CASE REPORT

Eye Discomfort and Blurred Vision Preceding Oculomotor Nerve Palsy in a Warning Headache : A Case Report

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Abstract : Cerebral aneurysms can present with warning headaches before rupture or during minor leaks. Internal carotid artery-posterior communicating artery (IC-PC) aneurysms are among the few aneurysms for which the clinical observation of growth and associated symptoms is possible. Enlargement or morphological changes may worsen oculomotor nerve (ON) palsy, intensified headache, or orbital pain, indicating an impending rupture that requires urgent intervention. Notably, blurred vision with eye discomfort preceding ON palsy during impending rupture is rarely reported. Herein, we present a case highlighting this phenomenon. A 74-year-old woman with hypertension and migraines with aura presented with a 14-day history of gradual-onset left frontal headache. Despite the initial normal neurological findings and no evidence of subarachnoid hemorrhage on computed tomography, she later developed blurred vision and left eye discomfort without objective ON palsy. Her symptoms were initially attributed to migraines. Two days later, the patient developed ptosis and was diagnosed with complete ON palsy. Magnetic resonance angiography revealed a left IC-PC aneurysm, and urgent direct clipping confirmed rupture of the aneurysm. The patient recovered without complications. Blurred vision with eye discomfort during a warning headache may indicate early ON dysfunction and impending aneurysm rupture. Early recognition and vascular evaluation are crucial to prevent catastrophic outcomes. J. Med. Invest. 73 : 257-259, February, 2026

Keywords **:** *warning headache, blurred vision with eye discomfort, internal carotid artery-posterior communicating artery aneurysm, oculomotor nerve palsy, impending aneurysm rupture*

INTRODUCTION

A warning headache is a headache that precedes aneurysmal rupture or re-rupture by several hours or weeks (1). Approximately 50% of patients with aneurysmal subarachnoid hemorrhage (SAH) experience this condition (2). Internal carotid artery-posterior communicating artery (IC-PC) aneurysms represent a unique subset of aneurysms for which clinical observation of growth is occasionally possible. During this progression, emerging oculomotor nerve (ON) palsy, manifesting as ophthalmoplegia, diplopia, or ptosis, along with intensifying headache and orbital pain, strongly suggests impending aneurysm rupture.

The ON comprises visceromotor fibers originating from the Edinger-Westphal nucleus and somatomotor fibers originating from the oculomotor nucleus, which converge at the medial part of the cerebral peduncle and emerge into the subarachnoid space from the midbrain. Because these fibers travel near the subarachnoid space, ON involvement typically results in complete ON palsy. This condition is characterized by mydriasis and loss of the pupillary light reflex due to visceromotor fiber dysfunction, along with ophthalmoplegia, diplopia, and ptosis caused by somatomotor fiber impairment (3).

We report a case of a patient who presented with a warning headache and subjective visual disturbances, including blurred vision and visual discomfort. These symptoms occurred before the onset of objective ON palsy and served as early indicators of impending aneurysmal rupture.

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CASE DESCRIPTION

A 74-year-old woman with a history of hypertension and migraine with aura since her 30s presented with a gradual onset of left frontal headache that persisted over two weeks. She initially visited a local clinic nine days after symptom onset, where she was prescribed analgesics ; however, her symptoms persisted. Three days later, the pain worsened, and the patient was transported to our hospital. Upon initial evaluation, the patient exhibited no neurological deficits such as ON palsy. A computed tomography (CT) scan showed no evidence of SAH, and the patient was placed under observation (Figure 1A).

The following day, she reported the recurrence of a left frontal headache along with blurred vision. Neurological examination remained normal, with no signs of ON palsy, such as ptosis, ophthalmoplegia, or anisocoria. A repeat CT scan revealed no intracranial hemorrhage, and observation was continued.

The next day, she visited a specialized headache clinic and reported persistent headache and left eye discomfort. The neurological examination results were unremarkable. Based on her longstanding history of migraine with aura, she was diagnosed with migraine, and preventive therapy with lomerizine hydrochloride (20 mg/day) and sodium valproate (400 mg/day) was initiated along with triptan for acute attacks.

