

CAVERNOUS SINUS SYNDROMES

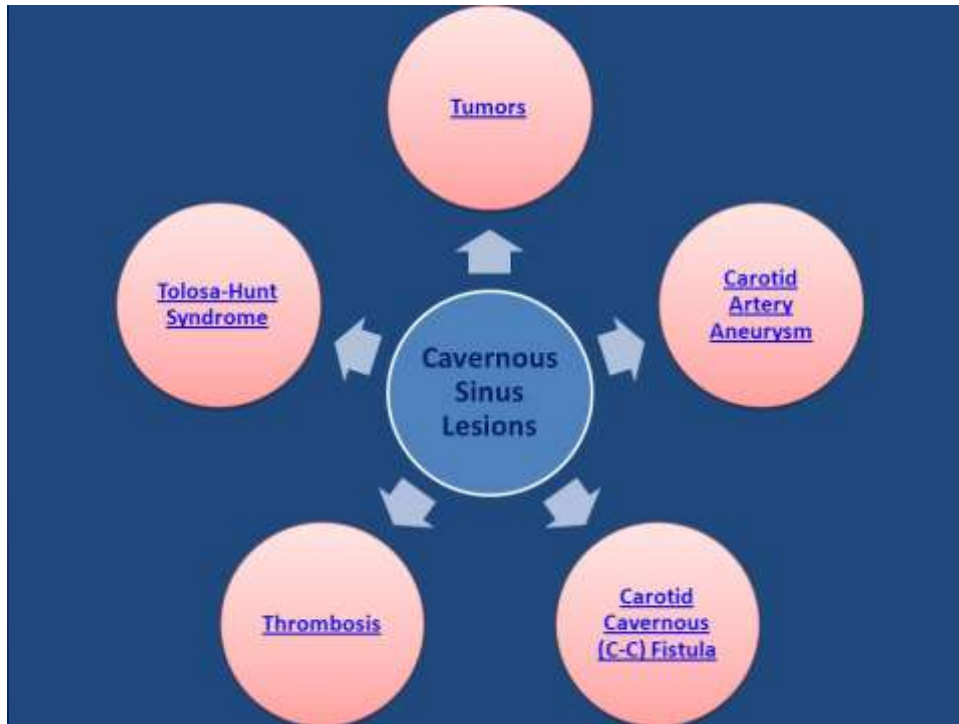
Ashraf Desouky

- The cavernous sinus is the main venous drainage of the eye and orbit encompassing all the ocular motor nerves, the trigeminal nerve, and the sympathetic supply and the internal carotid artery.

Background

- Cavernous sinus syndrome describes symptoms comprising ophthalmoplegia, chemosis, proptosis, Horner syndrome, and/or trigeminal sensory loss evoked by vascular, inflammatory, traumatic, infection, or neoplastic processes affecting the cavernous sinus.





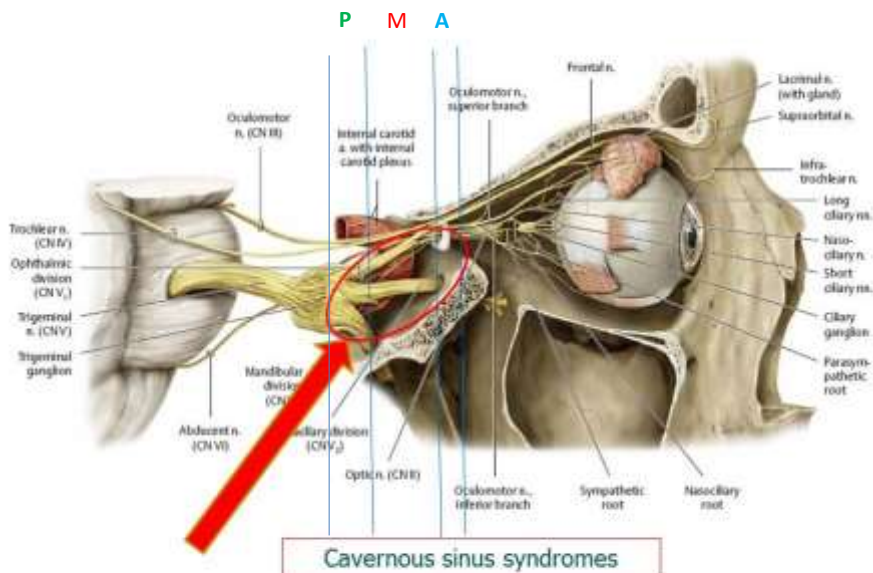
- Pain is frequent but not invariable.
- Visual loss may or may not be present
- Sensory loss may involve the ophthalmic division alone, or the ophthalmic and maxillary divisions or the three divisions.
- This is why we used the term syndrome **S**

