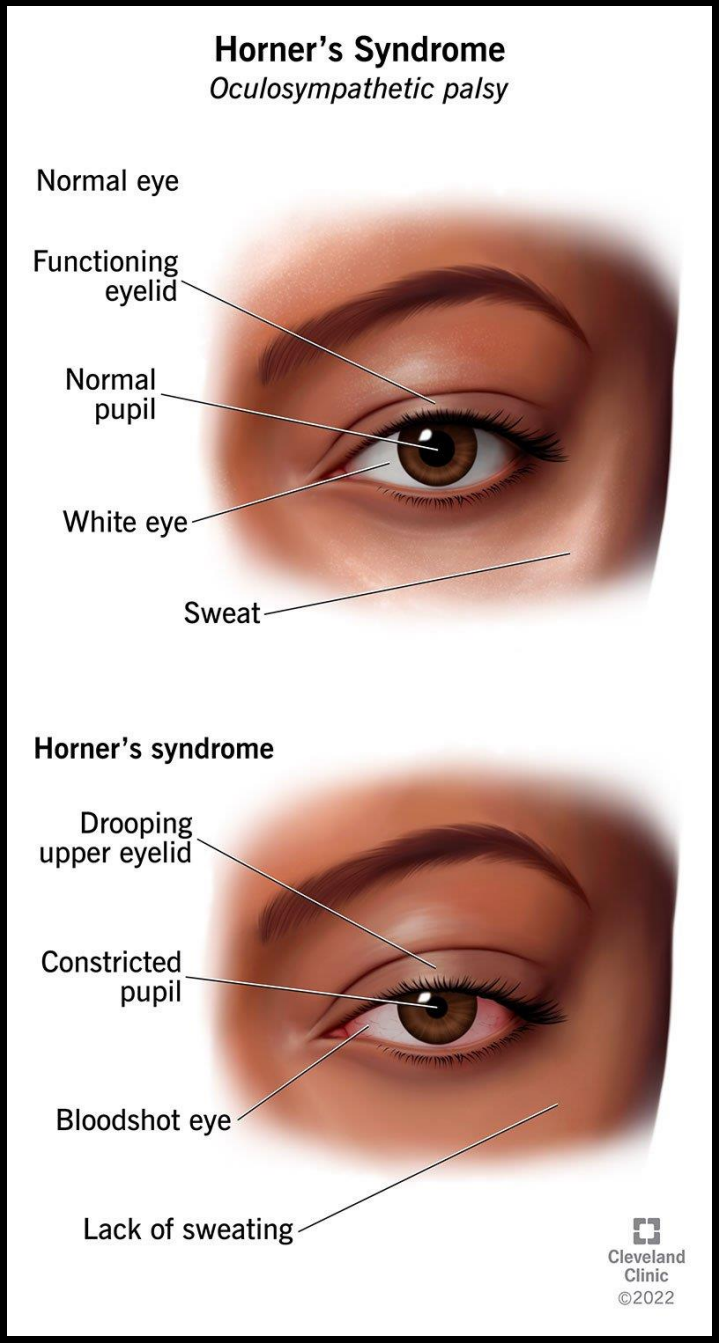
Presentation

- Ipsilateral
  - Enophthalmos -Posterior displacement of the globe
  - Ptosis - drooping of the upper eyelid.
  - Pupillary miosis - small or constricted pupils
  - Facial anhidrosis - loss of sweating
- Due to disruption at some point of the oculosympathetic pathway.
- Ptosis
  - Due to interruption of the sympathetic motor innervation of the superior tarsal muscle which is a small muscle composed of smooth muscle fibers intimately associated with the undersurface of levator palpebrae superioris muscle.
- Muscle inserts into the tarsal plate of the upper eyelid and controls eyelid elevation and retraction


