

Diplopia

Summary from Rosen's By Andrew Fredericks

Epidemiology

- Represents 1.4% of ophthalmologic emergencies
- Majority are binocular w/ Cranial Nerve palsies being most common cause

Pathophysiology

- Monocular diplopia: double visions that persists when the other eye is closed is related to distortions in the light path
- Binocular diplopia: double vision that results when either eye is closed is the result of misalignment in the visual axes with many causes—CNs, intra/supranuclear lesions in brainstem or above

Differential Diagnosis

- Critical: Basilar artery thrombosis, Botulism, Basilar meningitis, Aneurysm
- Emergent: Vertebral dissection, Myasthenia Gravis, Wernicke's encephalopathy, Orbital apex syndrome
- Urgent: Brainstem tumor, Miller-Fisher syndrome, Multiple sclerosis, Thyroid myopathy, Ophthalmoplegic migraine, Ischemic neuropathy, Orbital myositis, pseudotumor, Orbital apex mass

Signs and Symptoms

- Double Vision
- Monocular: diplopia resolves when pinhole is used, persists in affected eye when normal eye closed
- Restrictive, mechanical orbitopathy: gradual onset, sensations of mass effect/pain, fever if infectious, Graves' suggested w/ worse diplopia in morning, proptosis swelling, edema, hyperemia, palpebral swelling, abruptly restrict eye movement away from the muscle
- Neuroaxial process: can be sudden, vertical diplopia w/out vertical skew deviation suggest brainstem lesion
- Neuromuscular disorder: atrophy or weakness, weakness on forced eyelid closure normal reflexes and no sensory deficits

Work-up

- Neuro Exam w/ special attention to CNs,
- Pupillary and facial examination for signs of pupillary asymmetry, ptosis, lid lag, conjunctival injection or chemosis, periorbital swelling, or proptosis and assessment of overall head positioning
- Use questions below to narrow down dx:
 - 1. Is the diplopia monocular?
 - 2. Is the binocular diplopia a result of a restrictive, mechanical orbitopathy?
 - 3. Is the binocular diplopia a result of a palsy of the oculomotor CNs (III, IV, or VI) in a single eye?
 - 4. Is the binocular diplopia a result of a neuroaxial process involving the brainstem and related CNs?
 - 5. Is the binocular diplopia a result of a neuromuscular disorder?
- Monocular: Slit Lamp, Ophtho consult/referral
- Neuromuscular process: Ice Test, Edrophonium challenge
- Restrictive mechanical orbitopathy (myositis, tumor, orbital inflammatory,): Contrast-Enhanced MRI or CT of Orbits
- Isolated CN palsies: MRA/CTA/DSA brain, Contrast MRI/CT of orbits +/- Brain
- Consider LP for meningitis and Miller-Fisher Syndrome

Empiric Management

- Little primary treatment beyond addressing the primary disorder
- Signs of stroke: IV Fluid Bolus, Stroke evaluation
- Signs of infection: empiric abx pending CT, LP and confirmation of infection
- Signs of Wernicke's: Administer Thiamine

Disposition

- Typically requires admission for further w/u and tx of underlying disorder
- CN II and CN VI palsy from microvascular ischemia is generally self-limited w/ complete resolution in a few days in 95% of patients. They can be discharged home with close outpatient f/u