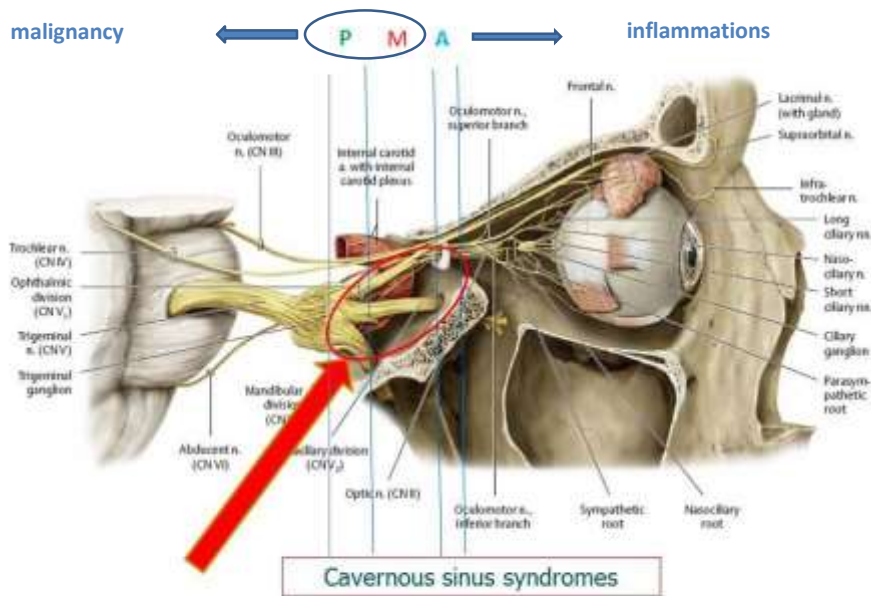
According to 5th CN affection

Anterior CSS the **ophthalmic D**

Middle CSS the **ophthalmic and maxillary D**

Posterior CSS the **three divisions**





Clinical Presentation

- **History**
- The signs and symptoms frequently found in patients with cavernous sinus lesions include visual loss, proptosis, ocular and conjunctival congestion, elevation of ocular pressure, ophthalmoplegia, and pain. Various combinations of these symptoms may occur, which generally are unilateral but may be bilateral with neoplastic processes.

Cavernous sinus tumors

Metastatic tumors

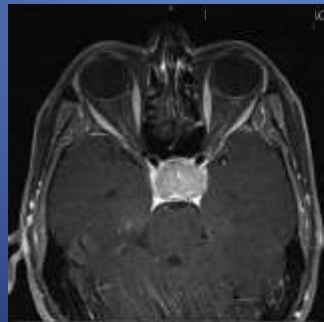
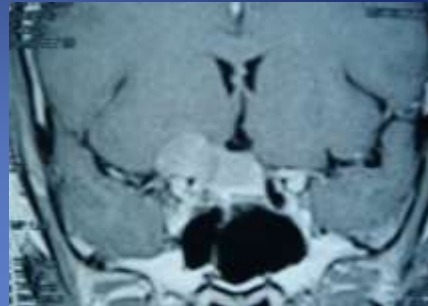
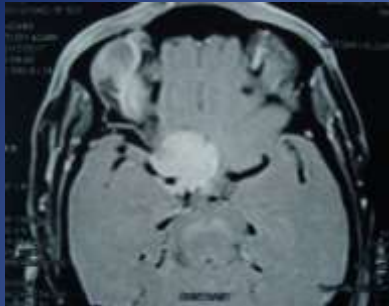
- Breast
- Prostate
- Lung