Horner's Syndrome
Oculosympathetic palsy
Normal eye
Functioning eyelid
Normal pupil
White eye
Sweat
Horner's syndrome
Drooping upper eyelid
Constricted pupil
Bloodshot eye
Lack of sweating
Cleveland Clinic
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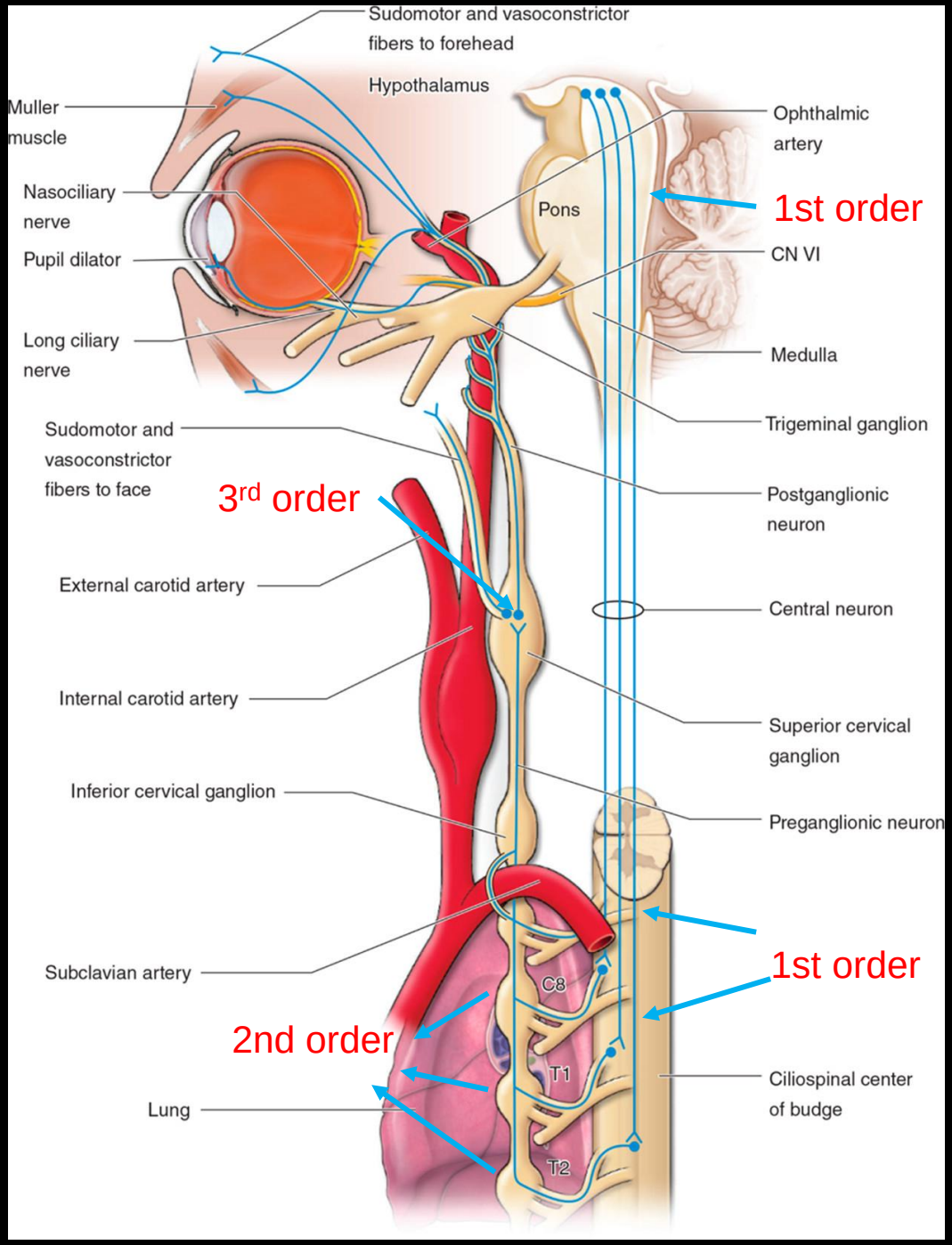
