

# Ocular conditions in Pediatric Patients

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# Case 1

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- 4yo F comes in with bump on eyelid – started few weeks ago
  - Some matting of lids in morning
  - No pain
  - No redness in eye
  - No Trauma
- Meds: none NKDA
- Gen health: good
- Birth history: F/T born, weighed at birth 7lbs 2oz, normal delivery



# Case 1

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- VA sc OD: 20/25                      OS: 20/25
- Pupils: Round, reacting to light no APD OU
- No strabismus
- IOP: soft OU
- Stereopsis: +Lang

# Case 1

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- Anterior segment





# Case 1

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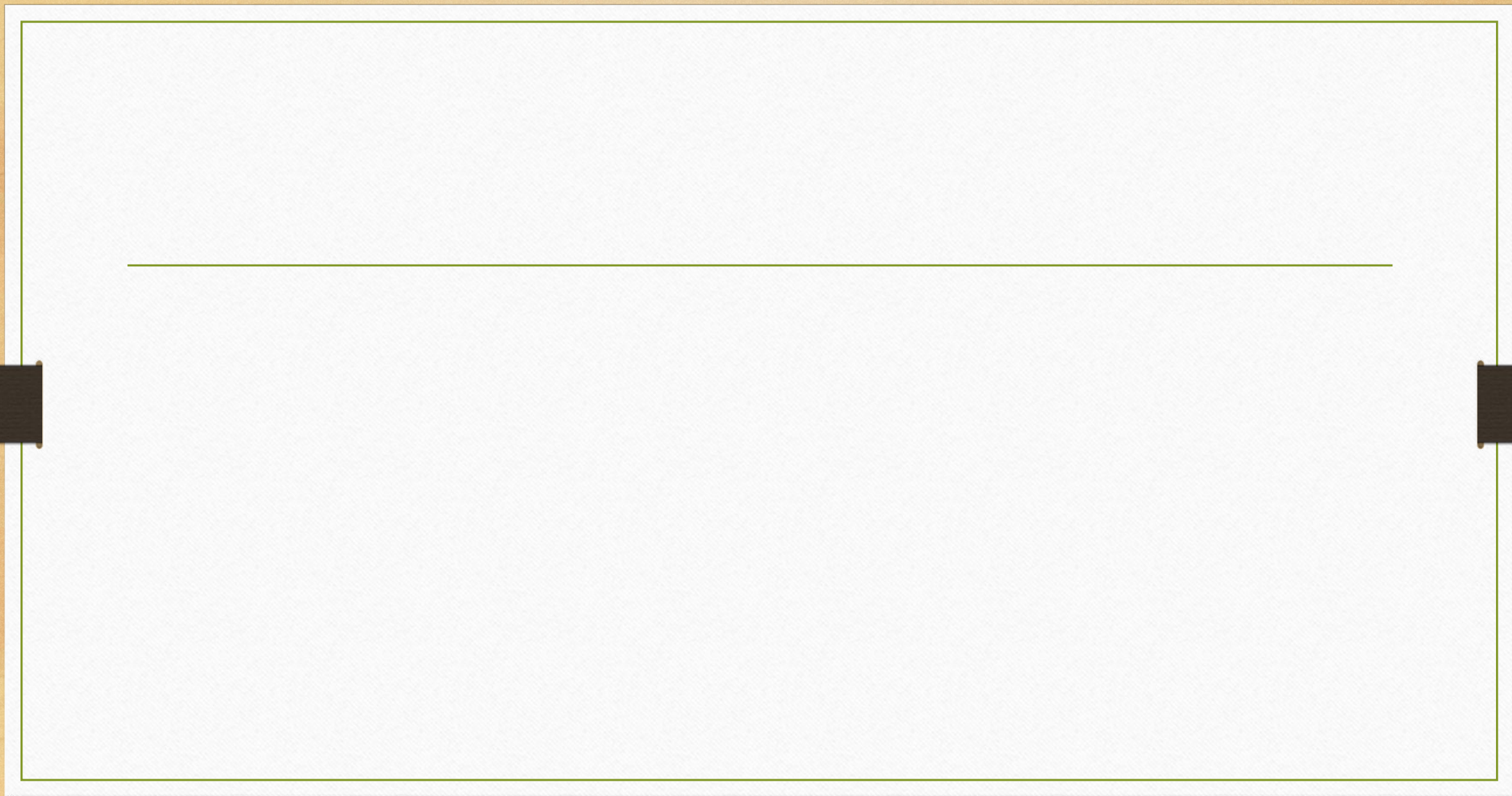
- Fundus evaluation:
  - 0.3/0.3 c/d ratio healthy nerves
  - Macula Flat +FLR OU
  - Mid periphery healthy OU
- Cycloplegic retinoscopy
  - OD: +2.50sph
  - OS: +2.50sph

# Case 1

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- Assessment and plan
  - Chalazion OS UL
  - Warm compresses
  - Lid hygiene
  - Chronic/ recurrent
  - f/up in 1-2 mths







# Case 2- pt BW

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- 2yo F swollen eye started couple of days ago and now much swollen
  - Some pain, some watery discharge
  - Went to PCP yesterday – gave clindamycin only one dose
  - No trauma
  - No fever
- F/t born, weighed at birth 7lbs 3oz, normal delivery
- Meds: Clindamycin one dose only
- NKDA

## Case 2- pt BW

- VA OD: F and F OS: F and F
- External photo:
- EOM: ?? Restriction in upgaze
- Pupils: no APD





## Case 2- pt BW

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- Tender to touch, warmth
- No Preauricular node



