Lids, Lacrimal & Orbit Disorder

OBJECTIVES:

- Orbit:
  - Anatomy and evaluation techniques.
  - Orbital trauma.
  - Proptosis.
- Lids:
  - Anatomy and evaluation techniques.
  - Trauma.
  - Lesions.
  - Malpositions.

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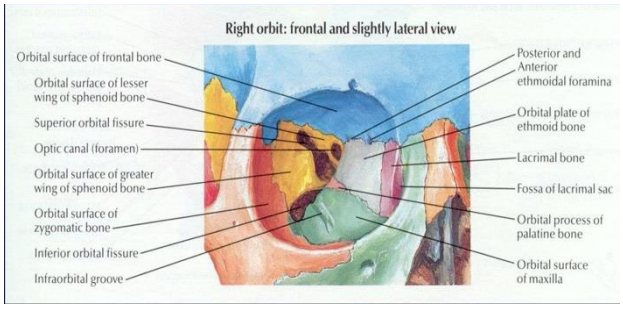
REFERENCES: lecture,
Editing file

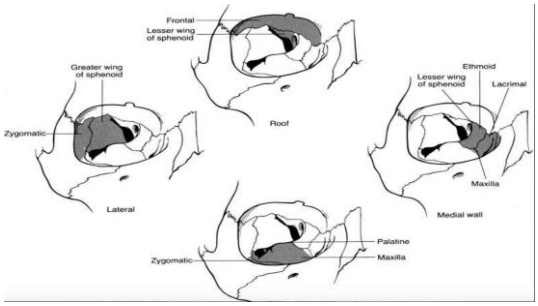
Color index: Important | Notes | Book | Extra

Special thanks to 436 (A) teamwork.

Anatomy of The Orbit

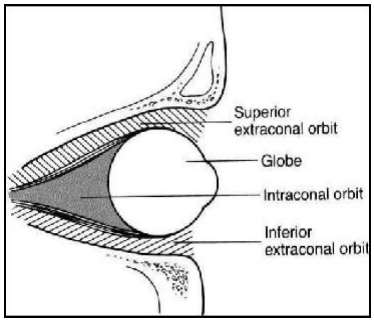
Orbital Walls



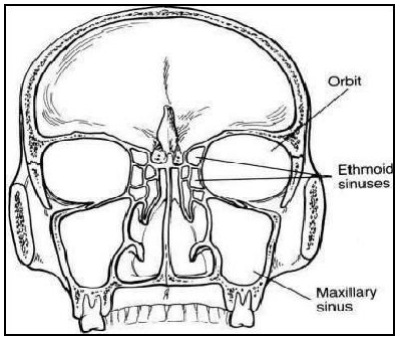


- The orbit is formed by 4 walls; the orbital floor, orbital roof, medial wall, and lateral wall.
- The orbital roof is mainly formed by the frontal bone and lesser wing of sphenoid.
- The orbital floor is formed mainly by the maxillary bone.
- The lateral wall is formed by the zygomatic bone anteriorly, and the greater wing of sphenoid posteriorly.
- The medial wall is formed by the maxillary bone anteriorly, the lacrimal bone in the middle, the ethmoidal bone taking most of the medial wall, and in the far end there's a small peace formed by the lesser wing of sphenoid.
- **The strongest wall is the lateral wall** and the thinnest **wall** is the medial **wall**.
- The thinnest bone in the medial wall is the ethmoidal bone which is also called "lamina papyracea" and it is 0.3-.04 mm in thickness (very thin!) which makes it easier for infections to cross over from the sinuses to the orbit and for fractures to occur.
- The thinnest bone in the orbit is the roof of the infraorbital canal.

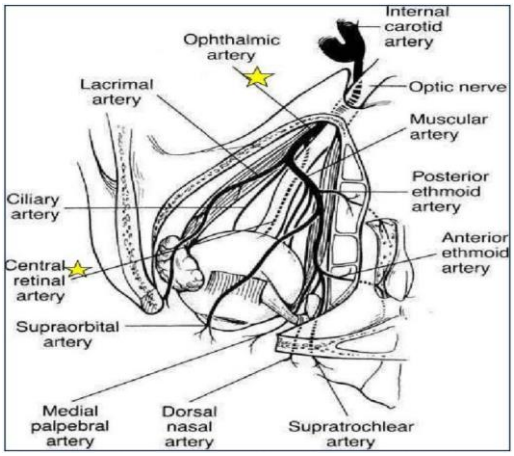
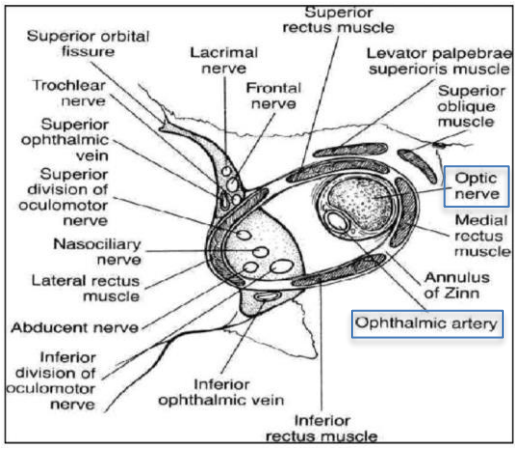
Orbital components



Sinuses



- The sinuses surround the orbit from 3 directions:
  - The maxillary sinus is below the orbit.
  - The ethmoidal sinuses and sphenoid sinus are nasal to the orbit (beside).
  - The frontal sinus is above the orbit.