Localized spread of tumor

- Nasopharyngeal
- Pituitary

Primary intracranial tumors

- Meningiomas
- Neurofibromas
- Chondromas (less common)
- Lymphomas



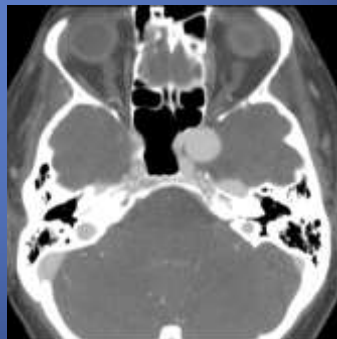
Meningioma
Pituitary adenoma

Cavernous sinus tumors

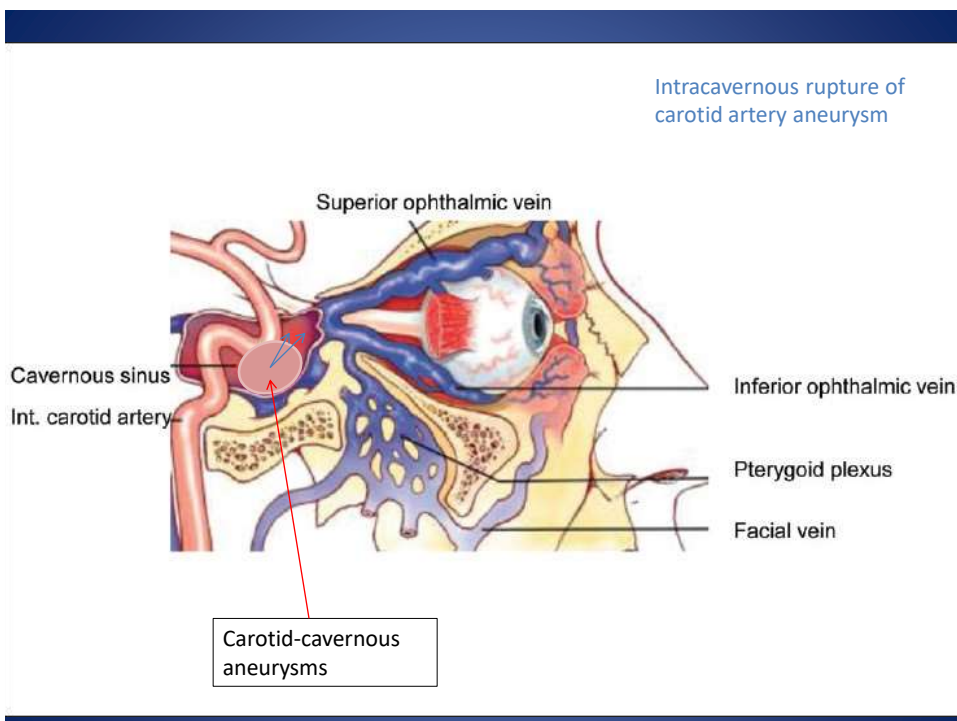
- Acute or slowly progressive ophthalmoplegia is the dominant presentation, with diplopia being the most common symptom.
- At times, diplopia is painful
- Exophthalmos can be observed.
- If the tumor is a pituitary macroadenoma, endocrine symptoms and/or visual field deficits may be present.

Carotid-cavernous aneurysms

- Patients frequently are elderly and present with subacute or chronic ophthalmoplegia. Rarely, they may have pain similar to that of trigeminal neuralgia.

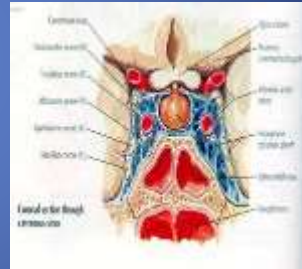


- Spontaneous rupture of a carotid-cavernous aneurysm leads to an abrupt onset of a direct C-C fistula. This results in acute onset of massive exophthalmos with orbital, ocular, and conjunctival chemosis, binocular diplopia, and visual loss.