# Case 2 – pt BW

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- Differential diagnosis
  - Preseptal cellulitis
  - Orbital cellulitis
  - Dacryoadenitis



# Case 2- pt BW

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- Assessment and plan
  - Suspect dacryoadenitis
  - Rule out orbital cellulitis
  - CT scan

# Case 2 – pt BW

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- ER visit
  - Mild orbital cellulitis
  - Dacryoadenitis OS UL
  - IV antibiotics

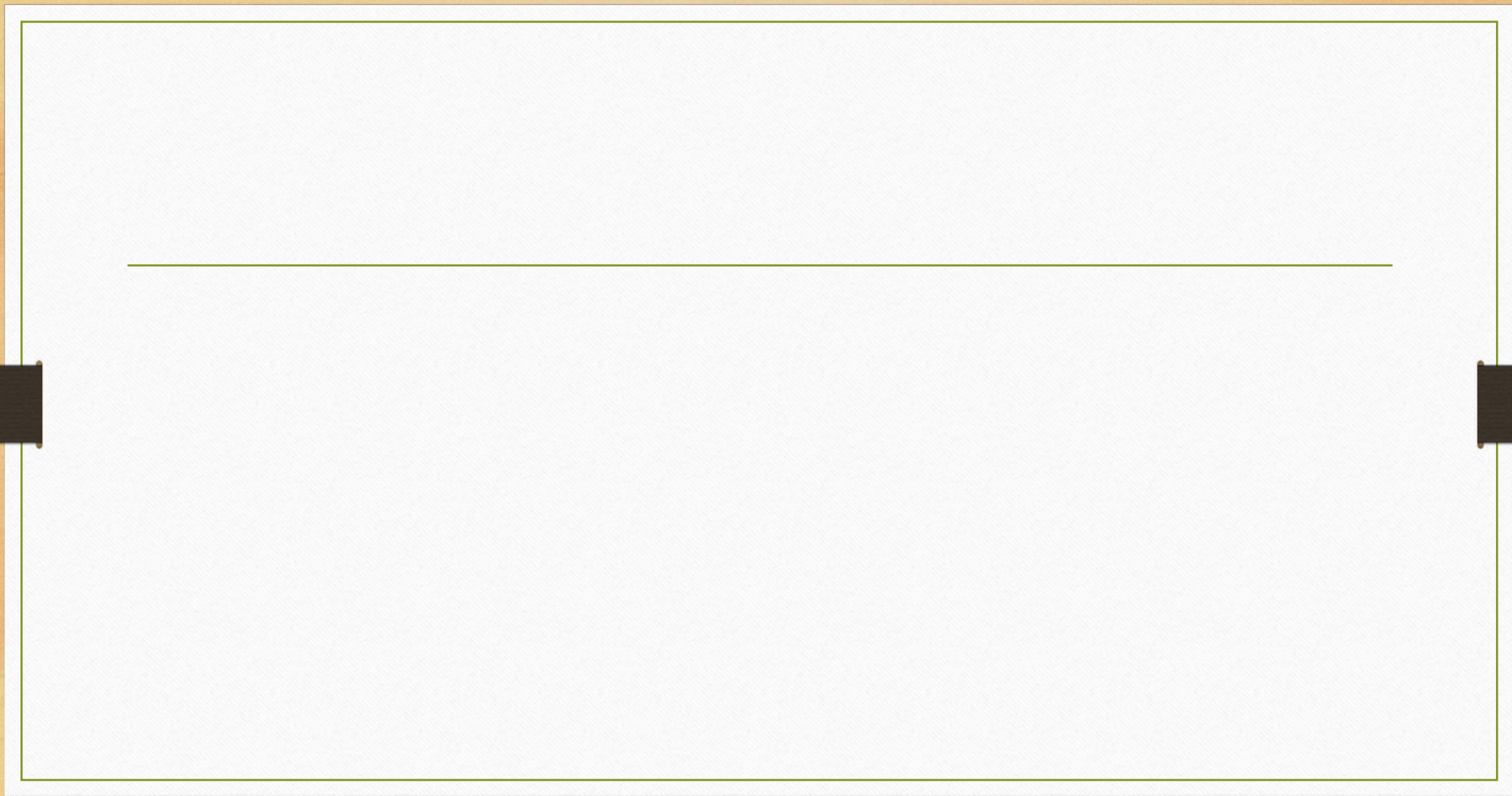


# Dacryoadenitis

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- Rare
- Inflammation of the lacrimal gland
- Superior temp
- Associated with pain/ tenderness
- Treated with IV antibiotics
- Draining with ENT/oculoplastics







# Case 3

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- 3mth old F was referred for enlarging lower lid mass since birth
- Purple discoloration/ no tenderness
- No trauma
- Full term born, weighed 7lbs 2oz at birth
- No developmental delays
- Normal delivery
- Meds: none, NKDA





# Examination

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- Fixate and followed OD/ OS
- Grossly normal posture
- No proptosis
- No ptosis
- Palpable mass on left lower lid
- Retinoscopy: OD: +2.00
- OS: +1.75 – 2.75 X 180
- Normal Anterior and Posterior exam

# Diagnosis



## Differential Diagnosis

- Dermoid cyst
- Trauma induced swelling
- Cellulitis
- Capillary hemangioma





# Assessment and plan

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- Capillary hemangioma OS LL
  - Causing induced astigmatism
    - $>1.5D$  is amblyogenic
  - Start timolol gel bid OS lid
  - f/up 3 weeks



f/up

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- No improvement in size
- Still had induced astigmatism
- To see oncologist hemangioma/ hematologist
  - Oral propranolol



