



1. IMAGE-BASED DISCUSSION

CHAPTER 1: ORBIT

00.03.06

- Identify the sign
 - X-ray AP view: **Tear drop sign**
 - Seen in blunt trauma → Fracture of the inferior orbital wall
- A 65-year-old diabetic female with Acute onset of proptosis & following features:
 - **Orbital Cellulitis**
 - Lid edema
 - Chemosis
 - Congestion
 - Dilated pupil
 - Relative Afferent Pupillary Defect (RAPD)- Optic nerve involvement
 - Most deadly complication: Cavernous Sinus Thrombosis
 - Earliest sign: Abduction Defect - Due to involvement of abducent nerve
- Identify the image
 - **Hertel's exophthalmometer**: Used to assess exophthalmos in adults.
 - **Luedde's exophthalmometer**: Used to assess exophthalmos in children.

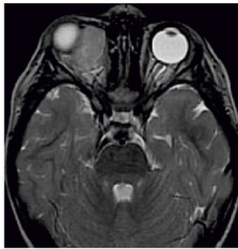

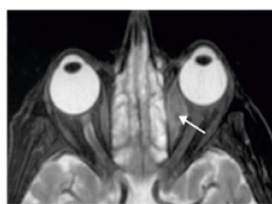
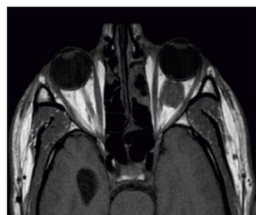


Important Information

- Preseptal Cellulitis
 - No proptosis
 - No paralysis of muscles

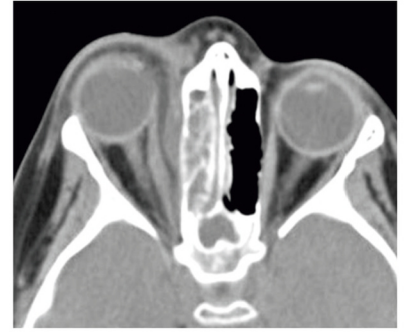


- M/c intraorbital tumours

In children		In adult	
Malignant	Benign	Malignant	Benign
 <ul style="list-style-type: none"> • Rhabdomyosarcoma <ul style="list-style-type: none"> ○ Desmin and vimentin positive ○ Rx: chemotherapy + radiotherapy 	 <ul style="list-style-type: none"> • Dermoid cyst <ul style="list-style-type: none"> ○ M/c site: Inferior-temporal ○ Rx: Excision 	 <ul style="list-style-type: none"> • Distant metastasis from primary tumours • NHL - M/c 	 <ul style="list-style-type: none"> • Cavernous hemangioma <ul style="list-style-type: none"> ○ axial proptosis

Yourwish

- Proptosis
 - MCC for U/L proptosis in a child is: Orbital Cellulitis
 - MCC for B/L proptosis in a child is: Neuroblastoma
 - MCC for U/L and b/l proptosis in an adult is: Thyroid Eye Disease
- M/c intraocular malignant tumours:
 - In child: Retinoblastoma
 - In adult: Choroidal melanoma
- Diagnosis:
 - **Subperiosteal abscess** - Periosteum near the MR is lifted up



CHAPTER 2: EMBRYOLOGY OF THE EYE

00.17.36

- Development of the eye starts at 22 days of gestation.
 - Gene involved: PAX6
 - Gene defect:
 - Microphthalmia: Small Axial Length: < 21 mm (Normal = 24 mm)
 - Anophthalmia: Absent eyeball
- Persistent hyperplastic primary vitreous:
 - Due to non-regression of the hyaloid artery
- **Muscae volitantes**:
 - Persistent hyoid vessel present as fragment & causes floaters
- **Mittendorf's dot**:
 - Anterior part of hyaloid vessel remains attached to posterior capsule of the lens
- **Bergmeister papilla**:
 - Posterior part remains attached to retina (specifically the Optic Disc)
- Diagnosis

Ankyloblepharon: adhesion between two eyelids



Symblepharon: adhesion between the palpebral and bulbar conjunctiva



- Diagnosis
 - Iris coloboma: keyhole pupil
 - M/c location is inferonasal
 - Associated with lens coloboma (misnomer as only ciliary zonules will be missing), retinal coloboma, choroidal coloboma



CHAPTER 3: LENS AND ITS DISEASES

00.22.56

- Visual Acuity (VA)
 - Distant vision measurement:
 - Snellen's chart: Read from 6m
 - ETDRS/Logmar chart: from 4m, negates the crowding phenomenon seen in Amblyopia
 - Near vision measurement
 - Jaeger's chart from 35 cm
 - Criteria
 - A. Low vision: 6/18 - 6/60
 - B. Economic Blindness: < 6/60 - 3/60
 - C. Social Blindness: 3/60 - 1/60
 - D. Manifest blindness: Vision less than 1/60
 - E. Absolute blindness: No Light Perception (PL negative)
 - WHO Definition of blindness: Visual Acuity (VA) \leq 3/60 or Visual Field (VF) \leq 10° in the better eye with best possible correction.
 - NPCBVI (National Programme for Control of Blindness & Visual Impairment): Presenting VA in the better Eye.
- Slit lamp examination
 - Gold standard for eye examination
 - Lenses used: (To examine fundus)
 - +90 D, +78 D: Convex lens gives real and inverted images
 - -58D: Concave lens gives virtual and erect images

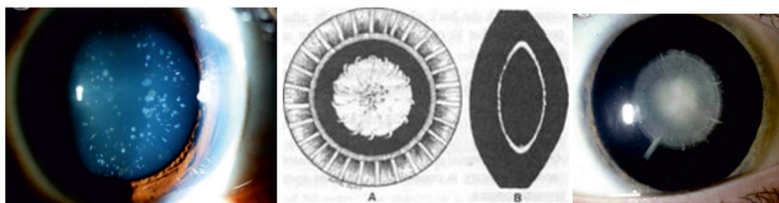
E = 6/60
 D N = 6/36
 H C U = 6/24
 O L A F = 6/18
 D H L E N = 6/12
 C T P A L O = 6/9
 D N M O B U C = 6/6



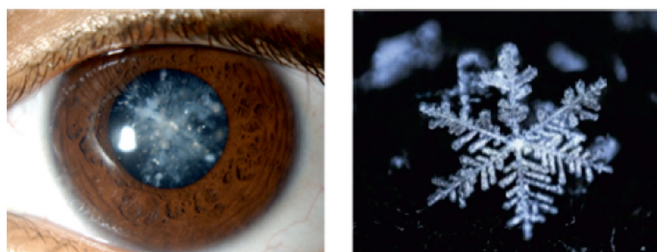
• Ophthalmoscopy

Direct ophthalmoscopy	Indirect ophthalmoscopy
<ul style="list-style-type: none"> • Magnification 15X. • Small field of view and a monocular image • Stereopsis Absent • For central retina examination <ul style="list-style-type: none"> ○ Optic disc → Glaucoma 	<ul style="list-style-type: none"> • Magnification 3-5X. • Wider field of view and binocular (3D) view. • Stereopsis present • For peripheral retina examination in retinal detachment <ul style="list-style-type: none"> ○ M/c site: Supero-temporal

- M/c congenital cataract is BLUE DOT.
- M/c cataract associated with loss of vision is LAMELLAR/ZONULAR
 - Riders: cortical opacities
 - Involves fetal nucleus (central & peripheral clearing)



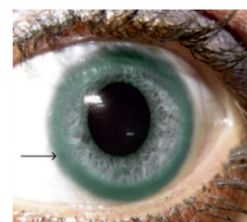
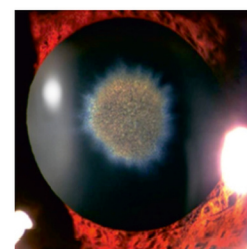
- M/c cataract associated with NIDDM (T2DM): Early senile cataract
- M/c cataract associated with IDDM (T1DM): Snowflake



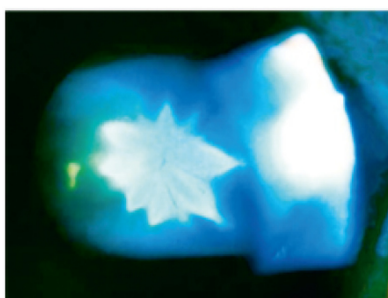
- Identify
 - Christmas tree cataract in myotonic dystrophy



- Sunflower cataract
 - Wilson's Disease
 - Mutation in the ATP7B gene on chromosome 13 → ↓ Ceruloplasmin
 - ↑ Copper in Urine
 - ↓ total serum copper
 - Chalcosis: Copper foreign body
 - Kayser-Fleischer Ring: Copper deposition in Descemet's membrane of the cornea.
 - In Wilson's disease → reversible (response to treatment)
 - Present in 100% cases of Neurological involvement.
 - May or may not be present in Hepatic involvement.
 - Described as Yellow, Brown / Blue or Brownish-green.

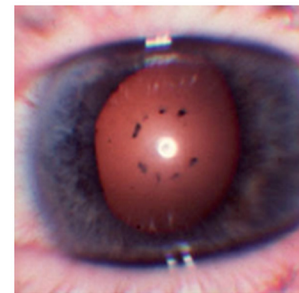


- Penetrating trauma leads to development of Anterior cortical cataract.
- Blunt trauma leads to the development of rosette cataract, which is a posterior cortical cataract.



- Pigment dispersion on the anterior lens capsule: **Vossius Ring**.

- Seen in blunt trauma



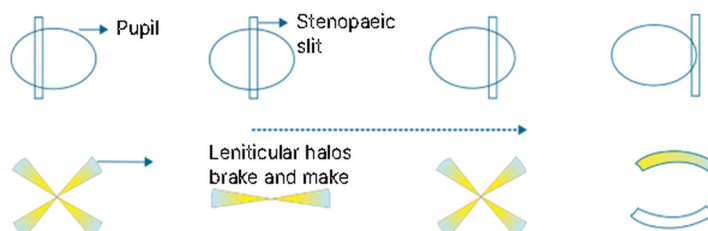
- Siderosis bulbi

- Fe intraocular foreign body



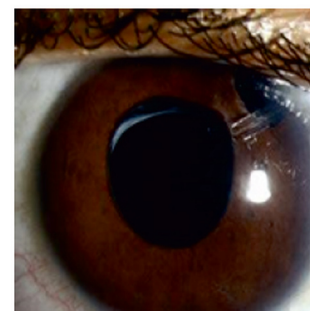
- Fincham's Test - Used to differentiate between halos in cataract and glaucoma:

- Cataract Halos: When a stenopaeic slit is passed across the eye, these halos fragment into segments.
- Glaucoma Halos: These halos remain intact and do not fragment



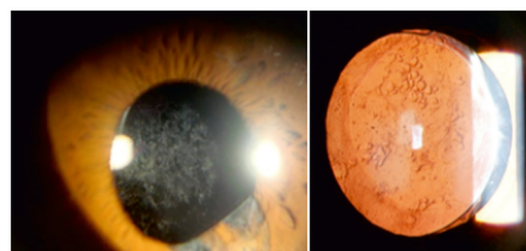
- Aphakia: Absence of lens

- Iridodonesis (Tremulousness of the iris)
- Aphakic Glasses (Effects)
 - Jack-in-the-Box
 - Roving Ring Scotoma
 - Pincushion Distortion
- Aphakic glasses are usually prescribed with a power of +10 to +12 D and produce approximately 25% magnification



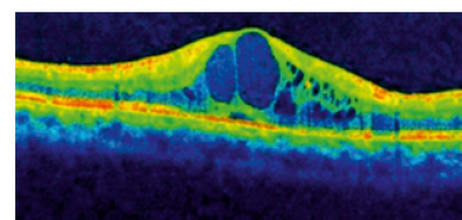
- Diagnosis & Treatment

- After cataract/Posterior capsular opacification
- Rx: NdYAG laser capsulotomy (1065nm)



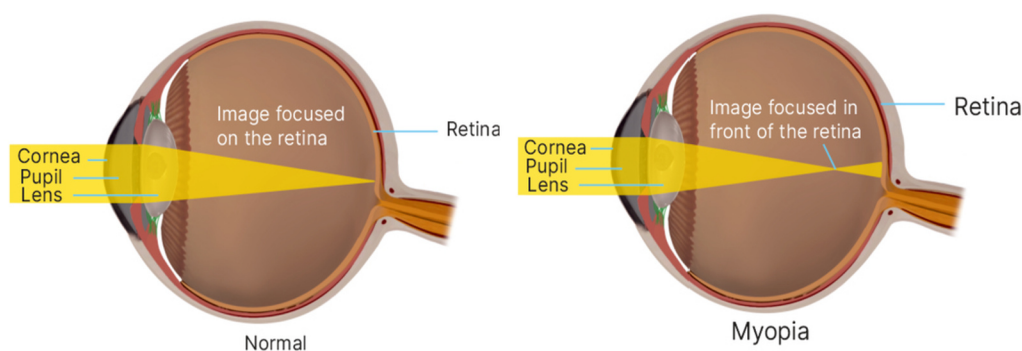
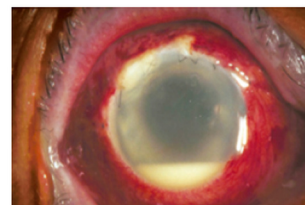
- Diagnosis: **CME**

- Symptoms: Sudden, painless loss of vision within 1-3 months post-cataract surgery.
- OCT: Optical Coherence Tomography → Untraretinal cyst
- Prophylactic Topical NSAIDs : Bromfenac, Nepafenac



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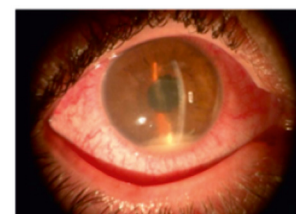
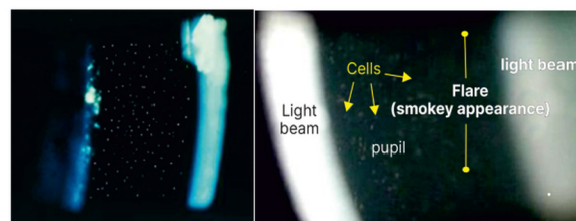
- Endophthalmitis: inflammation of the inner coats of the eye
 - Within 6 weeks: Acute Post-operative
 - M/c cause: **Staphylococcus epidermidis** > **Staphylococcus aureus**
 - After 6 weeks: Chronic / Delayed onset:
 - M/c cause: Propionibacterium acnes
 - Conjunctival congestion, hypopyon, hazy cornea
 - Treatment: 5% Povidone iodine on eyelash
- Paediatric cataract surgery.
 - PPPC = Phacoaspiration Primary Posterior capsulotomy + anterior vitrectomy
 - Axial Length
 - At birth = 16.5 mm
 - 3 yrs = 21 mm
 - Adult: 24 mm
 - IOL power is under-corrected by 10-20%.
 - If age is less than 2 years: 20% under-correction is done.
 - If age is 2 to 8 years: 10% under-correction is done.



CHAPTER 4: UVEA

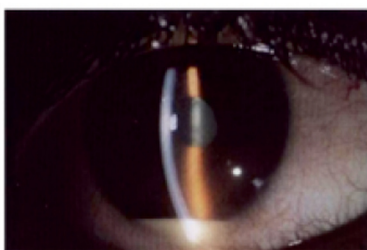
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- Anterior Uveitis
 - Earliest diagnostic feature: Cells > proteins in the anterior chamber
 - Neutrophils (M/c) initially
 - Later leukocytes
 - Smoky appearance due to proteins in AC
 - Circumcorneal congestion
 - Hypopyon
 - Keratic precipitates: Base down triangle in the lower 1/3 of the cornea
 - Mutton fat in chronic granulomatous
 - Small and medium in non-granulomatous
 - Fine in Fuchs heterochromic iridocyclitis
 - Iris nodule in granulomatous condition
 - Koeppe's nodules in the pupillary margin
 - Busacca's nodule in base of the iris
 - M/c complication in uveitis is secondary glaucoma
 - M/c complication in recurrent anterior uveitis is cataract
 - Rx: Topical steroids, Cycloplegics, Timolol

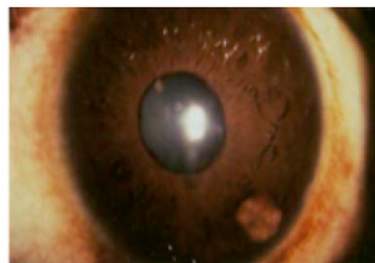




Koepple nodules

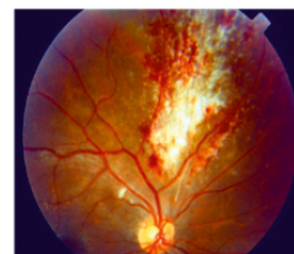


Hypopyon

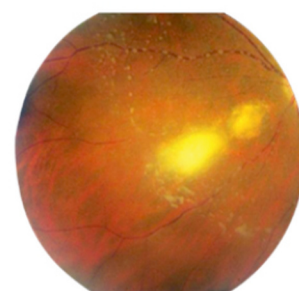


Busacca nodule

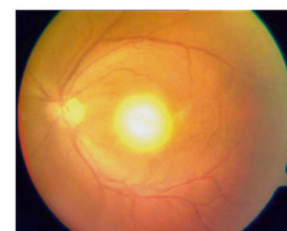
- Etiology of the disease
 - Pizza pie / Sauce n cheese appearance / Tomato splash - CMV retinitis
 - Rx: Gancyclovir



- Candle wax dripping → Sarcoidosis
 - Rx: Steroids



- Headlight in fog appearance → Toxoplasma
 - Rx: Spiramycin in pregnancy

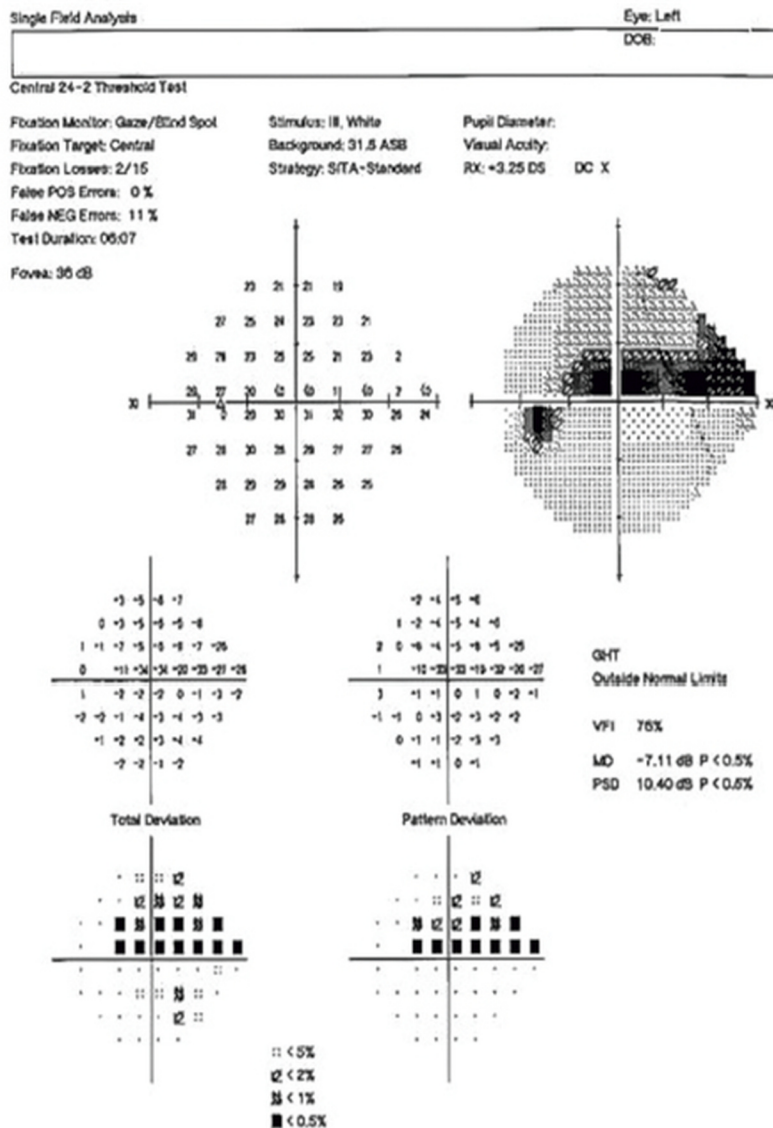


CHAPTER 5: GLAUCOMA

- Optic disc changes in glaucoma
 - Normal C:D ratio is 0.4 (40% by optic cup, 60% neuroretinal rim)
 - In glaucoma, the C:D ratio is 0.9 (only 10% neuroretinal rim is present)
 - Order of nerve fibres affected
 - Inferior and superior arcuate nerve > radial fibres > papillomacular bundle.