Blood Supply	Annulus of Zinn
 ▪ The main blood supply for the orbit comes from the internal carotid artery specifically from its ophthalmic branch. ▪ The ophthalmic artery gets inside the orbit along with the optic nerve and it gives many branches; The most important branch is the central retinal artery. ▪ The main problem with the central retinal artery is that it has no collaterals, so if it gets occluded the patients will immediately lose their vision.	 ▪ Annulus of Zinn is a ring of condense fibrous tissue, and it is the origin of all the recti muscles. It also contains the optic canal and the optic foramen. ▪ You can see the optic nerve along with the ophthalmic artery (the picture). ▪ Inside the Annulus of Zinn there're also the nasociliary nerve, abducens nerve, and the superior and inferior divisions of oculomotor nerve. ▪ The abducens nerve supplies the lateral rectus muscle. ▪ The superior and inferior divisions of oculomotor nerve supply the rest of the recti muscles. ▪ The nasociliary nerve is a mixed nerve that carries sensation to the cornea and conjunctiva & controls the pupil. Also, it supplies the ciliary muscles & ciliary body as well as the tip of the nose. ▪ That's why when a patient presented with a herpetic infection that involves the nose, you must examine the eyes very well. ▪ Herpetic infections are transmitted along the nerves, so it could start at the nose and travel through the nasociliary nerve all the way to the eye. This is called **hutchinson's sign**; when involving the tip of the nose and the eye. ▪ You can also see the superior orbital fissure. Part of the superior orbital fissure is contained within the annulus of zinn and the other part is outside the annulus. ▪ There are multiple vital structures that pass through the superior orbital fissure to get inside the orbit and to exit the orbit. Starting

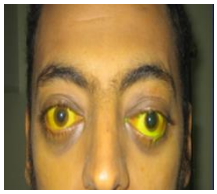
	from the top there're the lacrimal nerve, frontal nerve, and the trochlear nerve. - The trochlear nerve innervates the superior oblique muscle. - The origin of the superior oblique is outside the annulus of zinn which is why the trochlear nerve is outside the annulus of zinn. - The lacrimal nerve supplies the lacrimal glands. - The frontal nerve is a branch of the trigeminal nerve, and it is a sensory nerve. It gives sensation to the forehead and the whole scalp.

Evaluation

- **7P's:**
  - Pain.
  - Proptosis.
  - Progression.
  - Palpation.
  - Pulsation.
  - Periorbital changes.
  - Past medical history.

Pain	
▪ Infection. ▪ Inflammation. ▪ Hemorrhage. ▪ Malignant lacrimal gland tumor (most tumors are painless in the orbit).	
Progression	
♦ **Minutes to Hours** (if progression occurred within minutes to hours, there are only a few things that you need to think about)	
▪ Hemorrhage ▪ Orbital emphysema: air in the orbit.	

- It usually occurs due to trauma which results in a communication between the sinuses and the orbit. It increases the pressure in the orbit, and it can cause compression of the optic nerve and most importantly the central retinal artery.
  - If a patient presented to the ER with a medial wall or floor fracture, it's important to tell the patient to not blow their nose because the air can go from the sinuses to the orbit and it can increase the orbital pressure.




- Lymphangioma
  - Congenital hamartoma: abnormal lymphatic vessels that are present in the orbit that tend to bleed, so the patient may present with acute proptosis.
- Varix (upon valsalva)
  - Varicocele in the orbital veins that also tend to bleed & thus patients may present with acute proptosis.

♦ **Days to Weeks**

- Children: capillary hemangioma, rhabdomyosarcoma, retinoblastoma, neuroblastoma, leukemia.
- Inflammatory disease: Idiopathic orbital inflammatory disease, thrombophlebitis, thyroid orbitopathy, recurrent inflamed dermoid.
- Infections: orbital cellulitis, abscess, cavernous sinus thrombosis.
- Trauma, post-surgical, hemorrhage: orbital hemorrhage, lymphangioma.
- Malignancy: rhabdomyosarcoma, metastasis, granulocytic sarcomas, adenoid cystic carcinoma.
- Carotid-cavernous (C-C) fistula.

Infection	**Allergic Eyelid Swelling**
♦ **The orbital septum is the anterior boundary of the orbit, so anything anterior to the orbital septum is considered extra-orbital.** ▪ Preseptal Cellulitis: the infection is anterior to the orbital septum (extra-orbital). - Vision, motility, pupils, VF, disc are WNL (within normal limit). - Globe itself is not proptotic (the eyeball itself is in a normal position). ▪ Orbital Cellulitis: the infection is behind the orbital septum. - 90% secondary to sinus disease. - High risk of morbidity and mortality. • Orbital abscess. • Brain abscess. • Cavernous sinus thrombosis. - Treatment: • Admission for close observation. • Referral to ENT & infectious diseases. • Systemic antibiotics and surgery if needed.	♦ Not every eyelid swelling is infection, so how can you differentiate between swelling due to allergy or infection? - Preseptal cellulitis (infection) presents with redness, warmth, and tenderness. - Allergic eyelid swellings are not tender, red, or warm. For example, if a patient suddenly woke up with a huge swelling, it's most likely due to allergy because preseptal cellulitis takes time to develop.    

- Both preseptal cellulitis and orbital cellulitis present with eyelid swelling, redness, and pain.
- So, how can you differentiate between the two? patients with preseptal cellulitis are typically afebrile, healthy looking, and no signs of abnormalities in the eye; However, patients with orbital cellulitis could be febrile, sick looking, and they have abnormalities in vision, eye motility, eye position (proptosis), or decreased disc.
- For example, if a patient presented with eyelid swelling, redness, pain, along with proptosis → this is orbital cellulitis.
- Infections can easily cross-over especially through the medial wall.


Capillary hemangioma

- We need to treat it because they can develop amblyopia if left untreated. We need for the visual development to have a clear visual axis earlier in life, because if we block the visual axis, they will develop amblyopia and it will be difficult to treat later in life.
  - Treatment: beta blockers (1st line). If they don't respond to beta blockers, we give them steroids.

- **Months to Years** (mainly benign conditions)

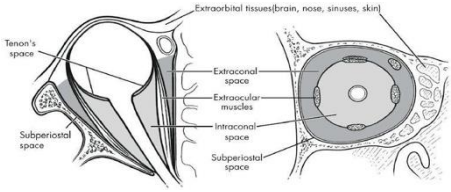
  - Dermoid Cysts.
  - Benign mixed tumors.
  - Neurogenic tumors.
  - Glioma, lymphoma & meningioma.
  - Fibrous histiocytoma.
  - Osteoma.
  - Lipoma
  - Cavernous hemangioma.

Proptosis	
Bilateral	**Unilateral**
♦ Seen in inflammatory, immune processes or systemic diseases.	♦ Primary orbital neoplasms are usually unilateral (mass occupying lesions).