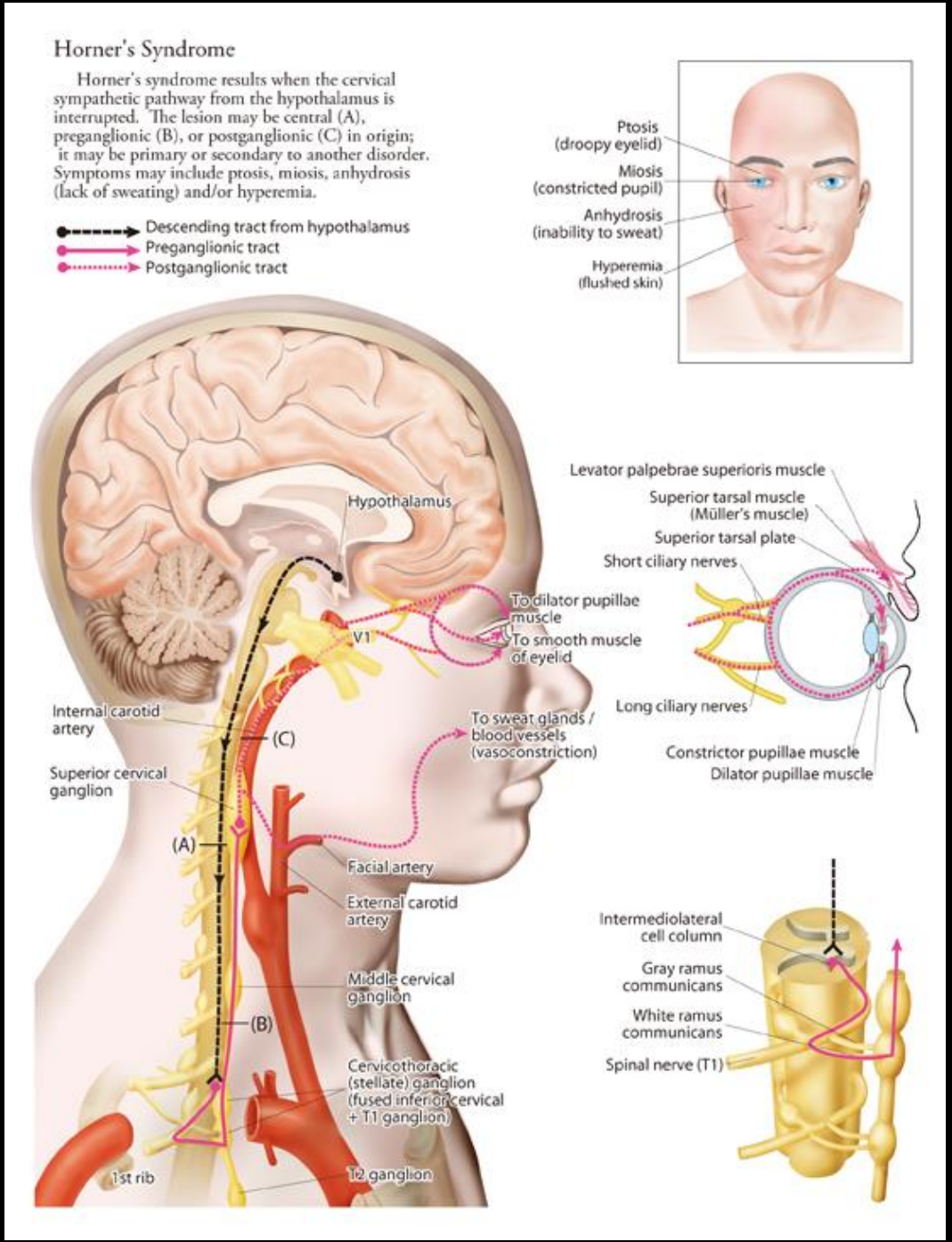
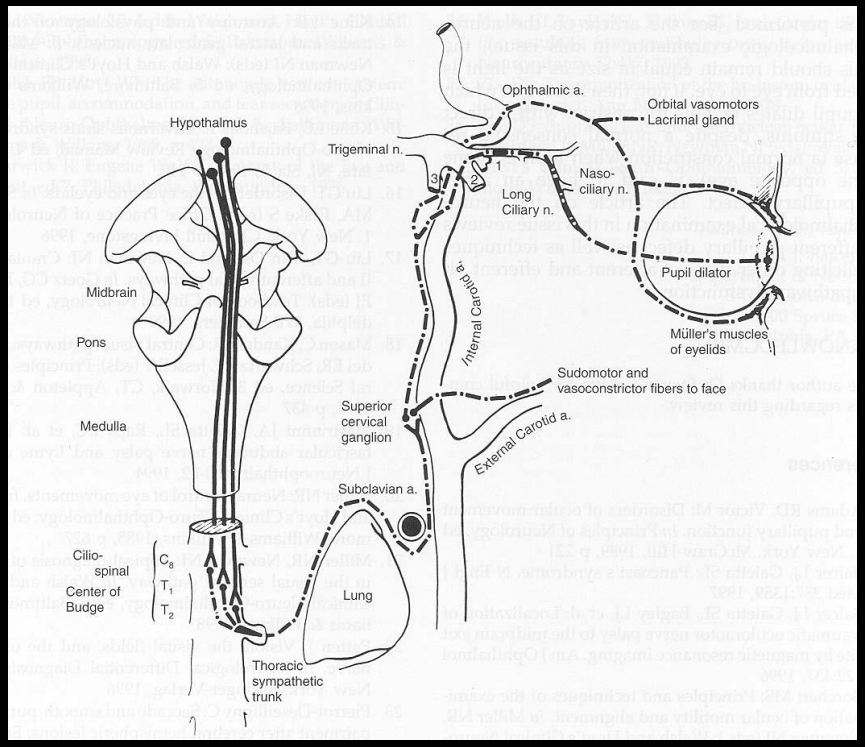
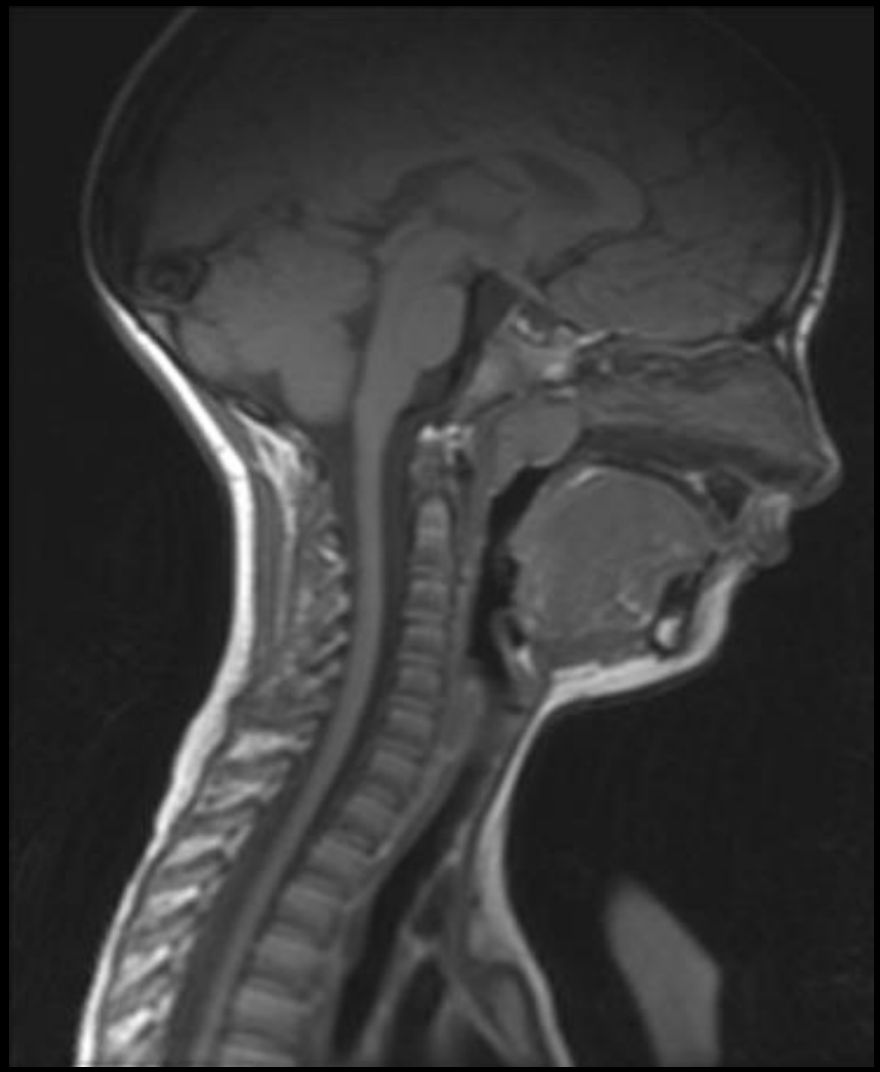

