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Intracranial Arterial Loop with a Complex Partially Thrombosed Large Aneurysm in the Posterior Circulation: A Case Report

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Abstract
Large, partially thrombosed intracranial aneurysms (PTIAs) in the posterior circulation are uncommon and technically challenging. Their presentation can overlap with posterior circulation stroke syndromes, particularly lateral medullary (Wallenberg) syndrome, complicating early diagnosis. Optimal treatment is individualized among microsurgical, endovascular, and hybrid strategies. A 66-year-old woman presented with headache, vertigo, visual impairment, and right peripheral facial palsy (House–Brackmann II). MRI/MRA and CTA demonstrated a posterior-circulation aneurysm measuring 16.1 × 13.8 mm, wide neck >4 mm, partial intraluminal thrombosis, and an associated arterial loop displacing the lateral medulla. Following multidisciplinary deliberation, microsurgical treatment was chosen. The patient was positioned sitting with the head secured in a Mayfield clamp; a right suboccipital craniotomy was performed starting with two burr holes, using a retrosigmoid approach. The aneurysm was visualized deep in the cerebellomedullary cistern adjacent to cranial nerves IX–XII, and microsurgical clipping of the neck was performed. Post-operatively, facial palsy worsened to House–Brackmann III/IV, without new focal deficits. Follow-up imaging is pending at the time of writing.

Keywords: Partially Thrombosed Aneurysm, Posterior Circulation, Pica Region, Retrosigmoid, Lateral Medullary Syndrome, Microsurgical Clipping, Case Report

Introduction
Posterior-circulation intracranial aneurysms constitute a minority of all aneurysms yet carry disproportionate diagnostic and therapeutic complexity because of their deep location, intimate relationship to the brainstem and lower cranial nerves, and the density of perforators in the

vertebrobasilar system. Clinical presentation may be subtle or protean, ranging from headache and vestibular symptoms to cranial-nerve deficits, and in some patients, can mimic posterior fossa stroke syndromes. In particular, lateral medullary (Wallenberg) syndrome, most often due to vertebral or PICA occlusion, presents with vertigo, ataxia, nystagmus, dysphagia, and dissociated sensory loss; careful vascular imaging is therefore essential when brainstem symptoms coexist with mass-effect signs to avoid misclassification of aneurysmal pathology as ischemic infarction.

Partially thrombosed intracranial aneurysms (PTIAs) in the posterior circulation are especially challenging. Laminated thrombus can distort the true neck, alter intra-aneurysmal hemodynamics, and generate progressive mass effect, while residual inflow channels predispose to regrowth after simple intraluminal embolization. In focused endovascular series of PTIAs, intraluminal coiling was associated with higher retreatment and recurrence compared with parent artery occlusion (PAO) in cases where collateral flow permitted deconstructive therapy; underscoring the unique biological behavior of these lesions and the limits of coil packing alone.

Consensus on optimal management remains elusive. Microsurgical strategies (clipping, trapping, bypass) can provide durable occlusion and immediate decompression of mass effect but demand deep approaches through narrow corridors with potential cranial-nerve/perforator morbidity. Conversely, endovascular therapy (coiling and stent-assisted techniques) offers lower initial invasiveness but may incur higher rates of re-intervention in wide-neck PTIAs because coil compaction and residual inflow can persist. Meta-analytic and cohort data comparing clipping and coiling in the posterior circulation generally suggest fewer peri-operative neurological deficits with coiling but greater durability (lower retreatment) after clipping, with mortality differences often neutral; highlighting the need for individualized decisions.
Reconstructive flow diversion has expanded endovascular options for wide-neck posterior-circulation aneurysms, yet perforator risk mandates careful selection. Device-specific cohorts with the p64 flow modulation device report encouraging mid- and long-term occlusion in selected saccular posterior-circulation aneurysms under strict antiplatelet regimens, but these results may not generalize to all morphologies; particularly partially thrombosed or fusiform lesions encasing perforators. Hybrid, staged approaches that combine endovascular and microsurgical techniques are increasingly reported for giant or thrombosed vertebrobasilar and distal PCA aneurysms.

