Mystery Case: Terson syndrome on CT head

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Figure 1 Plain CT head and cerebral angiography

CT head demonstrates acute tentorial subdural hemorrhage (A, arrowheads) and crescentic hyperdensities consistent with intraocular blood (B, arrows). Cerebral angiogram before and after coil embolization of right posterior communicating artery aneurysm is shown (C, arrow).

A 36-year-old woman presented with acute severe headache and generalized tonic-clonic seizures. CT head scan revealed a tentorial acute subdural hemorrhage (ASDH) and posterior globe hyperdensities suggestive of intraocular blood with a right posterior communicating artery aneurysm on cerebral angiography (figure 1). Ophthalmologic assessment confirmed Terson syndrome (figure 2).

Terson's¹ original definition of intravitreal hemorrhage (IVH) complicating subarachnoid hemorrhage has broadened to include ASDH with retinal and pre-retinal hemorrhages as well as IVH.² Plain CT head can demonstrate Terson syndrome, which is easily missed and warrants ophthalmologic input.² Significant persisting visual impairment may require vitrectomy with or without laser membranotomy.

AUTHOR CONTRIBUTIONS

Jithin S. George: conception and design of manuscript, acquisition, analysis, and interpretation of data, drafting/revising the manuscript for content, approved the final version. John S. Elston: conception and design of manuscript, analysis and interpretation of data, drafting/revising the manuscript for content, supervision, approved the final version.

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DISCLOSURE

The authors report no disclosures relevant to the manuscript. Go to Neurology.org for full disclosures.

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MYSTERY CASE RESPONSES

The Mystery Case series was initiated by the *Neurology*[®] Resident & Fellow Section to develop the clinical reasoning skills of trainees. Residency programs, medical student preceptors, and individuals were invited to use this Mystery Case as an educational tool. Responses were solicited through a group e-mail sent to the American Academy of Neurology Consortium of Neurology Residents and Fellows and through social media.

Of 18 respondents, 55% correctly identified acute tentorial subdural hemorrhage on noncontrast

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Figure 2 Optomap red-green composite fundus images

Wide-field scanning laser ophthalmoscopy (Optomap; Optos) using adaptive optics produces a digital fundus image by superimposing the 2 en face retinal raster scans from red and green wavelength lasers. The red laser light penetrates the retinal pigment epithelium up to the choroid, whereas green interrogates superficial retinal layers and retinal vessels. There is a large premacular hemorrhage OD (A, black asterisk). A smaller preretinal hemorrhage with a circular outline is present OS (B, white asterisk); the inner limiting membrane (ILM) is visible as a glistening superior border (B, between the 2 white arrows). In vivo optical coherence tomography scans or pathology specimens obtained following laser membranotomy can definitively identify whether the preretinal hemorrhages are sub-ILM or subhyaloid. Intravitreal extension accounts for the indistinct lower section of both fundus images (worse OD). Flame-shaped or arced, confluent retinal hemorrhages arising from the retinal nerve fiber layer are more superficial (B, example of this next to white arrowhead), whereas a dot and blot pattern indicates hemorrhage within deeper retinal layers (A, black arrowhead).

CT head scan, which also revealed bilateral posterior globe hyperdensities suggestive of intraocular blood. Thirty-eight percent said that there was an aneurysm seen on cerebral angiography, but only one respondent correctly identified it as a right posterior communicating artery aneurysm preembolization and postembolization. Wide-field laser ophthalmoscopy (Optomap; Optos, Dunfermline, UK) in figure 2 shows a large premacular hemorrhage of the right eye and smaller preretinal hemorrhage of the left eye. Combined, these findings are consistent with Terson syndrome, classically defined as intraocular hemorrhage associated with

subarachnoid hemorrhage, the correct answer given by 44% of respondents. Terson syndrome is thought to be caused by a rapid spike in intracranial pressure and has also been reported in patients with intracerebral hemorrhage and traumatic brain injury.

This case illustrates the importance of considering intraocular hemorrhage in patients with acute rises in intracranial pressure and that in some cases the diagnosis can be aided by signs present on head CT.

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