- **Causes:**
  - Inflammatory:
    - Thyroid disease (most common cause)
    - Orbital pseudotumor.
    - Wegener granulomatosis.
  - Infection:
    - Orbital abscess.
    - Cellulitis.
  - Vascular:
    - Orbital hemorrhage.
    - Lymphangioma (sudden).
    - C-C fistula.
    - Orbital varices-proptosis with Valsalva.

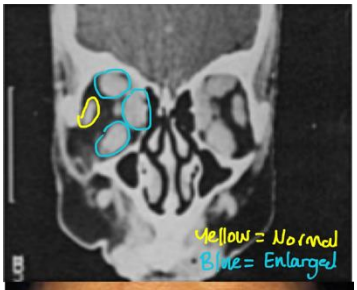
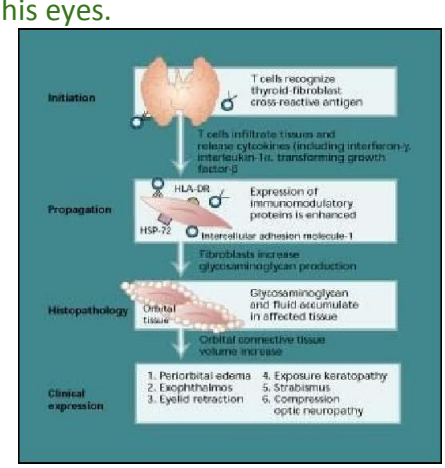
- Tumor:
  - Benign: cavernous hemangioma, lymphangioma.
  - Malignant: adenoid cystic carcinoma, lymphoma, glioma.
  - Contiguous: sinus, intracranial nasopharynx, skin.
  - Metastatic - lymphoma, leukemia, neuroblastoma.
  - Rhabdomyosarcoma.

♦ **Proptosis can be either: axial, non-axial, or pulsatile.**

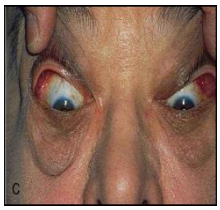


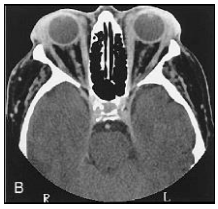
♦ **Pseudo-proptosis** (sometimes when the eyes are wide open, you might think that the patient has proptosis but actually they have lid retraction).

- 1st picture: the patient has lid retraction. You can see the sclera clearly under the upper eyelid.
- 2nd picture: one eye is sunken in → enophthalmos.
  The most common cause for enophthalmos is trauma. When there's a medial wall or an orbital floor fracture, some of the orbital contents will herniate into the maxillary sinus which will make the orbital space larger, and as a result the eye will sink in.

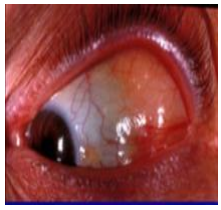
Inflammation	
Graves' disease	♦ Most common cause of **unilateral** or bilateral **proptosis.** ♦ May occur with any thyroid status. ▪ It can happen with hyperthyroidism, euthyroidism, or hypothyroidism, but most commonly with **hyperthyroidism**. ▪ Eye disease not controlled by thyroid ablation (because Graves' disease is an autoimmune disease, there are antigens in the orbit stimulating the thyroid gland, so even if the thyroid is removed there are still antigens in the eye). ♦ Treatment options: ▪ Steroids. ▪ Radiation (to the orbit to control the inflammatory process). ▪ Optic nerve decompression (surgery). ▪ Immunomodulators.   ♦ CT scan: A patient with an active thyroid eye disease has multiple **extraocular muscle enlagement.** ♦ The most common muscles to be affected are the medial rectus and inferior rectus. They may develop strabismus, lid retraction, lid lag, and visual loss. ♦ Visual loss can occur due to corneal ulceration or compression of the optic nerve that is caused by the enlarged muscles → compressive optic neuropathy. ♦ Second picture: chemosis (swelling) is seen with lid retraction. Because of severe proptosis, the patient cannot close his eyes. 
Idiopathic Orbital Inflammation	♦ Orbital pseudotumor. ♦ Myositis. ♦ Prompt response to steroids. ♦ OU or systemic think vasculitis (*except in kids).
Sarcoidosis	♦ lacrimal gland.
Vasculitis	♦ GCA, PAN, SLE, Wegener's granulomatosis, RA.

Lymphoproliferative Disorders (space-occupying lesions)	♦ Lymphoid hyperplasia and lymphoma (2nd most common cause for orbital pathology) ▪ 20% of all orbital mass lesions ▪ salmon patch appearance ▪ molds to orbital structures ▪ 50% arise in lacrimal fossa ▪ 17% bilateral ♦ Plasma cell tumors ♦ Histiocytic disorders ▪ Macrophage based d/o.






Palpation

♦ 1st picture: this patient presented with a mass outside the orbit → dermoid cyst.
♦ Dermoid cysts tend to happen at any suture line.

Pulsation

♦ **With bruits:**
▪ Cavernous carotid fistula Orbital -Arteriovenous fistula Dural-Arteriovenous (a-v) fistula.
♦ **Without bruits:**
▪ Meningoencephalocele.
▪ Neurofibromatosis.
▪ Orbital roof defect (condition after surgical removal of orbital roof, sphenoid wing dysplasia).


Periorbital changes

♦ 1st picture: encephalocele.
♦ 2nd picture: this patient had a tumor removed from the cheek, but he had a recurrence. The right eye is pushed up because of the tumor recurrence.


Rhabdomyosarcoma

- Most common primary orbital malignancy of childhood.
- Average age: 7-8.
- Sudden onset and rapid evolution of unilateral proptosis (within days).
- 90% survival, if you treat it before metastasis happens.
- Any child with unilateral proptosis that progressed within a few days → you need to consider it as a medical emergency.
- Unilateral proptosis is an important sign for rhabdomyosarcoma, leukemia, and other malignant tumors. In other words, unilateral proptosis is a sign of a bad (malignant) disease.

- If a pt presented with pain, swelling, and redness → orbital cellulitis.
- **If they don't present with any symptoms except for unilateral proptosis → Rhabdomyosarcoma.**
- What's the difference between retinoblastoma and rhabdomyosarcoma? retinoblastoma is more common and they only present with proptosis in late stages. Retinoblastoma occurs in the orbit only whereas rhabdomyosarcoma can occur in other parts of the body.