The posterior inferior cerebellar artery (PICA) region exemplifies the anatomic and technical constraints of posterior fossa aneurysm surgery: the working space is limited; the aneurysm is often deep and off-axis; and cranial nerves IX–XII crowd the field, elevating the risk of postoperative dysphagia, hoarseness, shoulder weakness, or hypoglossal dysfunction [3,8]. As such, approach selection (e.g., retrosigmoid vs far-lateral variants), the use of temporary clipping, and adjuvant intraoperative imaging (e.g., ICG) must be tailored to the individual vascular anatomy and perforator landscape.
Here, we report a large, wide-neck, partially thrombosed posterior-circulation aneurysm associated with an arterial loop compressing the lateral medulla, initially raising concern for

lateral medullary syndrome. We detail the clinical presentation, multimodal imaging, and the rationale for a sitting-position retrosigmoid suboccipital microsurgical strategy, and we discuss the immediate outcome in the context of current evidence on PTIAs, posterior-circulation aneurysm surgery, and evolving endovascular reconstruction.

Case Presentation

A 66-year-old female presented with several weeks of headache, vertigo, and progressive visual impairment. Neurological examination revealed right peripheral facial palsy (House–Brackmann II) and mild gait imbalance. There was no dysphagia, Horner's syndrome, or dissociated sensory loss.

Given the vestibulocerebellar symptoms and facial weakness, posterior circulation stroke syndromes, particularly lateral medullary syndrome, were considered. However, the absence of bulbar symptoms and targeted imaging prompted an alternative diagnosis.

On imaging, MRI (T2-weighted) showed a heterogeneous lesion with mass effect at the cerebellomedullary cistern. CTA/MRA confirmed a posterior-circulation aneurysm measuring 16.1 × 13.8 mm with a wide neck (>4 mm) and partial thrombosis, associated with an arterial loop deviating the parent vessel and deforming the lateral medulla.

Options included (i) microsurgical clipping with/without trapping/bypass, (ii) stent-assisted coiling, (iii) parent artery occlusion (PAO) if collaterals allowed, and (iv) flow diversion. Given the mass effect, wide neck, thrombus, and neurovascular crowding near cranial nerves IX–XII, microsurgery was favored to achieve durable occlusion and decompression while preserving perforators and lower cranial nerves.

The patient was positioned sitting with the head secured in a Mayfield head clamp. A right suboccipital craniotomy was fashioned starting with two burr holes, followed by a retrosigmoid approach to the cerebellomedullary cistern. After CSF release and gentle cerebellar relaxation, the arachnoid was opened. The aneurysm, partially thrombosed with a broad neck, was visualized deep to the VII–VIII complex and adjacent to cranial nerves IX–XII. Careful microdissection preserved the lower cranial nerves, and microsurgical clipping of the neck was performed.

Postoperative course. The patient awoke without new focal deficits but with worsening facial palsy to House–Brackmann III/IV. There was no dysphagia or hoarseness. She was discharged in stable condition.

Discussion

Diagnostic nuance: aneurysm versus lateral medullary syndrome. Because PTIAs in the posterior fossa can compress the medulla and vestibular pathways, they may mimic LMS. In our case, vertigo and imbalance initially suggested LMS; however, imaging revealed a complex aneurysm causing mass effect rather than infarction. This distinction is critical because management differs fundamentally between ischemic infarction and aneurysmal mass effect.

Pathophysiology and behavior of partially thrombosed aneurysms. PTIAs are characterized by laminated thrombus and vasa vasorum–driven wall remodeling; they may grow despite luminal occlusion. Intraluminal embolization can leave persistent flow channels within thrombus and is associated with recanalization/retreatment, whereas PAO often produces aneurysm shrinkage and symptom improvement when collateral circulation is sufficient. In the posterior circulation, however, PAO may endanger perforators and brainstem perfusion.

Choosing a strategy: microsurgery, endovascular, or hybrid. Microsurgical clipping/trapping ± bypass offers durable occlusion and decompression but demands deep approaches and navigation around brainstem perforators and lower cranial nerves. Endovascular coiling is less invasive but may need retreatment in partially thrombosed, wide-neck lesions. Flow diversion is a reconstructive option in carefully selected anatomies, with device-specific cohorts (e.g., p64) reporting high occlusion rates under strict antiplatelet protocols. Hybrid strategies—endo-assisted trapping or staged combinations—are described for giant/thrombosed vertebrobasilar and distal PCA aneurysms.