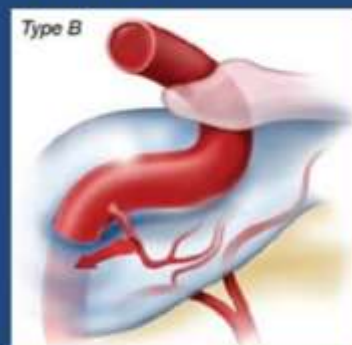
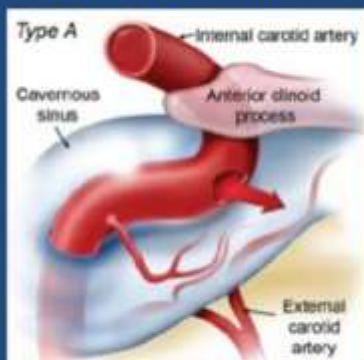
Carotid Cavernous Fistula

- Abnormal communication between previously normal carotid artery and cavernous sinus
- Characterized as:
 - Direct vs. Indirect
 - High vs. Low Flow
 - Traumatic vs. Spontaneous



TYPES

- **Direct**
 - Between the intracavernous internal carotid artery and cavernous sinus
- **Indirect**
 - Between meningeal branches of the internal carotid artery and cavernous sinus



(Barrow DL, Spector RH, Braun IF, Landman JA, Tindall SC, Tindall GT: Classification and treatment of spontaneous carotid-cavernous sinus fistulas. *J Neurosurg* 62:248-256, 1985)

Etiologies of Direct CCF

- From trauma in 75% of all cases
 - Basal skull fracture tears ICA within cavernous sinus
 - Traumatic fistulae-high flow rates, sudden and dramatic onset of symptoms
- Spontaneous rupture of aneurysm or atherosclerotic artery in 25%
 - Post-menopausal, hypertensive females
 - Lower flow rates, less severe symptoms

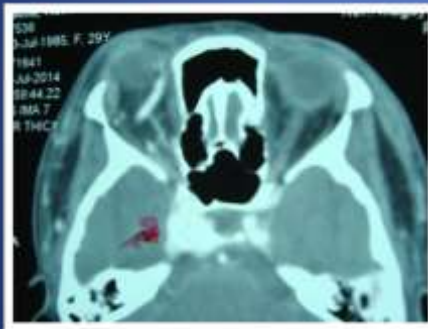


F 29y following an accident



Ophthalmoplegia







CCF



Signs of Direct CCSF

- Ptosis
- Very red, chemotic conj
- Increased IOP from increased episcleral venous pressure
- Anterior segment ischemia in 20%
 - Corneal edema, cell/flare, iris atrophy, rubeosis, cataract
- Proptosis is pulsatile
- Bruit and thrill
- Muscle palsies
- Visual loss

