906-4
Multiple Sclerosis
Eye Movements

Transient spontaneous primary position upbeat nystagmus with lid nystagmus
Rapid bursts of horizontal square wave oscillations opening her eyes to fix on a target.
Horizontal gaze evoked rotary (torsional) nystagmus

(Rotation of the globe is best seen by observing conjunctival blood vessels).
Eye Movements

Gaze evoked unsustained *upbeat* nystagmus

Saccadic pursuit except on downgaze

Saccadic Dysmetria

Hypermetria left gaze to center.
Clinical Features of Upbeat Nystagmus

Box 10–3. Clinical Features of Upbeat Nystagmus

- Present in center position; usually increases on looking up
- Slow phases may have linear-, increasing-, or decreasing-velocity waveforms
- Poorly suppressed by visual fixation of a distant target
- Convergence may increase, suppress or convert to downbeat nystagmus
- Associated with abnormal vertical vestibular and smooth-pursuit responses, and saccadic intrusions (square-wave jerks) that produce a bow-tie nystagmus

See also: Pathogenesis of Central Vestibular Nystagmus. For recorded examples, see Fig. 10-3. For etiologies, see Table 10-2. (Related Video Display: Downbeat nystagmus, Upbeat, Torsional Nystagmus)
Upbeat Nystagmus

Localizes to the **Caudal Medulla** with lesion affecting the

Perihypoglossal group of nuclei including

- nucleus intercalatus
- nucleus of Roller
- nucleus of pararaphailes
Upbeat Nystagmus

More rostral brainstem lesions may interrupt the ventral tegmental tract containing projections from the vestibular nuclei that receive inputs from the anterior semicircular canal

or

Involve the brachium conjunctivum in the rostral pons and Medulla.
## Etiology of Upbeat Nystagmus

<table>
<thead>
<tr>
<th>Etiology</th>
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<tbody>
<tr>
<td>Infarction of medulla(^{57,114,329,365,390,496,671}) or cerebellum and superior cerebellar peduncle(^{78,742})</td>
</tr>
<tr>
<td>Wernicke’s encephalopathy(^{130,239,381,685a,744})</td>
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<tr>
<td>Multiple sclerosis(^{239,481,516})</td>
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<td>Tumors of the medulla,(^{239,290}) cerebellum,(^{219,678}) or midbrain(^{200,680})</td>
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<tr>
<td>Cerebellar degenerations(^{241,242}) or anomalies(^{527a})</td>
</tr>
<tr>
<td>Brainstem encephalitis(^{238})</td>
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<tr>
<td>Creutzfeldt–Jacob disease(^{742a})</td>
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<td>Behcet’s syndrome(^{351})</td>
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<td>Meningitis(^{323})</td>
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<tr>
<td>Leber’s congenital amaurostis and other congenital disorders of the anterior visual pathways(^{382})</td>
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<tr>
<td>Thalamic arteriovenous malformation(^{510})</td>
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<tr>
<td>Congenital(^{636})</td>
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<tr>
<td>Organophosphate poisoning(^{366})</td>
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<td>Tobacco(^{627})</td>
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<td>Associated with middle ear disease(^{379})</td>
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<td>Transient finding in infants(^{342})</td>
</tr>
</tbody>
</table>

Clinical Features of Torsional Nystagmus

Box 10-4. Clinical Features of Torsional Nystagmus

- Torsional jerk nystagmus (minimal vertical or horizontal components) present with eye close to central position
- Slow phases may have linear-, increasing-, or decreasing-velocity waveforms
- Poorly suppressed by visual fixation of a distant target
- Exacerbated by changes in head position or vigorous head shaking
- May be suppressed by convergence
- Often occurs in association with ocular tilt reaction or unilateral internuclear ophthalmoplegia
- May be precipitated or modulated by vertical smooth pursuit movements

See also: Pathogenesis of Central Vestibular Nystagmus, in Chapter 10. For etiologies, see Table 10-3. (Related Video Display: Downbeat nystagmus, Upbeat, Torsional Nystagmus)
Figure 1 Series of sagittal and axial FLAIR scans show classical callosoptal and deep periventricular foci of increased signal intensity surrounding cavatating areas in this patient with long standing MS.
Neuroimaging

Note perpendicular orientation towards the ventricle classic for “Dawson fingers”

Note a small foci in the pons

Courtesy of Anne Osborn, M.D.
References


References