2mth f/up

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# Capillary Hemangioma

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- Benign Hamartomas of capillary endothelial cells
- Common vascular tumor of childhood in orbit
  - Preseptal
  - Intraorbital
  - Compound/ mixed
- Females (3:1) and premature kids
- Rapid phase between 6mths and 1 year of life
- Slow involutinal phase that happens through the 1<sup>st</sup> decade



# Risks

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- Deprivation amblyopia
  - Ptosis
  - Proptosis
- Deformity of the globe
- Refractive amblyopia
  - Unilateral astigmatism



# Treatment

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- **Observation for small lesions**
- **Surgery**
  - Bleeding
- **Intralesional steroids**
  - Risk for central retinal artery occlusion
  - Go slow on injection
- **Systemic steroids**
  - Retarded growth
  - Elevated Blood sugar levels
  - Reduced resistance to infection



# Treatment

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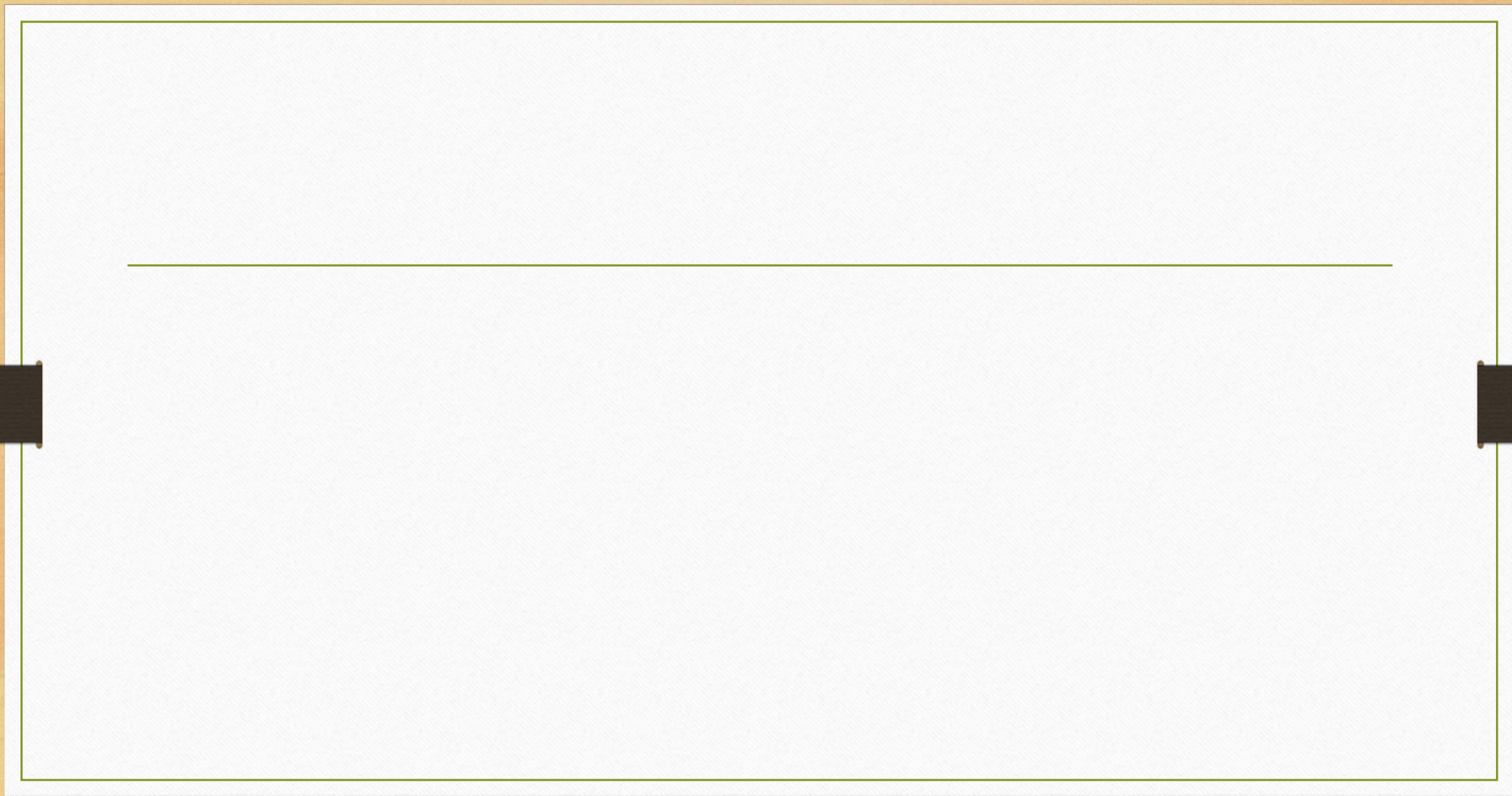
- **Oral propranolol**

- Dosage: started at 1mg/kg/day divided BID and then increased to 2mg/kg/day
- 40 – 50% of them reduce in size by 1 mth
- Side effects:
  - Fatigue
  - Hypotension/ hypoglycemia (rare)



- **Topical B blocker**

- Timolol gel 0.5% bid (smaller lesions)





# Case 4

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- 10yo Male “right eye looks bigger” for 2 weeks for second opinion
  - No pain
  - No trauma
  - No other issues
- Saw another eye Dr. 1 week ago ??chalazion
- F/T born
- FHox: unremarkable
- Meds: none, NKDA
- Gen health: good



