PHOTO ESSAY

“Peering at the Tip of the Nose” as a Sign of Thalamic Haemorrhage

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ABSTRACT

A 76-year-old female presented with sudden onset of left hemiplegia and hemianaesthesia. Examination revealed tonic downward deviation of both eyes and esodeviation of the left eye, with no upgaze beyond midline and mild abduction deficits bilaterally. Bilateral ptosis was seen, reflecting partial levator dehiscence compounded by pseudoptosis due to the depressed position of the eyes. “Peering at the tip of the nose” sign, reflecting acute downward and esodeviation of the eyes, is highly suggestive of thalamic haemorrhage. It is thought to reflect damage to the mesodiencephalic junction, which contains structures important for vertical gaze and vergence. Awareness of this sign may assist clinicians with the correct anatomical localisation of stroke in patients who present with thalamic haemorrhage.

Keywords: Eye movements, neuro-ophthalmology, thalamic haemorrhage

CASE REPORT

A 76-year-old female presented with sudden onset of left hemiplegia and hemianaesthesia. She had a background history of chronic obstructive pulmonary disease, hypertension, and osteoporosis. She was an active smoker with a 100-pack-year smoking history. Her only medication was aspirin. On arrival to hospital she was hypertensive, but other vital signs were within normal limits. She was alert and oriented. Speech was severely dysarthric but content and comprehension were normal. She had a 0/5 left hemiplegia involving the face, arm, and leg. There was absent sensation to all modalities on the left. Neuro-ophthalmological examination revealed tonic downward deviation of both eyes and esodeviation of the left eye, with no upgaze beyond midline and mild abduction deficits bilaterally. Bilateral ptosis was seen with absent lid creases, reflecting partial levator dehiscence compounded by pseudoptosis due to the depressed position of the eyes (Figure 1). Pupils were miotic and minimally responsive to light. Funduscopy was unremarkable. An unenhanced

computed tomography (CT) of the brain was performed and revealed an area of acute intracerebral haemorrhage centred on the right thalamus and posterior limb of the internal capsule measuring 28 × 23 × 27 mm (Figure 2).

The patient had magnetic resonance imaging (MRI) 2 days later that confirmed the finding on CT and also showed innumerable foci of susceptibility artefact in the cerebral hemispheres and posterior fossa, in keeping with amyloid angiopathy.

The patient remained severely disabled a week after her stroke, and a decision was made to palliate her. The forced downward and inward deviation of the eyes had improved by this time, but she still had a complete upgazy palsy.

DISCUSSION

“Peering at the tip of the nose” sign reflecting acute downward and medial deviation of the eyes is highly suggestive of thalamic haemorrhage.¹ Thalamic haemorrhage may cause a wide variety of

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FIGURE 1 Centre image shows the eyes in primary position. There is bilateral blepharoptosis with absent lid creases associated with forced downward deviation and esodeviation of the left eye. Examination of ocular motility shows loss of upgaze and mild bilateral abduction deficits.

FIGURE 2 Unenhanced CT of the brain showing $28 \times 23 \times 27$ mm haemorrhage centred on the right thalamus and extending into the posterior limb of the internal capsule.

neurological signs, including contralateral hemiparesis, contralateral hemisensory loss, aphasia, movement disorders, abulia, stupor, and inattention. Neuro-ophthalmological manifestations of thalamic stroke are common and include oculomotor disturbances in both the vertical and horizontal planes, homonymous field defects, visual neglect, and pupillary abnormalities. Oculomotor abnormalities are extremely varied according to the location of the lesion. They most often occur as a result of extension to or compression of the mesencephalic-diencephalic junction or adjacent dorsal midbrain. Autopsy studies have confirmed that haemorrhages that appear to be confined to the thalamus radiologically may often show involvement of the midbrain on pathological examination.² This would be in keeping with many of the oculomotor abnormalities seen in these patients that overlap considerably with classical pretectal syndromes.

Recognised patterns of oculomotor abnormality include paralysis of upward gaze, forced downward

deviation with or without medial deviation, impaired abduction (pseudoabducens palsy), acute esotropia without forced downgaze, paralysis of convergence, conjugate horizontal gaze deviation away from the lesion side ("wrong-way eyes"), and skew deviation.³ Our patient exhibited forced downward deviation of the eyes with associated medial deviation of the left eye in keeping with the "peering at the tip of the nose" sign. Although peering at the tip of the nose is most frequently associated with thalamic haemorrhage, there have been several published cases of this sign in patients with lesions centred on other nearby structures, including the midbrain and the pons.^{4,5}

Peering at the tip of the nose is clinically recognised as a combination of forced downward deviation and convergence, often with abduction deficits (pseudoabducens palsy). This combination of abnormalities is believed to be a result of damage to the mesencephalic-diencephalic junction, which contains structures important for vertical gaze

and vergence.² The paramedian thalamus contains descending inhibitory cortical pathways for convergence. These pathways extend to contralateral vergence neurons in the midbrain, which then project to the ipsilateral oculomotor medial rectus subnuclei. It then follows that damage to this area may result in loss of convergence inhibition, or conversely act as a direct irritative stimulus on convergence neurons, leading to forced inward deviation of the eyes and impaired abduction.⁶ Forced downward deviation in thalamic haemorrhage may reflect damage to any number of structures crucial for normal vertical gaze. The interstitial nucleus of Cajal, the mesencephalic reticular formation, the posterior commissure, and rostral interstitial nucleus of the medial longitudinal fasciculus are all located around the mesencephalic-diencephalic junction.² Damage to any of these structures may disturb the normal position of the eyes in the vertical plane and impair active vertical eye movements. Interestingly, forced downward deviation is often transient, and is reported to resolve after treatment of raised intracranial pressure. It can then potentially be inferred that it is the result of hydrocephalus or traction on mesencephalic structures that cause the sign.⁷

The “peering at the tip of the nose” sign is a reliable clue to the presence of a lesion located around the mesodiencephalic junction, most commonly a thalamic haemorrhage. Clinicians may have difficulty with anatomical localisation of thalamic haemorrhage if they are not aware of this sign. It also provides a useful clinico-anatomical demonstration of

the complexity of maintenance of normal ocular position.

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REFERENCES

- [1] Kumral E, Kocaer T, Ertübey NO, Kumral K. Thalamic hemorrhage. A prospective study of 100 patients. *Stroke* 1995;26:964–970.
- [2] Choi KD, Jung DS, Kim JS. Specificity of “peering at the tip of the nose” for a diagnosis of thalamic hemorrhage. *Arch Neurol* 2004;61:417–422.
- [3] Miller NR, Newman NJ, Bioussé V, Kerrison JB, editors. *Walsh & Hoyt’s Clinical Neuro-Ophthalmology*. 6th ed. Philadelphia: Lippincott Williams & Wilkins; 2005.
- [4] Pullicino PM, Wong EH. Tonic downward and inward ocular deviation ipsilateral to pontine tegmental haemorrhage. *Cerebrovasc Dis* 2000;10:327–329.
- [5] Fisher CM. The pathologic and clinical aspects of thalamic haemorrhage. *Trans Am Neurol Assoc* 1959;84:56–59.
- [6] Pullicino P, Lincoff N, Truax BT. Abnormal vergence with upper brainstem infarcts: pseudoabducens palsy. *Neurology* 2000;55:352–358.
- [7] Leigh RJ, Zee DS. *The Neurology of Eye Movements*. 4th ed. New York: Oxford University Press; 2004.