Surgical considerations near the PICA region and lower cranial nerves. Microsurgical clipping in the PICA region is notoriously challenging: the corridor is narrow; the aneurysm is deep and off axis; and the brainstem and cranial nerves IX–XII crowd the field. Risks include dysphagia, hoarseness, shoulder weakness, and hypoglossal dysfunction. Strategies include early CSF release, meticulous arachnoid dissection, minimal retraction, judicious temporary clipping, and intraoperative ICG or DSA to confirm patency and exclude perforator compromise. Our patient's transient facial-nerve worsening (HB III/IV) likely reflects manipulation-related neurapraxia or transient ischemia, with expected improvement as edema resolves.

Follow-up and prognosis. PTIAs warrant long-term imaging surveillance because thrombosis can evolve and recanalize. After clipping, surveillance (CTA or MRA; DSA if equivocal) at 6–12 months and periodically thereafter is reasonable. Cranial nerve palsies often partially recover over months with targeted rehabilitation.

What this case adds. It illustrates aneurysmal mass effect masquerading as LMS; documents sitting-position retrosigmoid microsurgery for a wide-neck PTIA abutting IX–XII with practical operative steps; and synthesizes current evidence guiding modality selection in posterior-circulation PTIAs.

Table 1. Intracranial aneurysm types, challenges, and typical strategies

Type	Morphology	Common sites	Key challenges	Typical strategies
Saccular (berry)	Dome with discrete neck	ACoA, MCA bifurcation, PCoA	Rupture risk; neck orientation	Clipping or coiling depending on neck/dome ratio

Fusiform	Spindle-shaped, no neck	Vertebrobasilar, ICA	No clip purchase; perforators	Flow diversion reconstruction; bypass; selective PAO
Dissecting	Intimal tear, intramural hematoma	Vertebral, PICA	Rebleed/ischemia; fragile wall	Stent-assisted reconstruction; trapping ± bypass
Partially thrombosed	Laminated thrombus; large	Posterior circulation; giant	Mass effect; recurrence after coiling	Microsurgery or hybrid; PAO if collaterals; FD in select cases [1–6]
Giant (≥25 mm)	Any of the above	Posterior > anterior (relative)	High morbidity; cranial-nerve compression	Multimodality, staged or hybrid approaches

Figure 1. Sagittal T2-weighted MRI demonstrating mass effect at the cerebellomedullary cistern.

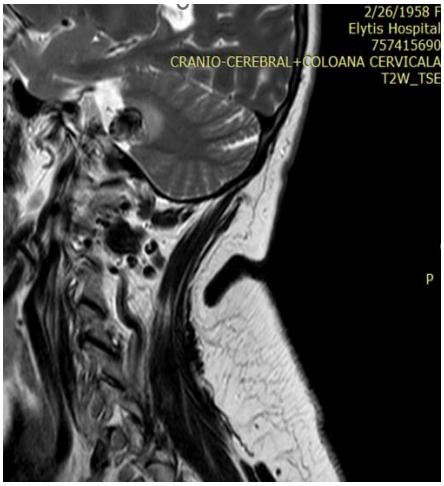


Figure 2. Coronal T2-weighted MRI showing lateral displacement of the medulla by theaneurysmal complex.

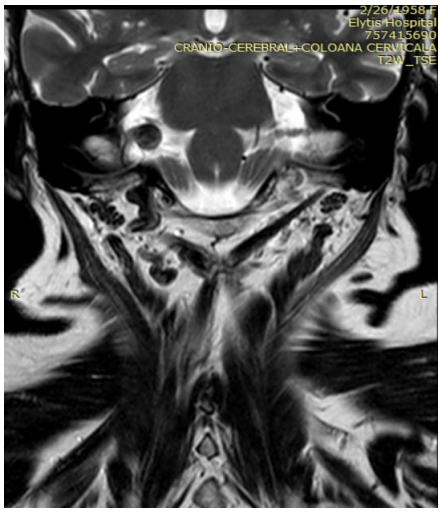
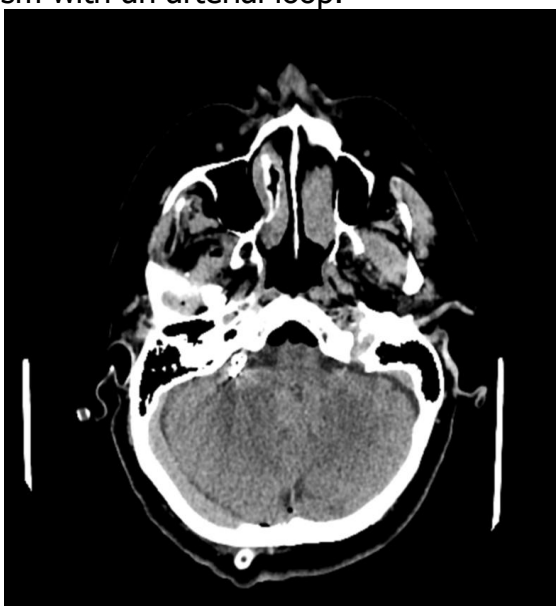