# Case 4

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- VA sc OD: 20/20                      OS: 20/20
- Pupils: Round, Reactive to light, No APD
- No proptosis, ptosis
- EOM: q/o Mild restriction in ABduction OD
- Anterior Segment: unremarkable
- Posterior Segment: unremarkable



# Case 4

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- Felt very small bump along bony structure of right eye, round, rubbery (inf Temp)
- No pain, no tenderness

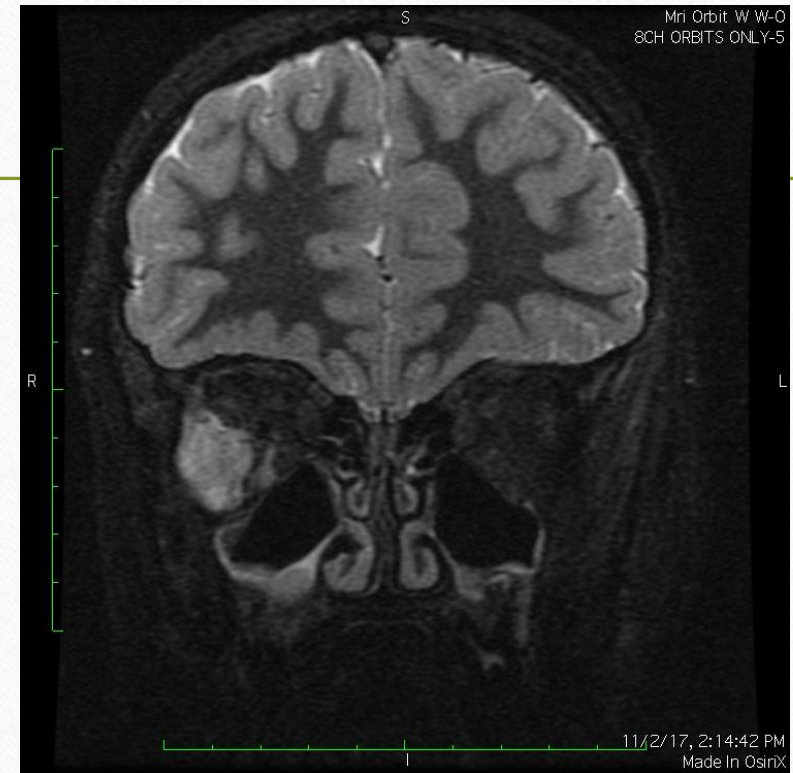
# Case 4

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- Differential
  - Trauma
  - Orbital cyst
  - Rhabdomyosarcoma



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- MRI of orbits with and without contrast



# Case 4

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- Highly suspicious Rhabdomyosarcoma
- Saw Shields couple of days later and had Surgical debulking with pathology confirmation for Rhabdo
- CHOP for chemo and Radiation





# Rhabdomyosarcoma

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- Most common Malignant soft tissue mesenchymal tumor in childhood
- 35% arise neck and head region
- Three classifications:
  - Orbital tumors
  - Non orbital cranial parameningeal tumors
  - Non parameningeal tumors of the neck and head

# Orbital RMS

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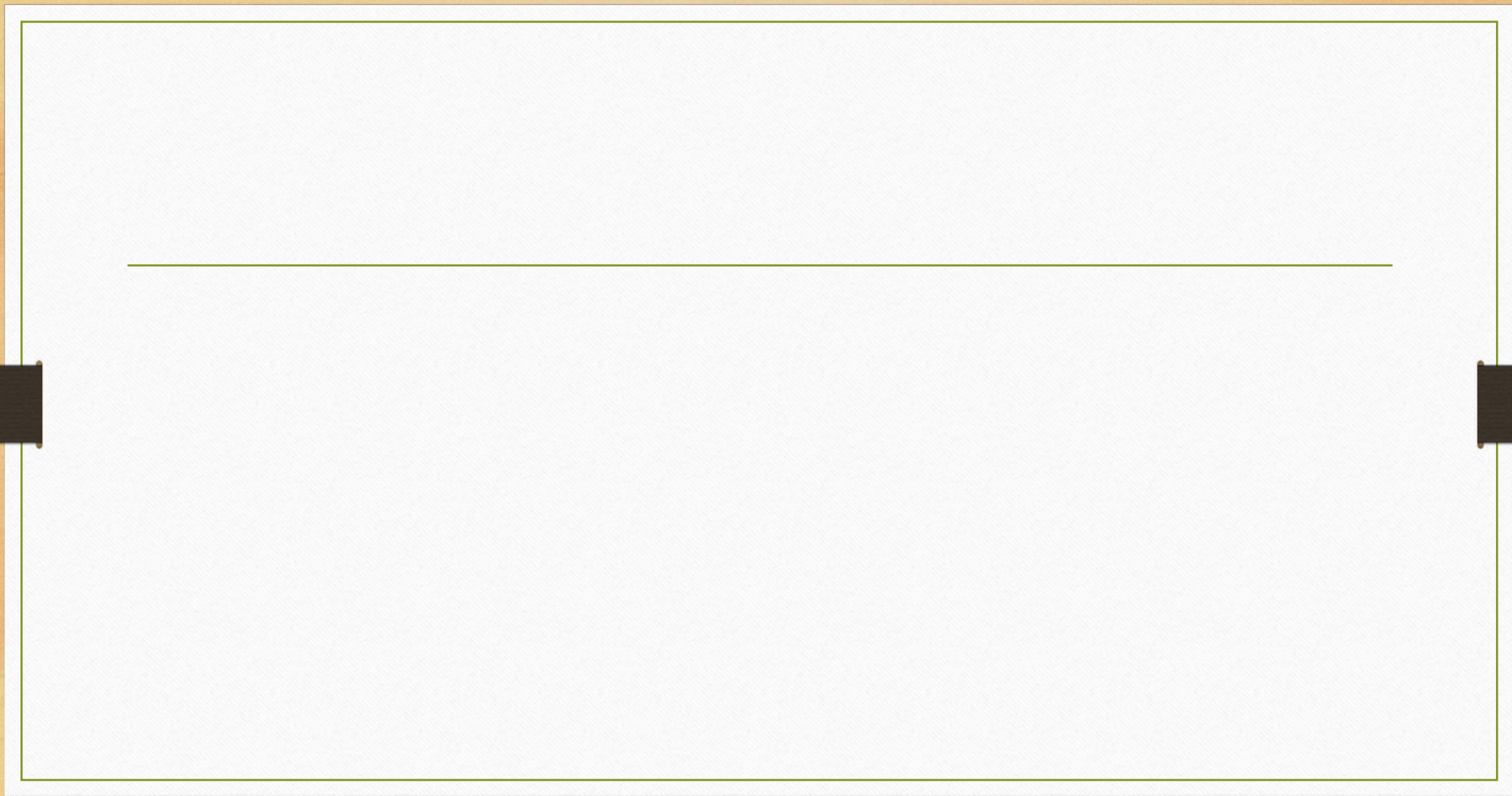
- Arise from or adjacent to the EOM
- Lesions arise from eyelids
- 10% of all rhabdomyosarcoma cases
- Subtypes in orbit:
  - Less common alveolar type – more aggressive (inferiorly)
  - More common Embryonal type (89%) – less aggressive (sup medially)