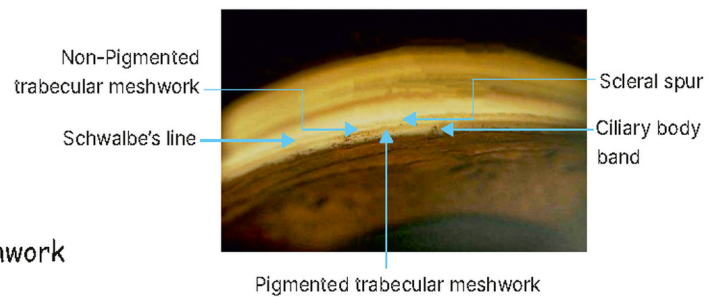
- Perimetry chart
 - Optic disc is on the nasal side, hence physiological blind spot is located temporally
 - Here, the superonasal visual field is affected, hence inferotemporal retinal fibres are affected



- Primary congenital glaucoma
 - CYP1B1 gene involved
 - Ground glass cornea due to edema
 - Haab's striae due to Descemet's membrane tear leading to corneal edema
 - Bluish discoloration of the sclera
 - Triad of lacrimation (earliest), photophobia, and blepharospasm
 - Buphthalmos due to increased axial length
 - TOC is goniotomy
 - Combined trabeculectomy and trabeculotomy in case the cornea is hazy



- Visual field defects in glaucoma
 - Earliest change is isopter contraction
 - Most specific is paracentral scotoma
- Gonioscopy: To assess the angle of anterior chamber:
 - Structures seen from anterior to posterior
 - Schwalbes line
 - Non-pigmentary and pigmentary trabecular meshwork
 - Scleral spur
 - Ciliary body
 - Grading on gonioscopy



Grade 0	No structures visible	0-degree
Grade 1	Only Schwalbe's line is visible	10-degree peripheral vision present
Grade 2	Till the trabecular meshwork is visible	20-degree peripheral vision present
Grade 3	Till the scleral spur is visible	30-degree peripheral vision present
Grade 4	All 4 structure visible	40-degree peripheral vision present

- Indirect gonioscopes
 - Goldmann single mirror
 - Zeiss four mirror
 - Posner four mirror
 - Sussman four mirror
 - Ritch Trabeculoplasty lens
- Direct gonioscopes
 - Koeppel
 - Barkan
 - Swan-Jacob
- Vogt's triad: A telltale sign of previous attack of glaucoma
 - Glaucoma fleckens: Anterior subcapsular lenticular opacity
 - Iris atrophy
 - Pigment dispersion

Important Information

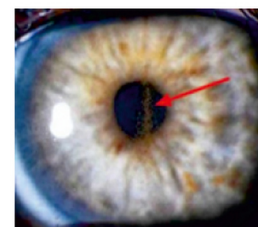
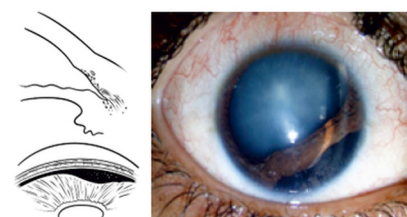
- In acute angle closure glaucoma, the pupil will be mid-dilated, oval, and unreactive pupil
 - In acute anterior uveitis, a small, irregular, nonreactive pupil
 - Frequent changes in myopic glasses: nuclear cataract
 - Frequent changes in myopic glasses in young: keratoconus
 - Fluctuation of vision: diabetic
 - Frequent change in presbyopic glasses: Open-angle glaucoma
- DOC in POAG, PACG, NTG → Prostaglandin analogues
 - Earlier in POAG: Beta blockers
 - Earlier in Angle closure glaucoma: Pilocarpine

Yourwish

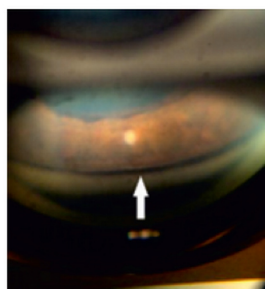
- Side effects of prostaglandin analogues:
 - CME
 - Iris pigmentation
 - Tricomegaly
 - Blepharoconjunctivitis
 - Uveitis



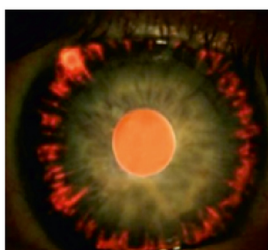
- Angle recession: Separation of longitudinal and circular fibres of the ciliary body
 - High trauma may lead to blockage of the meshwork → Angle recession glaucoma
- Separation of ciliary body from scleral spur: Cyclodialysis
- Separation of iris from its root: Iridodialysis (D-shaped pupil)
- Pigment dispersion syndrome
 - MC in males and myopes
 - Pigment deposition in corneal endothelium: Krukenberg's spindle



- Increased pigment in trabecular meshwork: Sampoliasis line



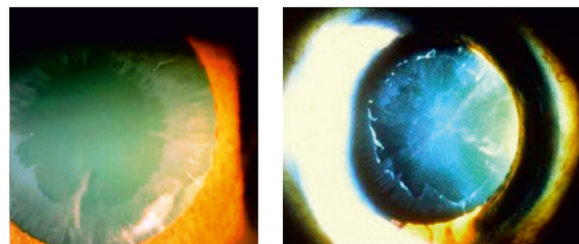
- Characteristic iris defects → Transillumination due to pigment loss from the iris



- Pigments block the trabecular meshwork → raised intraocular pressure
- Reverse pupillary block can be seen
- Pseudoexfoliation
 - Deposition of whitish fibrillary substance on the lens capsule, iris epithelium, ciliary body, and conjunctiva

Important Information

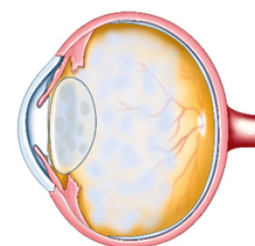
- A sudden decrease in IOP is seen in cataract surgery and glaucoma surgery



CHAPTER 6: RETINA

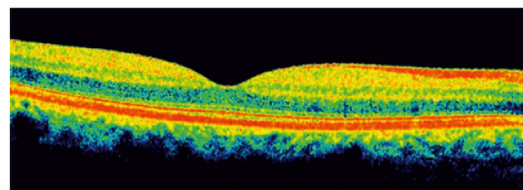
- Aqueous misdirection syndrome/malignant glaucoma/ inverse glaucoma
 - Aqueous humour pockets in the vitreous
 - Only glaucoma where mydriatic is the DOC
 - DOC: 1% atropine
 - Surgery: Irido-zonulo hyaloidectomy

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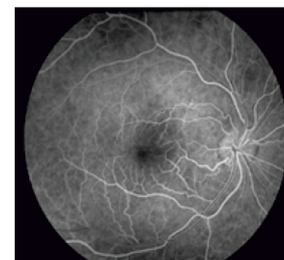
Optical coherence tomography of the macula

- RNFL (Retinal Nerve Fiber Layer) → Highly reflective (hyper-reflective) layer
- RPE (Retinal Pigment Epithelium) → Highly reflective layer
- Fovea → Shows a central dip/depression (foveal pit)



Fundus fluorescein angiography

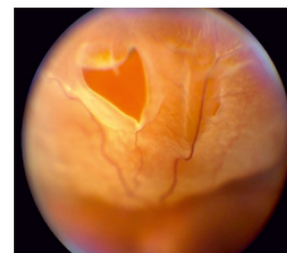
- Dye injected via the antecubital vein reaches the choroid in 10 seconds and 1 second later in the retina
- Foveal avascular zone → black because of thick RPE + ganglion cell layer
- In fundus autofluorescence, vessels and the disc are black



- Sudden loss of vision + floaters + curtain falling in front of eye:

Rhegmatogenous retinal detachment

- Horse-shoe-shaped tear at the superotemporal part
- Seen in trauma, aphakia, >6D myopia
- Photopsia, pigment in the vitreous cavity: Shaffer's sign
- Rx:
 - Scleral banding, pneumoretinopexy (M/c used gas is SF6, best is C3F8)
 - Silicon oil implant followed by secondary surgery to remove the silicon later

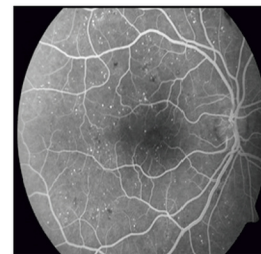


NPDR

- Soft exudates - Cotton wool spots
- Hard exudates
- Dot blot hemorrhages (outer plexiform layer)
- Flame-shaped hemorrhages in nerve fibre layer
- Microaneurysm, in nerve fibre layer → Earliest finding in DM

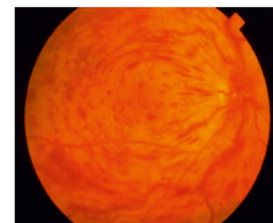


- In insulin-dependent DM, pt is symptomatic → fundus examined after 5 years
- In non-insulin-dependent DM, pt is asymptomatic → fundus examined asap
- Hyperfluorescent dots indicate microaneurysm



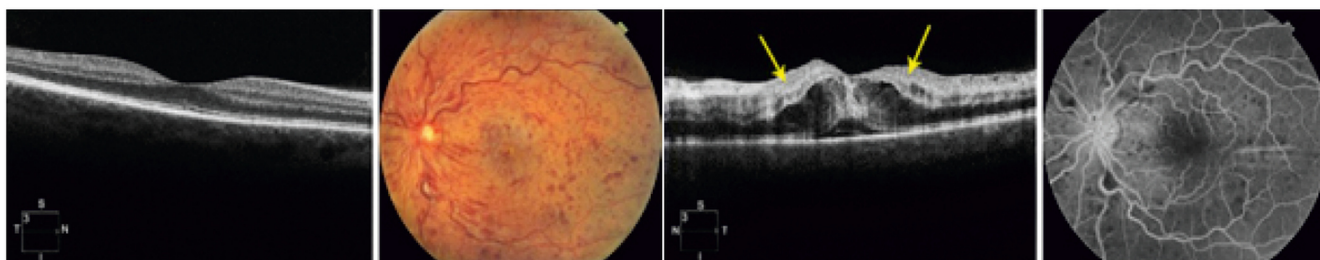
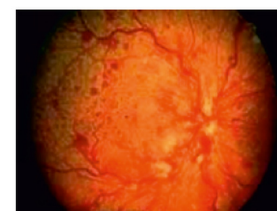
- **CRVO**

- Splash tomato appearance of retina
- Cystoid Macular Edema
- Disc edema
- Leads to 90-100 days glaucoma due to neovascularisation involving iridocorneal angle to compensate the blood supply



- Rx:

- Anti-VEGF: Ranibizumab
- Intravitreal steroids for CME
- Ozudex: Intravitreal steroid implant



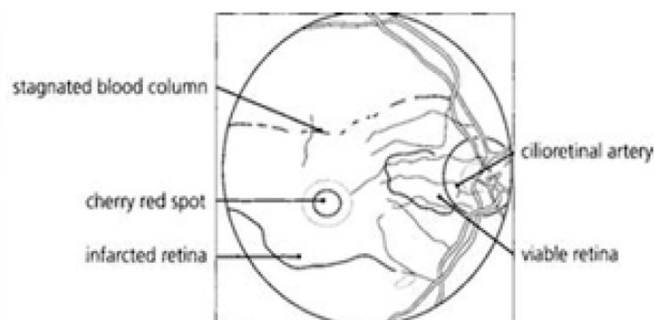
- **CRAO**

- Entire fundus is pale with blood columns
- In 45 % of people, there is an extra blood supply to the macula by cilioretinal artery
 - A branch of short posterior ciliary artery, which is not affected in CRAO
- This leads to tunnel vision and cherry red spot



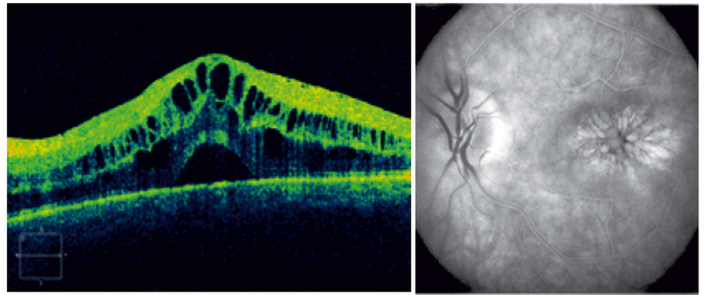
- Rx

- Retinal ischemic time is 90 min, maximum time of viability is 12 hrs
- Best management is **paracentesis**: Counterpressure is decreased so that the hollen horst plaque of cholesterol is dislodged from the artery
- Ocular massage > IV mannitol > paracentesis > carbogen inhalation > intravenous tissue plasminogen activator



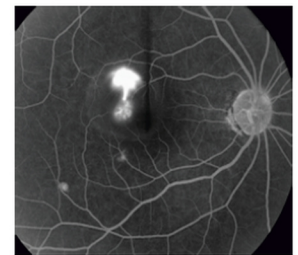
- **CME**

- Intra-retinal cysts
- Causes of CME
 - Irvin Gass syndrome
 - Pars planitis
 - PGF2 alpha analogues
 - Sympathomimetic
 - CRVO
 - DM
 - Niacin
- FFA: Flower petal appearance



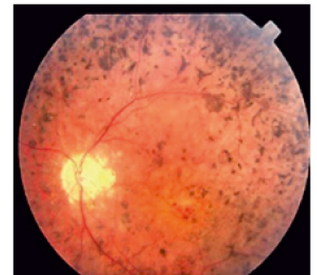
- **Central serous retinopathy**

- Smoke stack appearance
 - Seen only in 15-20% cases but specific to CSR
- Ink blot appearance in 80% of cases
- Seen in young type A personality
- Form of exudative retinal detachment
- Amsler grid test to detect macular pathology
- IOC: OCT macula
- Rx: Reassurance for 3 months, and if not resolved, again reassure for 3 months
- After 6 months of reassurance photodynamic therapy with dye Verteporfin.



- **Retinitis pigmentosa**

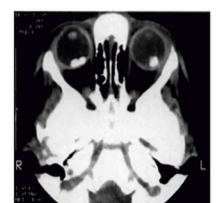
- **Triad of**
 - Pale waxy disc
 - Arterovenular attenuation
 - Bony spicules of pigments
- M/c is sporadic
- If hereditary, then M/c is AD
- X-linked has the worst prognosis
- C/F: secondary glaucoma, cataract, night blindness (earliest), complete blindness by 35-45 years of age
- ERG shows abnormal A waves
- Rx: No treatment
 - If 15000 IU of vitamin A PALMITATE injection is given, then blindness can be delayed by 40 years of age



- 18-month-old male with flexer winter steiner rosettes on histopathology and following clinical features:

- **Retinoblastoma**

- Features:
 - Leucocoria (M/c)
 - Strabismus (2nd M/c)
 - Hypema
 - Hypercontrast due to calcification
- IOC - NCCT
- IOC to detect mets: MRI
- First investigation: USG
- B/L retinoblastoma + pinealoblastoma = T/L retinoblastoma



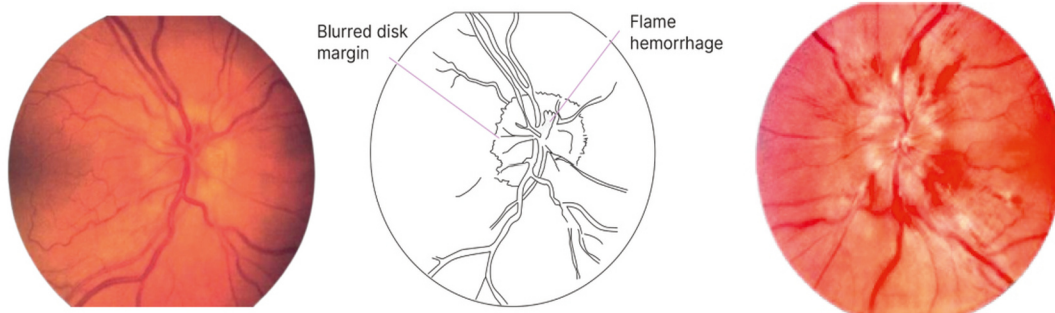
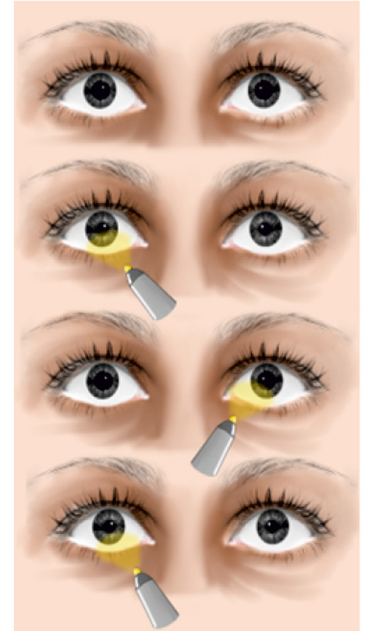
Yourwish

- M/c secondary tumor associated is osteosarcoma of head of femur
- Rx:
 - Chemotherapy -6 cycles with VEC regimen
 - Intravitreal/ intrarterial injection of melphalan

CHAPTER 7: NEURO-OPHTHALMOLOGY

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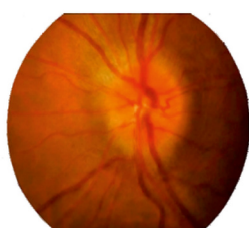
- Marcus gun pupil/RAPD (Relative Afferent Pupillary Defect)
 - When light is moved from the normal eye to the affected eye, the affected pupil paradoxically dilates instead of constricting.
- Argyryl Robertson pupil:
 - Accommodation reflex present, Light reflex absent
 - B/L pupils constricted
 - Seen in neurosyphilis
- Aedes pupil:
 - U/L dilated pupil
 - Accommodation reflex present, Light reflex absent.
 - Seen in ciliary ganglionitis
 - Pilocarpine 0.125% pupil constricts due to hypersensitivity
- Papilledema
 - B/L disc edema due to raised intracranial tension
 - No loss of vision, dyschromatopsia, RAPD
 - Earliest feature: Loss of venous sensation > increased tortuosity of vessels
 - Peri-papillary disc hemorrhages
 - Amourosis fugax: Transient loss of vision
 - Paton's line: Retinal stretch line
 - Enlargement of blind spot in perimetry
 - Rx: diuretics



- **Horner's syndrome**
 - U/L constricted pupil and partial ptosis due to Muller's muscle paralysis
 - Pseudoenophthalmus due to partial ptosis
 - Anhydrosis: Common in preganglionic lesion
 - M/c etiology: Pancoast tumor leading to sympathetic ganglion compression
 - In congenital case, there is a light-colored iris
 - Because sympathetic fibres are required for melanosomes
- **Optic neuritis**
 - Sudden painful loss of vision, RAPD, history of multiple sclerosis
 - Retrobulbar neuritis → Painful ocular movements



- Papillitis
 - Irregular disc
 - Inflammation of intraocular portion of optic nerve
- Neuroretinitis → Inflammation of neuroretinal rim
 - Seen in Cat scratch disease by *B. hensle*
- Scotomas in optic neuritis:
 - Central scotoma
 - Centrocecal scotoma
 - Altitudinal defect
- Increase in symptoms on heat: Uhthoff's phenomenon
- Rx: Intravenous Methyl prednisolone 1 gm for 3 days f/b oral 1mg/kg for 11 days



Central Scotoma

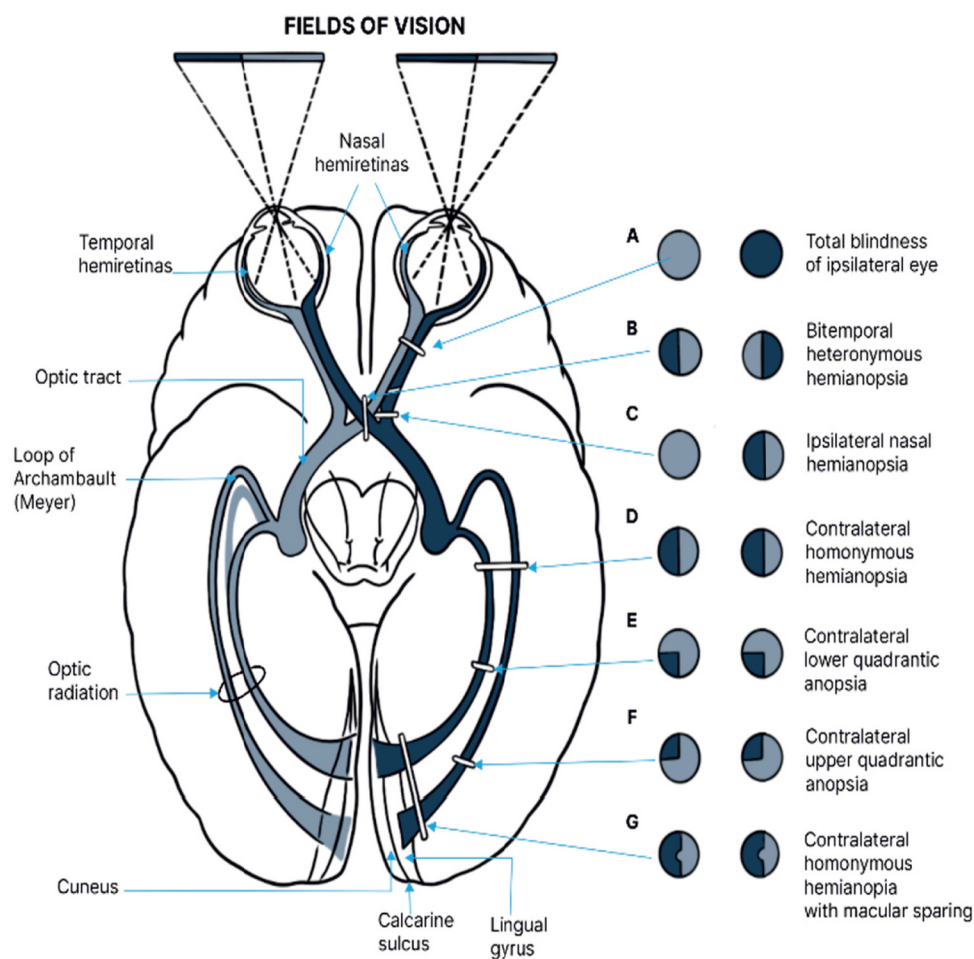


Centrocecal Scotoma



Altitudinal Defect

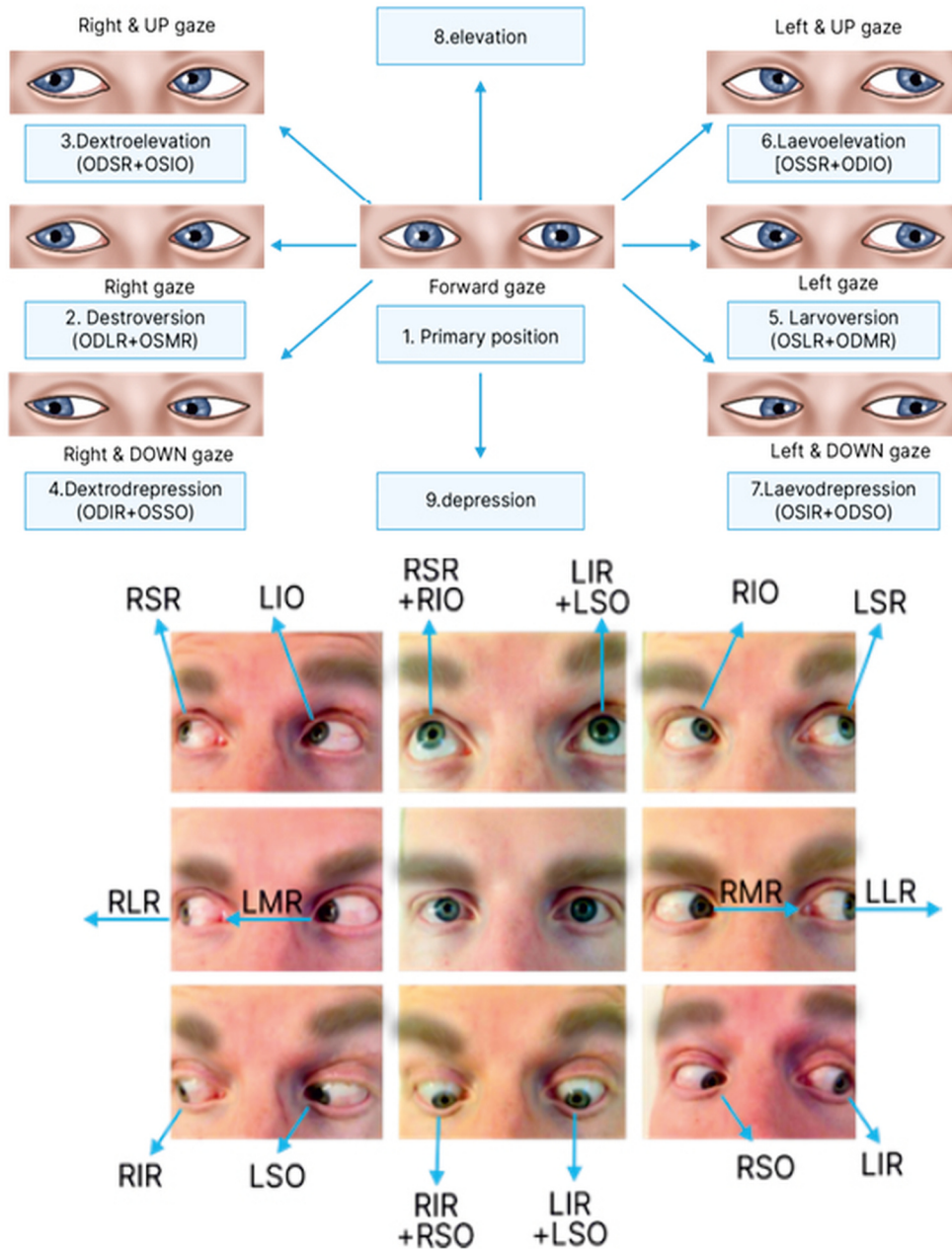
Visual Field Defects



- "Pie in the sky" → Contralateral homonymous superior quadrantanopia (due to temporal lobe lesion - Meyer's loop).
- "Pie on the floor" → Contralateral homonymous inferior quadrantanopia (due to parietal lobe lesion)

