

Case Report

Ruptured posterior cerebral artery aneurysm presenting with a contralateral cranial nerve III palsy: A case report

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Abstract

Background: Posterior cerebral artery aneurysms can frequently present with an ipsilateral cranial nerve III palsy.**Case Description:** We report the first case of a posterior cerebral artery aneurysm associated with a contralateral cranial nerve III palsy. A 64-year-old male presented with acute subarachnoid hemorrhage, Hunt and Hess grade 3, and a left-sided fixed and dilated pupil. Computed tomography scan showed hemorrhage, mainly within the left basal cisterns. Digital subtraction angiography revealed a right-sided P1–P2 junction aneurysm.**Conclusions:** This case demonstrates that, although the neurological exam can help pinpoint the location of a lesion, false localizing signs should be recognized.**Key Words:** Cerebral aneurysm, cranial nerve III, oculomotor nerve, posterior cerebral artery, posterior communicating artery, subarachnoid hemorrhage**Access this article online****Website:**www.surgicalneurologyint.com**DOI:**

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INTRODUCTION

Cranial nerve III (CN III) palsy from a posterior communicating artery (PCoA), posterior cerebral artery (PCA), or superior cerebellar artery aneurysm is a well-established phenomenon.^[6,8] CN III dysfunction can result from direct compression of the nerve by the aneurysm. CN III palsy typically occurs suddenly in conjunction with subarachnoid hemorrhage but may also be the only presenting sign of aneurysms in these locations. Here, we report a unique case of a patient with a ruptured right P1–P2 junction aneurysm that resulted in a paradoxical left CN III palsy.

CASE PRESENTATION

Clinical presentation

A 64-year-old Cantonese male, with no significant past medical history, was transferred to our institution with

acute subarachnoid hemorrhage, Hunt and Hess grade 3, and Fisher grade 4. Upon arrival, Glasgow coma scale score was 8 and so he was intubated. His left pupil was also fixed and measured 5 mm [Figure 1]. Initial computed tomography (CT) scan revealed a mostly left-sided subarachnoid hemorrhage along the basal cisterns with intraventricular extension and hydrocephalus.

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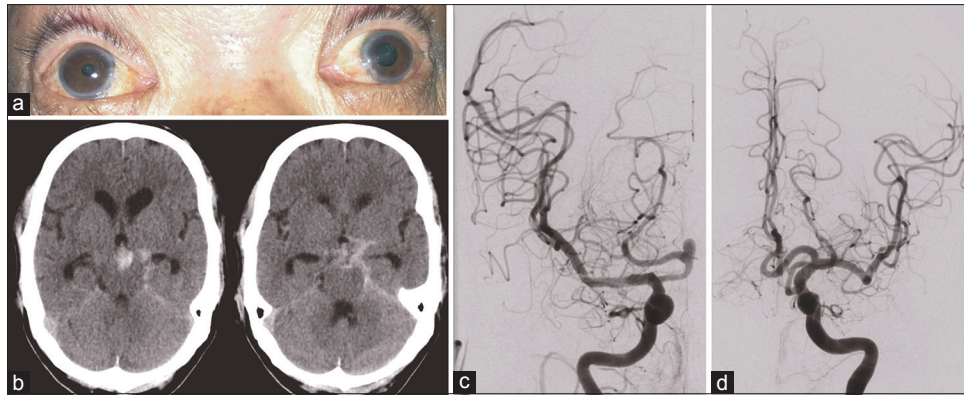


Figure 1: Clinical presentation. (a) Left side CN III palsy. (b) Computed tomography scan with predominantly left side subarachnoid hemorrhage. (c) Right and (d) left internal carotid artery angiograms showing right P1–P2 junction aneurysm

He subsequently underwent emergent placement of a right-sided external ventricular drain and was rushed to the angiography suite where a 5 mm × 3.5 mm right P1–P2 junction aneurysm was identified [Figure 1].

Aneurysm treatment

The aneurysm was successfully treated with balloon-assisted coil embolization via the right PCoA. A small neck remnant was noted, and hence 6 weeks after presentation, the patient underwent pipeline stent placement within the right PCA across the aneurysm neck.

Clinical course

The patient was managed in our neurosurgical intensive care unit for approximately 2 weeks and on the floor for 4 weeks. He required two additional angiograms for vasospasm treatment with intraarterial verapamil. He also required shunting, tracheostomy, and percutaneous endoscopic gastrostomy tube. However, the tracheostomy was decannulated and he was transitioned to oral intake by the time of discharge. He was discharged home and was awake, following commands, moving all extremities with full strength, and had near resolution of his CN III palsy with the left pupil 1 mm larger than the right pupil.