Indirect
spontaneous



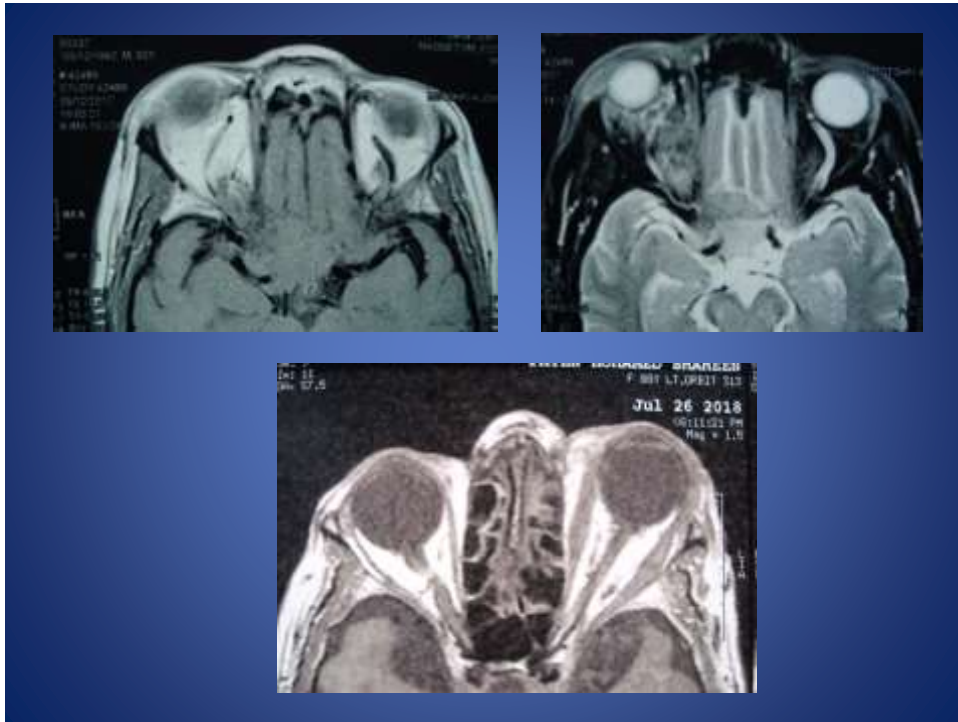
IOP
14 30





Radiological Evaluation of CCSF

- Angiography is the definitive diagnostic examination
- CT and MRI may show
 - Enlarged superior ophthalmic vein
 - Enlarged muscles
 - Enlarged cavernous sinus with a convex shape to the lateral wall



Treatment of CCS Fistulas

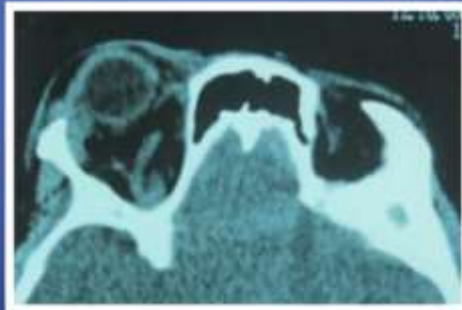
- **99% of treatment is done by interventional neuroradiologists**
 - Intravascular approach-placement of thrombogenic materials, eg coils
- Other therapies include:
 - carotid artery ligation
 - surgical exposure with clipping of the fistula

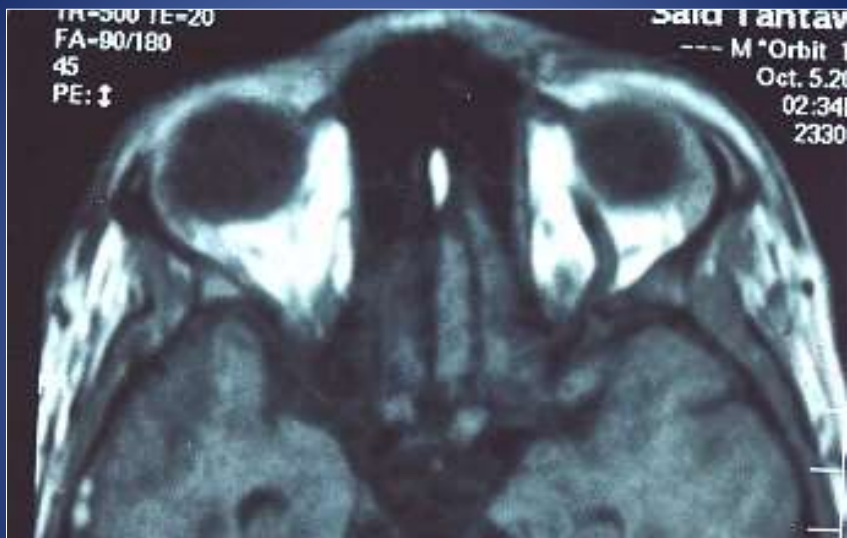
Cavernous sinus thrombosis

- This is infrequent in the antibiotic era.
 - It may occur as a complication of spreading infection from the ethmoid, sphenoid, or frontal sinuses or from midfacial, dental, or orbital infections.
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- Retrobulbar pain, drooping of the upper eyelid, and diplopia may be the first symptoms indicating the lesion's extension to the cavernous sinus.

