss and T2 hyperintense signal	Lower lip hemangioma (clinical notes)
3	F	5 yr	Decreased flow in right MCA	Diffusely small caliber of right ICA from its origin to its distal cavernous segment where it reconstitutes; poorly visualized cervical right VA; prominence of the right A1 segment	Mild hypoplasia of the inferior cerebellar vermis	Right-face hemangioma, left masticator and parotid space hemangiomas, right frontal scalp hemangioma (clinical notes)
4	F	7 yr	Normal	Slightly reduced caliber of right ICA compared with left ICA	Dandy-Walker malformation, enlarged right trigeminal cistern	Right-sided neck hemangioma (clinical notes)
5	F	7 yr	Normal	Retrosophageal aberrant course of the right subclavian artery; tortuosity and large caliber of the left cervical ICA; hypoplasia of the right common carotid artery and ICA, with nearly normal caliber of the distal ICA; low bifurcation of the right common carotid artery; slight asymmetry in size of the intracranial ICAs; hypoplasia of the right A1 segment; prominent bilateral posterior communicating arteries	Normal	Hemangiomas over the right chest, arm, and part of face (clinical notes)
6	M	10 yr	Normal	Tortuosity of the bilateral distal petrous, cavernous, and supraclinoid segments of the ICAs; asymmetrically smaller appearance vs mild segmental narrowing of the right distal supraclinoid ICA and ICA terminus; 4-mm aneurysm in the right cavernous ICA, 3-mm right supraclinoid ICA aneurysm; hypoplastic right A1 segment, with the right A2 and more peripheral ACA branches arising from the left A1	Asymmetric smaller and dysplastic right cerebellar hemisphere, mild dysplasia of the cerebellar vermis; asymmetric expansion of the right internal auditory canal; asymmetric enlarged right trigeminal cistern; prominent retrocerebellar CSF space	Hemangioma over right forehead and cheek (clinical notes)

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7	F	7 yr	Decreased anterior circulation flow bilaterally; improved after syngangiosis	Asymmetric small caliber of the left ICA petrous and cavernous segments; supraclinoid segment of the left ICA, flow signal within the left MCA and ACA from collaterals; right persistent trigeminal artery; prominent right ophthalmic artery; focal narrowing proximal right M1 segment; extensive collateralization with small arterial vessels surrounding the brain stem; intracranial VAs and inferior basilar artery are diffusely small in caliber	Dandy-Walker malformation, dysplastic small right cerebellar hemisphere; enlarged right trigeminal cistern	Facial hemangioma, right upper lip and palate (clinical notes)
8	F	3 mo	Normal	Trifurcated ACA originating from supraclinoid left ICA, no right A1 segment and Acoma; small posterior communicating arteries.	Small and dysplastic left cerebellar hemisphere; prominent retrocerebellar CSF; enlarged left trigeminal cistern space; coloboma and atrophy of the left medial rectus and history of nerve III palsy; asymmetric olfactory bulbs	Hemangioma of the left upper eyelid, flat hemangioma in the right lower lid and right upper lid
9	M	5 yr	Normal	Prominent and tortuous right ICA	Enlarged right trigeminal cistern; dysplastic small right cerebellar hemisphere and inferior vermis; prominent retrocerebellar CSF space	Right cerebellopontine angle/internal auditory canal, right temporal and right lacrimal fossa hemangiomas (seen on prior MR imaging)
10	F	1 yr	Normal	Focal ectasia with irregularity of the petrous-cervical junction ICA on the left; tortuous cavernous and supraclinoid left ICA; increased caliber of the left cervical ICA; tortuous right cavernous and supraclinoid ICA, mild narrowing of the supraclinoid segment; prominent left Pcoma, tortuous right M1 segment, tortuosity of the VAs; frontopolar branch from ICA terminus	Enlarged left trigeminal cistern	Residual small hemangiomas involving left facial soft tissues, left temporalis fossa, left pterygopalatine fossa, left orbit, and anterior left cavernous sinus