CHAPTER 8 SQUINT

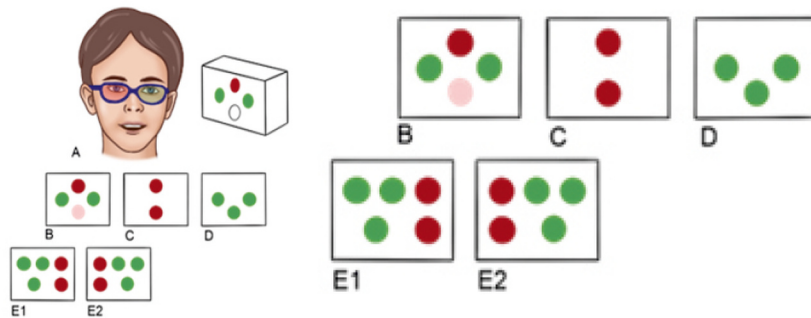
- In abducted position:
 - Elevation is done by superior rectus and depression by inferior rectus
- In adducted position:
 - Elevation is done by inferior oblique and depression by superior oblique
- Dextro-elevation by RSR and LIO
- Levoversion by LLR and RMR
- Levodepression by LIR and RSO



- Worth four dot test
 - For diplopia, suppression, ARC
 - Interpretation:
 - Normal binocular single vision A - 1 red, 2 green, 1 orange (red-green)
 - Abnormal retinal correspondence B - 1 red, 2 green, 1 orange
 - Left suppression C - 2 red lights

- Right suppression D - 3 green lights
- Alternating suppression E1- 3 green & 2 red lights alternating
- Diplopia (in the pic: crossed diplopia seen in exotropia) E-2: 5 lights, i.e., 2 red & 3 green

- E1: Esotropia
- E2: Exotropia



- Laws in extraocular muscle movements:
 - I. **Sherrington's law** of reciprocal innervation
 - During ocular motility, an increased flow of innervations to the agonist muscle is accompanied by a decreasing flow to the antagonist muscle of same eye.
 - Dextroversion: RLR +++, RMR ---
 - ii. **Hering's law** of equal innervation
 - It states that equal & simultaneous innervation flows from the brain to a pair of muscles of both eyes (yoke muscles) which contract simultaneously in different binocular movements
 - Dextroversion RLR +++, LMR +++
- **Accommodative esotropia**
 - Normal AC/A ratio is: 5 Prism dioptre (PD) = 2.50°
 - For every 1D accommodation of lens, 2.5° of 5PD of convergence of light rays occurs
 - Accommodative convergence per unit accommodation is: convergence of eye per unit accommodation = PD/D
 - M/c type of squint in children.
 - Sub-types:
 - Refractive accommodative esotropia
- AC/A ratio: normal
- T/t: + glasses for both near and distant vision
 - Non-refractive accommodative esotropia
- AC/A ratio: High
- Rx: 0 power for distance and ++ power for near vision (Executive bifocal glasses)
 - Mixed accommodative esotropia
- AC/A ratio: High + refractive error
- Rx: + power for distance and ++ power for near vision (bifocal glasses)



- **Difference between paralytic and non paralytic squint**

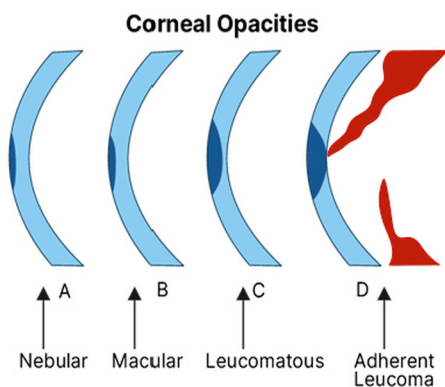
- Esotropia - uncrossed diplopia
- Exotropia - **Crossed** diplopia

	PARALYTIC	NON PARALYTIC
Onset	Acute	Chronic
Diplopia	Present	Absent
Ocular Movement	Limited	Normal
False Projection	Present	Absent
Head Posture(Compensation)	Present	Absent
Nausea/Vomiting	Present	Absent
Secondary Deviation	Greater than primary	Equal to primary

CHAPTER 9: CORNEA

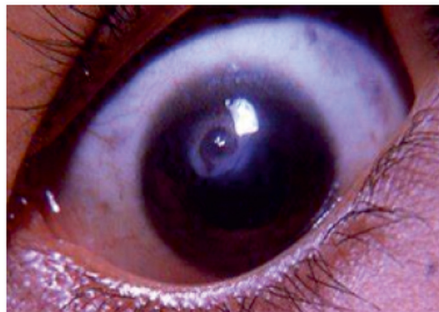
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• Corneal opacities



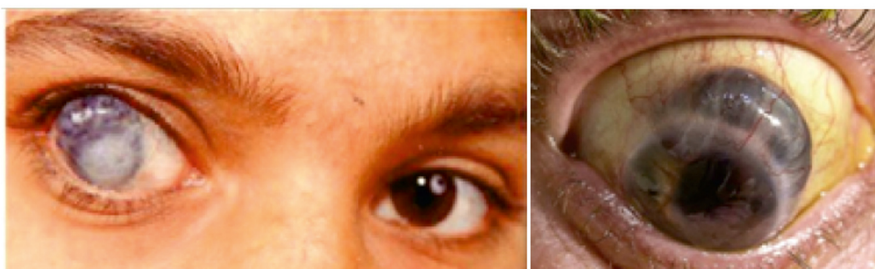
NEBULAR	Iris with crypts and furrows is visible
MACULAR	Iris is seen, but no fine details are visible
LUECOMATOUS	Iris is not seen
ADHERENT LUECOMA	Leucoma to which the uveal tissue is adhered posteriorly

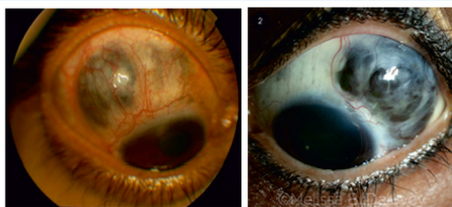
• Descematocele: Shiny bulge in the centre of opacity



• Staphyloma

- Corneal ulcer → Descematocele (only Descemet's membrane) → Rupture → Aqueous leak + iris plug → Pseudocornea forms → Cannot withstand IOP → Staphyloma.

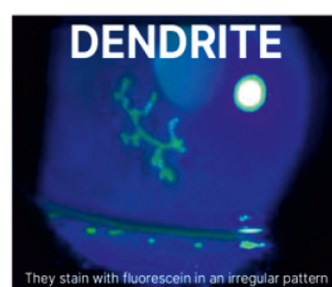
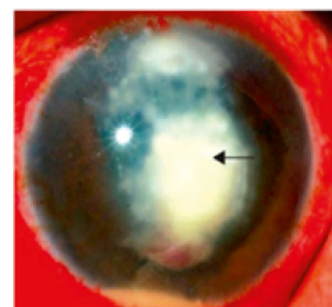


Intercalary:	Bulging at the limbus	
Ciliary:	Bulging at ciliary body	
Equatorial	Bulging at equator	
Posterior	Seen in high myopia	

- DD for staphyloma
 - Scleromalacia perforans
 - No bulge is present
 - Seen in autoimmune condition-**Rheumatoid arthritis**
- **Fungal corneal ulcer**
 - H/o organic matter injury
 - M/c cause is *A.fumigatus*
 - Signs > symptoms
 - Dry-looking ulcer
 - Margins: Fluffy / Non-defined
 - **Satellite Lesions**: Small lesions around the main incision
 - Line of demarcation where fungal antigen & host antibody meet: **Wessley's Immune Ring**.
 - Hypopyon: **Non-sterile & fixed, gravity-independent**
 - Congestion of the conjunctiva
 - Less pain and less photophobia
 - Rx
 - Branched fungi: **Natamycin**
 - Non-Branched fungi: **Nystatin**
 - New generation antifungal: **Voriconazole**

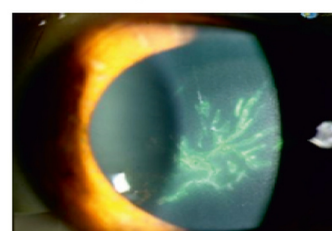


- **Herpes simplex keratitis vs varicella zoster keratitis**
 - Pathognomonic feature of viral keratitis: Decrease of Blink Reflex
 - Herpes simplex keratitis
 - Dendritic ulcer: Irregular, zig-zag, branching linear ulcer with terminal bulbs (knobs)

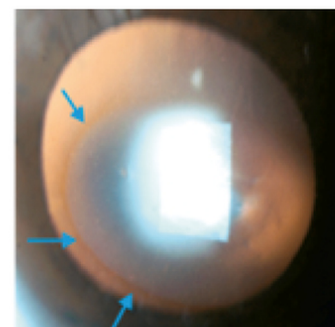
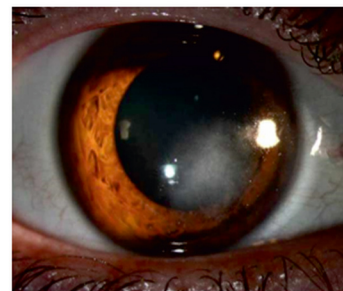



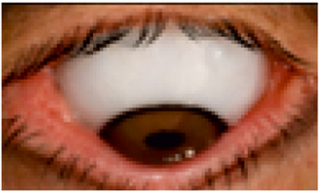
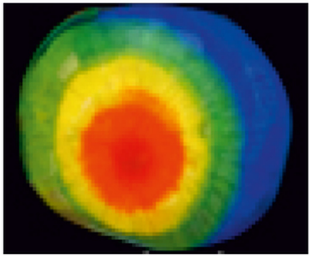

- Stains with **sodium fluorescein** (orange dye) → Appears **green under cobalt blue light**.
- Superficial Punctate epithelial keratitis → Dendritic ulcer (Geographic ulcer)
- Disciform keratitis (Endothelitis- Type IV delayed hypersensitivity reaction to HSV antigens.)

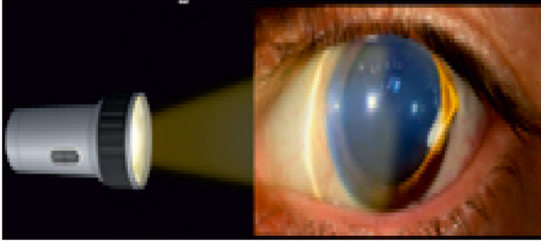

- **Varicella zoster keratitis**
 - Pseudo dendrites → Nummular keratitis (Anterior stromal infiltrates forming 'coin shaped lesions')
 - Disciform keratitis
 - **Hutchinson's Sign**:



- If the side or tip of the nose is involved, ocular involvement will be there
- Due to shared innervation of the cornea and nasal skin by the **nasociliary nerve**
 - Rx: Topical antivirals and Oral Antivirals:
 - **Disciform Keratitis:**
 - **Steroids:** only after good antiviral coverage
 - **Only indication of steroids in keratitis**
- **Interstitial keratitis**
 - Bacterial: Tuberculosis, Syphilis, and Leprosy
 - Viral: Herpes Simplex Virus (HSV), Herpes Zoster Ophthalmicus (HZO).
 - Protozoan: Acanthamoeba.
 - Autoimmune: Wegener's granulomatosis and Rheumatoid Arthritis
 - Rx: Topical steroids
- **Keratoconus:**



Fleischer Ring	<ul style="list-style-type: none"> • Iron deposition in the corneal epithelium at the base of the cone 	
Vogt's Striae	<ul style="list-style-type: none"> • Vertical striations in Descemet's membrane • Due to stretching from corneal thinning 	
Munson's Sign	<ul style="list-style-type: none"> • On downward gaze: Cone presses against the lower lid • Produces a V-shaped protrusion of the lower eyelid 	
Topographic Changes	<ul style="list-style-type: none"> • Hot colors (red, yellow): corneal thinning • Cool colors (blue, green): normal cornea 	
Scissor Reflex	<ul style="list-style-type: none"> • Seen on retinoscopy • Due to irregular astigmatism 	

Rizzuti Sign	<ul style="list-style-type: none"> • Temporal light illumination • Cone casts a bright arrow-shaped reflex on the nasal limbus. 	
Hydrops	<ul style="list-style-type: none"> • Corneal edema 	

Important Information

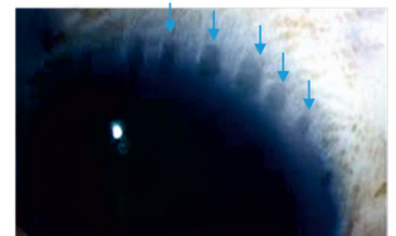
- Kayser-Fleischer ring → Copper deposition in Wilson's disease (Descemet's membrane)
- Ferry's line → Iron deposition around trabeculectomy bleb

- Rx:
 - Corneal Collagen Cross-Linking with Riboflavin (M/c)
 - Optical keratoplasty
 - Intrastromal corneal ring segments: Made of Polymethyl Methacrylate (PMMA)
- Suture used in keratoplasty
 - 16-24 water-tight nylon 10.0 suture interrupted/continuous
 - Vicryl for conjunctiva
- Keratoplasty indication
 - Optical: To restore vision
 - Therapeutic: Non-healing ulcers
 - Tectonic: Restores integrity (Perforation)
 - Cosmetic: No chance of vision improvement, only for cosmetic purposes
- Contraindications for procuring cornea (HLA typing not required)
 - Death from any of these causes
 - Hepatitis B/hepatitis C / HIV
 - Unknown cause
 - Rabies
 - COVID 19
 - Prion disease
 - Crutz-Jacob disease
 - Poisoning
 - Septicemia
- Refractory procedures on cornea: **Radial keratotomy**
 - Radial cuts are given on corneal surface, leading to flattening
 - Absolute contraindication in boxers → Can lead to corneal rupture
 - LASIK is a relative contraindication in boxers → Can lead to dislocation of flap

CHAPTER 10: CONJUNCTIVA

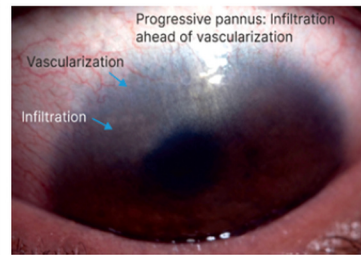
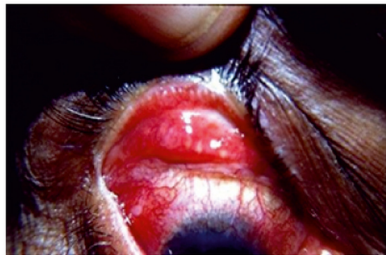
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- Epidemic keratoconjunctivitis
 - AKA: Pink eye, Madras eye, Eye Flu
 - M/c organism: **Adenovirus**
 - C/F
 - Lid edema
 - Foreign Body Sensation
 - Pre-auricular lymphadenopathy
 - Subepithelial corneal infiltrates
 - Photophobia
 - Congestion
 - Treatment: Self-limiting (resolves 7-12 days)
 - Cold Compresses
- Acute hemorrhagic keratoconjunctivitis
 - Picornavirus
 - M/c **-Enterovirus 70**
 - **Coxsackie A24**
- Trachoma
 - Chlamydia trachomatis serotypes A, B1, & C
 - C/F
 - Pathognomonic feature: Bulbar follicle at the limbus → **Herbert pits**

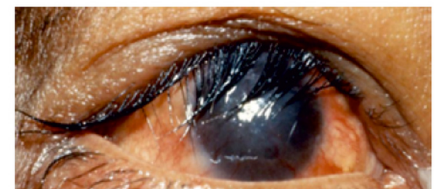


Herbert's pits

- Pannus
 - Progressive pannus:- Infiltration is ahead of vascularisation
 - Regressive pannus: Infiltration is behind vascularisation



- Trichiasis: Misdirected eyelashes (Dystichiasis: extra row of eyelashes)

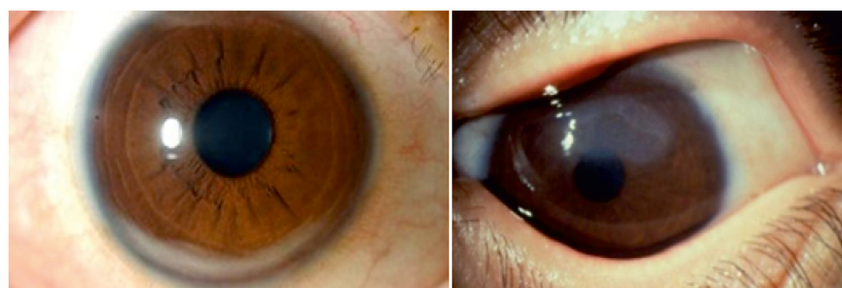
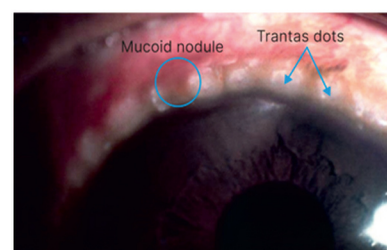


Important Information

- Entropion: Post-trachoma scarring → Inward rolling of eyelid



- Tylosis: Thickening of tarsal plates
- Prophylaxis- SAFE strategy
- Indication: Bulbar follicles in children of 1-9 years : Prevalence $\geq 10\%$
- SAFE Strategy
- S- Surgery for trichiasis \rightarrow entropion
- A- Antibiotics (Azithromycin 1g stat or 20mg/kg)
- F- Facial hygiene
- E- Environmental sanitation
- Vernal keratoconjunctivitis
 - AKA: Spring Catarrh
 - Hypersensitivity reaction: Type I + IV \rightarrow Type I \rightarrow Type IV
 - Age group: Teenagers
 - Bilateral condition
 - Sex: M $>$ F
 - More common: Summers
 - Maxwell Lyon sign Thick ropy discharge with eosinophils
 - Papillae: Cobblestone
 - \rightarrow Giant papillae \rightarrow seen in Giant Papillary Conjunctivitis (GPC), usually associated with contact lens use
 - Horner Trantas dots: Mucoid nodules
 - Pseudogerontoxon \rightarrow peripheral corneal opacities
 - Shield ulcer
 - Rx:
 - \rightarrow Olopatadine: New-generation topical antihistamine
 - \rightarrow Mast cell stabilizer (sodium cromoglycate)

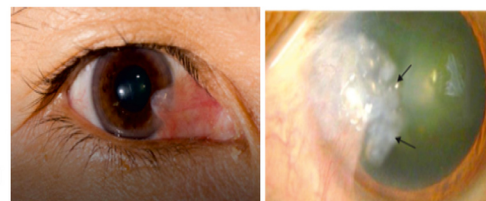


- Phlyctenular conjunctivitis
 - Allergic response of conjunctival & corneal epithelium to endogenous allergen
 - Hypersensitivity reaction: Type IV (Delayed hypersensitivity)
 - M/c bacterial antigen: S.aureus $>$ M.tuberculosis
 - Age: 5-15 Yrs
 - Sex: F $>$ M
 - Unilateral condition
 - C/F:
 - \rightarrow Limbal nodule
 - \rightarrow Fascicular ulcer
 - Rx: Oral/topical Steroids