- 1st & 2nd picture: This patient was presented with a huge proptosis that developed within 2 weeks. Because the patient came to the hospital early, it was unlikely that she had any metastasis. A biopsy was taken to confirm the diagnosis and she was treated with chemotherapy and radiation therapy. The 2nd picture is the same patient after one year. In conclusion, you can save the patient's life if you diagnose them early.

Past Medical History

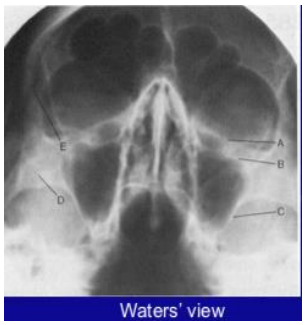
- Past medical history is very important, because for example, if a patient with a known history of Graves' disease was presented with proptosis, then it's most likely related to Graves' disease.
- If a patient with a known history of sinus disease was presented with eyelid swelling and proptosis, then it's most likely orbital cellulitis.

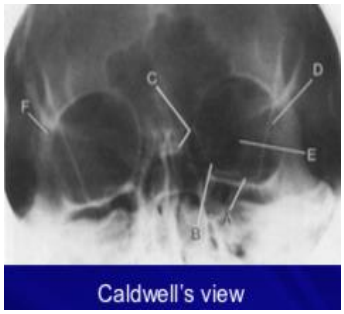
Imaging Option

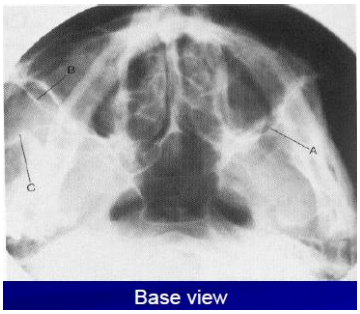
- Plain films
- CT scan
- MRI
- Ultrasound

Plain film

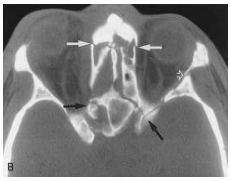
- Quick
- R/o foreign bodies
- Infrequently used



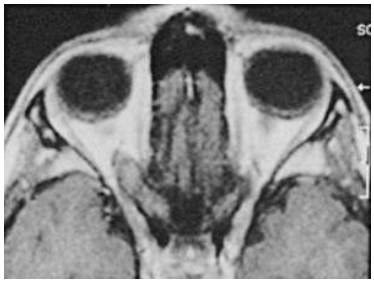
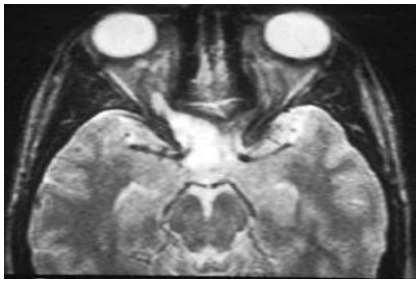
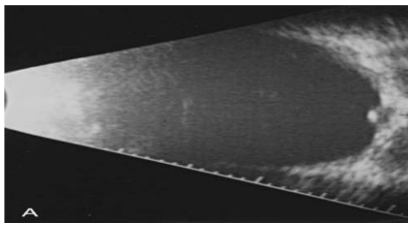




CT Scan (most commonly used)		
Strengths	Weakness	Protocols
▪ Spatial resolution. ▪ Bone: fracture, destruction, calcification. ▪ Quick: emergencies trauma. ▪ Cheaper.	▪ Radiation: 1-2 cGy. ▪ Soft tissue definition. ▪ Contrast iodinated: avoid it in case of allergy. ▪ May need MRI anyway (not cheaper)	▪ Axial and coronal +/- Contrast.

				
♦ This patient has an active thyroid eye disease (Graves). You can see enlargement of the extraocular muscles		♦ Single extraocular muscle enlargement. Less likely caused by Graves disease. More likely caused by other inflammatory causes, or a tumor.	♦ Multiple fractures are seen.	♦ This patient has an orbital mass behind the eyeball.

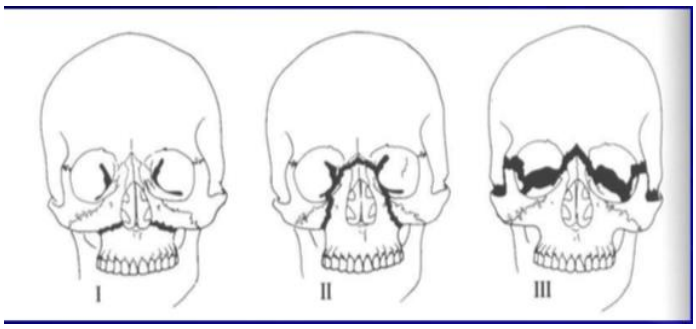
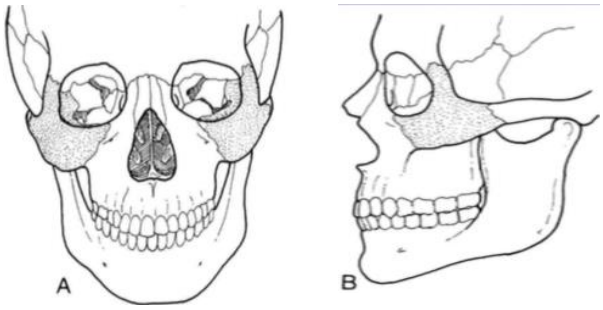
MRI		
Strengths	Weakness	Protocols
▪ Tissue. ▪ T1 anatomy. ▪ T2 pathology. ▪ No radiation.	▪ Magnetic: pacemakers, surgical clips. ▪ Claustrophobia.	▪ Axial/coronal/sagittal ▪ Gadolinium contrast - Non-iodinated. - Allergies RARE ▪ Orbital lesions.