# Orbital RMS

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- Rapidly growing painless mass – proptosis
- Mean age is 6-8yo
- Anterior involvement
  - Involve levator – eyelid edema, hemorrhage, pain
- Posterior involvement
  - Vision changes – optic nerve is compressed
- Invasion of adjacent bone and soft tissues
- Metastases to lungs and bones





# Case 5

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- 10yo M “swelling of the upper eyelid” X 2days
  - Some tenderness on touch
  - Some discharge
  - H/o Meibomianitis OU
- Meds: none, NKDA
- F/T born
- Gen health: good

# Case 5

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# Case 5

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- Assessment and plan
  - Preseptal cellulitis OS UL
  - Secondary to clogged glands
- Augmentin 40mgs tid X 7-10 days
- Warm compresses/ lid hygiene

# Case 6

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- 3yo F “ swelling of eyelid” X 2-3 days
- No pain
- No fever
- Meds: none, NKDA
- Gen health: good
- F/T born



# Case 6

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# Case 6

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- Assessment and plan
  - Preseptal Cellulitis OS UL
  - Augmentin tid 7-10 Days





# Case 7

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- 8yo F “ swelling of upper lid” X 2-3 days
  - Got worse
  - Pain on touch
  - No d/c
  - No Trauma
- Gen health: good – no Fever, some cough and cold
- Meds: none, NKDA

# Case 7

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- VA sc OD: 20/40                      OS: 20/20
- Pupils: round, reacting to light, no APD





# Case 7

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- Assessment and plan
  - Orbital Cellulitis OD
  - Sent to ER
  - CT scan r/o sinusitis
  - IV antibiotics

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- Orbital tissue infections

- Preseptal more common (72%)

- Orbital

- Pathogens

- Staph aureus

- Strep Pyogens

- Hemophilus influenzae

- Strep Pneumoniae



# Preseptal vs Orbital cellulitis

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- Preseptal

- No effect on VA
- Warm lids
- No fever
- EOM full
- Pupils normal
- Obvious local cause
  - Bug bite
  - Chalazion
  - Localized trauma
  - Localized inflammation

- Orbital

- VA affected
- Warm lids and pain
- Proptosis/ chemosis
- Fever and lethargy
- EOM restricted
- Pupils APD
- Causes
  - Sinusitis (Ethmoid sinus)
  - Subperiosteal abscess
  - Worse preseptal