- **Pterygium**

- A wing-shaped fold of conjunctiva encroaching upon cornea.
- M/c Site - Nasal
- Etiology: UV Rays,
- Sex: Male > Female
- Elastic degeneration of conjunctiva
- **Stocker's Line**: deposition of iron on the epithelium of the cornea at the apex
- Astigmatism
 - Due to flattening along the horizontal axis.
 - Leads to **WTR (With-The-Rule) Astigmatism**
 - Diplopia due to astigmatism or physical restriction of eye movements
- Rx: Excision
 - Bare Sclera Technique (BST): 80% recurrence rate.
 - BST + Mitomycin-C 0.02% for 2 minutes
 - **PERFECT Sx**: Pterygium Extended Resection Followed by Extended Conjunctival Transplantation (conjunctival autograft)

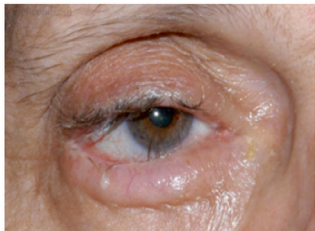



CHAPTER 11: OCULAR ADNEXA

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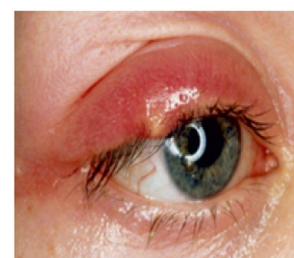
- Congenital Ptosis
 - Characteristic feature: **Absence of lid crease**
 - **Rx**:
 - <1.5mm: Fasanella servat operation
 - >1.5mm: Frontalis Brow sling
 - Complicated ptosis: if associated with Marcus-Gunn jaw winking syndrome
- Acquired ptosis
 - Neurological- Horner's syndrome, 3rd cranial nerve palsy
 - Myogenic = Myasthenia gravis
 - Improves on IV neostigmine and ice pack application



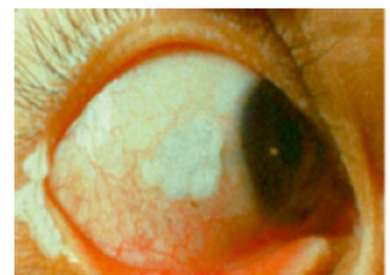
Surgeries done in Entropion	Surgeries done in Ectropion
Jones procedure 	V-Y operation 
Bick's procedure	Z plasty
Quickert procedure	Medial conjunctivoplasty

- **Stye/ Hordeolum externa**

- Acute and tender swelling at the lid margin
- Infection of: Hair follicle > Gland of Zeis
- M/c causative organism: Staphylococcus aureus
- Recurrent Styes: Suspect refractive error (especially in children)
 - Eye rubbing with dirty hands → repeated infection



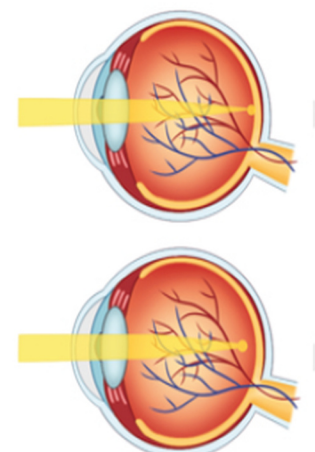
- Tender, painful swelling located at the lid margin
- May be associated with fever
- Treatment of Stye
 - Topical antibiotic eye ointment (e.g., Moxifloxacin)
 - Oral antibiotics (e.g., Levofloxacin)
 - Oral NSAIDs
 - Hot fomentation
- **Chalazion**
 - Chronic non-tender swelling away from the lid margin
 - Lipogranulomatous inflammation of the Meibomian gland
 - Rx
 - Intralesional steroid - Triamcinolone
 - Incision & Curettage (Best treatment)
- Vertical incision → from the conjunctival side
- Horizontal incision → from skin side (rare)
- **Acute dacryocystitis**
 - Acute condition with leukocytosis, fever, and tenderness over the regions as shown
 - Due to infective obstruction of nasolacrimal duct
 - Regurgitation test is CI
 - Rx: Oral/IV antibiotics
- Class of xerophthalmia
 - Bitot spots: Class X-IB
 - Due to deficiency of mucus component in the tear film
 - Rx: Vitamin A Palmitate on 0, 1, and 14 days.
 - Oral Dosage
 - Age < 6 months: 50,000 IU
 - Age 6 months - 12 months: 1 Lakh IU
 - Age > 12 months: 2 Lakh IU
 - Intramuscular (IM) Dosage: Half the oral dose
 - Keratoconjunctivitis sicca is due to aqueous component deficiency seen in Sjogren's syndrome (autoimmune)



CHAPTER 12: OPTICS

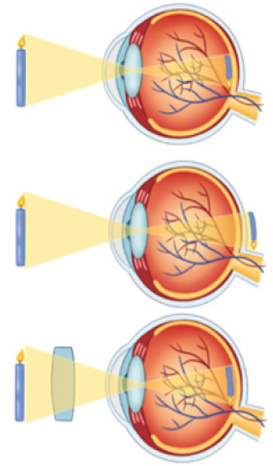
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- Myopia
 - Image falls in front of retina
 - Divergent glasses are given
 - Uncorrected tend to develop exotropia

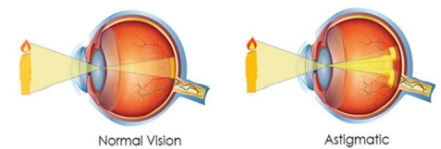


Yourwish

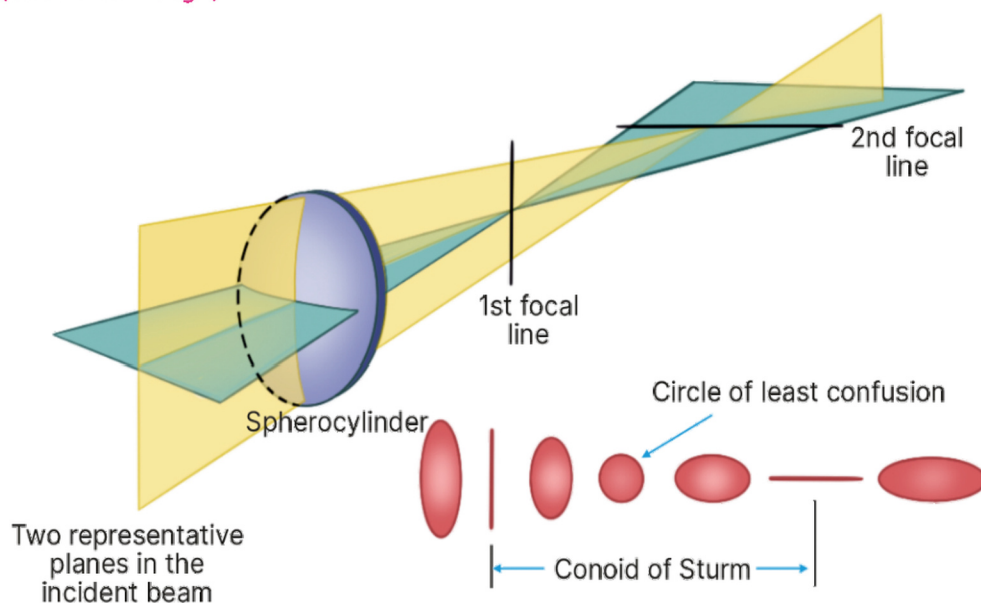
- Hypermetropia
 - Image falls behind the retina- Convergent
 - Convex glasses are given
 - Uncorrected tend to develop esotropia



- Astigmatism
 - Different points of focus
 - Cylindrical lenses are given



- Sturms conoid
 - Power is directly proportional to curvature and inversely proportional to focal length
 - Horizontal rays are being focused earlier, hence less focal length and more power along horizontal surface than vertical surface
 - This is **against the rule astigmatism**
 - Point at which convergence of vertical rays will be equal to divergence of horizontal rays: **Point of least confusion (most clear image)**



- Prescription of glasses: X axis -3D, Y Axis -4D, homatropine used, distance 1m
 - Distance correction is 1m
 - Homatropine correction is 0.5
 - Corrected RE along X axis is $-3-1-0.5=-4.5$
 - Corrected RE along Y axis is $-4-1-0.5=-5.5$
 - Prescription
 - -4.5D spherical with -1D cylindrical at 180°
 - -5.5 spherical with +1D cylindrical at 90°

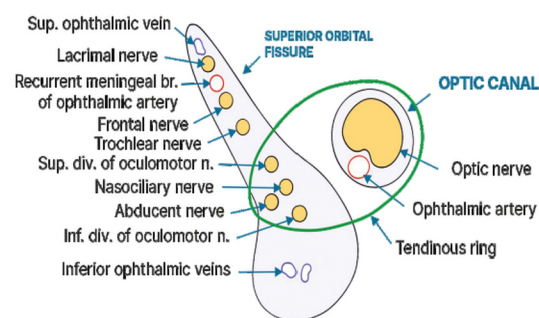
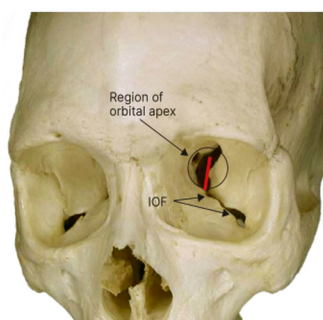
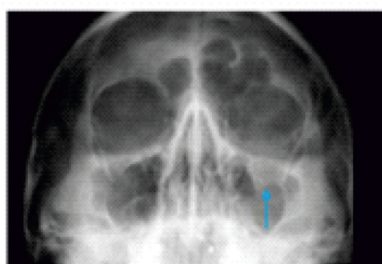


2. ONE LAST REVISION

ORBIT

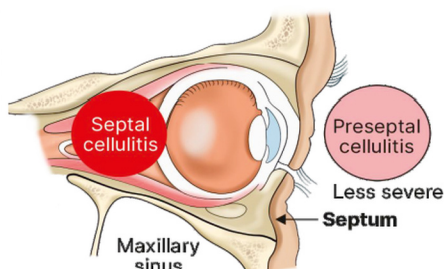
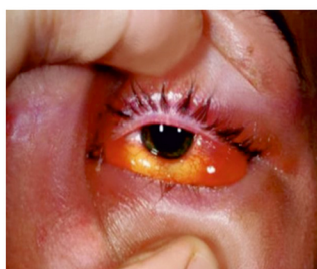
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- **Tear drop sign** → Inferior orbital fracture following Blunt trauma to the orbit
- Differentiate between Orbital apex syndrome and Superior orbital fissure syndrome
 - Orbital apex syndrome → Superior orbital fissure + Optic canal involved
 - Optic canal has optic nerve and ophthalmic artery
 - Loss of vision due to involvement of the optic nerve
 - Superior orbital fissure syndrome → Only the superior orbital fissure is involved

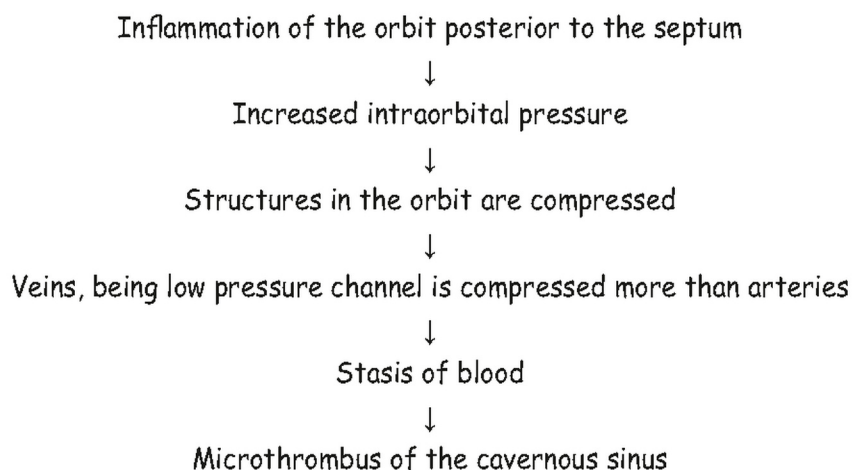


Cavernous Sinus Thrombosis

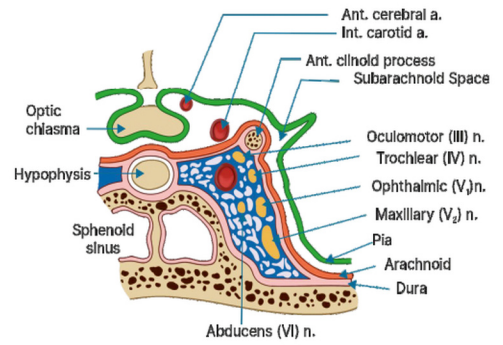
- A 65-year-old diabetic female with a history of upper tooth extraction done 2 weeks ago



- O/E Lid edema, conjunctival congestion, and Mid dilated pupil → **Orbital cellulitis**
- Most deadly complication → **Cavernous sinus thrombosis (CST)**

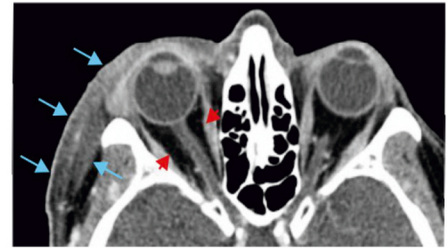


- Earliest sign of involvement of other side of cavernous sinus in CST: Abduction defect
- Treatment of orbital cellulitis
 - IV Vancomycin + 3rd Generation Cephalosporin
 - Metronidazole for anaerobic organism
- Treatment for Cavernous sinus thrombosis
 - IV Tissue plasminogen activator / LMWH



Q.A 4 yr boy presents with fever, proptosis, and eye pain. Most likely cause is?

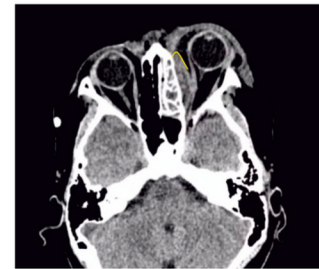
- Acute frontal sinusitis
- Retinoblastoma
- Orbital cellulitis
- Retrobulbar neuritis
- Preseptal cellulitis



Ans: Preseptal cellulitis due to swelling of the preseptal region

Q.A. A 35-year-old male presented with proptosis, fever, decreased vision, and history of recurrent sinusitis. There was discharge from the nose, and an NCCT was done. Most likely diagnosis is ?

- Preseptal cellulitis with sinusitis
- Orbital cellulitis with sinusitis
- Subperiosteal abscess
- Cellulitis only



Ans: c

- Medial rectus is pushed towards the lateral side by an abscess lying under the periosteum.

Thyroid Eye Disease

- Normal upper eyelid covers 2mm of cornea
- Earliest feature in Thyroid eye disease : Dalrymple sign

Stimulation of sympathetic fibres



Muller's muscle



Upper eyelid retraction



- Forced duction test differentiates between → Paralytic and Restrictive squint
 - Forceps is placed in nasal limbus and move in the opposite direction of gaze
 - If the eyeball moves → due to paralytic squint
 - Paralytic squint - paralysis of the muscle
 - If the eyeball does not move → due to restrictive squint
 - Restrictive squint - fibrosis of the muscle
- Qualitative assessment of proptosis is:



Worm's eye view test**Naffziger's test**

Relative position of the eyeball is checked

Q. In thyrotoxicosis, absence of blinking reflex and incomplete closure of lids is known as?

- Mobius sign
- Von Graefe's sign
- Dalrymple sign
- Stellwag sign

Ans: d

Signs In Thyroid Eye Disease

- Convergence insufficiency → Mobius sign
- Lid lag in down gaze → Von Graefe sign
- Upper eyelid retraction → Dalrymple sign
- Absence of blinking reflex and incomplete closure of lids → Stellwag sign

Q. Most common unilateral cause of proptosis in adults?

- Orbital cellulitis
- Intraorbital metastasis
- Thyroid eye disease
- Carotid cavernous fistula

Ans: c


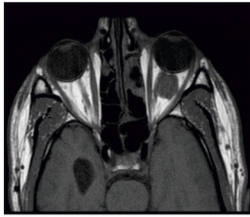
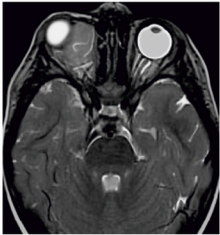
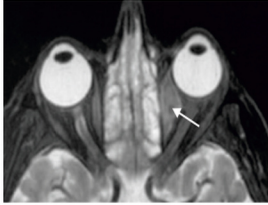
Proptosis

- M/C cause of U/L and B/L proptosis in adults
 - Thyroid eye disease
- M/C cause of U/L and B/L proptosis in children
 - U/L proptosis → Orbital cellulitis
 - B/L proptosis → Neuroblastoma
- Exophthalmometer is used for quantitative assessment of proptosis in adult & children
 - Proptosis - Distance from centre of cornea to lateral orbital rim >21mm
 - In adult - Hertel's exophthalmometer
 - In children - Luedde's exophthalmometer



Yourwish

Tumors Of The Orbit

Intraorbital		
	Children	Adult
		
Benign	Dermoid cyst 	Cavernous / Capillary Hemangioma 
Malignant	Rhabdomyosarcoma	Orbital metastasis / NHL
Intraocular		
Malignant	Retinoblastoma	Choroidal melanoma

Q. Most common malignant intraocular tumour in adults is?

- Metastatic
- Retinoblastoma
- Choroidal melanoma
- Hemangioma

Ans: c

LENS AND ITS DISEASE


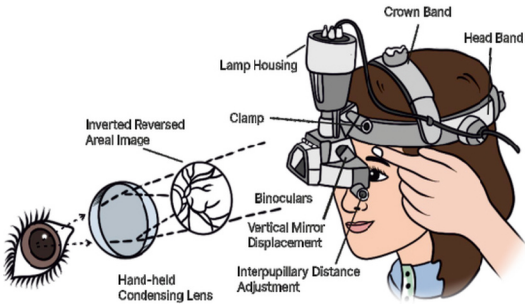
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Blindness

- WHO → Visual acuity $\leq 3/60$ or Visual field ≤ 10 degrees with best corrected visual acuity in better eye
- NVPCB - VI → Visual acuity $\leq 3/60$ or Visual field ≤ 10 degrees with presenting visual acuity in the better eye
- Low vision → Va 6/18 to 6/60
- Economic blindness → Va $< 6/60$ to 3/60
- Social blindness → Va $< 3/60$ to 1/60
- Manifest blindness → Va $< 1/60$
- Absolute blindness → no perception of light
- MC cause of blindness / preventive blindness in adults
 - Cataract > Glaucoma > ARMD > Trachoma > Onchocerciasis

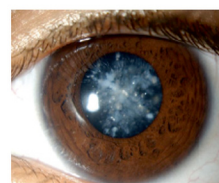
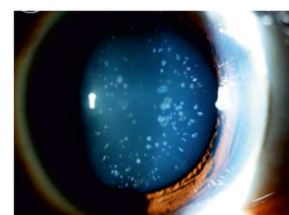
- MC infective cause of blindness is Trachoma
- MC cause of blindness in children → Vitamin A deficiency

Ophthalmoscope

Features	Direct Ophthalmoscopy	Indirect Ophthalmoscopy
Condensing lens	Not Required	Required
Examination distance	As close to patient's eye as possible	At an arm's length
Image	Virtual, erect	Real, inverted
Illumination	Not as bright; not useful in hazy media	Bright; useful in hazy media
Area of field in focus	About 2 disc diameters or View it 3mm of retina	About 8 disc diameters or View till 12mm of retina
Stereopsis	Absent	Present
Field of vision	Central	Peripheral
Uses	Glaucoma	Retinal detachment
Image		

Cataract

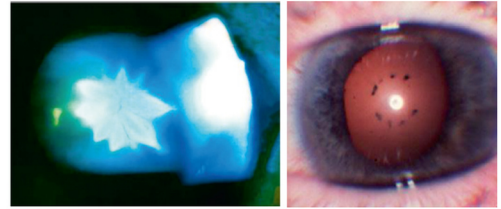
- A 15-year-old boy is brought in for a routine eye check-up. On examination, the following is seen:
 - Diagnosis → Blue dot cataract
 - M/C congenital cataract
 - Not associated with loss of vision
- M/C congenital cataract associated with loss of vision → Lamellar / Zonular cataract
 - Deposition of protein in the fetal nucleus of lens and riders at the periphery
- M/C cataract seen in Type I diabetic mellitus → Snowflake cataract
- M/C cataract seen in Type II diabetic mellitus → Early senile cataract
- Type II DM > Type I DM
 - M/C cataract seen in diabetic mellitus → Early senile cataract
 - Most specific cataract associated with Diabetic mellitus → Snowflake cataract



- Christmas tree cataract seen in → Myotonic Dystrophy



- Blunt trauma
 - Posterior cortical cataract → Rosette cataract
 - Pigment dispersion on Anterior lens capsule → Vossius ring
- Penetrating trauma → Anterior cortical cataract



Clinical Features

- Nyctalopia:
 - Difficulty in night vision
 - Due to Cortical Cataract
- Hamarlopia, Cataract of second sight, Index myopia: → Nuclear Cataract
 - Hamarlopia- Difficulty in day vision

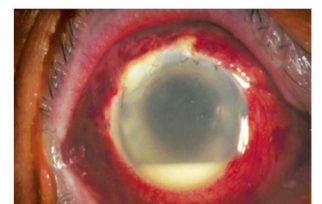
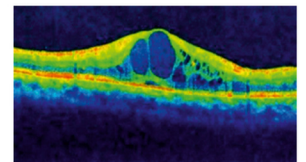
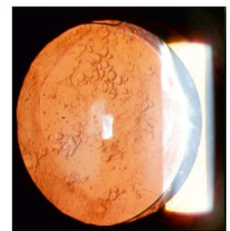
Surgery