11	F	1 yr	Normal	Absent right Pcoma; hypoplastic left A1 segment, smaller left intracranial ICA; prominent vasculature supply to the left orbital hemangioma, from ECA meningeal branches through orbital apex; low bifurcation of left ICA in neck, collaterals around distal cervical ICA	Enlarged left trigeminal cistern	Hemangiomas involving the left porous acusticus and left foramen ovale; left orbit and periorbital hemangioma
12	M	3 yr	Normal	Tortuosity of the intracavernous and supraclinoid segments of both ICAs, tortuosity of the upper cervical portion of the left ICA; abnormal course of the	Diminutive intracranial and intraorbital segments of the right optic nerve	Bilateral beard distribution large segmental hemangioma, airway hemangioma (clinical notes)

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Subject	Sex	Age	CBF	Arteriopathy	Brain Parenchyma/Other	Hemangioma
13	F	3 yr	Normal	left MCA, hypoplastic A1 segment of the left ACA Absent right A1 segment; tortuosity of the cavernous segment of the left ICA; reduction in caliber and tortuosity of the right vertebral, right CCA, right ECA, and right ICA	Dysplastic vermis; bilateral enlarged trigeminal cisterns	Hemangiomas in right face and left periorbital region (clinical notes)
14	M	2 m	Normal	Distal basilar tortuosity with hypoplastic right VA; marked hypoplasia of right A1 segment, marked tortuosity of bilateral ICAs at the carotid siphons, mild decreased caliber of right ICA	Mild inferior vermian hypoplasia and prominence of the CSF posterior fossa spaces	Large segmental facial hemangioma extending from the right scalp to the nose and lip (clinical notes)
15	M	1 yr	Normal	Tortuosity of the cervical right ICA near the skull base	Prominent CSF spaces around the cerebellum without associated malformations	Right orbital-facial hemangioma (clinical notes)
16	F	1 mo	Normal	Absent right A1 segment	Normal	Right face hemangioma (clinical notes)
17	F	4 yr	Normal	Multifocal luminal irregularity of the right A1 segment	Enlarged right trigeminal cistern	Right trigeminal cistern hemangioma abutting the right cavernous sinus, right internal auditory canal, and right cerebellopontine angle hemangioma, also around basal cisterns and midbrain; right parotid gland hemangioma; bilateral choroid plexus region and pineal region hemangiomas; right lacrimal gland hemangioma involving the superior and lateral extraconal soft tissues of the right orbit; right pterygopalatine fossa hemangioma; hemangioma in subcutaneous tissues of the forehead (seen on prior MR imaging)
18	M	8 mo	Normal	Right-sided aortic arch and aberrant left subclavian artery; hypoplastic right CCA that terminates in the right ECA resulting in absence of the right ICA; anomalous tortuous vessel originating from the distal left ICA, proximal to the origin of the left ophthalmic artery, crossing the midline and reconstituting the right MCA, and also giving origin to a hypoplastic right ophthalmic artery; additional reconstitution of the right anterior circulation via a large left ACA and AcomA and via bilateral PcomAs	Normal	Right-sided hemangioma near right eye and lateral forehead (clinical notes)

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Subject	Sex	Age	CBF	Arteriopathy	Brain Parenchyma/Other	Hemangioma
19	F	6 yr	Normal	Highly tortuous distal cervical right ICA; left persistent trigeminal artery joining the left AICA; nonvisualized right PcomA; trifurcated A2 branching pattern and duplicated right SCA; asymmetric ophthalmic arteries	Retrocerebellar CSF cyst with mass effect on the dysplastic cerebellum, dysplastic vermis	Hemangiomas in bilateral temporal areas, right upper lip, bilateral eyelids (clinical notes)