Sudomotor and vasoconstrictor fibers to forehead
Hypothalamus
Muller muscle
Nasociliary nerve
Pupil dilator
Long ciliary nerve
Ophthalmic artery
Pons
1st order
CN VI
Medulla
Trigeminal ganglion
Sudomotor and vasoconstrictor fibers to face
3rd order
Postganglionic neuron
External carotid artery
Central neuron
Internal carotid artery
Superior cervical ganglion
Inferior cervical ganglion
Preganglionic neuron
Subclavian artery
1st order
C8
2nd order
T1
Lung
Ciliospinal center of budge
T2

- Central (A):
  - Involves the first order neuron that starts in the hypothalamus and descends down the brainstem to the level between C8 and T2
- Preganglionic (B):
  - Involves the second order neuron that passes from the brainstem to the superior cervical ganglion in the neck
- Postganglionic (C):
  - Involves the third order neuron that ascends along the internal carotid artery to enter the cavernous sinus, where it joins the ophthalmic division of the trigeminal nerve



Horner Syndrome:
Imaging of the Sympathetic Pathways

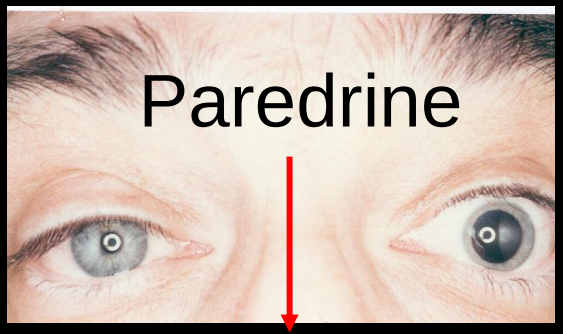


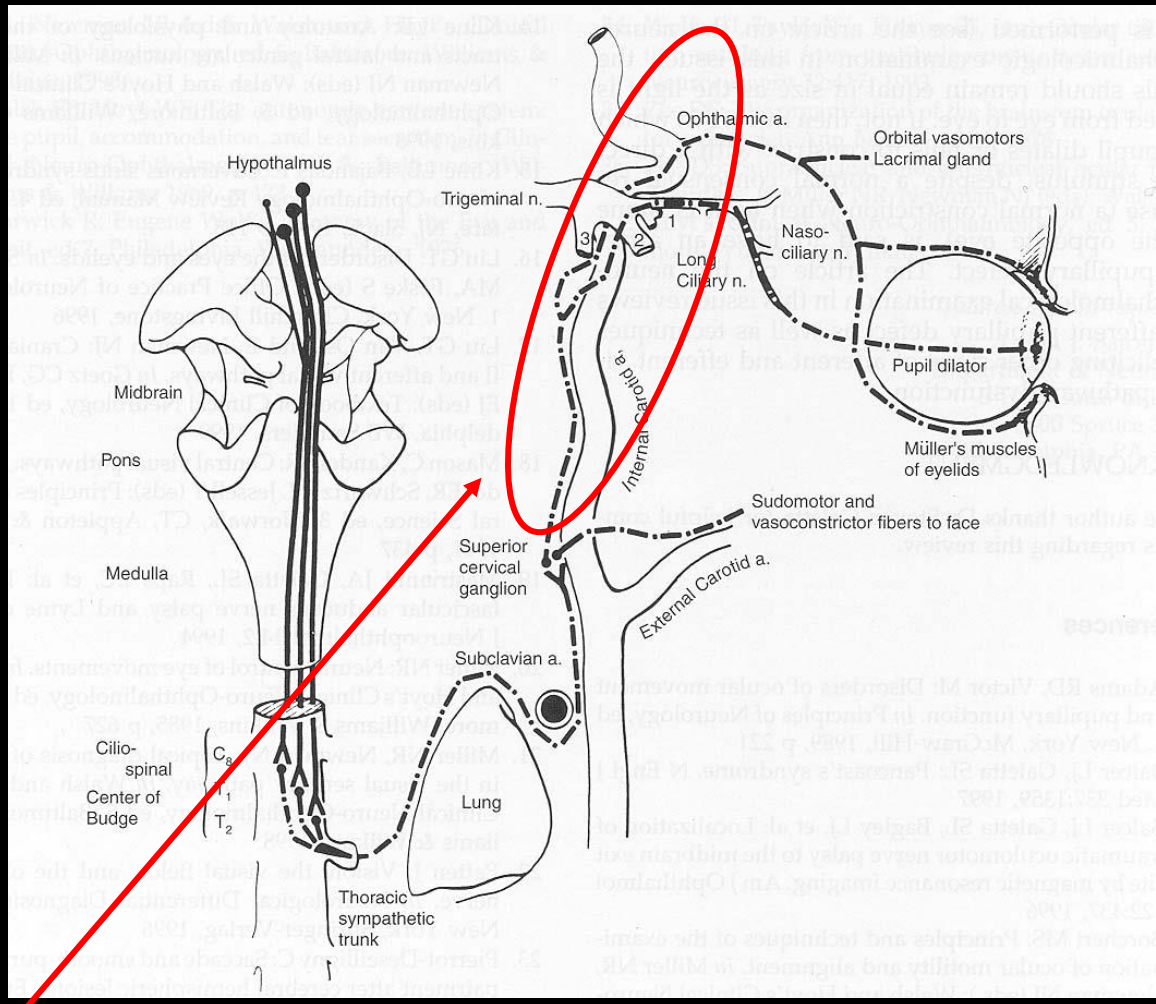


Etiology

- Brainstem stroke or tumor or syrinx of the preganglionic neuron – In one study, 33% of patients with brainstem lesions demonstrated Horner syndrome
- Trauma to the brachial plexus
- Tumors (eg, Pancoast) or infection of the lung apex
- Lesion of the postganglionic neuron Dissecting carotid aneurysm – In one study, 44% of patients with internal extracranial carotid artery dissections had painful Horner syndrome, which remained isolated in half the cases
- Carotid artery ischemia
- Migraine
- Middle cranial fossa neoplasm
- Multiple sclerosis