Two days later, the patient developed ptosis. Evaluation at a nearby ophthalmology clinic revealed complete left ON palsy, including ptosis, ophthalmoplegia, and anisocoria. The patient was then promptly referred to our hospital. Magnetic resonance imaging (MRI) showed no SAH (Figure 1B) ; however, magnetic resonance angiography (MRA) revealed a left IC-PC aneurysm (Figure 1C and D).

Given the clinical course and imaging findings, impending rupture of the IC-PC aneurysm was suspected, and urgent direct clipping was performed. Intraoperatively, the cerebrospinal fluid was slightly blood-tinged, and a small clot was identified adjacent to the aneurysm (Figure 1E and F), confirming the diagnosis of a ruptured aneurysm. The aneurysm was successfully obliterated, and the ON was found to be compressed by the aneurysm (Figure 1G and H).

The patient experienced no surgical complications and was discharged in stable condition. Although complete recovery from ON palsy required several months, complete functional restoration was achieved.

DISCUSSION

This case highlights a patient presenting with blurred vision and eye discomfort, likely due to mild dysfunction of the visceromotor or somatomotor fibers, or minimal orbital pain. The absence of objective findings, such as dilated pupils, ophthalmoplegia, or ptosis, delayed the diagnosis of impending aneurysm rupture. Two important clinical implications can be drawn from this case.

First, IC-PC aneurysms may induce eye discomfort before the development of overt ON palsy. This phenomenon may be due to mild visceromotor fiber impairment, subtle somatomotor dysfunction, or vague orbital pain. The ON contains peripherally located visceromotor fibers, which are responsible for autonomic functions, such as pupil control, and centrally located somatomotor fibers, which control the extraocular muscles. Anatomically, IC-PC aneurysms project posteriorly and inferiorly, compressing the ON as it enters the dura mater. Such compression may initially affect peripheral visceromotor fibers, resulting in early pupil-related symptoms before the somatomotor fibers are involved (4-6). Furthermore, the variability in clinical presentations, such as "pupil-sparing ON palsy" or isolated ptosis, may also occur and is suggested to reflect changes in the degree and direction of aneurysmal compression (7-9). Subtle ON dysfunction often remains undetected until overt symptoms, such as pupil dilation or ophthalmoplegia, become apparent.

Minimal orbital pain may serve as an early indicator of aneurysmal irritation. Previous reports have linked orbital pain to IC-PC aneurysms and internal carotid artery (ICA) dissections, suggesting that irritation of the ICA can radiate pain to the orbit