20	F	2 yr	Normal	Tortuous anterior circulation with numerous collateral vessels; tortuous right distal ICA with an anomalous lateral bifurcation and a tortuous prominent right A1 segment; large collateral vessel extending from the right ICA bifurcation extending to the choroid plexus of the right lateral ventricle and terminating as a pericallosal branch in the region of the intracranial hemangioma; tortuous distal ACAs; numerous looping of the A2 segment of ACAs and extensive tortuosity involving the MCAs	Absence of the corpus callosum; polymicrogyria along medial frontal lobes, at site of prior surface hemangiomas	Hemangioma located between the lateral ventricles along absent corpus callosum; also, along surface of medial frontal lobes; choroid plexus hemangiomas; facial and frontal scalp hemangioma extending into the right orbit (clinical notes)
21	F	1 mo	Normal	Left ICA is asymmetrically larger than the right, the left ophthalmic artery is prominent and tortuous; both ACAs are primarily supplied by the vessels on the left; prominent vessels in the left ambient cistern	Hypoplastic dysmorphic superior vermis	Bilateral orbital hemangiomas; left upper eyelid/orbital hemangioma (clinical notes)
22	F	28 days	Normal	Asymmetrically increased caliber of the cervical left ICA and its petrous, cavernous, and supraclinoid segments, as well as the left ophthalmic artery; tortuosity of the A2 segment of the right ACA; dominant left PcomA; left maxillary artery arises from left ICA distal petrous segment	Mild inferior vermian hypoplasia; dysplastic superior vermis; velum interpositum cyst, right choroidal fissure cyst, left eye coloboma; enlarged left trigeminal cistern	Left preseptal/peri-orbital hemangioma
23	M	1 mo	Normal	Dominant right and hypoplastic A1 segment of the left ACA; some focal tortuosity of the distal cervical segment of the left ICA; lower bifurcation of the right CCA	Left posterior fossa arachnoid cyst; small left cerebellar hemisphere; enlarged left trigeminal cistern	Hemangioma in the left internal auditory canal; facial hemangioma (clinical notes)
24	F	6 mo	Normal	Marked tortuosity of the petrous portion of the right ICA; tortuous basilar artery	Dandy-Walker malformation	Hemangioma over right scalp, periauricular, and involving right eyelid
25	F	4 mo	Normal	Left ECA branches appear asymmetrically prominent, supplying left periauricular hemangioma	Normal	Cutaneous/subcutaneous left periauricular hemangioma that involves the inferior ear and extends into and along the superficial parotid gland; smaller hemangiomas along the superficial aspect of the right parotid

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Subject	Sex	Age	CBF	Arteriopathy	Brain Parenchyma/Other	Hemangioma
26	F	7 days	Normal	Asymmetric ICAs, left larger than right; azygous ACA and dominant left VA	Small dysplastic right cerebellar hemisphere; enlarged right trigeminal cistern, ipsilateral to the hemangioma	gland; small hemangioma in inferolateral right orbit Segmental hemangioma of the right face and scalp, extending to the upper neck and chest (clinical notes)
27	M	1 yr	Normal	Fusiform dilation and marked tortuosity of the left supraclinoid ICA extending into the left M1 segment and left A1 origin; tortuous and ectatic left P1 segment; more distal vessels demonstrate relatively abrupt tapering	Midbrain asymmetry with the left cerebral peduncle and upper pons appearing smaller than the right	Tongue hemangioma (clinical notes)
28	M	1 mo	Normal	Left internal carotid artery is asymmetrically larger than the right; aplastic right A1 segment and both ACAs being supplied by the left ICA; asymmetrically enlarged left ophthalmic artery	Normal	Multiple hemangiomas within the left face, largest involving the pre- and postseptal tissues of the left orbit; left facial segmental infantile hemangioma in S1 and S2 segments (clinical notes)