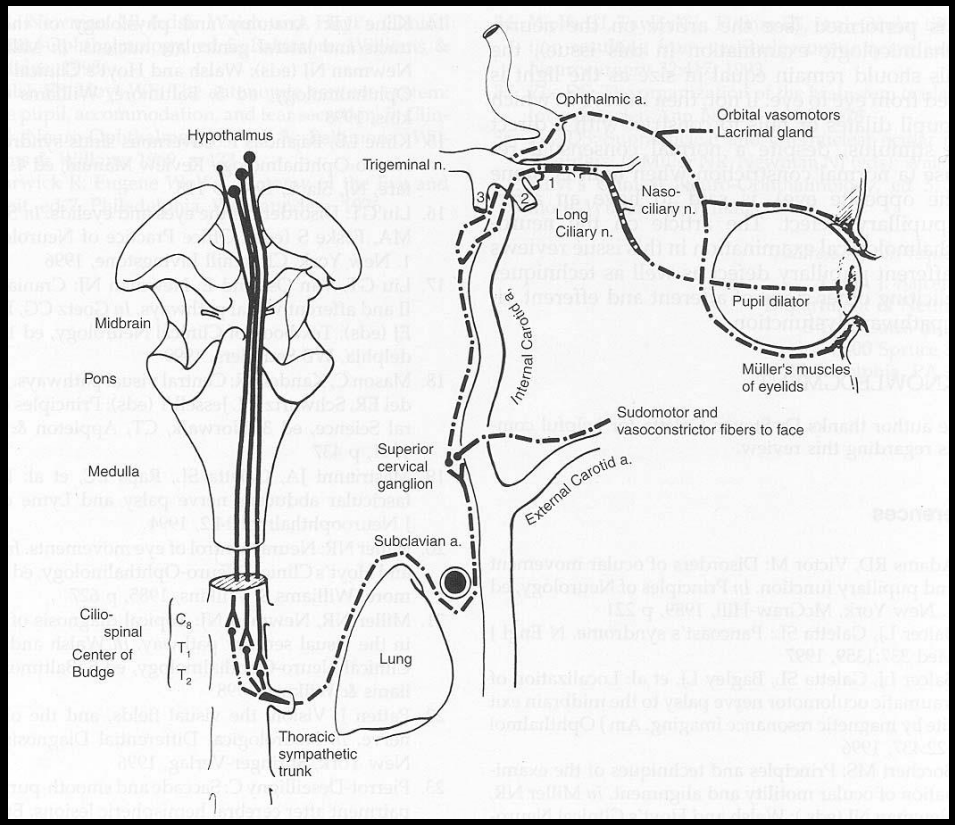
Horner Syndrome Localization





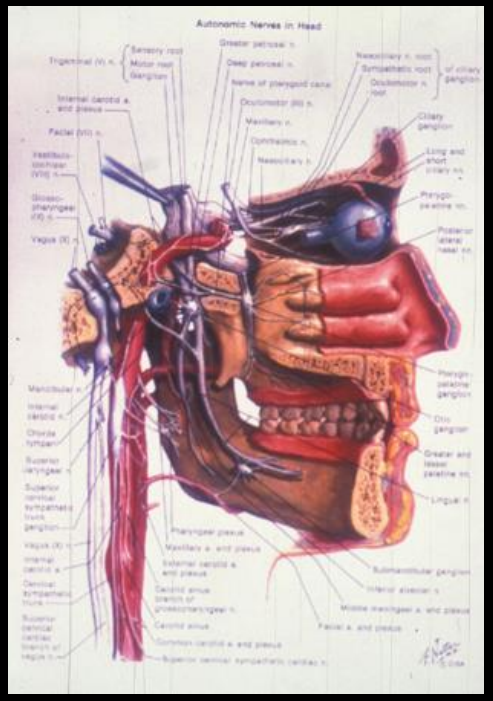
Horner Syndrome Imaging

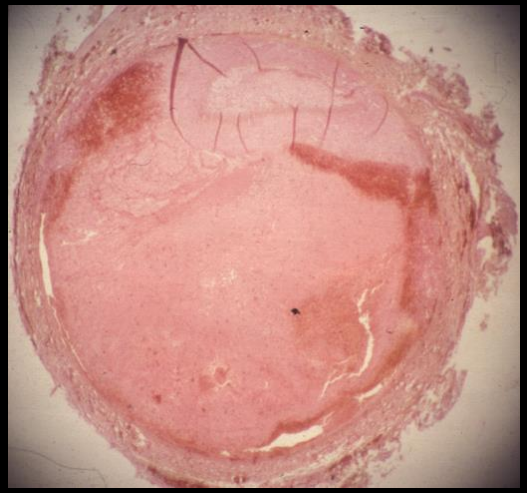
- Based on localization:
  - 3rd order
  - 1st or 2nd order
  - Don't know

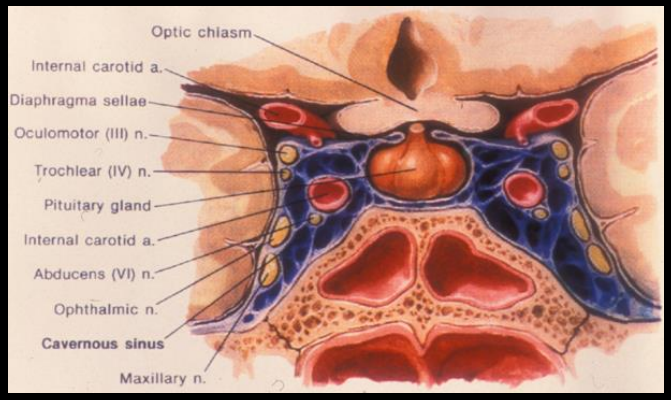


Painful acute Horner syndrome Third order

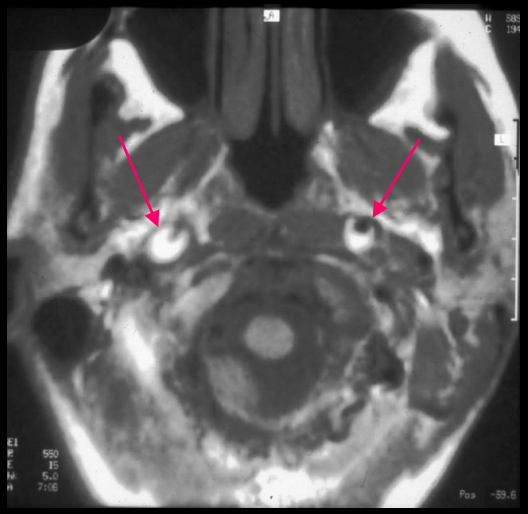
- Internal carotid artery dissection
- Cavernous sinus aneurysm