- Trypan blue dye is used to stain anterior lens capsule → In Capsulorhexis
- Anaesthesia used in ocular surgery
 - Retrobulbar
 - Peribulbar
 - Topical anaesthesia - Proparacaine 0.5%

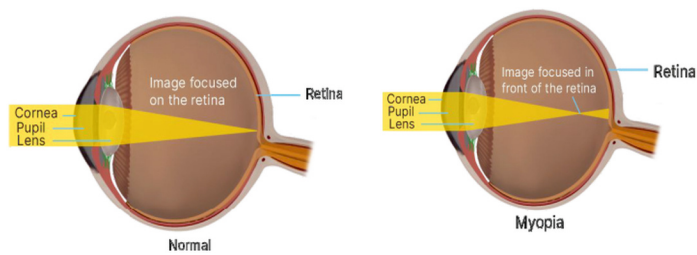
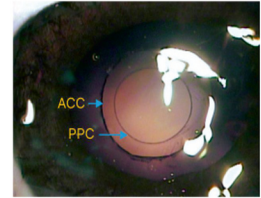


Complications Of Cataract Surgery

- MC complication of cataract surgery:
 - After cataract - Proliferation of equatorial epithelial cells and deposit between the posterior optic and the posterior capsule
 - Elschnig pearls and sommering ring
 - Treatment - Nd Yag capsulotomy
- Irvine Gass syndrome
 - Intraretinal cyst
 - Gradual, painless, and progressive loss of vision after 2-3 months of uneventful cataract surgery
 - 2 hyperreflective layers of retina on OCT: Nerve Fiber Layer and Retinal Pigment Epithelium
- Endophthalmitis:
 - Red eye, hazy cornea, Hypopyon (Pus in the anterior chamber)
 - Causative organism within 6 weeks → Staph epidermidis > Staph aureus
 - Causative organism after 6 weeks → Propionibacterium Acnes
 - Prevention → 5% Povidone iodine just before surgery on eyelashes/periorbital area
- Surgery of choice for paediatric cataract:
 - Phacoaspiration with Primary posterior capsulotomy (PPPC)



- IOL power undercorrection value:
 - For 0-2 years → 20% of power obtained
 - For 2-8 years → 10% of power obtained
 - Power is corrected to prevent myopia in later stages



UVEA AND ITS DISEASES

00:40:48

Anterior Uveitis

- A 25-year-old male comes with the finding of cells in the anterior chamber → Keratic precipitate



- Diagnosis → Anterior uveitis
- Arlt's triangle → Triangular collection of keratic precipitates on corneal endothelium seen in anterior uveitis
- Treatment → Topical steroids (DOC)
- MC complication → Secondary Glaucoma
- MC complication of Recurrent disease → Complicated Cataract
- Pupil in Acute anterior uveitis → Small, constricted, irregular, non-reacting

Important Information

- Pupil in Acute congestive glaucoma → Mid dilated, oval, and non-reacting



Q. Which cell type is most typically seen in KP of non-granulomatous uveitis?

- PMN cells
- Monocytes
- Lymphocytes
- Plasma cells

Ans: c

Yourwish

- Keratic precipitate
 - Non-granulomatous uveitis → Small & medium
 - Granulomatous uveitis → Mutton fat
- Cells
 - Non - granulomatous uveitis & Granulomatous uveitis → 24-72 hrs → Neutrophils
 - Non - granulomatous uveitis & Granulomatous uveitis → >72 hrs → Lymphocytes

Q. In acute anterior uveitis, the pupil is:

- a. Oval
- b. Circular
- c. Small, irregular
- d. Dilated

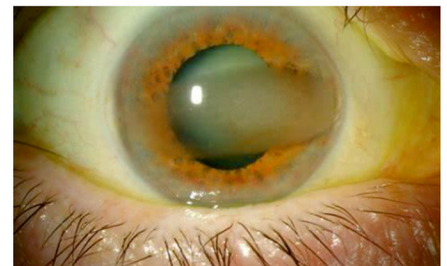
Ans: c

Q. Subacute anterior uveitis associated with raised intraocular pressure can be treated by all of the following except:

- a. Acetazolamide
- b. Timolol
- c. Cyclopentolate
- d. Pilocarpine

Ans: d

- Band-shaped keratopathy
 - Seen in Interpalpebral region
 - Deposition of Calcium phosphate
 - Deposit in Bowman's layer of the cornea

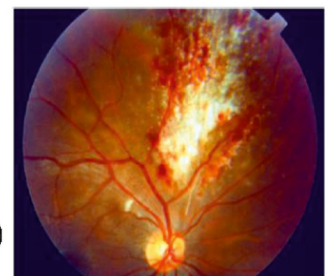


Q. EDTA is used in the treatment of:

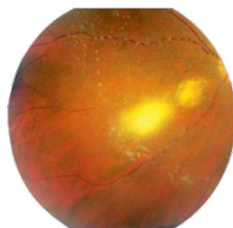
- a. Band-shaped keratopathy
- b. Lipid keratopathy
- c. Bullous keratopathy
- d. Exposure keratitis

Ans: a

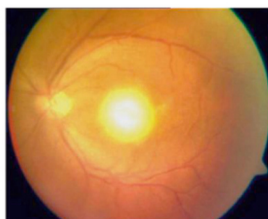
- EDTA is not given by the intravenous route because cornea is avascular structure
- EDTA is given by topical application for 30 minutes → Wash
- CMV Retinitis → Pizza pie appearance or Tomato ketchup appearance
 - Treatment → TOC: Ganciclovir
 - "Splashed tomato appearance" → Seen in central retinal artery occlusion (CRAO)
- Patient with granulomatous uveitis
 - O/E Candle wax dripping
 - Diagnosis → Sarcoidosis



- Treatment → Steroids
- Other diseases that lead to granulomatous uveitis - Tuberculosis, Syphilis, and Leprosy



- Headlight in fog appearance → Toxoplasma gondii infection
- Treatment of Toxoplasmosis in pregnancy is Spiramycin

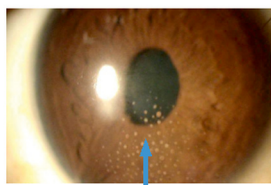


Sympathetic Ophthalmitis

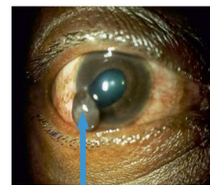
- MC: Develops following injury by Chisel & Hammer



Chisel & Hammer



Keratic precipitates (Mutton fat)



Iris prolapse in trauma

- O/E - Keratic precipitate, Iris prolapse in trauma
- Most dangerous period of Sympathetic ophthalmitis → 2 weeks to 2 months
- Earliest sign of sympathetic ophthalmitis → Retrolental flare
- Earliest symptom of sympathetic ophthalmitis → Loss of accommodation
- Treatment:
 - When vision in injured eye is PL negative, and the other eye is normal → Enucleation of traumatic eye
 - When vision in injured eye is 6/60, and the other eye is normal → Primary repair
 - When signs and symptoms of sympathetic ophthalmitis starts in the other eye → High-dose steroids

Q. All of the following are true about sympathetic ophthalmitis except:

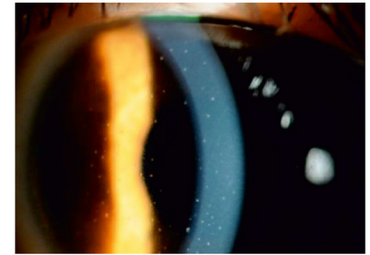
- Earliest sign is retrolental flare
- Most of the cases occur within two weeks of injury
- Uveal antigen has been implicated as the responsible exciting agent
- First symptom is loss of accommodation

Ans: b

- Antigen present is Retina S

Q. True statement about Fuch's heterochromic iridocyclitis

- a. Hyperpigmented iris
- b. Hypopigmented iris
- c. Posterior synechiae
- d. Coarse Kps



Ans: b

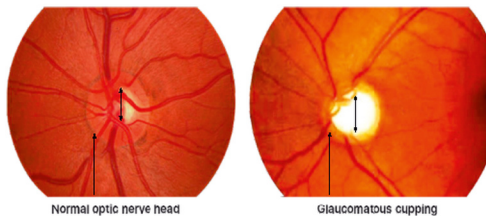
Triad of Fuch's Heterochromic Iridocyclitis

- Cataract
- Diffuse Fine/stellate Keratic precipitate
- Iris Heterochromia

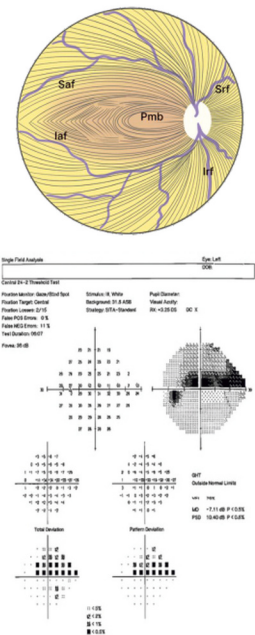
GLAUCOMA

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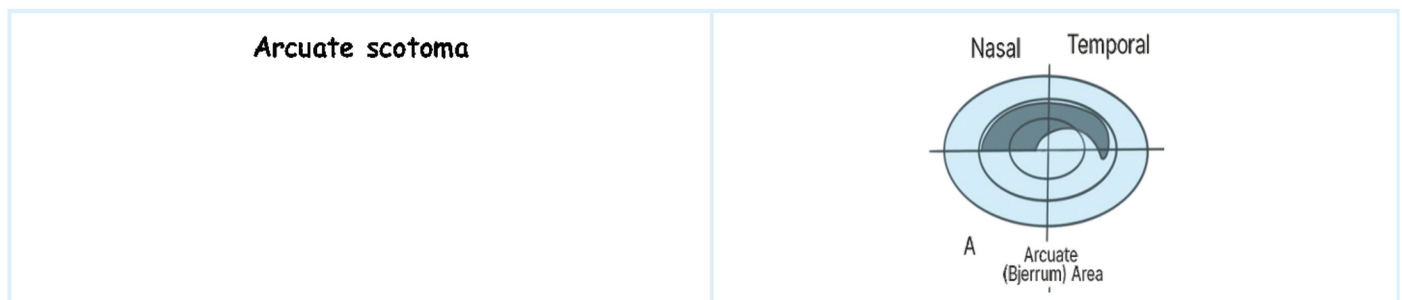
- Tonopen → Used in patients with scarred / edematous cornea
- c/d ratio

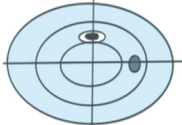
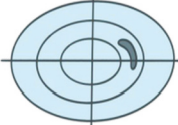
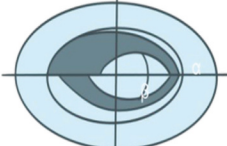
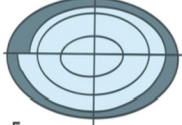

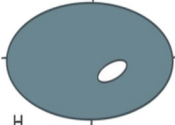


- 0.4 - Normal
- 0.9 - Glaucoma → Cupping
- Retinal nerve fibre
 - Superior arcuate fibres
 - Inferior arcuate fibres
 - Superior radial fibres
 - Inferior radial fibres
 - Central fibres - Papulomacular bundle
- Optic nerve head has no photoreceptors and lies on nasal side
 - Optic nerve head projects an area of scotoma in the visual field → Blind spot
 - Blind spot lies on the temporal side
- The earliest visual field defect in glaucoma: Isopter Contraction
- Significant visual field defect in glaucoma: Paracentral Scotoma



Visual Field Defect In Glaucoma



<p>Paracentral scotoma</p>	<p>Nasal Temporal</p>  <p>B Superior paracentral scotoma</p>
<p>Seidel's scotoma</p>	 <p>C Seidel's scotoma</p>
<p>Double arcuate scotoma with superior central nasal step</p>	 <p>E Double arcuate (Ring) scotoma with superior central nasal step</p>
<p>Roenne's nasal step</p>	 <p>F Roenne's nasal step</p>
<p>Tunnel vision</p>	 <p>G Tubular Field</p>
<p>Only temporal island of vision left</p>	 <p>H Only temporal island of vision</p>

Congenital Glaucoma

- A 5-month-old child is brought by parents to eye OPD with the following presentation:

- Diagnosis → Congenital glaucoma
- Triad of congenital glaucoma
 - Lacrimation (earliest)
 - Photophobia
 - Blepharospasm
- Other clinical features → Buphthalmos, ground-glass cornea, Haab striae, subluxated / dislocated anterior lens, and increase in the axial length of eyeball.
- Haab's striae → Horizontal tears in the Descemet membrane of the cornea

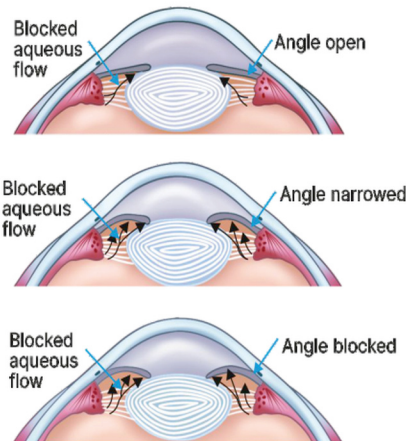


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Management Of Glaucoma

Primary Angle Closure Glaucoma

• Pathology



Narrowing of angle of anterior chamber

↓
Increases in IOP

↓
Compress the optic nerve head

↓
Loss of neuroretinal rim

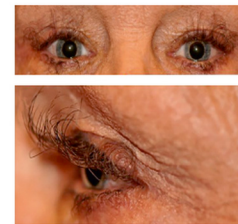
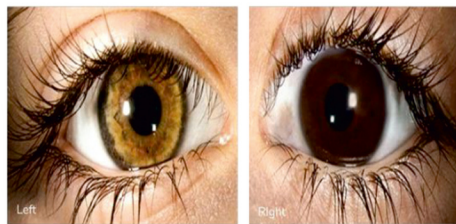
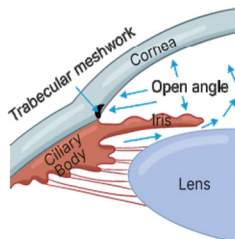
- Drug of choice → PGF2 (Latanoprost)

Acute Attack Of Angle Closure Glaucoma

- IOP rises from 15mmHg to 60mmHg
- Medical Management → IV Mannitol and Pilocarpine
- Surgical Management → Laser Iridotomy in both eyes

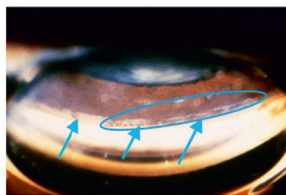


Primary Open Angle Glaucoma

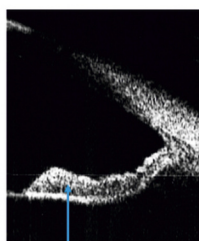
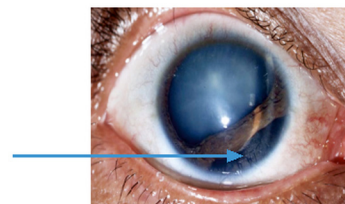


- Drug of choice → PGF2 Alpha analogues
 - S/E - Iris hyperpigmentation, Uveitis, CME, Trichomegaly
- Sympathomimetic drugs cause CME in aphakic patients
- Pilocarpine also causes uveitis
- C/I of alpha 2 agonist
 - Children- cause Respiratory Apnea
 - Old age- causes depression
- C/I of Non-Selective beta blockers → Asthma
- Angle recession glaucoma
 - Tell-tale sign of the amount of trauma

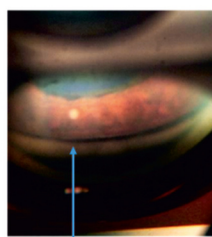
- Causes separation between longitudinal & circular fibers of the ciliary body
- Leads to damage of the trabecular meshwork → ↑ IOP



- Iridodialysis
 - Tearing up of the iris at its root
 - Leads to uniocular diplopia
 - D-shaped pupil
- Pigment Dispersion Syndrome

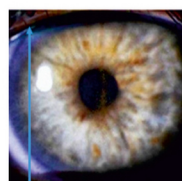


Reverse Iris Configuration

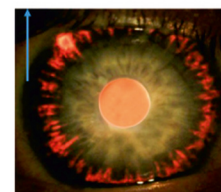


Sampolesi line- Pigment dispersion in TBM

Krukenberg spindle- Pigment dispersion on cornea endothelium



Transillumination defects



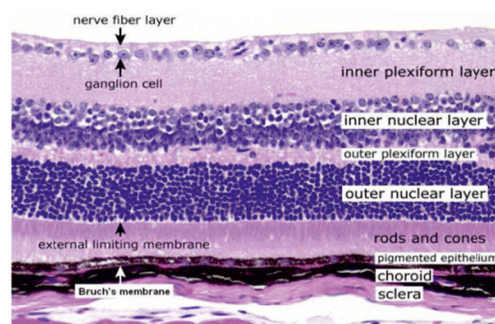
- Krukenberg spindle → Pigment dispersion on cornea endothelium
- Transillumination defects
- Sampolesi line → Pigment dispersion in Trabecular meshwork
- Reverse Iris Configuration → Iris is Concave anterior

RETINA

01:09:17

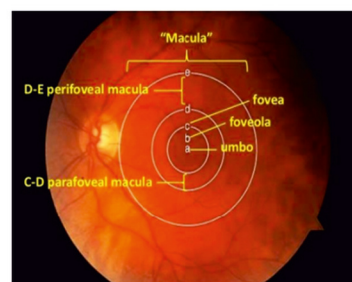
Layers Of The Retina

- Internal limiting membrane
- Nerve fibre layer
- Ganglion cell layer
- Inner plexiform layer
- Inner nuclear layer
- Outer plexiform layer
- Outer nuclear layer
- External limiting membrane
- Photoreceptors
- Retinal pigment epithelium

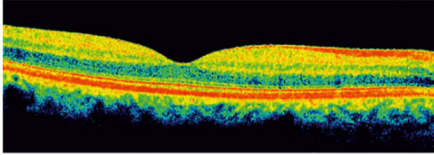

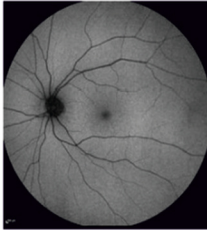


Macula

- Diameter - 5.5mm
- Outer to Innermost layer
 - Fovea centralis
 - Fovea
 - Umbo

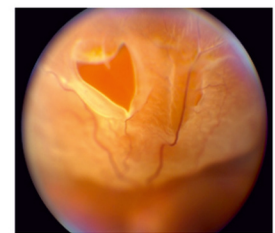


Investigations

INVESTIGATIONS	FEATURES
<p>OCT - Optical Coherence Tomography</p> 	<p>Hyperreflected epithelium → Nerve fibre layer and Retinal pigment epithelium</p>
<p>Fundus Fluorescein Angiography</p> 	<p>Dense pigment at the macula and thick Gangliocyte layer at centre of macula, as a result appears black. Disc and vessels → White</p>
<p>Fundus Autofluorescence</p> 	<p>Disc and vessels → Black</p>

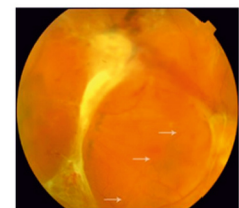
Retinal Detachment

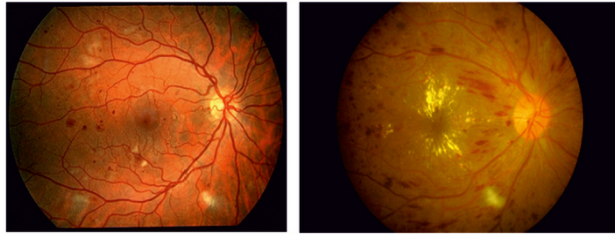
- A 65-year-old patient with high myopia, sudden painless loss of vision, flashes of light, and curtain falling signs comes to the eye OPD
 - Diagnosis → **Rhegmatogenous retinal detachment**
 - Treatment → Silicon Bending / Scleral buckling, Pneumoretinopexy, Silicon oil
 - Gas used in Pneumoretinopexy → self-absorbable
 - SF₆ - sulphur hexafluoride (M/C)
 - C₃F₈ - Per-fluoropropane (Best)
 - Silicon oil needs to be removed after 2 -3 months because it is maculotoxic



Diabetic Retinopathy

- A 58-year-old diabetic patient comes with loss of vision. The following image is seen.
 - Diagnosis → **Tractional Retinal Detachment**
 - Occurs due to sequelae of **Proliferative Diabetic Retinopathy**
- Non proliferative Diabetic retinopathy
 - Dot blot haemorrhages, Soft and hard exudates





Etdrs Classification Of Diabetic Retinopathy

Form	Characteristics
Non - Proliferative DR	
Mild NPDR	<ul style="list-style-type: none"> • Microaneurysms → Mostly in the nerve fibre layer
Moderate NPDR	<ul style="list-style-type: none"> • Dot blot hemorrhage in the outer plexiform layer • Soft exudates • Hard exudates
Severe NPDR "4-2-1 rule"	<p>Any of the following and no signs of proliferative retinopathy:</p> <ul style="list-style-type: none"> • Severe intraretinal hemorrhages and microaneurysms in each of the 4 retinal quadrants, or • Venous beading in 2 or more quadrants, or • Intraretinal Microvascular Abnormalities in 1 or more quadrants
Very severe NPDR	<ul style="list-style-type: none"> • ≥ 2 criteria for severe NPDR in the absence of neovascularization
Proliferative DR	
PDR	<p>One or both of the following:</p> <ul style="list-style-type: none"> • Neovascularization • Vitreous/preretinal hemorrhage
High-risk PDR	<p>Any 3 of the following:</p> <ul style="list-style-type: none"> • Neovascularization at any location • Neovascularization at the optic disc • Severe neovascularization <ul style="list-style-type: none"> ○ New vessels within 1-disc diameter of the optic nerve head that are larger than one-quarter to one-third the disc area in size ○ New vessels elsewhere that are \geq one-half the disc area in size • Vitreous or preretinal hemorrhage