29	F	2 mo	Normal	Hypoplastic left VA; persistent hypoglossal artery forming a small left intracranial vertebral artery; tortuous cervical ICAs; hypoplastic parts of aorta, with isolated subclavian, with no left VA in neck	Normal	Airway/subglottic hemangioma
30	F	1 mo	Normal	Normal	Enlarged right trigeminal cistern	Hemangioma in the cutaneous and subcutaneous soft tissues in the right premalar region; segmental hemangioma of the right upper lip and cheek (clinical notes)
31	F	1 mo	Decreased left ICA	Left cervical ICA narrowing	Enlarged left internal auditory canal and trigeminal cistern	Left orbital and left internal auditory canal
32	F	5 mo	Decreased left ICA	Left cervical ICA hypoplastic/tortuous, aberrant left ophthalmic artery origin from basilar artery; aberrant right subclavian artery	Absent thyroid glands; enlarged left trigeminal cistern	Multiple hemangiomas in left scalp
33	F	1 yr	Decreased left ICA	Left ICA absent from bifurcation to supraclinoid, persistent trigeminal artery	Normal	Left orbital and right posterior neck
34	F	14 yr	Normal	Tortuous right cavernous ICA, with aberrant artery arising from it	Dysplastic right cerebellar hemisphere and vermis; enlarged right trigeminal cistern; left atrial intraventricular cyst	Right face (clinical notes)
35	F	8 mo	Decreased right MCA	Right ICA absent/not visualized (complete circle of Willis)	Right cerebellar hypoplasia	Right eye, forehead, and lateral cheek
36	F	9 mo	Decreased right MCA, AICA, PICA	Small right CCA; very small and dysplastic right ICA; absent/markedly hypoplastic right VA persistent trigeminal artery; segmental absence of basilar artery	Normal	Right cheek and scalp (clinical notes)

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Subject	Sex	Age	CBF	Arteriopathy	Brain Parenchyma/Other	Hemangioma
37	F	7 yr	Normal	between PTA and basilar tip (origin of SCAs and PCAs) Stenosis left SCA origin; aberrant origin right SCA; small-caliber left CCA; very small-caliber and dysplastic left ICA; both ACAs arise from left ICA; right A1 hypoplastic; large PcomAs bilaterally; left vertebral artery absent	Normal	Left forehead extending toward the eyebrow, pre- and postauricular areas (clinical notes)
38	F	2 yr	Normal	Right arch with aberrant left SCA origin; small right CCA and terminates into ECA; right ICA absent in neck, faintly reforms at skull base and dysgenesis; right A1 hypoplastic	Hypoplastic inferior vermis and cerebellar hemispheres, right > left	Right face (clinical notes)
39	F	15 yr	Decreased left MCA, bilateral ACA, left PCA	History of coarctation post repair; aberrant origin of left SCA; left CCA small and terminates into ECA; left ICA absent in neck, faintly reforms at skull base and dysgenesis; small terminus left ICA; dysplastic left PcomA; absent right PcomA; present-but-dysplastic right A1; left PCA attenuated; small distal branches of left MCA; Moyamoya collaterals	Left cerebellar hypoplastic; bilateral frontal subependymal heterotopia	Left face (clinical notes)
40	M	10 mo	Normal	Focal mild narrowing proximal left ICA; dysgenesis of left PcomA	Left cerebellar hypoplasia	Left scalp, forehead, orbit, masticator space, internal auditory canal, around proximal common carotid artery Left face (clinical notes)
41	F	2 yr	Normal	Both CCAs terminate largely into ECAs; very small left ICA, dysplasia at skull base; right ICA diminutive and seen at skull base; both ICAs reconstitute in distal cavernous segment by ECA collaterals; terminal ICA reformed by PcomA; mild ectasia of terminal left ICA	Normal	

Note:—ACA indicates anterior cerebral artery; PcomA, posterior communicating artery; PTA, posterior cerebral artery; PCA, posterior cerebral artery; bifurc, bifurcation; SCA, subclavian artery; ECA, external carotid artery; CCA, common carotid artery; ICA, internal carotid artery; PTA, persistent trigeminal artery; AcomA, anterior communicating artery;