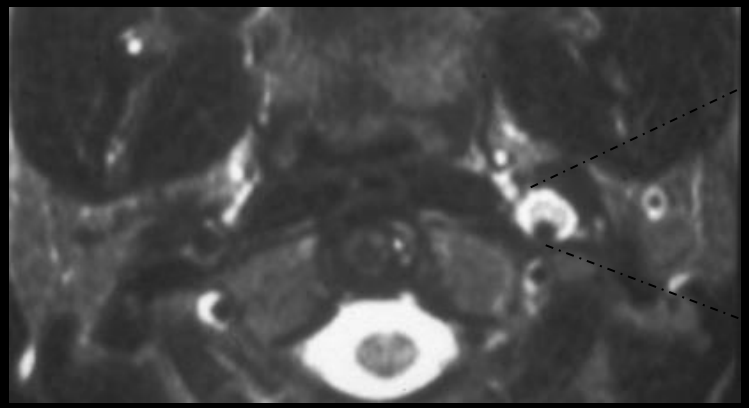


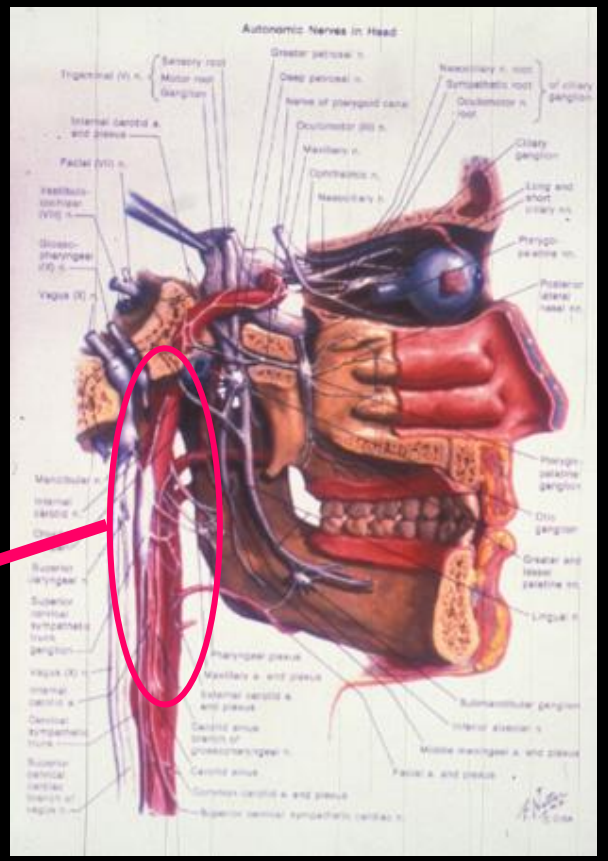




Painful acute Horner syndrome
Third order

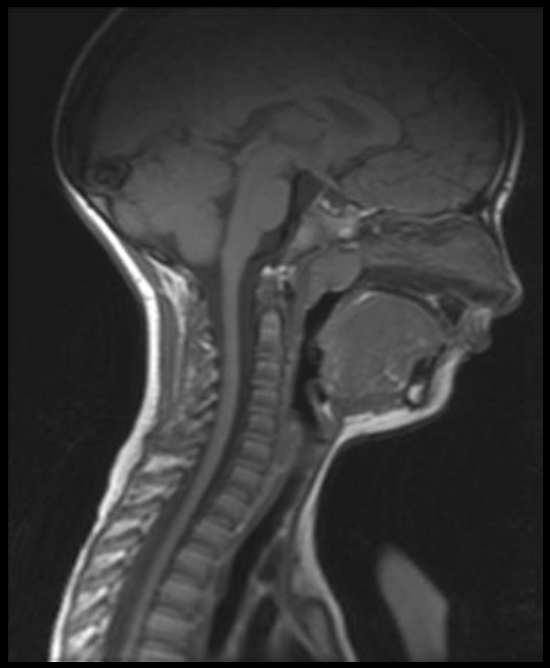


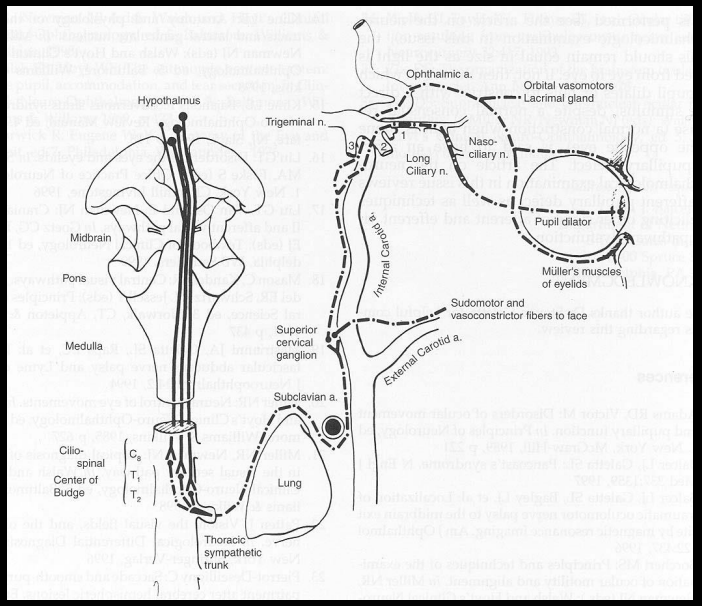




Horner syndrome

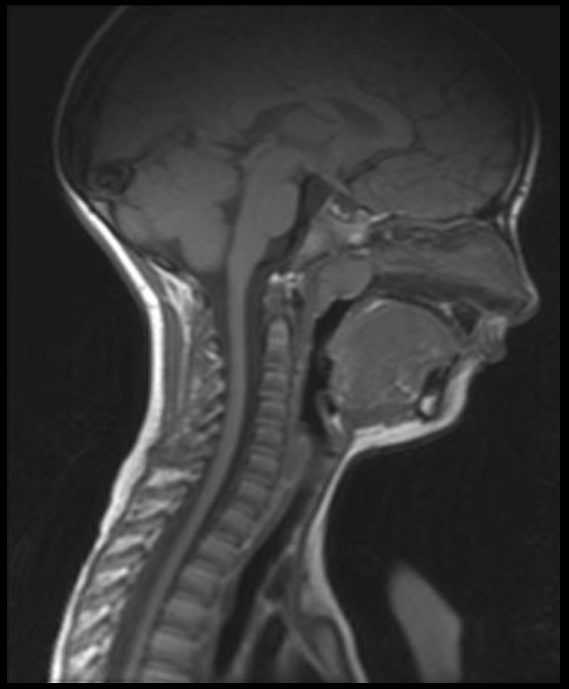
- 3rd order:
  - MRI brain and orbits with gadolinium
    - Down to the jaw
  - MRA head and neck
  - May need neck MRI

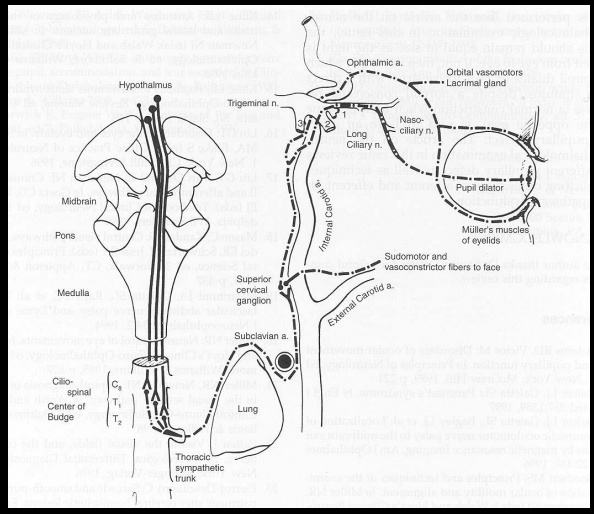




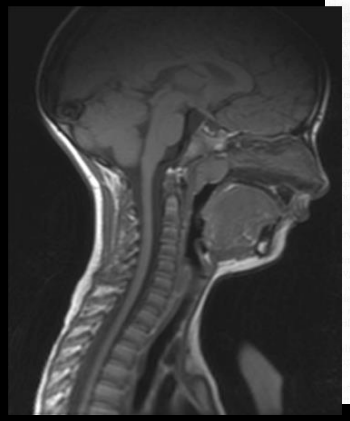
Horner syndrome

