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Abstract:

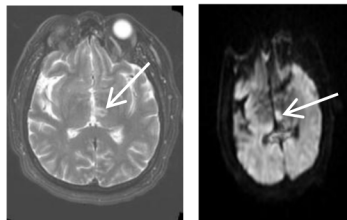
Background and aims: Eye movement abnormalities associated with midbrain thalamic junction infarcts are not well understood. Involvement of the midbrain may result in vertical gaze palsy or partial third nerve palsy. However, these findings have rarely been reported in paramedian thalamic infarcts. **Methods:** We performed a retrospective chart review of two cases of paramedian thalamic infarcts presenting with isolated or predominant abnormal eye movements. **Results:** The first patient was a 54 year-old female who presented with an acute onset of expressive aphasia and vertical gaze palsy. Neurological examination revealed vertical gaze palsy, abnormal convergence and mild expressive aphasia. Expressive aphasia resolved after Recombinant Tissue Plasminogen Activator (rt-PA) administration. However, her ocular findings persisted. Magnetic Resonance Imaging (MRI) of the brain showed an acute left paramedian thalamic infarct. The second patient was a 42 year-old female who presented with a 2 day-history of acute onset of decreased visual acuity of the right eye as well as inability to adduct the right eye. Neurological examination revealed right medial rectus palsy, right eyelid ptosis, mildly enlarged and poorly reactive right pupil and mild hypotropia of the left eye. MRI of the brain showed an acute right paramedian thalamic infarct with small extension to the upper right midbrain. **Conclusions:** We reported two cases of thalamic midbrain junction infarcts with different rare ocular manifestations. Strokes of this area should be considered in patients presenting with acute onset of vertical gaze palsy or partial third nerve palsy.

Case 1:

- Case 1 was a 54 year-old female with a past medical history of hypertension, diabetes mellitus and hyperlipidemia who presented to the emergency room with an acute onset of expressive aphasia and double vision.
- Neurological examination revealed expressive aphasia, mild right sided weakness, and right facial droop.
- Ophthalmological examination revealed vertical gaze palsy and difficulty with convergence in the left more than right eye.
- National Institute of Health Stroke Scale (NIHSS) at first evaluation was 9.

Hospital course:

- After treating her hyperglycemia, patient received Recombinant Tissue Plasminogen Activator (rt-PA).
- She spent a day in the Intensive Care Unit (ICU) as a routine post rt-PA care. She was then transferred to a stroke step down unit. Her expressive aphasia and right sided weakness improved before discharge. However, her ocular findings persisted. NIHSS at discharge was 3.
- Magnetic Resonance Imaging (MRI) of the brain showed an acute left paramedian thalamic infarct.
- The rest of the stroke work up including MR angiogram and transthoracic echo were negative.
- Her stroke was determined to be lacunar in etiology.

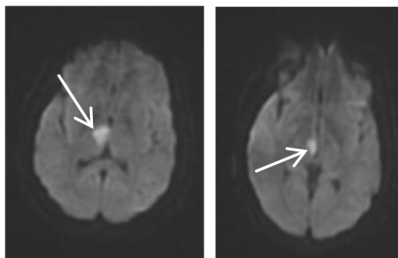


Radiologic findings in Case 1:

- MRI DWI sequence on the left showing hyperintensity in the left paramedian thalamus suggestive of acute ischemic stroke.
- MRI T2 sequence on the right showing mild hyperintensity in the same area.

Case 2:

- Case 2 was a 42 year-old female with a past medical history of diabetes mellitus and hypertension who presented to the hospital with a two day history of acute onset of decreased vision in the right eye.
- Neurological examination revealed right medial rectus palsy, right eyelid ptosis, mildly enlarged and poorly reactive right pupil and mild left eye hypotropia.
- MRI of the brain showed an acute right paramedian thalamic infarct with a small extension into the right upper midbrain.
- The rest of stroke work up was negative.
- The acute ischemic stroke was determined to be lacunar in etiology.



Radiologic findings of the second case:

MRI of the brain DWI sequence showing acute infarct in the right paramedian thalamic area with small extension into the right upper midbrain.

Case discussion and literature review:

- Lesions of the midbrain are known to result in various abnormal eye movements such as third nerve or vertical gaze palsies.
- Lesions of various nuclei in the brain stem such as oculomotor nuclei may result in third nerve palsy.
- Mesencephalic reticular formation lesions including the nucleus of Darkschewitsch, the rostral interstitial medial longitudinal fasciculus, the interstitial nucleus of Cajal, and the posterior commissure are known to produce vertical gaze palsies.
- We reported two different cases of abnormal eye movements related to the paramedian thalamic infarct.
- The first one presented with abnormal convergence and vertical gaze palsy. The second one presented with partial third nerve palsy.
- In one large series of paramedian thalamic infarcts, somnolence and hemisymphromes were the most common manifestations. However, third nerve palsy and vertical gaze palsy were also common (53% and 39%, respectively). This series included patients with large vessel disease also and some with basilar stenosis. Unlike our patients who had lacunar infarcts.
- The inferomedial (posterior thalamoperforating artery) territory is usually involved in the stroke.
- Acute ischemic stroke of the paramedian thalamus could be related to various subtypes such as cardioembolic, large vessel disease, or lacunar infarcts. Both of our patients had the lacunar subtype.

Conclusions:

- Stroke of the paramedian thalamic area should be considered in the differential diagnosis for abnormal eye movements; especially of acute onset. Recognition of subtle findings such as abnormal convergence or vertical gaze palsy may be an early sign for life threatening emergency such as basilar artery occlusion.

References:

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