DISCUSSION

The finding of pupil dilatation is most commonly associated with ipsilateral lesions such as hemorrhage, uncal herniation, or cerebral aneurysms of the PCoA, PCA, or SCA that cause external compression on the parasympathetic efferent fibers of CN III.

Causes of a CN III palsy contralateral to the lesion are still unclear and have been attributed to aberrant anatomy of CN III and rotational forces on the brainstem.^[3] Cases of CN III palsy due to a contralateral frontal intraparenchymal hemorrhage,^[3,5] subdural hematoma,^[2,4,10] and meningioma^[7] have been reported.

In our patient, initial imaging [Figure 1b] revealed acute subarachnoid hemorrhage predominantly within

the interpeduncular cistern and left ambient cistern. The cerebral peduncles were not effaced, but there was a large amount of hemorrhage surrounding the left peduncle. Given the enlarged left pupil with no asymmetry appreciated on motor exam, a ruptured left PCoA aneurysm was presumed to be the cause of the subarachnoid hemorrhage. However, angiography revealed a right-sided P1–P2 junction aneurysm. We hypothesize that the geometric shape and orientation of the aneurysm resulted in its dome pointing into the origin of the left CN III within the interpeduncular cistern, thereby causing direct pressure on the nerve. Another plausible mechanism given the orientation of the right-sided aneurysm is that when it ruptured the hemorrhage collected nearly entirely on the left side and the subsequent mass effect on the left CN III produced a contralateral fixed and dilated pupil. Following endovascular treatment of the aneurysm, the left pupil remained enlarged but decreased in size by the time the patient was discharged. This delayed but near-resolution of a CN III palsy after endovascular treatment of PCoA and PCA aneurysms is consistent with the published literature.^[1,8,9]

CONCLUSION

We report the first case of a posterior cerebral artery aneurysm associated with a contralateral CN III palsy. Although the neurological examination plays a critical role for operative planning, false localizing signs need to be considered prior to any definitive management plan.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Brigui M, Chauvet D, Clarençon F, Degos V, Sourour NA, Nouet A, et al. Recovery from oculomotor nerve palsy due to posterior communicating artery aneurysms: Results after clipping versus coiling in a single-center series. *Acta Neurochir (Wien)* 2014;156:879-84.
2. Browder J. A Resumé of the Principal Diagnostic Features of Subdural Hematoma. *Bull N Y Acad Med* 1943;19:168-76.
3. Chen R, Sahjpal R, Del Maestro RF, Assis L, Young GB. Initial enlargement of the opposite pupil as a false localising sign in intraparenchymal frontal haemorrhage. *J Neurol Neurosurg Psychiatry* 1994;57:1126-8.
4. Chesnut RM, Gautille T, Blunt BA, Klauber MR, Marshall LE. The localizing value of asymmetry in pupillary size in severe head injury: Relation to lesion type and location. *Neurosurgery* 1994;34:840-5.
5. Chung KH, Chandran KN. Paradoxical fixed dilatation of the contralateral pupil as a false-localizing sign in intraparenchymal frontal hemorrhage. *Clin Neurol Neurosurg* 2007;109:455-7.
6. Fujiwara S, Fujii K, Nishio S, Matsushima T, Fukui M. Oculomotor nerve palsy in patient with cerebral aneurysms. *Neurosurg Rev* 1989; 12:123-32.
7. Gassel MM. False localizing signs, A review of the concept and analysis of the occurrence in 250 cases of intracranial meningioma. *Arch Neurol* 1961;4:526-54.
8. Hanse MC, Gerrits MC, van Rooij WJ, Houben MP, Nijssen PC, Sluzewski M. Recovery of posterior communicating artery aneurysm-induced oculomotor palsy after coiling. *AJNR Am J Neuroradiol* 2008;29:988-90.
9. Moon K, Albuquerque FC, Ducruet AF, Crowley RW, McDougall CG. Resolution of cranial neuropathies following treatment of intracranial aneurysms with the Pipeline Embolization Device. *J Neurosurg* 2014;121:1085-92.
10. Pevehouse BC, Bloom WH, McKissock W. Ophthalmologic aspects of diagnosis and localization of subdural hematoma. An analysis of 389 cases and review of the literature. *Neurology* 1960;10:1037-41.