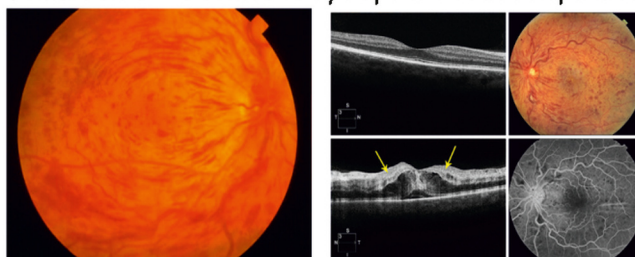
- Small hyperfluorescent dots → Microaneurysms



Yourwish

Central Retinal Vein Occlusion

- A 48-year-old hypertensive female on OCPs comes to eye opd with sudden painless loss of vision

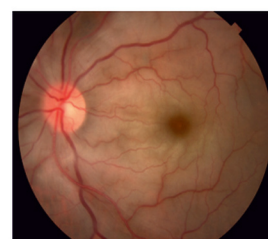


- Diagnosis → CRVO
- Splash tomato appearance, CME, mild edema of optic nerve head, disc edema, macular edema

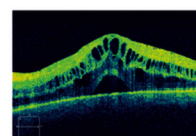
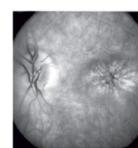
Central Retinal Artery Occlusion

- A 55-year-old female presents with sudden painless loss of vision. On fundus examination, the following fundus image is seen

- O/E - Pale retina with cherry red spot, Cattle tracking/Box car appearance
- Diagnosis → CRAO
- Treatment
 - Ocular massage leads to the dislodgement of Hollenhorst plaque (cholesterol emboli)
 - If massage fails → IV mannitol
 - If mannitol fails → Paracentesis - Best treatment
 - IV Tissue plasminogen activator
 - Carbogen (5% CO₂ and 95% O₂) inhalation

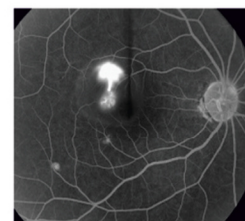
**Cystoid Macular Edema**

- Cystoid macular edema
 - FFA → Flower petal appearance
 - OCT → Intraretinal cysts

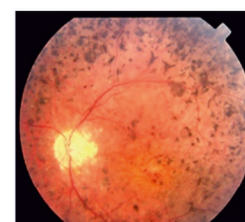
**Central Serous Retinopathy**

- A 25-year-old male who is a PG aspirant comes with sudden, painless loss of central vision. He has been stressed about the NEETPG/ INICET exam. The following image is obtained on FFA

- Diagnosis → Central serous retinopathy
 - Exudative form of retinal detachment
- Smoke stack appearance on FFA → specific (seen in only 15-20%)
- Ink bottle appearance on FFA → non-specific (seen in only 80-85%)
- Other features - Metamorphosia
- IOC → OCT Macula
- Treatment → Reassurance and photodynamic therapy

**Retinitis Pigmentosa**

- A 36-year-old male presents with difficulty in night vision, and fundus image as shown.
 - Diagnosis → Retinitis pigmentosa
 - Triad of the disease → Pale waxy disc, AV attenuation, Bony spicule pigmentation
 - Earliest feature → Night blindness due to dystrophy of rods at the periphery



Retinoblastoma

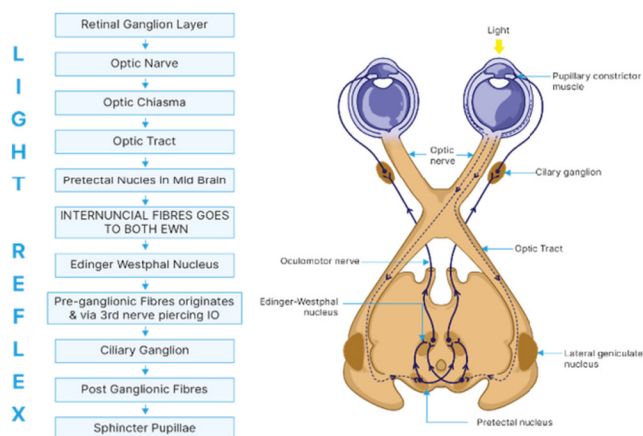
- An 18-month-old child with white pupillary reflex and exotropia in right eye. On CT scan, the calcification is seen as shown
 - Diagnosis → Retinoblastoma
 - **Trilateral Retinoblastoma** → B/L retinoblastoma + Pineoblastoma
 - The first investigation done is USG
 - IOC for Retinoblastoma → NCCT
 - IOC for metastasis of Retinoblastoma → MRI because Retinoblastoma spreads via the optic nerve
 - Treatment
 - VEC Regimen (Vincristine, Etoposide, Cisplatin)
 - Intra-arterial/Intravitreal: Melphalan → alkylating agent



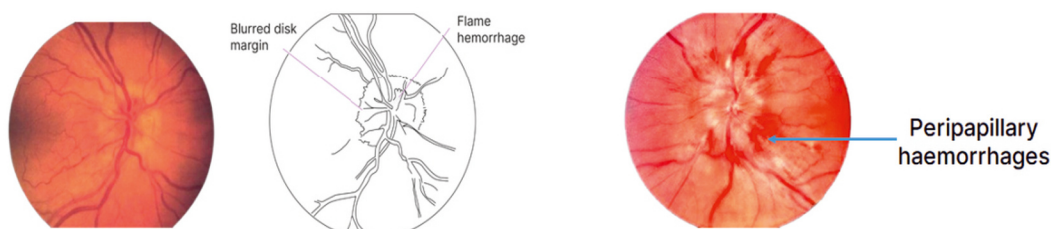
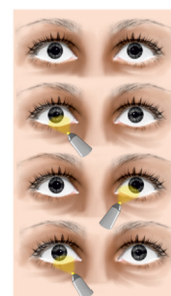
NEUROPTHALMOLOGY

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Pupillary Light Reflex Pathway



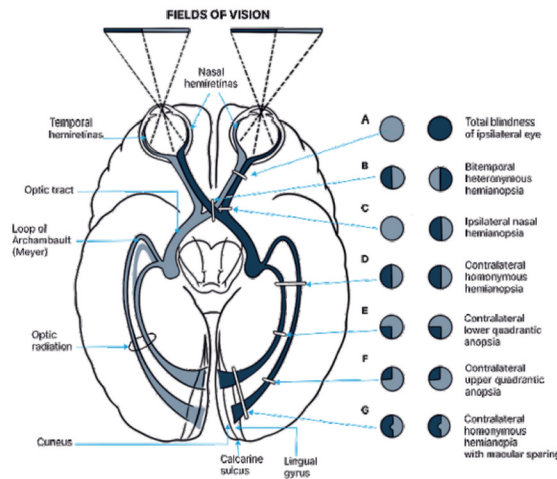
- Marcus Gunn pupil/RAPD (Relative Afferent Pupillary Defect) → **Swinging light reflex test**
 - Shine light in one eye → observe both pupils constrict
 - Quickly swing the light to the other eye
 - RAPD present: When light is moved to the affected eye → both pupils dilate
 - Normal: Both pupils constrict equally in both eyes
- Papilledema
 - Blurred disc margins, flame hemorrhage, peripapillary hemorrhages, enlarged blind spot, amaurosis fugax



- A 60-year-old patient with a history of Pancoast tumour presents with the following presentation:
 - Diagnosis → Horner syndrome / Oculosympathetic nerve palsy
 - Clinical features
 - Miosis
 - Anhidrosis (seen only if preganglionic type)
 - Ptosis
 - Pseudo enophthalmos



Visual Field Defects



Site of lesion	Visual fibres affected	Visual field loss	Features
Optic nerve	<ul style="list-style-type: none"> • Temporal fibres of ipsilateral eye • Nasal fibres of ipsilateral eye 	<ul style="list-style-type: none"> • Temporal & nasal visual field loss of ipsilateral eye 	Ipsilateral anopia
Optic chiasma	<ul style="list-style-type: none"> • Bilateral nasal fibres 	<ul style="list-style-type: none"> • Bilateral temporal visual field loss 	Bitemporal heteronymous hemianopia
Optic tract	<ul style="list-style-type: none"> • Temporal fibres of ipsilateral eye • Nasal fibres of contralateral eye 	<ul style="list-style-type: none"> • Nasal visual field loss of ipsilateral eye • Temporal visual field loss of contralateral eye 	Contralateral Homonymous hemianopia
Parietal lobe	<ul style="list-style-type: none"> • Superior temporal fibres of ipsilateral eye • Superior nasal fibres of contralateral eye 	<ul style="list-style-type: none"> • Inferior nasal visual field loss of ipsilateral eye • Inferior temporal visual field loss of contralateral eye 	Contralateral lower homonymous quadrantanopia (pie on the floor)
Temporal lobe	<ul style="list-style-type: none"> • Inferior temporal fibres of ipsilateral eye • Inferior nasal fibres of contralateral eye 	<ul style="list-style-type: none"> • Superior nasal visual field loss of ipsilateral eye • Superior temporal visual field loss of contralateral eye 	Contralateral upper homonymous quadrantanopia (pie in the sky)

Occipital lobe (PCA involved)	<ul style="list-style-type: none"> • Temporal fibres of ipsilateral eye • Nasal fibres of contralateral eye 	<ul style="list-style-type: none"> • Nasal visual field loss of ipsilateral eye • Temporal visual field loss of contralateral eye 	Contralateral Homonymous hemianopia with macular sparing
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- Macular sparing occurs due to the dual blood supply of occipital lobe by PCA and MCA

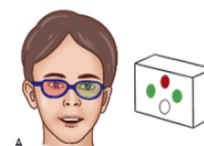
SQUINT




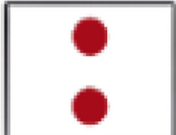
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- Test for stereopsis
 - Circle test
 - Animal test
 - Titmus fly test
 - Randot E
 - TNO
 - Lang
 - Frisby





- Worth four dot test
 - Importance → Diplopia, normal retinal correspondence, Abnormal retinal correspondence, Suppression
 - Interpretation:

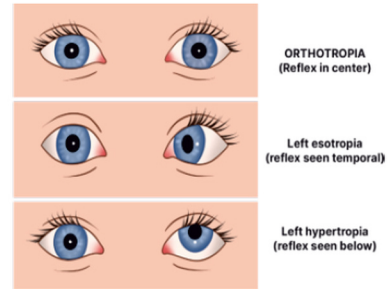


Normal binocular single vision:	1 red, 2 green, 1 orange (red-green) dots seen 
Esotropia	3 green & 2 red dots seen 
Exotropia	2 red & 3 green dots seen 
Left suppression	2 red dots seen 

Yourwish

<p>Right suppression</p>	<p>3 green dots seen</p> 
<p>Abnormal retinal correspondence</p>	<p>1 red, 2 green, 1 orange (red-green) dots seen</p> 

- Hirschberg corneal light reflex
 - Light is shown in front of the eye
 - Interpretation



Hirschberg cornea light reflex test.

<p>Normal</p>	<p>Light is seen in the centre of pupil</p>
<p>Left eye Estropia</p>	<p>Reflex seen at temporal side</p>
<p>Left eye Hypotropia</p>	<p>Reflex seen below</p>

- 1mm shift causes 7° squint
- Light lies at inner pupillary margin → 15°
- Light lies in between inner and outer pupillary margin → 30°
- Light lies at outer pupillary margin → 45°

Q. In the Worth four dot test, image 'D' is seen. What is the diagnosis?

- Right eye suppression
- Left eye suppression
- Crossed diplopia
- Uncrossed diplopia



Answer: a. Right eye suppression

- Maddox rod test
 - Slit placed horizontally → appears as vertical line
 - Slit placed vertically → appears as horizontal line
 - Interpretation



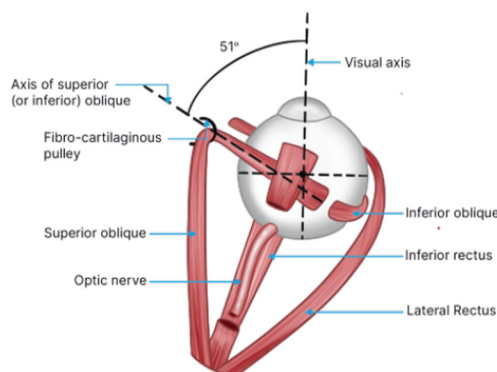
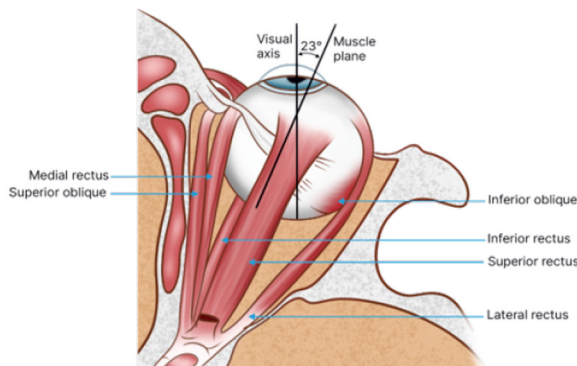
Answer: b. Uncrossed diplopia

- Lateral rectus palsy causes esotropia, which causes uncrossed diplopia
 - Convergent squint
 - No effect on the pupil
- Oculomotor nerve palsy
 - Down & out position of eyeball
 - Down due to Superior oblique supplied by Trochlear nerve
 - Out due to Lateral rectus supplied by Abducent nerve

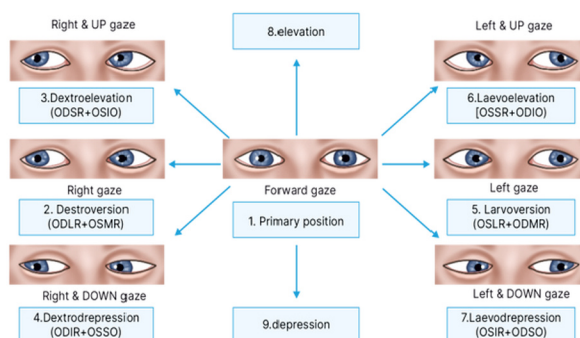


Actions Of Muscle

Muscle	Primary	Secondary	Tertiary
Medial rectus	Adduction	-	-
Lateral rectus	Abduction	-	-
Inferior rectus	Depression	Extorsion	Adduction
Superior rectus	Elevation	Intorsion	Adduction
Inferior oblique	Extorsion	Elevation	Abduction
Superior oblique	Intorsion	Depression	Abduction



- Abducted position of the eye
 - Elevator → Superior recti
 - Depressor → Inferior recti
- Adducted position of the eye
 - Elevator → Inferior oblique
 - Depressor → Superior oblique
- Dextro-elevation → RSR+LIO
- Levodepression → LIR+RSO
- Levoversion → LLR+RMR



Q. Secondary deviation is more than primary deviation in

- Spastic squint
- Paralytic squint
- Concomitant squint
- Incomitant squint

Answer: b. Paralytic squint and c. Concomitant squint

- Concomitant squint → Extraocular movements are present
- Incomitant squint → There may be paralysis or restriction of one or more muscles
- In paralysis or restriction, there will be secondary deviation > primary deviation
- Primary and secondary deviation assessed by the cover and uncover test

CORNEA

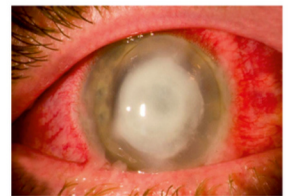
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Bacterial Corneal Ulcer

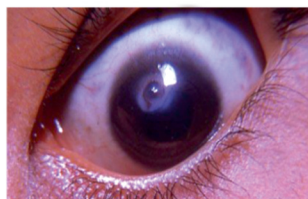
- A 30-year-old male has a history of prolonged contact lens wear. Develops redness, and he ignores it. Then, later, after a month he visits the eye OPD with this condition of the cornea
 - Diagnosis → Bacterial Corneal Ulcer
 - Causative organism → Pseudomonas

Important Information

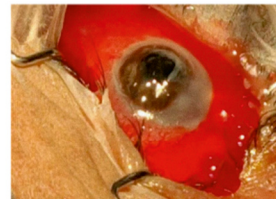
- Causative organism of ulcer in a person with contact lens use f/b swimming in the pond or washing with tap water → Pseudomonas aeruginosa
- Complications



Bacterial corneal ulcer



Descemetocele



Perforated corneal ulcer

When ulcerative process is deepened & reaches upto descemet's membrane leading to its bulging, it is then known as **descemetocele**.

↓

Any straining in the form of sneezing & coughing will perforate corneal ulcer leading to escape of aqueous humor & lowering of intraocular pressure (IOP).

↓

Perforation of the cornea is followed by plugging of the perforation by the iris.

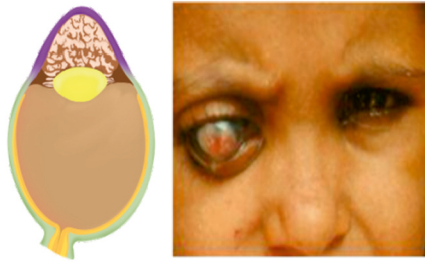
↓

Epithelization of the plugged iris takes place by palisades of Vogt present at limbus, leading to formation of **pseudocornea**

↓

Pseudocornea is thin & cannot withstand intraocular pressure (I.O.P), so it bulges forward along with the iris plastered posteriorly (ectatic cicatrix), leading to **anterior staphyloma**

Yourwish

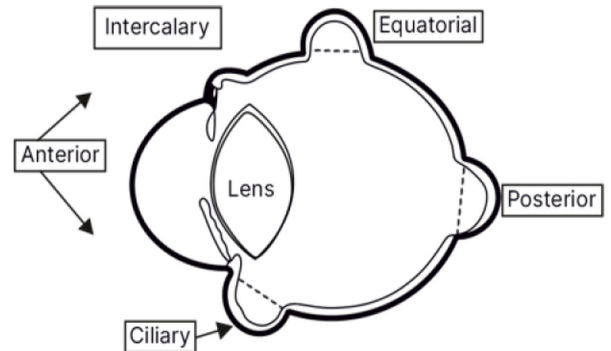


Anterior staphyloma

Staphyloma

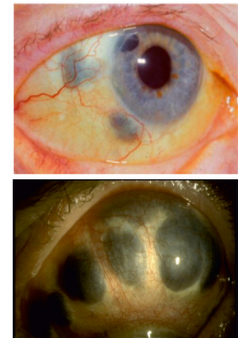
Types

- Anterior staphyloma → Bulge anteriorly
- Intercalary staphyloma → Bulge of outer coat at limbus
- Ciliary staphyloma → Bulge of outer coat at ciliary body
- Equatorial staphyloma → Bulge at the equatorial region
 - Seen in patients with high myopia
- Posterior staphyloma → Bulge at the posterior region
 - Seen in patients with high myopia



Differential Diagnosis

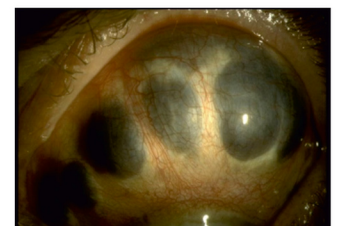
- Scleromalacia perforans
 - Thinning of outer coat with a view of uveal tissue underneath
 - Bulge is absent
- Ciliary staphyloma
 - Bulging of the outer coat with uveal tissue (Ciliary body) incarceration
- Both are seen in Rheumatoid arthritis



Q. A middle-aged female with RA presents with the following slit lamp picture. What is the condition shown?

- Scleromalacia perforans
- Ciliary staphyloma
- Melanoma
- Retinoblastoma

Answer: b. Ciliary staphyloma



Q. Scleromalacia perforans is a complication of

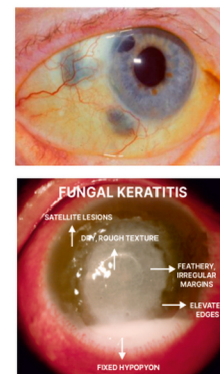
- Rheumatic arthritis
- Sarcoidosis
- Tuberculosis
- Herpes zoster

Answer: a. Rheumatic arthritis

Fungal Corneal Ulcer

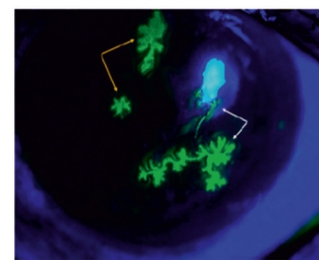
- A 50-year-old farmer visits an OPD with a history of injury by the cow's tail while milking the cow. The following picture is obtained
 - Diagnosis → Fungal keratitis

- Characteristics features → Non-defined margins, dry-looking ulcer, satellite lesions, fixed and non-sterile hypopyon
- Most common fungus → *Aspergillus fumigatus*
- Wesley's immune ring → Demarcation around lesion due to Ag-Ab interaction.
- Treatment
 - Filamentous (Branched) fungus- Natamycin
 - Non Filamentous (Branched fundus)- Nystatin
 - New generation- Voriconazole



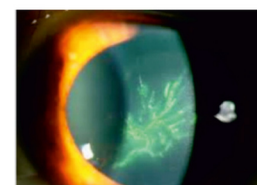
Herpes Simplex Keratitis

- Dendritic ulcer consists of irregular, zig-zag linear, branched lesions which are knobbed at ends.
- Geographic keratitis
 - Coalescence of dendritic ulcers leading to the formation of large ulcers resembling a geographic map appearance
- Disciform keratitis
 - Due to a delayed hypersensitivity reaction of the endothelial antigen to antibodies formed against HSV antigen, leading to corneal edema.
 - Only viral keratitis where Steroids can be given
- Stain used → Sodium Fluorescein
 - Stained with fluorescein dye (orange coloured) & seen in cobalt blue light: Green fluorescence is present.