CST

1. Deterioration of general condition
2. Bilaterality
3. Enlarged SOV







3 cardinal signs

Sinus affection

Congested SOV

Abscess formation

Cavernous Sinus Inflammation

Auto
immune

- Vasculitis (Wagner's), sarcoidosis

Infection

- Bacterial most common
- Fungal
- Viral H Zoster

Idiopathic

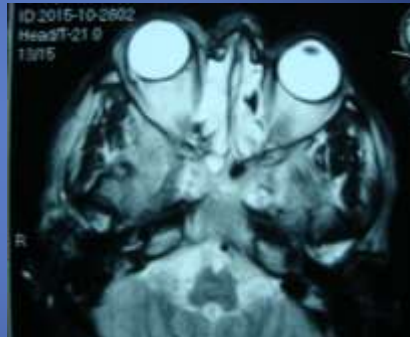
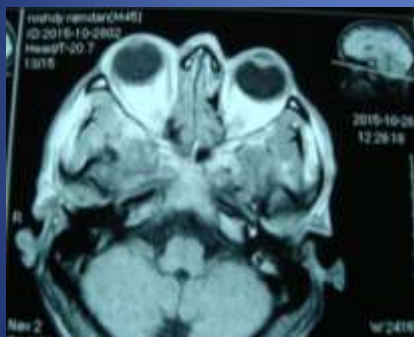
- Tolosa Hunt syndrome

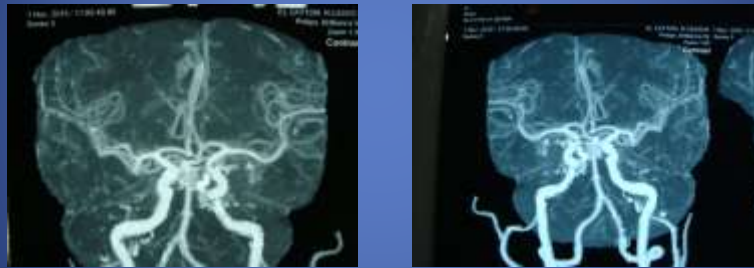
Idiopathic = THS





Mucormycosis or CS Syndrome??





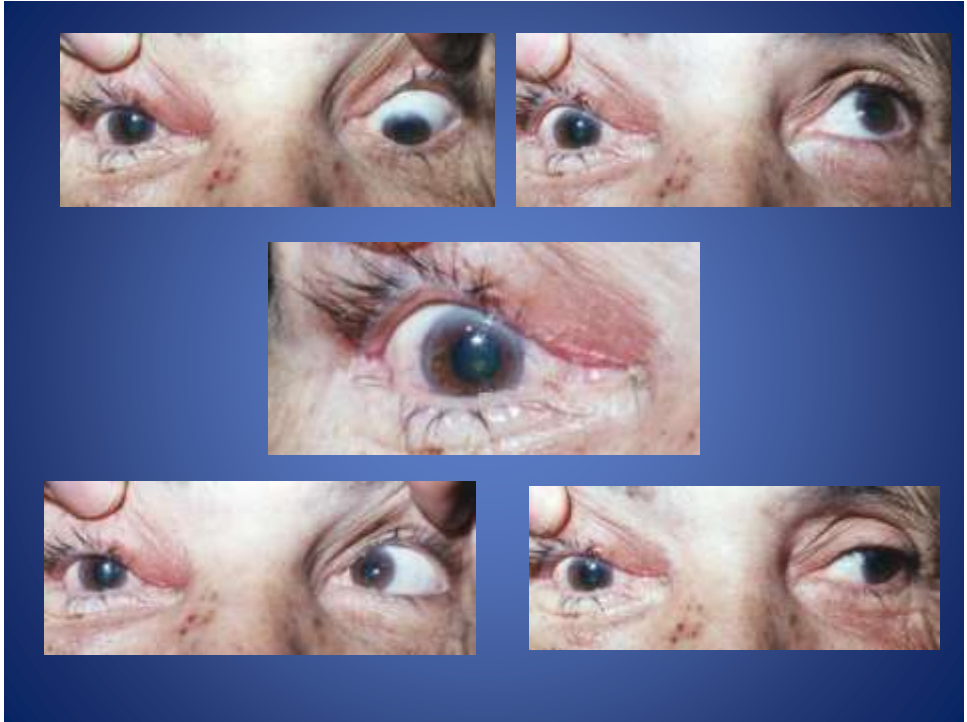
- The key to diagnosis of this group is **pain**
- Severe episodic Tolosa Hunt
- No or minimal Fungal infection

Infections

- Most commonly fungal, less bacterial, much less viral HZ.

Case No. 1







*Thank
You!*