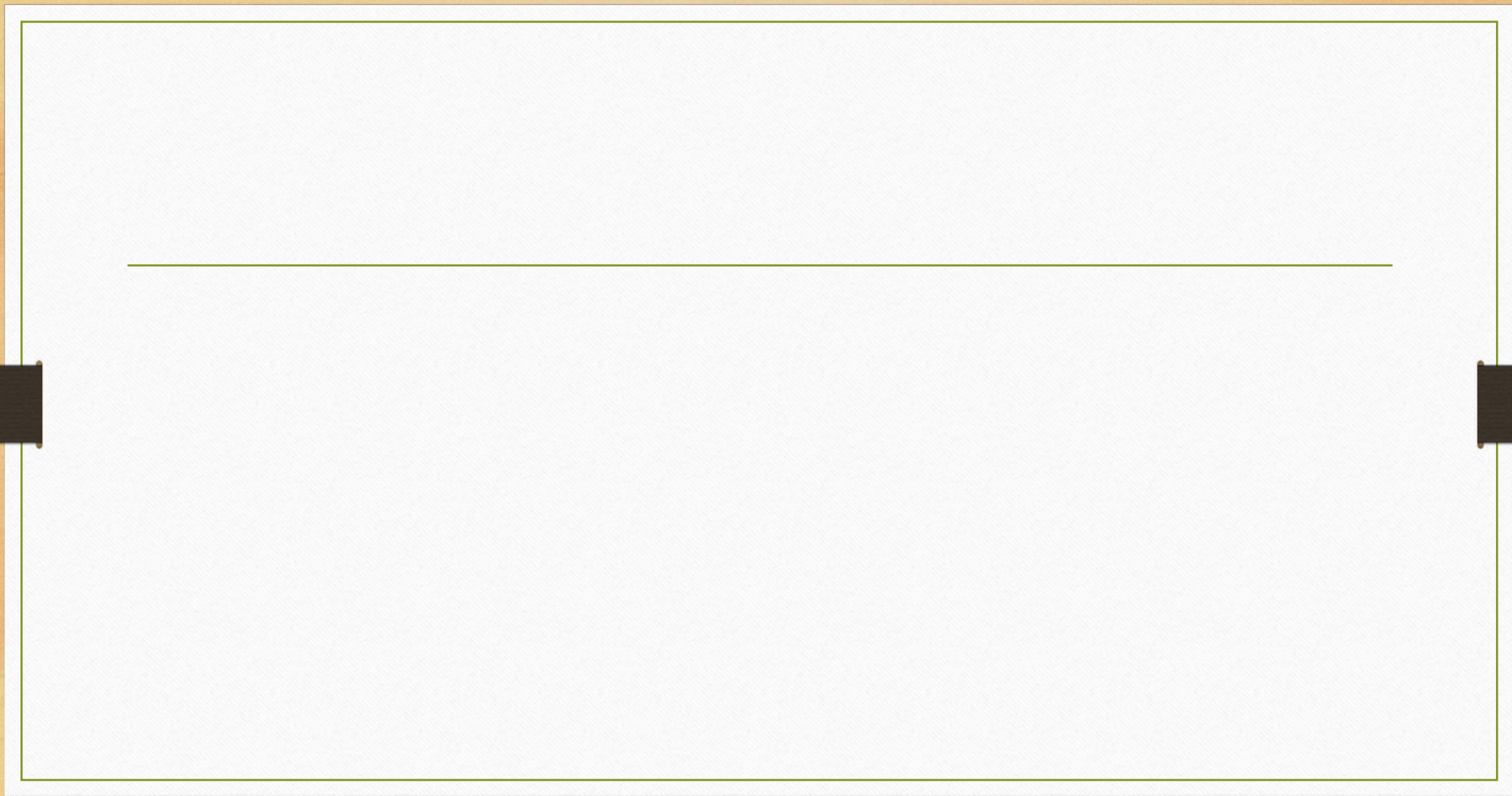




# Clinical pearls

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- Small babies/younger children less immunity
- Infection passes through tissues easily
  - Risk for Meningitis
  - Brain abscess
  - Cavernous sinus thrombosis – VI N palsy, high fever
- Hospitalization with IV
- Rocephin (Ceftriaxone)
  - Cephalosporin
  - Bacterial infections
  - Given IM





# Case 5

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- 6mths old Male “ small bump on white of eye”
  - For few weeks
  - Getting worse
  - No pain
- Meds: none, NKDA
- Gen health: good
- F/t born, weighed at birth 8lbs, C section

# Case 5

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- VA sc OD: CSM                      OS: CSM
- Pupils: round, reacting to light, No APD
- EOM: full
- No Strab – grossly normal



# Case 5

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# Case 5

- Differential Diagnosis
  - JXG – juvenile xanthogranuloma (red in color)
  - Cyst
  - Dermoid
  - Fibrous histiocyoma (white in color)
    - Rare