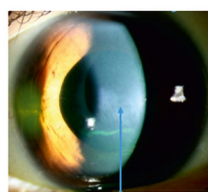
Herpes Zoster Keratitis

- Pseudodendritic keratitis → No knobbed ends
- Nummular keratitis → Coin-shaped lesions due to Involvement of cornea stroma.
- Vesicles around the periorbital region → Due to involvement of the frontal nerve
- Hutchinson sign → Vesicles on the tip/side of the nose indicate cornea involvement

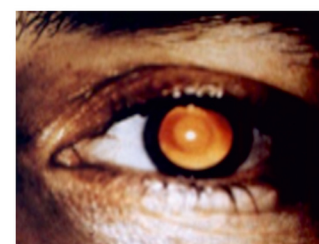
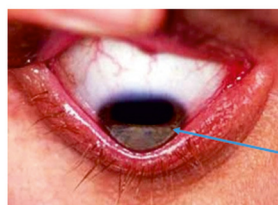


Keratoconus

- 21-year-old with decreased vision, frequent change of myopic glasses
 - Diagnosis → Keratoconus



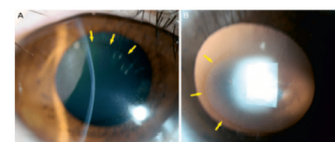
Vogt's striae- DM stretch lines



- Vogt's striae → Vertical stretch of Descemet's membrane
- Munson sign → V-shaped protrusion of the lower eyelid on looking downwards
- Oil drop reflex

Important Information

- Oil drop cataract → Galactosemia
- Oil drop reflex → Keratoconus
- Oil globule reflex → Anterior lenticonus



- Iron deposition on corneal epithelium → Fleischer ring
- Treatment
 - Toric glasses
 - Rigid gas permeable contact lens → Cellulose acetyl butyrate
 - C3R → Corneal collagen crosslinking with Riboflavin
 - Keratoplasty

Q. Treatment of early keratoconus is

- Soft contact lenses
- Rigid gas permeable lenses
- Toric lenses
- Keratoplasty

Answer: c. Toric lenses

- Toric lenses are used to treat astigmatism

Q. Which refractive surgery is not preferred in a 21-year-old boxer

- PRK
- RK
- SMILE
- LASIK

Answer: b. RK

- Refractive surgery **contraindicated** in Boxers → Radial keratotomy > LASIK

CONJUNCTIVA

02:08:31

Conjunctivitis

- Hyperacute conjunctivitis in a 3-day-old child

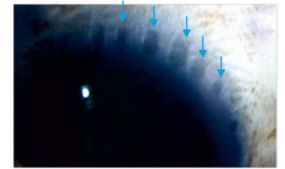


- Diagnosis → Ophthalmia neonatorum
- Etiology → *Neisseria Gonorrhoeae* → Grows in chocolate agar
- Characteristic features → Thick purulent discharge, very painful, **may lead to blindness**
- Redness, watering, foreign body sensation, photophobia, Pre-auricular lymphadenopathy,
- Diagnosis → Eye flu/ Epidemic keratoconjunctivitis/ Pink eye
- M/C cause → Adenovirus
- M/C organism causing Acute hemorrhagic conjunctivitis → Picornavirus
- Enterovirus 70 > Coxsackie A24

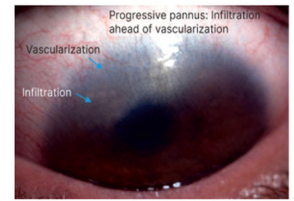


Trachoma

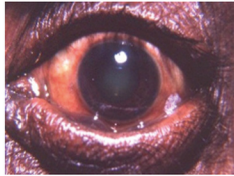
- 7-day-old newborn, the following features are seen
 - Diagnosis → Trachoma
 - Herbert pits → Scars at the limbus
 - Entropion → Inward rolling of eyelids
 - Pannus → Infiltration along with vascularization
 - Progressive pannus → Infiltration ahead of vascularization
 - Regressive pannus → Infiltration behind of vascularization



Herbert's pits



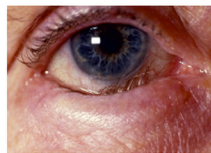
Progressive pannus: Infiltration ahead of vascularization
Vascularization
Infiltration



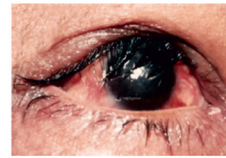
Tylosis: Thickened tarsal plate



Arit's line- Fibrotic scar on upper palpebral conjunctiva



Entropion- Inward rotation of eyelids



Tylosis: Thickened tarsal plate

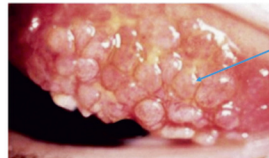
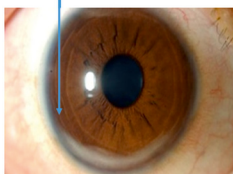
- Tylosis → Thickening of the tarsal plate
- Trichiasis → Misdirected eyelashes
- Arit's line → Fibrous line in the upper palpebral conjunctiva
- Management → SAFE strategy
 - S - Surgery for Trichiasis > Entropion
 - A - Azithromycin → 20 mg /kg
 - F - Facial hygiene
 - E - Environmental sanitation



Vernal Keratoconjunctivitis

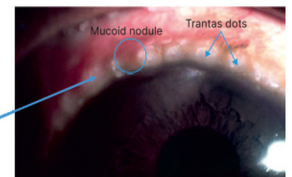
- Male, Teenager visits eye OPD with parents, complains of itching in both eyes, which is more in the summer.

Pseudogerontoxon



Cobblestone papillae

Maxwell Lyon sign- Thick ropy discharge containing eosinophils



Horner tranta spots

- Diagnosis → Vernal keratoconjunctivitis - A/K/A Spring catarrh
- Shield's ulcer
- Cobblestone papillae
- Maxwell Lyon sign → Thick ropy discharge with eosinophils
- Horner tranta dots → Mucoid nodules at the limbus
- Pseudogerontoxon Peripheral corneal opacities

Q. Shield corneal ulcer is seen in:

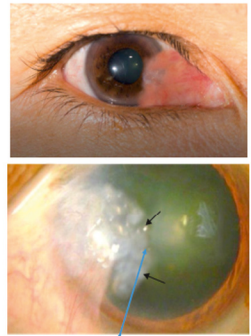
- Phlyctenular keratoconjunctivitis
- Vernal keratoconjunctivitis
- Trachoma
- Fungal Ulcer

Yourwish

Answer: b. Vernal keratoconjunctivitis

Pterygium

- Wing-shaped fold of conjunctiva encroaching upon cornea upto anterior stroma → Pterygium
 - M/C cause of pterygium → UV light > IR rays > Tropical dust climate
 - Stocker's line → Iron deposition on corneal epithelium at the leading edge of pterygium
- Management of pterygium
 - Only Excision
 - Excision with mitomycin C
 - TOC for pterygium → Excision with autograft



Stocker's line- Iron deposition on cornea epithelium at the leading edge of pterygium.

→ PERFECT Surgery → Pterygium extended resection followed by extended conjunctival transplant

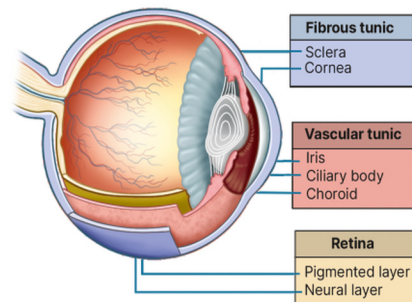
Q. Which of the following is true about pterygium?

- a. Associated with infrared radiation exposure
- b. Probe can be passed underneath the pterygium at the limbus
- c. There is elastotic degeneration with Descemet's membrane distortion
- d. Bare sclera technique of treatment has 30-80% recurrence

Answer: d. Bare sclera technique of treatment has 30-80% recurrence

SCLERA

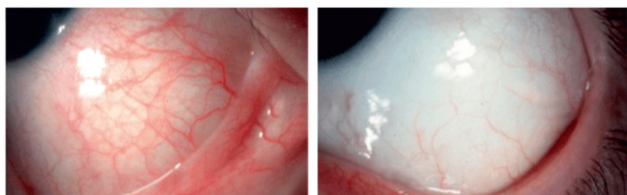
- Parts of Sclera (superficial to deep)
 - Episclera
 - Sclera proper
 - Lamina Fusca
- Difference between Episcleritis and Scleritis



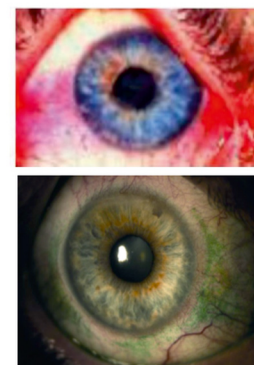
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Episcleritis	Scleritis
<ul style="list-style-type: none"> • Inflammation of the episclera 	<ul style="list-style-type: none"> • Inflammation of the sclera proper
<p>Associated with RA, SLE, or Wegener's Granulomatosis</p>	
<ul style="list-style-type: none"> • Minimal pain • Sectoral redness ± nodules • Normal vision • Self-limited 	<ul style="list-style-type: none"> • Increased pain • Redness present • Blurred vision • Photophobia

- Mobile vessels, which blanch with phenylephrine drops
- Adherent vessels, which don't blanch with phenylephrine drops



- Rose Bengal stain
 - Seen under normal light
 - Stains dead, devitalised cells & mucus
- Lissamine green stain
 - Seen under normal light
 - Stains dead, devitalised cells & mucus
- Fluorescein stain
 - Seen in cobalt blue light, emits green colour



Q. Sequence of staining in dry eye

- Fluorescein stain>Rose Bengal>Lissamine green
- Lissamine green>Rose Bengal> Fluorescein dye
- Fluorescein dye> Lissamine green> Rose bengal
- Rose Bengal> Lissamine green> Fluorescein dye

Answer: c. Fluorescein dye> Lissamine green> Rose Bengal

OCULAR ADENEXA

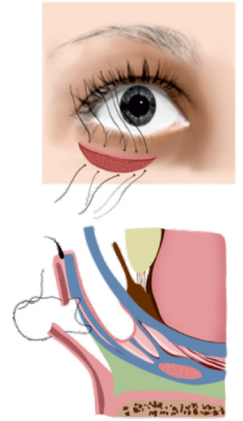
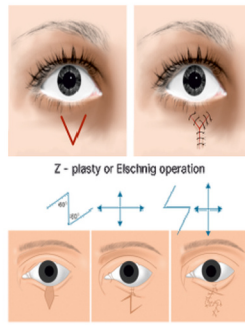
- Improvement with Ice pack application and on IV neostigmine
 - Diagnosis → **Myasthenia Gravis**
 - Due to inhibition of acetylcholinesterase, the action of acetylcholine is prolonged
- Oculosympathetic paralysis/ Horner's syndrome
 - Etiology →
 - **PanCoast tumour** in adults
 - Fracture of clavicle in difficult delivery → congenital
 - Miosis
 - Ptosis- 2mm due to paralysis of Muller's muscle
 - Anhidrosis-loss of sweating of the face
 - Enophthalmos(Pseudo)
- Congenital ptosis
 - Absent lid crease, ptosis more than 1.5mm, surgery of choice → Frontalis Brow sling surgery
 - Absent lid crease, ptosis less than 1.5mm, surgery of choice → Fasanella-Servat procedure



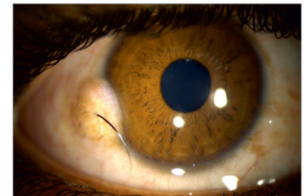
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- Jones procedure → Entropion
 - Other surgery → Bick, Quickert procedure
- V-Y operation, Z plasty, Medial conjunctivoplasty → Ectropion

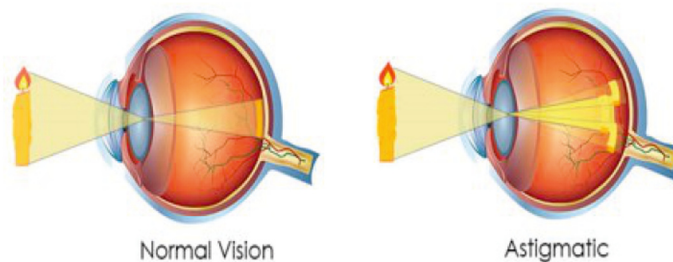


- Painful lid swelling with small elevation at the root of hair follicle
 - Diagnosis → **Stye**
 - Acute painful swelling at the lid margin, a/w refractory error in the child
 - Refractory error → Constant rubbing of eyes → Recurrent infection
 - Infection of the root of the hair follicles or gland of zeis
 - M/C organism in stye → Staphylococcus aureus
 - Treatment → Hot fomentation, antibiotics, and anti-inflammatory
- Chronic non-tender swelling away from the lid margin
 - Diagnosis → **Chalazion**
 - Recurrent condition → Sebaceous cell carcinoma
 - Blockade of the duct of the Meibomian gland
 - Treatment:
 - Intralesional triamcinolone
 - Incision & Drainage → Best
- Limbal Dermoid
 - Benign congenital tumour containing Choristomatous tissue
 - MC site → Inferotemporally (Limbus)
- Dermolipoma
 - Abnormal growth of adipose tissue
 - MC site → Fornix (temporal)

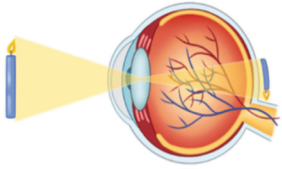
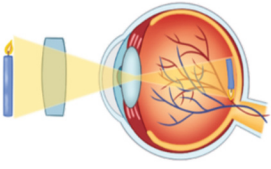


OPTICS

- Normal vision → one focal point on retina
- Astigmatism → multiple focal points on retina
 - Treated with cylindrical glasses



02:24:57

<p>Hypermetropia</p>  <p>Hyperopia</p>	<ul style="list-style-type: none"> • Light rays from infinity, with accommodation at rest → Focused behind the retina 	<ul style="list-style-type: none"> • Convex lens (convergent glasses)  <p>Correction with lens</p>
<p>Myopia</p>	<ul style="list-style-type: none"> • Light rays from infinity with accommodation at rest → Focused in front of the retina 	<ul style="list-style-type: none"> • Concave lens (divergent glasses)

- Sturm's Conoid → Configuration of rays refracted through an astigmatic surface
- Horizontal rays (blue): Increased power → Decrease focal length
- Vertical rays (yellow): Decreased power → Increase focal length
- Horizontal curvature > vertical curvature → Against-the-rule astigmatism
- **Circle of least confusion**
 - Divergence of Horizontal rays is equal to the convergence of vertical rays

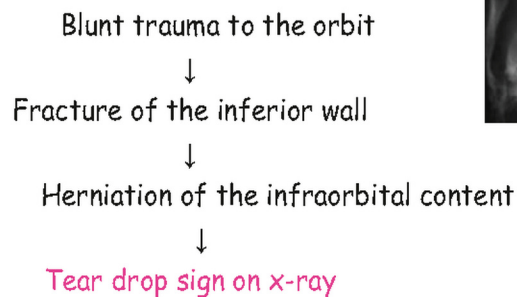
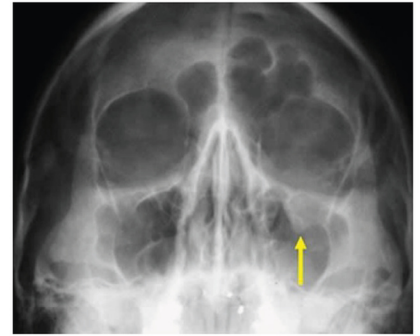


3. ONE LINERS IN OPHTHALMOLOGY

ORBIT

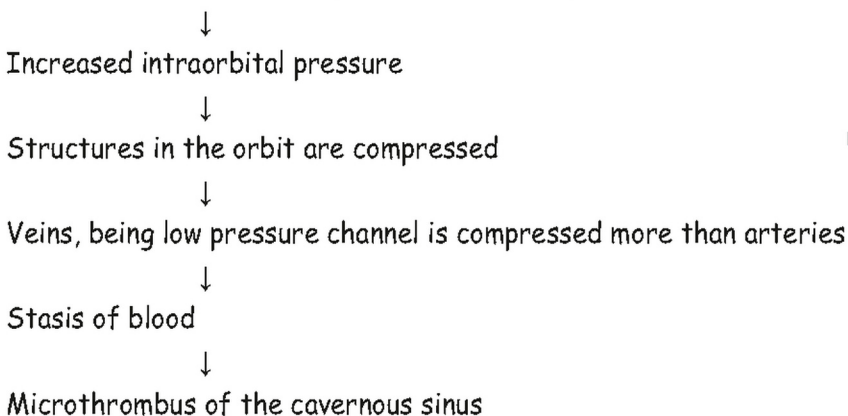
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- Thinnest wall of orbit: Medial wall
 - Formed by Lamina papyracea → a part of the Ethmoid bone
- Thickest and strongest wall of orbit: Lateral wall
 - Formed by the zygomatic bone
- Weakest point of the orbit: Inferior / Posteromedial

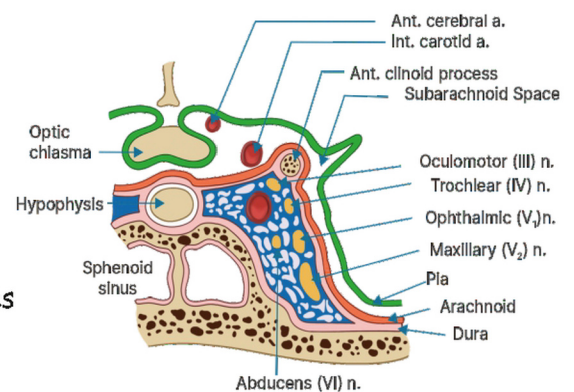


- Differentiate between Orbital apex syndrome and Superior orbital fissure syndrome
 - Orbital apex syndrome → Loss of vision observed due to involvement of optic nerve
→ Superior orbital fissure + Optic canal involved
 - Superior orbital fissure syndrome → Superior orbital fissure involved
- M/c organism of orbital cellulitis and preseptal cellulitis → Staphylococcus aureus
- Most deadly complications of orbital cellulitis → Cavernous sinus thrombosis
 - Pathology

Inflammation of the orbit posterior to the septum



- Investigations
 - MRI
 - Assessment of Abducent nerve by testing the abduction of eyeball (lateral rectus involvement)
- Earliest sign of involvement of the other side of cavernous sinus in CST: Abduction defect
- Treatment of orbital cellulitis
 - IV Vancomycin + 3rd generation Cephalosporin
 - Metronidazole for anaerobic organism



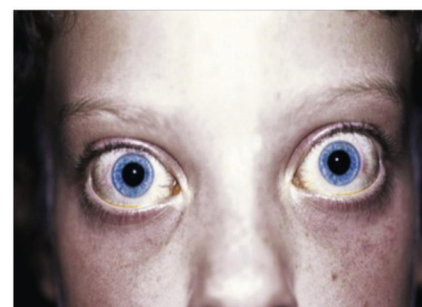
THYROID EYE DISEASE

- M/c cause of U/L and B/L proptosis in adults: Thyroid eye disease
- M/c cause of U/L and B/L proptosis in children
 - U/L proptosis → Orbital cellulitis
 - B/L proptosis → Neuroblastoma
- Earliest sign in Thyroid eye disease: **Dalrymple sign**

Stimulation of sympathetic fibres of Muller's muscle



Upper eyelid retraction



- Lid lag in down gaze → **VonGraefe sign**
- Forced duction test differentiates between → Paralytic and Restrictive squint
 - Forced duction test is positive in restrictive squint



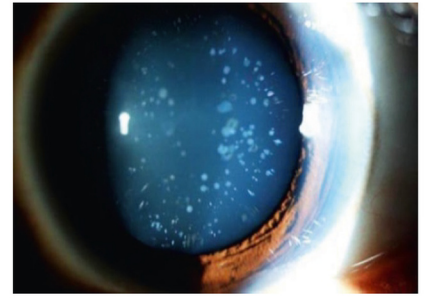
- To assess exophthalmos:
 - In adult - Hertel's exophthalmometer
 - In children - Luedde's exophthalmometer
 - Interpretation - Distance from centre of cornea to lateral orbital rim $\geq 21\text{mm}$
- Intermittent proptosis → Orbital varices
 - Proptosis appears in prone position
 - Proptosis disappears in the supine position
- Pulsatile proptosis → To and fro movement of the orbit
 - Carotid cavernous fistula
 - Sphenoid dysplasia
 - Neurofibromatosis - leads to sphenoid dysplasia
 - Orbit roof fracture

Tumours of Orbit and Eyeball

Intraorbital		
	Children	Adult
Benign	Dermoid cyst	Cavernous / Capillary Hemangioma
Malignant	Rhabdomyosarcoma - Desmin positive	Metastasis / NHL
Intraocular		
Malignant	Choroidal / Malignant melanoma	Retinoblastoma

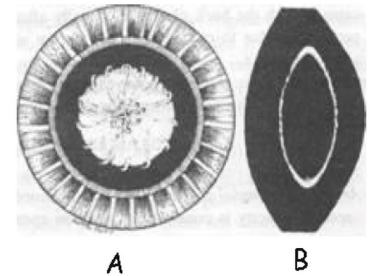
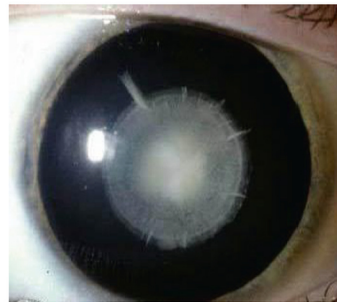
LENS AND ITS DISEASE

- Snellen's chart is based on Form sense
- Low vision → Va 6/18 to 6/60
- Economic blindness → Va < 6/60 to 3/60
- **Social blindness** → Va < 3/60 to 1/60
- Manifest blindness → Va < 1/60
- Absolute blindness → no perception of light
- Magnification of direct ophthalmoscope → 15x
- Magnification of indirect ophthalmoscope → 3-5x
- Cause of blindness / preventive blindness in the world: Cataract (M/c)
 - Cataract > Glaucoma > ARMD > Trachoma > Onchocerciasis
- M/c cause of blindness in children → Vitamin A deficiency
- M/c congenital cataract → Blue dot cataract
 - Not associated with loss of vision
- M/c cataract associated with loss of vision → Lamellar / Zonular cataract
 - Part of the lens affected in Lamellar / Zonular cataract is the fetal nucleus