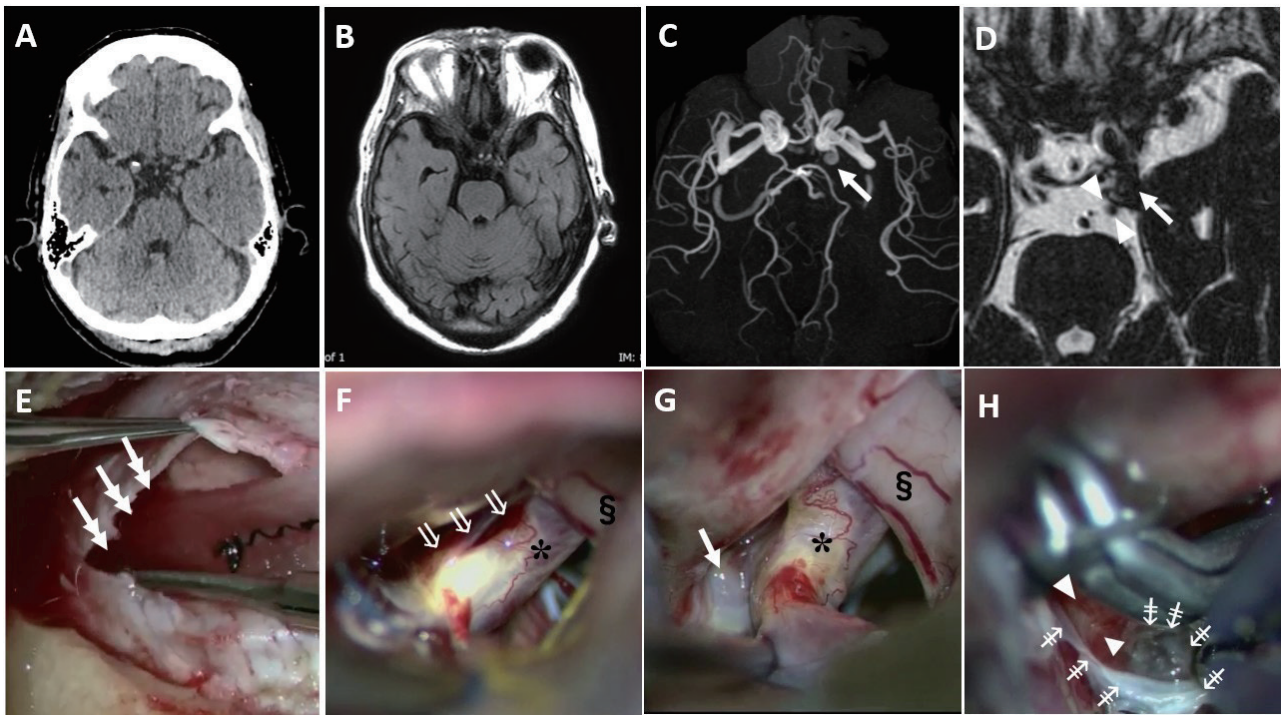

Figure 1.
A-D : Preoperative images
(A) Head computed tomography scan performed at the first visit of the patient to our hospital, showing no evidence of subarachnoid hemorrhage (SAH).
(B) Brain magnetic resonance imaging (MRI) with fluid-attenuated inversion recovery, obtained after the onset of complete oculomotor nerve (ON) palsy, demonstrating no evidence of SAH.
(C) Magnetic resonance angiography revealing an aneurysm originating from the left internal carotid artery-posterior communicating artery (IC-PC) bifurcation (white arrow).
(D) Constructive interference in steady-state MRI showing the aneurysm (white arrow) near the left ON (paired arrowheads).

E-H : Intraoperative photographs
(E) Slightly blood-tinged cerebrospinal fluid (two-headed arrows) was observed upon incision of the dura mater.
(F) Left internal carotid artery (*), left optic nerve (§), and a small blood clot (double arrows) near the ruptured IC-PC aneurysm were identified. The aneurysm itself is not visible, as this figure was captured before dissection around the aneurysm.
(G) The IC-PC aneurysm (white arrow) extending posteriorly and inferiorly was confirmed after dissection around the aneurysm.
(H) After the aneurysm was secured with a clip, needle puncture and dissection of the aneurysmal dome allowed confirmation of direct anatomical contact between the aneurysm wall (arrows with double strokes) and the ON (paired arrowheads).

(10, 11).

Second, eye discomfort may be a warning sign of impending aneurysm rupture, even in the absence of ON palsy. Patients with headaches without evidence of SAH on CT are often managed with observation. However, the sensitivity of CT for detecting SAH diminishes over time (12). Although MRI fluid-attenuated inversion recovery imaging offers higher sensitivity than CT, its diagnostic accuracy decreases approximately three weeks after aneurysm rupture (13). In some cases, as observed in this patient, ruptured aneurysms can only be surgically confirmed. Therefore, early vascular imaging with CT angiography, MRA, or angiography is crucial when symptoms suggest a minor leak or impending aneurysm rupture.

Furthermore, distinguishing between a minor leak and an impending aneurysm rupture is not necessary when a patient presents with a warning headache, as clinical management—prompt surgical intervention—remains the same. Therefore, a lumbar puncture was not considered essential in the present case. Paradoxically, if a warning headache had not been suspected, performing a lumbar puncture before the onset of ON palsy might have been useful, as it could have revealed an SAH. This could have prompted further vascular evaluation, leading to an earlier diagnosis.