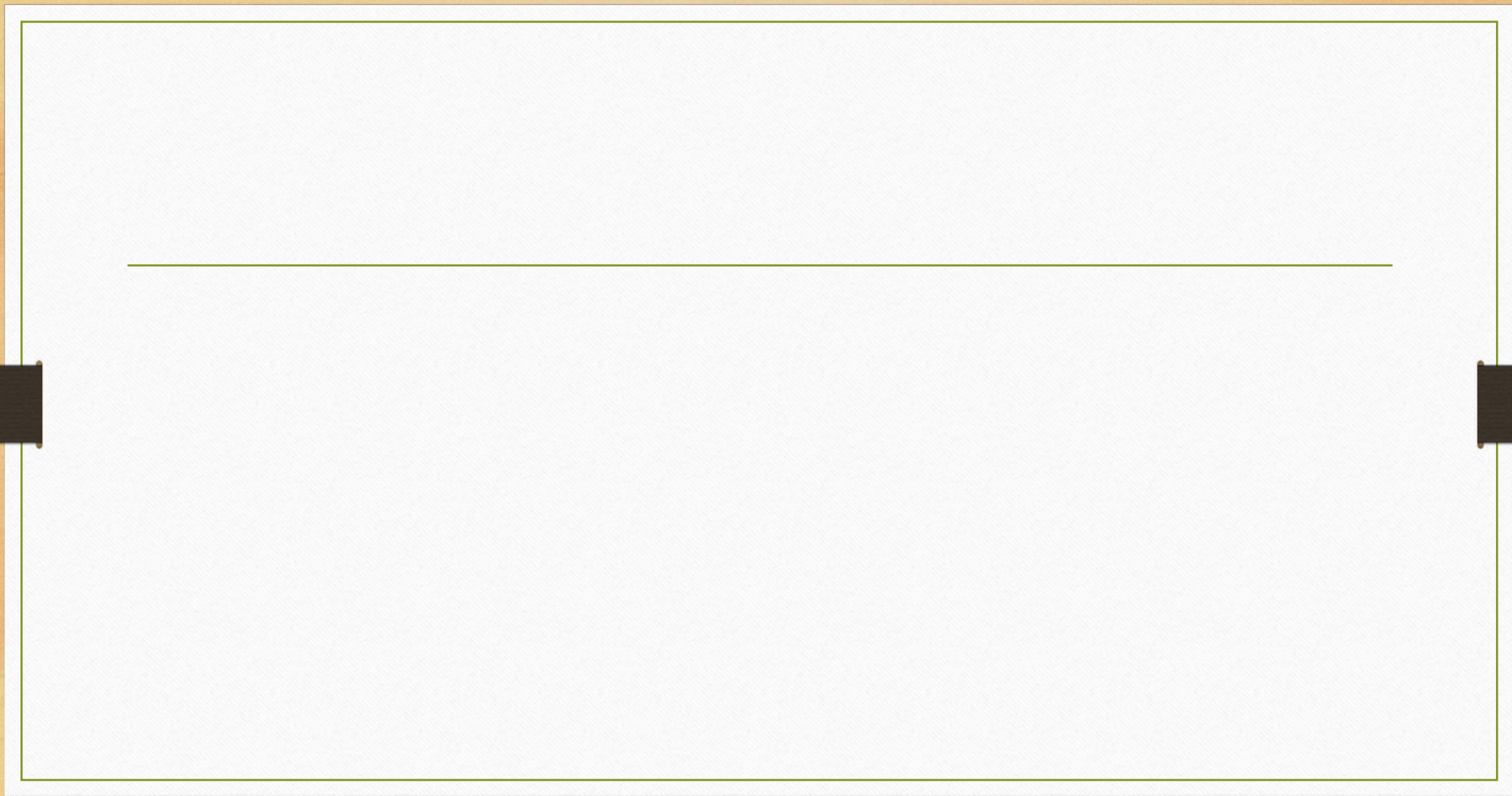




# Case 5

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- Sent to Dr. Shields at Wills eye hospital
  - UBM – solid mass 3.2mm thickness
  - No intraocular component
- Dx: epithelial cyst with chronic granulomatous inflammation
- Surgically removed





# Case 6 – patient TT

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- 5yo Male came in for “floaters in the eye”
  - Past 2-3 days
  - No pain
  - No other symptoms
- POHx: unremarkable eye exam 1 yr ago
- Meds: none, NKDA
- Birth history: F/T born, weighed 7lbs at birth, C section

# Case 6- patient TT

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- VA sc: OD: 20/40 NI with PH                      OS: 20/20
- Pupils: normal, no APD
- IOP: normal OU
- Anterior segment: normal
- Cycloplegic Retinoscopy: OD: +1.50sph              OS: +0.50sph



# Case 6 – patient TT

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- Posterior segment
  - As seen



# Case 6 – patient TT

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- Differential diagnosis
  - Coats disease
  - Retinal detachment
  - Retinoblastoma





# Case 6 – patient TT

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- More testing
  - U/S B scan revealed: lesion with calcification

# Case 6 – patient TT

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- Assessment and plan:
  - Retinoblastoma (sporadic)
  - No evidence of ON or choroidal invasion
  - Enucleation



# Case 6- TT

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- Retinoblastoma
  - uncommon childhood cancer of the eye
  - Retinoblasts, chromosome 13q, RB1 gene
  - Dx usually < age 2yo, but some have been seen as old as teenagers
  - 75% unilateral (sporadic), 25% bilateral (familial)
  - Boys = girls

# Case 6 - TT

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- Familial
  - Tends to run in families
  - Mostly bilateral
  - Dx usually <5yo
  - Risk of metastasize – pineal gland, bone, soft tissues
  - f/up as new born then q 3-4 mths till age 3-4yo
  - f/up q 6 mths till age 5-6 yr old
  - f/up annually



# Case 6 - TT

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- Sporadic
  - No familial history
  - Mostly unilateral
  - As old as teenagers have been dx
  - 1-2% chance siblings have it
  - Not at risk for metastasize