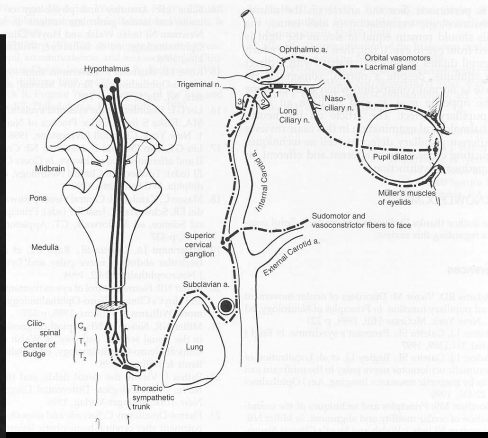
- 1st or 2nd order:
  - MRI brain with gadolinium
  - MRI cervical spine with gad
  - May need MRA aortic arch and neck
  - May need MRI neck and pulmonary apex
  - Chest X-Ray
  - **CTA of aortic arch and neck**





Horner syndrome





- <u>You don't know where:</u>
  - **MRI brain and orbits with gadolinium**
  - MRA head and neck
  - MRI cervical spine with gad
  - May need MRA aortic arch and neck
  - May need MRI neck and pulmonary apex
  - Chest X-Ray
  - **CTA of aortic arch and neck**