CONCLUSION

Ocular discomfort accompanied by headache may be an early warning sign of impending ON palsy and aneurysm rupture. Even in the absence of overt neurological deficits, prompt vascular evaluation is critical to ensure a timely diagnosis and intervention, potentially preventing catastrophic outcomes.

CONFLICT OF INTEREST

The authors declare no competing interests.

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Ethical approval and consent to participate : All procedures in this study were performed in accordance with the 1964 Declaration of Helsinki. A series of treatments was performed after obtaining appropriate written informed consent from the patients. The requirement for additional written consent for inclusion in this study was waived by the Ethics Committee of Saiseikai Shiga Hospital because of the retrospective and observational nature of the study (permission number : 714).

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REFERENCE LIST

1. Verweij RD, Wijdicks EF, van Gijn J : Warning headache in aneurysmal subarachnoid hemorrhage. A case-control study. Archives of neurology 45 : 1019-1020, 1988
2. Okawara SH : Warning signs prior to rupture of an intracranial aneurysm. Journal of neurosurgery 38 : 575-580, 1973
3. Nakano T : Autonomic innervation of the pupil [In Japanese]. Neurological medicine 82 : 1-8, 2015
4. Sunderland S, Hughes ES : The pupillo-constrictor pathway and the nerves to the ocular muscles in man. Brain : a journal of neurology 69 : 301-309, 1946
5. Kerr FW, Hollowell OW : Location of pupillomotor and accommodation fibres in the oculomotor nerve : experimental observations on paralytic mydriasis. Journal of neurology, neurosurgery, and psychiatry 27 : 473-481, 1964
6. Rhoton AL, Jr. : Aneurysms. Neurosurgery 51(4 Suppl) : S121-158, 2002
7. Arle JE, Abrahams JM, Zager EL, Taylor C, Galetta SL : Pupil-sparing third nerve palsy with preoperative improvement from a posterior communicating artery aneurysm. Surgical neurology 57 : 423-426 ; discussion 426-427, 2002
8. Motoyama Y, Nonaka J, Hironaka Y, Park YS, Nakase H : Pupil-sparing oculomotor nerve palsy caused by upward compression of a large posterior communicating artery aneurysm. Case report. Neurologia medico-chirurgica 52 : 202-205, 2012
9. Asakura K, Tasaki T, Okada K : [A case of unruptured anterior temporal artery aneurysm showing pupil-sparing oculomotor palsy]. No shinkei geka. Neurological surgery 14 : 777-782, 1986
10. Yokoya S, Hino A, Goto Y, Hashimoto Y, Oka H : Strictly Limited Orbital Pain as Sentinel Headache of Subarachnoid Hemorrhage. World neurosurgery 114 : 27-29, 2018
11. Guillon B, Biousse V, Massiou H, Bousser MG : Orbital pain as an isolated sign of internal carotid artery dissection. A diagnostic pitfall. Cephalalgia : an international journal of headache 18 : 222-224, 1998
12. Perry JJ, Stiell IG, Sivilotti ML, Bullard MJ, Emond M, Symington C, Sutherland J, Worster A, Hohl C, Lee JS, Eisenhauer MA, Mortensen M, Mackey D, Pauls M, Lesiuk H, Wells GA : Sensitivity of computed tomography performed within six hours of onset of headache for diagnosis of subarachnoid haemorrhage : prospective cohort study. BMJ (Clinical research ed.) 343 : d4277, 2011
13. Hashimoto Y, Nunomura K, Kihara M, Baba T, Fujishige M, Yamamura A, Nakagawa T, Hashi K : FLAIR Imaging in patient with low grade subarachnoid hemorrhage during the non-acute phase [In Japanese]. Jpn J Neurosurg (Tokyo) 20 : 671-677, 2011