		▪ Fat suppression (allows you to see the structures inside the orbit clearly).
Examples (how to differentiate between T1 & T2? In T1 the fluid appears dark, which is why the eyeball are black in T1; In T2 the fluid appears bright, which is why the eyeballs are white in T2).		
T1  No fat suppression. Orbital structures cannot be seen. Dark eyeballs = T1.	T2  Bright eyeballs = T2.	T1  With fat suppression. The orbital structures can be seen clearly. Dark eyeballs = T1.
Ultrasound (Orbital Echography)		
▪ **Features:** - Dynamic. - Less expensive. - +/-Availability variable.	 This is an ultrasound showing an orbital cyst behind the eyeball	

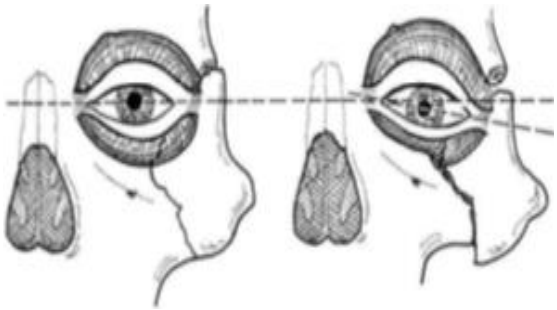
Facial trauma and fractures

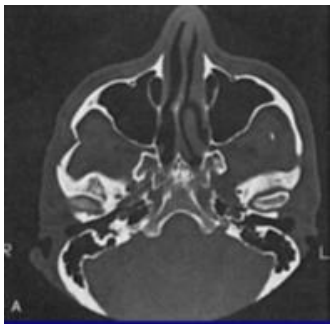
- **Facial Trauma:**
  - ♦ Midfacial fractures.
  - ♦ Zygomaticomaxillary Complex (ZMC)fracture.
  - ♦ Wall and floor fractures:
    - ▪ Medial wall: lamina papyracea.
    - ▪ Orbital floor: blow out vs rim involvement (blow out fractures can easily be missed, especially in children).
    - ▪ Lateral wall and orbital roof (less common).

- Optic canal fractures:
  - Traumatic optic neuropathy.

LeForte Fractures	Zygoma
	

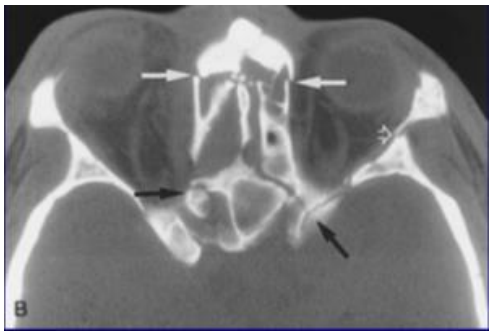
ZMC Fractures



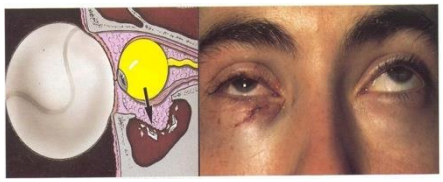


Optic Canal

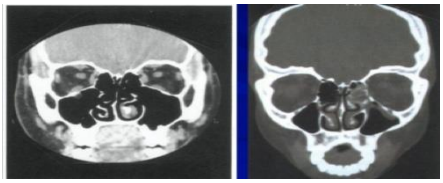
may be with or without displaced bony fragments



Floor Fractures



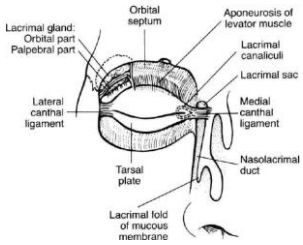
Find the fracture:



- 1st picture: This boy had a trauma in his right eye at school. He was taken to a general emergency room. There was no pain in his eye, no redness, and no swelling. And because of that he was discharged, but the boy was still complaining.
- In the picture you can see that when he tries to look up, the right eye looks abnormal because there's **entrapment of the inferior rectus muscle caused by a small fracture, so he cannot look up. This type of fracture that causes muscle entrapment typically happens in children more than adults because the bones are more elastic**. This causes small fractures that will cause some of the orbital contents to herniate and then they'll get entrapped.

- So, it's very important to check the eye motility in every patient that presents with orbital trauma because it's tricky to pick up this kind of fracture if you don't check the eye motility.
- **This patient needs urgent surgery because if the muscle remains entrapped, there will be necrosis and he'll end up with permanent double vision**. Another thing that can happen if the muscle remains entrapped is oculocardiac reflex, which means that they can develop abnormal cardiac rhythm.

Lacrimal Disorders



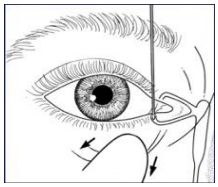
- **Structure and Function:**
  - The lacrimal gland is approximately 2cm long and it is situated superior-temporally behind the orbital rim.
  - It can be divided into two main parts:
    - Orbital: larger and sits on the lateral margin of levator palpabrae.
    - Palpebral: smaller and located along the inner surface of the eyelid.
  - The two lobes are separated by levator aponeurosis, which is the tendon for levator muscle.
- **Physiology:**
  - From the palpebral lobe there are small ductioles secreting the tears to lubricate the eye, these ductioles open into the superior fornix, the tears will lubricate the cornea, and then will be drained through the lacrimal drainage system starting with the lower punctum which is a small round opening and upper punctum, and from there, there are small ducts called canaliculi (canaliculus).
  - The upper and lower canaliculi will meet to form common canaliculus, then it will go inside the lacrimal sac, then from the lacrimal sac the nasolacrimal duct will take the tears to the inferior meatus.
  - The canthal ligaments attach the eyelid to the bone. There are two canthal ligaments; the medial canthal ligament, and the lateral canthal ligament. The lacrimal sac is behind the medial canthal ligament.