Figure 3. CTA/MRA confirming a 16.1 × 13.8 mm, wide-neck (>4 mm), partially thrombosed posterior-circulation aneurysm with an arterial loop.



Conclusion

Complex, wide-neck partially thrombosed aneurysms in the posterior circulation can mimic lateral medullary syndrome and demand prompt vascular imaging. For lesions abutting the brainstem and lower cranial nerves, sitting-position retrosigmoid microsurgery offers a controlled corridor for durable occlusion and decompression when performed with meticulous technique and cranial-nerve preservation. Management should be individualized, balancing surgical durability, endovascular safety, and perforator risk, with long-term imaging follow-up given PTIA behavior [1-8].

Declarations

Authors NH, LM, NA, NZ have no declarations
Ethical: There are no ethical problems
Patient Consent: The patient consent was obtained to discuss this case and publish it.

References

[1] Lee J, Cho WS, Yoo RE, Yoo DH, Cho YD, Kang HS, Kim JE. The Fate of Partially Thrombosed Intracranial Aneurysms Treated with Endovascular Intervention. J Korean Neurosurg Soc. 2021 May;64(3):427-436. Epub 2021 Feb 26. PMID: 33631913; PMCID: PMC8128530.

[2] Nambu K, Kamide T, Tsutsui T, Kitabayashi T, Yoshikawa A, Misaki K, Nakada M. Partially thrombosed distal posterior cerebral artery aneurysm treated with surgical trapping through occipital transtentorial approach assisted by endovascular coil embolization. Surg Neurol Int. 2023 Jan 20; 14:20. PMID: 36751440; PMCID: PMC9899450.

[3] You W, Meng J, Yang X, Zhang J, Jiang G, Yan Z, Gu F, Tao X, Chen Z, Wang Z, Chen G. Microsurgical Management of Posterior Circulation Aneurysms: A Retrospective Study on

Epidemiology, Outcomes, and Surgical Approaches. Brain Sci. 2022 Aug 11;12(8):1066. PMID: 36009128; PMCID: PMC9406061..
[4] Morofuji Y, Izumo T, Sato K, et al. Hybrid treatment for a giant thrombosed aneurysm at the vertebrobasilar junction. Interv Neuroradiol. 2020;26(6):780–787.
[5] Belavadi R, Gudigopuram SVR, Raguthu CC, Gajjela H, Kela I, Kakarala CL, Hassan M, Sange I. Surgical Clipping Versus Endovascular Coiling in the Management of Intracranial Aneurysms. Cureus. 2021 Dec 17;13(12):e20478. PMID: 35047297; PMCID: PMC8760002.
[6] Hellstern V, Aguilar-Pérez M, Henkes E, Serna-Candel C, Wendl C, Bäzner H, Ganslandt O, Henkes H. Endovascular Treatment of Posterior Circulation Saccular Aneurysms With the p64 Flow Modulation Device: Mid-and Long-Term Results in 54 Aneurysms from a Single Center. Front Neurol. 2021 Jul 16; 12:711863. PMID: 34335461; PMCID: PMC8322946.
[7] Kim JS. Pure lateral medullary infarction: clinical-radiological correlation of 130 acute, consecutive patients. Brain. 2003 Aug;126(Pt 8):1864-72. Epub 2003 May 21. PMID: 12805095..
[8] Abla AA, McDougall CM, Breshears JD, Lawton MT. Intracranial-to-intracranial bypass for posterior inferior cerebellar artery aneurysms: options, technical challenges, and results in 35 patients. J Neurosurg. 2016 May;124(5):1275-86. Epub 2015 Nov 13. PMID: 26566199.