# Case 6- TT

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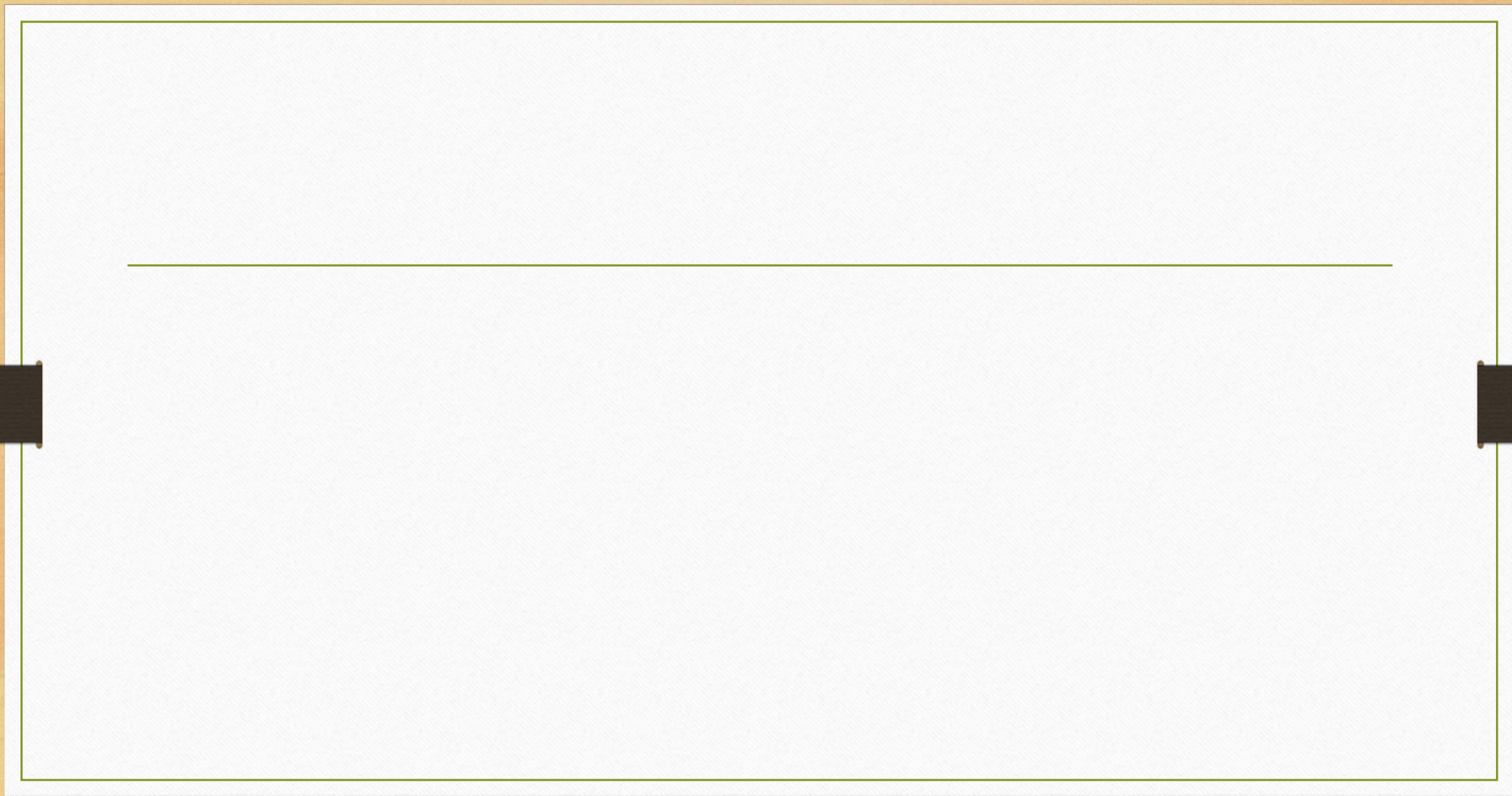
- Testing
  - MRI brain and spinal column
  - Blood tests
  - Hearing test



# Case 6 – TT – Treatment

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- Evidence of choroidal or ON invasion
  - Chemotherapy
- Unilateral vs bilateral
- Treatment options
  - Enucleation
  - Chemotherapy
  - Radiation/ cryotherapy/ photocoagulation
- Cure rate > 90%





# Case 7 - MP

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- 6 yo F c/o periorbital edema
  - Started 4 mths ago, getting worse
  - Rubs her eyes a lot, tried Claritin no relief
  - No disch



# Case 7 - MP

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- LEE: never
- F/T born, appendicitis Sx 2 mths ago, No Sz
- Meds: none, NKDA
- Gen health: good, no edema elsewhere



# Case 7 - MP

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- Uncorrected VA:

- OD: 20/40
- OS: 20/40

- Manifest refraction:

- OD: -0.75 sph (20/20)
- OS: -0.75 sph (20/20)

# Case 7 - MP

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- Pupils: round, reactive and no APD
- Slit Lamp Exam:
  - Papillae OU palpebral conjunctivae OU
  - Some redness OU
- No strab: ortho for D and N with no glasses
- Color vision: normal
- EOM: full and painless



# Case 7- MP

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- Posterior segment:
  - ON: healthy, 0.3 c/d ratio OD and OS
  - Macula: flat, + FLR OU
  - Periphery: no holes, or tears 360 deg OU

# Case 7- MP

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- Assessment and Plan:
  - Allergic shiners
  - Zyrtec for 2 weeks
  - Pataday one drop q 24hrs OU for 2 weeks
  - Follow up in 2 weeks



# Follow up appt

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- c/o still no changes in edema
- Child is otherwise healthy and is doing well
- No edema in any other parts of the body
- Patient still rubs her eyes



# Case 7 - MP

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- Slit Lamp exam
  - No more redness in eyes
  - No papillae OU
- Rest of exam remains stable



# Differentials - eye

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- Preseptal Cellulitis
- Orbital Cellulitis
- Bug Bite
- Psuedotumor of orbit
- Ocular oncology – rhabdomyosarcoma
- Dermoid cysts





# Differentials – systemic

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- Cardiovascular disease
- Liver disease
- Thyroid – hypothyroidism
- Kidney – nephrotic syndrome

# Case 7 - MP

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- Urine analysis
  - Positive for protein 3+
- Blood work
  - Low levels of albumin
  - Blood cholesterol was high



# Case 7 - MP

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- Nephrology consult
  - Oral prednisone 14mg/ low salt diet
  - 3mths on taper schedule



# Case 7- MP

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- Nephrotic syndrome
  - Kidneys leak protein from blood into urine
  - Type : minimal change disease
  - high dose steroids for 6 weeks
  - Taper schedule for total of 3 mths
  - Risk of relapse is 70%
  - Usually outgrow this 3-5 yrs after diagnosis



# Case 7- MP

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## NEPHROTIC SYNDROME



THE SWOLLEN CHILD



# Case 7- MP

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Thank You

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