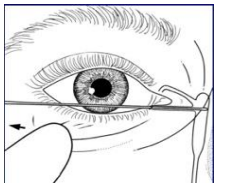
Congenital Lacrimal Duct Obstruction (common problem)

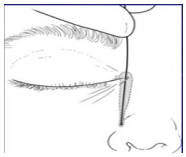
- 1st picture: one of the most common conditions that **a child can present with is tearing and discharge. This condition is called congenital lacrimal duct obstruction.** The reason why they accumulate tears and have discharge is because they have delayed canalization of the nasolacrimal duct. Commonly the delayed canalization happens at the valve of Hasner at the distal end of the nasolacrimal duct. The nasolacrimal duct has a membrane that's supposed to be perforated before birth, but some children present with delayed membrane perforation.
- In congenital lacrimal duct obstruction, the tears will accumulate in the lacrimal sac because of the obstruction, and eventually there will be discharge because the accumulation of tears in the lacrimal sac is a media for infection so the child will present with a low-grade infection.
- Another cause for the discharge is the lacrimal sac is lined with mucus secreting cells. In children with a perforated nasolacrimal duct, the mucus goes to the nose. Whereas in children with this condition, the mucus cannot go to the nose and, so it will accumulate in the eye. They can be presented with unilateral or bilateral excess tearing and discharge. To treat this condition, we usually ask the parents to massage the area above the medial canthal ligament regularly until the age of 1. If the patient was presented after the age of 1, the chances of opening the duct through massaging the area is really low, so we go for probing.

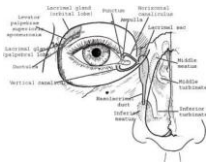
- If a child presents with tearing but no discharge, you need to think about congenital glaucoma, foreign body or absence of the punctum of the lacrimal sac.
- 2nd picture: this patient has an acute nasolacrimal duct obstruction, so he developed acute dacryocystitis which is an acute infection in the lacrimal sac.

In adults with lacrimal drainage problems, we do lacrimal irrigation to detect where the obstruction is, and to introduce a cannula through the punctum all the way to the lacrimal sac.



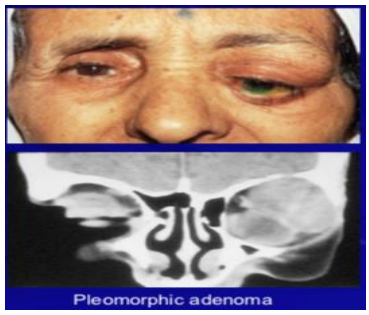






In children, probing is done. A metallic probe is introduced through the punctum, and then through the canaliculus, and then all the way down to the nose so it can perforate the membrane. Sometimes, a stent made of silicone will be placed to prevent the membrane from reforming and it will be removed after a few months.

- **Lacrimal gland masses**
  - Inflammatory:
    - Sarcoidosis.
    - Orbital Pseudotumor.
    - Vasculitis.
  - Non-inflammatory:
    - Lymphoproliferative.
    - Epithelial neoplasms.

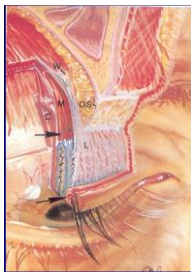


Lacrimal gland fossa lesions

Disease	Duration	Presence of pain	Ultrasound reflectivity	CT	Management
Orbital pseudotumor	Days to chronic	Yes	Low	Localized or diffuse, molds to bone and globe	Management: systemic steroids, XRT
Lymphoma	Months	No	Low	Homogenous, oblong, molds to globe/bone	XRT, CTX (systemic disease)
Pleomorphic adenoma (benign mixed tumor)	Often > 1 year	No	Medium to high, regular internal structure	Well circumscribed, globular, possible bony expansion or excavartion.	complete excision with capsule without biopsy
Adenoid cystic carcinoma, malignant epithelial tumors	< 1 year	Yes (perineural invasion)	Medium to high, irregular internal structure	Round to oval mass with bony erosion	incisional biopsy, await permanent sections; exenteration

The Eyelids

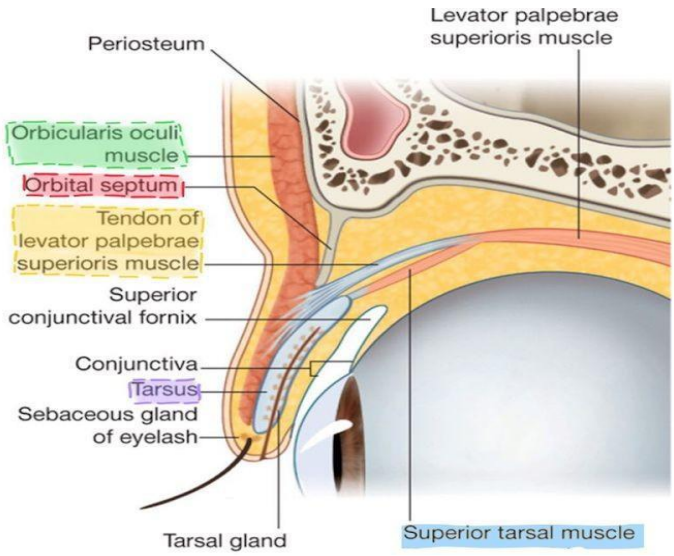
- Anatomy
- Trauma
- Lid lesions.
- Lid malpositions.



Anatomy of The Eyelids

- The upper eyelid anatomy:

From outside:
skin → orbicularis muscles (supplied by facial nerve)
→ orbital septum (a dense fibrous tissue) → orbital fat (also called pe aponeurotic fact) → levator muscle which will be changed to tendon called levator aponeurosis, will attach to tarsals Muller muscle of conjunctiva.
Tarsal is a condense fibrous tissue that is forming the skeleton of the eyelid, within tarsals are meibomian glands: fat secreting (sebaceous) glands, opens on the lid margin.
(this is just to tell you that the orbital septum is the anterior boundary of the orbit. So, anything anterior to the orbital septum is considered extra-orbital, and anything posterior to the orbital septum is considered orbital).



Eyelid Trauma

- Types: Blunt, sharp/penetrating
- Classification:
  - The lid margin is spared (not involved):
    - Skin and orbicularis only injured → skin sutures. You don't need to suture the orbicularis muscle; you only need to suture the skin.
    - FAT protrusion = septum violated, DO NOT suture the orbital septum. You need to do a thorough evaluation of the eye to rule out eyeball laceration.
  - The Lid margin involved:
    - You need to suture the lid margin properly and meticulously because if the suturing wasn't properly done, the cornea will be irritated with every blink.
  - The canthals involve:
    - You need to call ophthalmology because the medial and lateral canthal ligaments are what stabilize the eyelid. If the canthal ligaments are injured, they need to be sutured to their proper positions to avoid any eyelid abnormalities.
  - The canalicula involve:

- You need to call ophthalmology immediately because you need to treat the patient with suturing the canaliculus and putting a stent or a silicone tube through it to avoid permanent closure of the duct. This needs to be done acutely.

Lid laceration with canalicular involvement. A metallic probe (called Bowman p h

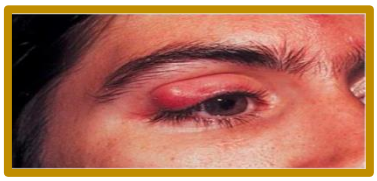
♦ **Blepharitis**
  - Blepharitis is a chronic inflammation that involves the eyelashes, and it can also involve the meibomian glands.
  - Usually patients with blepharitis present with redness, irritation, and tearing due to the toxins present in the lid margin.
  - They are treated with topical antibiotics and lid hygiene.
  - Most common causative organism is Staph aureus.
  - The main goal of treatment is not to eradicate the disease, but it is to control the symptoms.

♦ **Herpes Zoster Ophthalmicus**
  - It involves the ophthalmic division of the trigeminal nerve.
  - It occurs in the elderly without any comorbidities, however, if it occurs in young individuals you need to think about predisposing factors such as immunodeficiency.

- **Eyelids lesions**

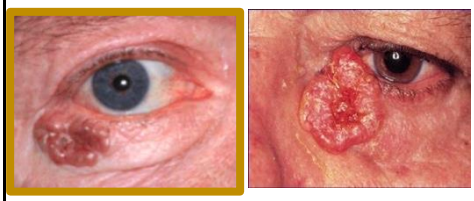
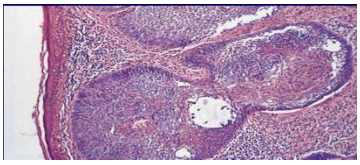
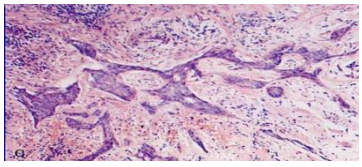
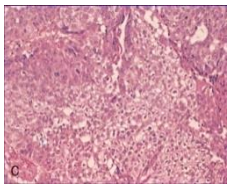
♦ **Sty**
  - Sty is an inflammation around the root of the eyelashes.
  - Patients will present with redness, swelling of the eyelid, and sometimes pus can be seen.
  - They are treated with topical antibiotics and applying a warm compress.

♦ **Chalazion (very common)**
  - Chalazion is an inflammation of the meibomian glands.
  - The meibomian orifices are blocked and as a result there will be accumulation of the meibomian gland secretions in the meibomian gland itself which is why the patients will present with swelling.
  - In some cases, it presents with a co-infection and the patient presents with redness and pain along with the swelling. They are treated with topical antibiotics and a warm compress. If there's no improvement, we need to do surgery to evacuate the sebum.



♦ **Xantholasma**
  - Lipid deposits in the eyelid. We treat the hyperlipidemia along with treating the eyelid lesions.

- **Eyelid Tumors**

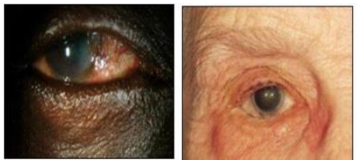
Basal Cell Carcinoma	Squamous cell	Sebaceous Adenocarcinoma
▪ 90-95% of malignant eyelid. ▪ Tumors Lower lid and medial canthal areas. ▪ Nodular and morpheaform types. ▪ Medial canthal lesions can be problematic. ▪ 3% mortality.   Nodular  Morpheaform	▪ 40 times less common than BCC. ▪ More aggressive, associated with > perineural invasion. ▪ Most arise from pre-existing lesions. ▪ Variable presentations.  	▪ Highly malignant. ▪ 2x more common in the upper lid. ▪ Multicentric. ▪ Separate upper and lower lid lesions in 6-8%. ▪ Pagetoid spread.  

- **Eyelid malpositions:**
  (ectropion, entropion, blepharoptosis, retraction)

  - **Ectropion**
    - Outward turning of lid margin (the eyelid is becoming so lax that it is turning away from the eye).
    - Types:
      - Congenital.
      - Involutional (aging).
      - Paralytic (facial nerve palsy → orbicularis muscle paralysis).
      - Cicatricial.
      - Mechanical


  - **Entropion**
    - Inversion of the lid margin (the eyelid is turning towards the eye)

- Types:
  - Cicatricial:
    - Most common type of entropion.
    - Happens as a sequela of trachoma which used to be a common infection in our area years ago.
    - Usually patient develop entropion many years later (Ex. patient had the infection 40 years ago).
    - They usually present with entropion, corneal scarring, or dryness.
    - Trachoma caused by chlamydia trachomatis which is an intracellular bacterium that cannot be stained with a gram stain because it doesn't have a cell wall, and It is treated with tetracycline, azithromycin, or clarithromycin.
  - Involutional (aging).
  - Congenital.
  - Acute-spastic.



Left: upper eyelid entropion
Right: lower eyelid entropion

- **Trichiasis:**

Isolated eyelashes that are misdirected towards the eye.

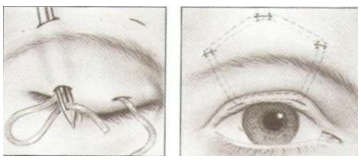
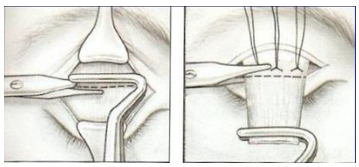
- **Blepharoptosis:**
  - Blepharoptosis is drooping or inferior displacement of the upper lid.
  - Classification:
  - Congenital vs acquired:
    - Myogenic →a problem with the levator muscle.
    - Aponeurotic → a problem with the levator aponeurosis.
    - Neurogenic → a problem with the innervation of the levator muscle (3rd nerve palsy) or the muller muscle (Horner's syndrome).
    - Mechanical → a mass or swelling in the eyelid that's causing ptosis.
    - Traumatic → trauma affecting the nerve, muscle, or aponeurosis.

Myogenic	▪ Congenital (most common cause of myogenic ptosis). - Dysgenesis of levator (malformation of the levator muscle). ▪ Acquired - Localized or diffuse disease. - Muscular dystrophy. - CPEO (chronic progressive external ophthalmoplegia). - MG (myasthenia gravis). - Oculopharyngeal dystrophy.  This child has congenital dysgenesis of the levator muscle. The levator muscle of the right eye is underdeveloped. Some children lift their chin to be able to see properly, but some children don't do that which allows the eyelid to block the pupil and this results in amblyopia. If the pupil is blocked by the eyelid, we need to do surgery as soon as possible to prevent amblyopia.
Aponeurotic	▪ Most common form of ptosis. - Most common cause is aging. - It is commonly seen in contact lens wearers because they tend to stretch their eyelids when applying the contact lens. - High lid crease with normal levator function.  
Neurogenic	▪ Acquired and congenital forms. ▪ Acquired: - 3rd nerve palsy** - Horner syndrome - Myasthenia gravis 

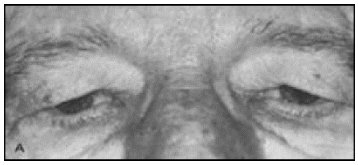
- Levator function:   

  - **Treatment**: (all surgical)
    - Mild ptosis, good levator function: Mullerectomy.
    - Any ptosis, reasonable levator function: Levator resection.
    - Severe ptosis, poor levator function: Frontalis suspension.
    - Children with ptosis covering the pupil need to be treated as soon as possible to prevent amblyopia.

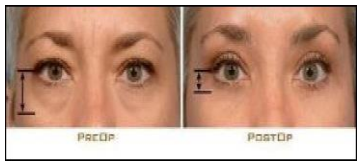
Mullerectomy:

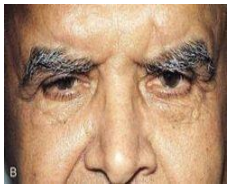

- **Dermatochalasis (pseudo-ptosis)**



There's excess skin hanging over the eyelid



Before and after blepharoplasty which is the most common cosmetic surgery done on the face.

Before surgery →	 
After surgery →	
Brow ptosis  The eyelid opening is normal, but the brow is drooping.	**Unilateral Brow ptosis**  The most common cause for unilateral brow ptosis is facial nerve palsy. The frontalis muscle of the eyebrow is supplied by the facial nerve.

- **Abnormal eyelid movements**
  - Blepharospasm.
  - Hemifacial spasm.
  - 7th nerve palsy.

- **Blepharospasm (both eyes are affected).**
  - Involuntary tonic, spasmodic contraction of orbicularis.
  - Dermatochalasis.
  - Rubbing.
  - Brow ptosis.
  - Frontalis spasm.
  - Blepharoptosis.
  - Levator dehiscence.
  - Ectropion/entropion.
  - Dry eye (we need to rule out local causes of irritation such as; dry eyes, foreign body, or eyelid

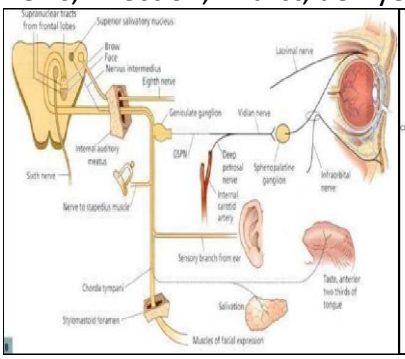
This patient has spasmodic contraction of the orbicularis and he has no control over it.

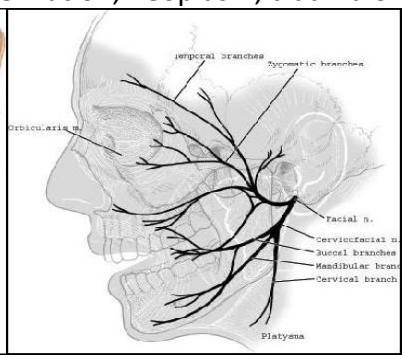
malposition).

- **Hemifacial Spasm (one eye is affected)**
  - Intermittent and involuntary contractions of the entire unilateral side of face.
  - Present during sleep.
  - Compression of 7th nerve at the level of the brain stem. (if both eyes are affected → idiopathic).
  - Spasm in the face can be a sequelae of a healing facial nerve palsy.
  - MRI evaluation.
- **7th nerve palsy**
  - Lower motor neuron lesion.
  - The most common cause for facial nerve palsy is Bell's palsy.
  - Manifestations:
    - Lagophthalmos (cannot close eyes) → exposure keratopathy and corneal ulceration.
    - Tearing.
    - Ectropion.
    - Brow ptosis.

Lagophthalmos

  - Location of lesion:
    - Supranuclear, brain stem, peripheral.
  - Cause of paralysis:
    - Bell's, infection, infarct, demyelination, neoplasm, trauma or miscellaneous.





Botox in Ophthalmology

Botulinum toxin:

- Clostridium botulinum
- Neurotoxin types A,B,C1,D,E,F,G
- Botox = Botulinum Toxin A
- Blocks the cholinergic nerve terminals, thereby decreasing release of acetylcholine
- Onset 3 days
- Peak effect 1-2 weeks Duration 6-12 weeks

Uses			
1) Blepharospasm	2) Strabismus	3) Glabella Botox	4) Botox for Crow's-Feet




- **Conclusion**
  - Knowing the anatomy helps to understand different pathological process, this is true for any medical specialty.
  - Early diagnosis and proper management of orbital cellulitis save patients vision and lives.so early diagnosis of orbital cellulitis is really vital.
  - Aponeurotic ptosis is the most common cause of ptosis.
  - Thyroid eye disease is an autoimmune disease and it's considered the most common cause of proptosis either unilateral or bilateral.
  - Unilateral recent proptosis in a child should be taken seriously.
  - Congenital nasolacrimal duct obstruction commonly caused by membranous obstruction and typically present with tearing and discharge since birth.
  - Chalazion is a common condition results from blockage of meibomian gland and present as discrete swelling in the eyelid.
  - Severe congenital ptosis needs to be corrected as early as possible to prevent amblyopia especially when the ptosis blocks the pupil if not it consider cosmetic and corrected by elective procedure any time.
  - Proper treatment of exposure keratopathy in pt with facial nerve palsy is critical to prevent corneal ulceration and scarring.

Cases


Good luck!