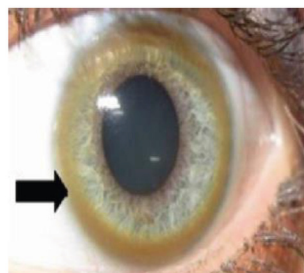


Important Information

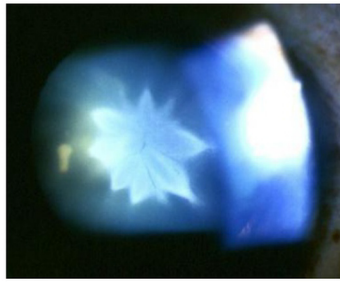
- Parts of the nucleus
 - Embryonic - 0 to 3 months
 - Fetal - 3 to 8 months
 - Infantile - 8 months to puberty
 - Adult - Puberty to Adulthood
- M/c cause of metabolic cataract → Type 2 DM
 - Most specific Type 1 Diabetic mellitus cataract → Snowflake cataract
 - M/c cataract seen in diabetic mellitus → Early senile cataract



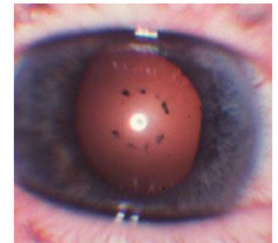
- Cataract associated with Wilson's disease → Sunflower cataract
 - Cataract associated with chalcosis (copper foreign bodies in eye) → Sunflower cataract
 - Copper deposition in Wilson's disease in Descemet's membrane of cornea → Kayser Fleischer ring



- Blunt trauma → Posterior cortical cataract → Rosette cataract

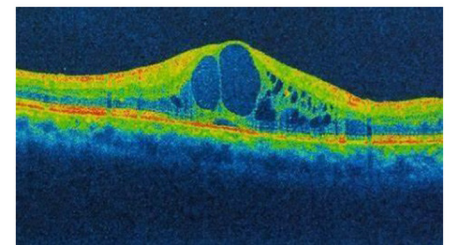


- Penetrating trauma → Anterior cortical cataract
- Pigment dispersion on Anterior lens capsule → Vossius ring
 - Blunt trauma → Posterior pigment of iris deposit in anterior lens capsule
- M/c intraocular foreign body → Iron (Siderosis bulbi)
- Most toxic intraocular foreign body → Copper
- M/c form of complicated cataract → Posterior subcapsular cataract
 - Polychromatic lustre due to bread crumb appearance
- M/c form of drug-induced cataract → Posterior subcapsular cataract
 - M/c drug to cause cataract → Steroids
- Cataract of second sight, Hamarlopia → Nuclear cataract
- Calculation of IOL power → Biometry
 - Components of Biometry
 - A scan → Axial length of eyeball
 - Keratometry → Horizontal and Vertical curvature of the cornea
- Formula used for calculation of IOL power (Axial length >24mm): SRK II formula
- Formula used for calculation of IOL power (Axial length <22mm): Hoffer Q
- Both lens and capsule removed in → ICCE (Intracapsular Cataract Extraction)
- Aphakia
 - Iridodonesis
 - Jet black pupil
 - Roving ring scotoma
 - Jack in box



Viscoelastics / Ocular Viscosurgical Device (OVD)

- Maintain Anterior chamber → Cohesive
- Protect corneal endothelium → Dispersive
- Femtolasers cataract surgery steps:
 - Main incision → Capsulorhexis → Breaking up of lens pieces
- M/c late complication of cataract surgery with treatment: After cataract
 - Treatment - Nd Yag capsulotomy
- Irwin Gass syndrome
 - Cystoid macular edema
 - Intraretinal cyst in Henle's layer / outer plexiform layer
 - Collection of fluid in the outer plexiform layer within 1-3months of surgery
- Endophthalmitis → Infection of the choroid, Retina, Vitreous humor, aqueous humor, and lens fibres
- Early onset Post-op endophthalmitis: Staph epidermidis > S.aureus
- Late onset Post-op endophthalmitis: Propionibacterium acne
- Surgery done in paediatric cataract



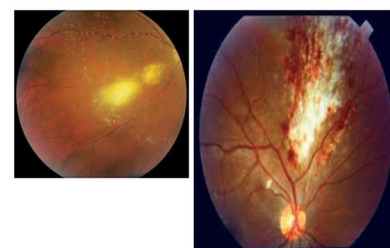
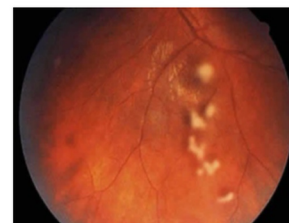
Yourwish

- Phacoaspiration with Primary posterior capsulotomy (PPPC)
- IOL power undercorrection value
 - For 0-2 years → 20%
 - For 2-8 years → 10%
 - Power is corrected to prevent post op myopia
- M/c cause of anterior lenticonus → Alport syndrome

UVEA

00:32:30

- Aqueous Humour production by:
 - Non-pigmented epithelial cells of the pars plicata of ciliary body
- Etiology of Anterior Uveitis:
 - Idiopathic (M/c)
 - HLA B27-associated seronegative arthropathy
 - Psoriatic arthritis
 - Ankylosing spondylitis
 - Inflammatory bowel disease
 - Reiter syndrome
 - Juvenile Rheumatoid arthritis
 - Behcet's disease - HLA B5 or HLA B51 associated
- Signs of acute anterior uveitis
 - Cells in the anterior chamber (lymphocytes)
 - Proteins in the anterior chamber
- Granulomatous uveitis - **Mutton fat KPs**
 - TB, syphilis, and leprosy
- Pupil in Acute anterior uveitis → Small, constricted, irregular, non-reacting



Important Information

- Pupil in Acute congestive glaucoma → Mid dilated, oval, and non-reacting
- Peripheral anterior bowing of iris leading to shallowing of AC → Iris Bombe
- Snowball opacities & Snow banking → Pars planitis
- Pizza pie retinopathy → CMV Retinitis
 - Treatment → Ganciclovir
- Candle wax dripping → Sarcoidosis
 - Treatment → Steroids
- Headlight in fog appearance → Toxoplasma retinitis

Sympathetic Ophthalmitis

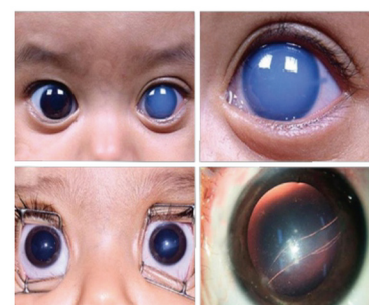
- Dangerous area of eye → Ciliary body
- Most dangerous period → 2 weeks to 2 months
- Earliest sign → Retrolental flare
- Earliest symptom → Loss of accommodation
- When vision in the injured eye is PL (light perception) negative, and the other eye is normal → Enucleation
- When vision in the injured eye is 6/60, and the other eye is normal → Primary repair
- When sign & symptom of sympathetic ophthalmitis starts in the other eye → High-dose steroids

GLAUCOMA

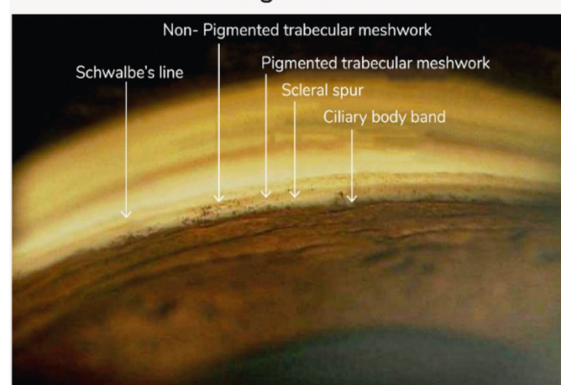
- Gold standard tonometer → **Goldmann's tonometer**
- Handheld portable Goldmann's tonometer → Perkins' tonometer
- Tonometer used in a patient with corneal opacity → Tonopen
- Earliest visual field defect in POAG → Isopter contraction
- Earliest significant visual field defect in POAG → Paracentral scotoma
- Advanced glaucoma
 - c/d ratio > 0.9 - 1
 - Lamina dot sign
 - Tunnel vision
 - Temporal island
- Haab's striae → Horizontal tears in the Descemet membrane of the cornea → corneal edema → Buphthalmos (Increase in size of eyeball)
- Triad of congenital glaucoma
 - Lacrimation (earliest)
 - Photophobia
 - Blepharospasm
- Surgery of choice → Goniotomy
- Technique → Gonioscope
- Angle of anterior chamber structures (anterior to posterior)
 - Schwalbe's line
 - Non-pigmented trabecular meshwork
 - Pigmented trabecular meshwork
 - Scleral spur
 - Ciliary body band
- Indirect gonioscopes → have a mirror
 - Goldmann, Zeis, Possner, Sussman
- Direct gonioscopes → does not have a mirror
 - Koeppe, Barkans, Swan, Jacob
- Frequent changes in Myopic glasses → Nuclear cataract
- Frequent changes in Myopic glasses in young adult patients → Keratoconus
- Fluctuation of vision in patients → Diabetes mellitus



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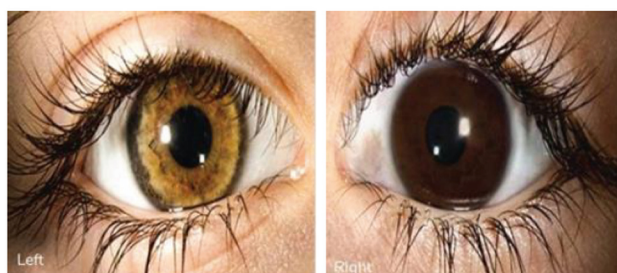


Normal Angle Structures

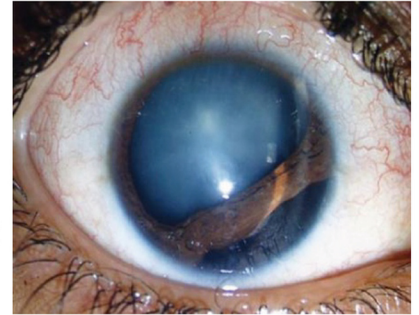


ANTI-GLAUCOMA DRUGS

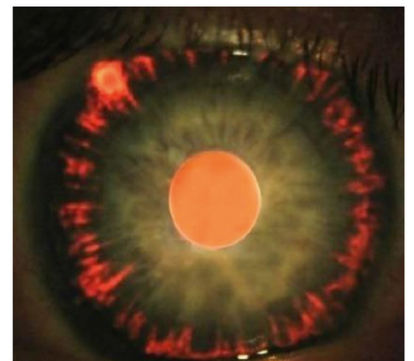
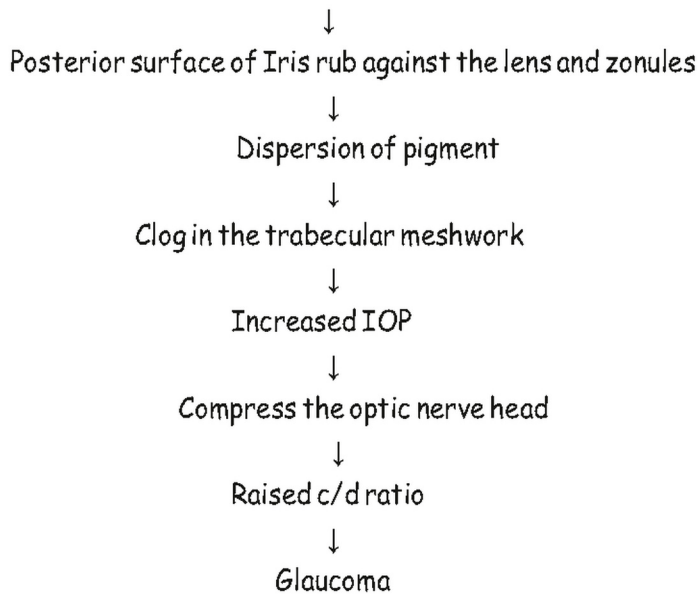
- Contraindicated in asthma → Non-selective beta blocker - Timolol
- Contraindicated in neonates/history of depression / DOC in pregnancy → Brimonidine
- S/E of PGF2 α agonist → Iris hyperpigmentation, Trichomegaly, CME



- C/I in aphakic → Sympathomimetics (Dipivefrine)
 - Cause CME
- Separation of longitudinal fibres and circular fibres of the ciliary body → Angle recession
- Separation of ciliary body from scleral spur → Cyclodialysis
- Tearing up of iris at its root / D-shaped pupil → Iridodialysis
 - Leads to uniocular diplopia



- Pigment Dispersion Syndrome → Transillumination defects
Concave arrangement of the iris anteriorly



- Pigment deposited on corneal endothelium in PDS → **Krukenberg spindle**
- Aqueous misdirection syndrome / malignant glaucoma / inverse glaucoma → DOC: Atropine

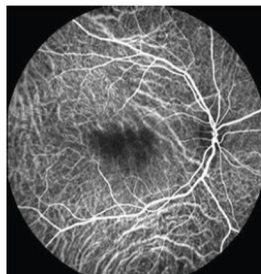
RETINA

00:51:22

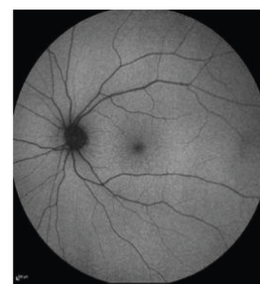
- Fluorescein Angiography
 - CRAO
 - BRAO



- Indocyanine green angiography
 - IOC - occult Choroidal Neovascular membrane

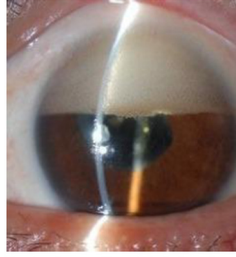


- Fundus Autofluorescence
 - Drusen appears Hyperfluorescent

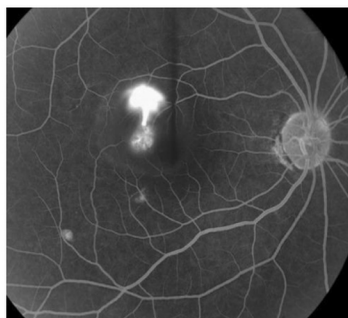


- Gas used in Retinal detachment Pneumoretinopexy
 - SF6 - Sulphur hexafluoride (M/c)
 - C3F8 - Per-fluoropropane (Best)

- Inverse hypopyon
 - Silicon oil in the anterior chamber



- Most important prognostic factor in Diabetic retinopathy → Duration
- Duration of Fundus examination
 - For Type 1 DM (IDDM) - After 5 years
 - For Type 2 DM (NIDDM) - Immediately
- The earliest feature of Diabetic retinopathy: Microaneurysms
- P/E ratio
 - Normal → 1:1
 - Diabetics → 1:3
- Hallmark of proliferative Diabetic retinopathy → Neovascularization
- Cause of loss of vision in Diabetic retinopathy → Cystoid macular edema
- Cause of loss of fundus glow
 - Vitreous haemorrhage
 - Tractional Retinal Detachment
- Hyperfluorescent dots → Microaneurysm
- Multiple black spots on retina FFA → Ischaemic retina
- CRVO
 - Splash tomato appearance, CME, Disc edema, 100-day glaucoma
- CRAO
 - Pale milky white retina, Box car appearance of vessels, cherry red spots on macula
- Central serous retinopathy
 - Smoke stack appearance on FFA → specific
 - Ink bottle appearance → non-specific



- Age-related macular degeneration
 - Male, white, smoking, alcohol, non-vegetarian
 - 2 Types
 - Dry ARMD (90% of cases) - 10% goes blind
 - Wet ARMD (10% of cases) - 90% goes blind
- Retinitis pigmentosa → Dystrophy of rods and cones
 - Pale waxy disc, AV attenuation, Bony spicule pigmentation
- Best's disease → Dystrophy of retinal pigment epithelium

Yourwish

- 6-year-old with no loss of central vision in the early stage
- Inheritance - Autosomal Dominant
- O/E - egg yolk appearance on macula
- Stargardt's disease → Dystrophy of retinal pigment epithelium
 - 20 years of age, early loss of central vision
 - Inheritance - Autosomal recessive
 - O/E - Beaten bronze appearance of retina
- Retinoblastoma →
 - A child of 18 months of age, leukoria, strabismus, with calcification intraocularly
 - IOC for Retinoblastoma → NCCT
 - IOC for metastasis of Retinoblastoma → MRI because Retinoblastoma spreads via the optic nerve

NEUROPTHALMOLOGY

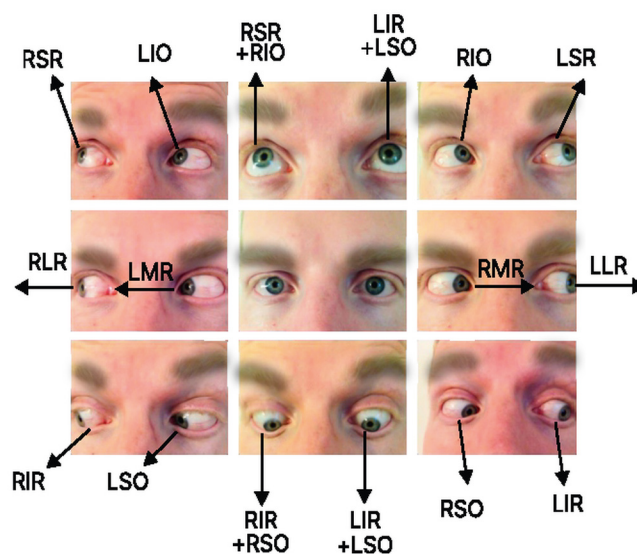
01:01:04

- Argyll Robertson pupil:
 - Neurosyphilis
 - Accommodation reflex present
 - Light reflex absent
 - Bilateral constricted pupil
- Holmes Adie's pupil:
 - Ciliary ganglionitis
 - Accommodation reflex present
 - Light reflex absent
 - Unilateral dilated pupil
- Optic neuritis - Retrobulbar neuritis:
 - Painful vision loss, altitudinal VFD, Uhthoff syndrome (signs and symptoms of optic neuritis exaggerated on exposure to heat)
- Papilledema:
 - A 40-year-old fat female with occipital headache, vision normal, dilated and tortuous vessels with peripapillary hemorrhages, enlarged blind spot on perimetry

SQUINT

01:03:48

- Abducted position of the eye
 - Elevator → Superior recti
 - Depressor → Inferior recti
- Adducted position of the eye
 - Elevator → Inferior oblique
 - Depressor → Superior oblique
- Pair of yoke muscles → receive the same nerve supply as per Hering's law
 - Dextroelevation → RSR+LIO
 - Levodepression → RSO+LIR
- Fixation → completed 6 weeks; fusion starts
- Fusion → completed 6 months; stereopsis starts
- Stereoptosis → 6 years
- Distant object



- Parallel rays → image is focused in the retina
- Near object
 - Divergent rays → Image would form behind retina (without accommodation) → Accommodation brings it onto retina.
- Act of accommodation:
 - Increase in the anterior curvature of the lens
 - Miosis
 - Convergence → Accommodative convergence
- For every 1D increase in the power of the lens, the accommodative convergence is 5PD or 2.5°
- Refractive accommodative esotropia:
 - AC/A ratio - normal (5PD)
 - Hypermetropia
- Non-refractive accommodative esotropia:
 - AC/A ratio - high
 - No refractory error
- Mixed accommodative esotropia:
 - AC/A ratio - high
 - Refractory error

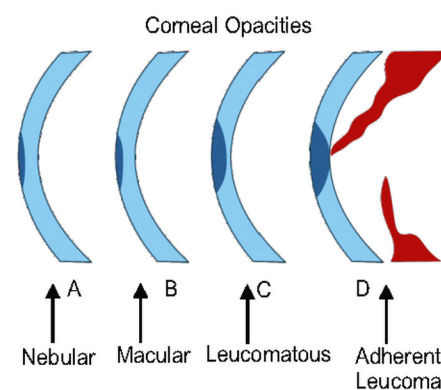
CORNEA

01.10.57

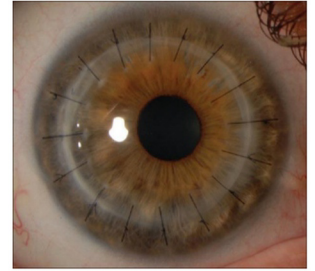
- M/c bacteria causing keratitis in India → Staph. epidermidis
- M/c bacteria causing keratitis in India → Staph. aureus
- When ulcerative process is deepened and reaches upto Descemet's membrane, leading to its bulging → Descemetocele
- Pseudocornea bulges forward along with the iris plastered posteriorly → Anterior staphyloma

Corneal Opacities

- Leukomatous opacity with iris plastered posteriorly → Adherent Leukoma
- No view across corneal opacity → Leukoma
- Fine details can't be seen → Macular
- Fine details (Crypts and furrows) seen → Nebular
- M/C fungus causing mycotic corneal ulcer → Fungus Aspergillus
- Dry-looking ulcer, satellite lesion, fixed hypopyon → Fungal keratitis
- Pseudodendritic keratitis, Nummular keratitis, Wesley's immune ring, Disciform keratitis → Herpes zoster ophthalmicus
- Dendritic keratitis, Geographic keratitis, Wesley's immune ring, Disciform keratitis → HSV keratitis
- **Hutchinson's rule**
 - If the tip of nose is involved, ocular involvement will be observed
 - Due to the common nerve supply to the cornea as well as to the side/tip of the nose
 - Nerve involved is → Nasociliary nerve
- Non-ulcerating inflammation of the stroma of the cornea → Interstitial keratitis
- Keratoconus
 - Non-inflammatory bilateral ectatic condition
 - Vogt's striae → Vertical stretch of Descemet's membrane
 - Munson sign → V-shaped protrusion of the lower eyelid on looking downwards



- Oil drop reflex
- Iron deposition on corneal epithelium → Fleischer ring
- Keratoplasty → Transplantation of the cornea
 - Sutures → Nylon 10-0
- Refractive surgery contraindicated in Boxers → Radial keratotomy > LASIK



Important Information

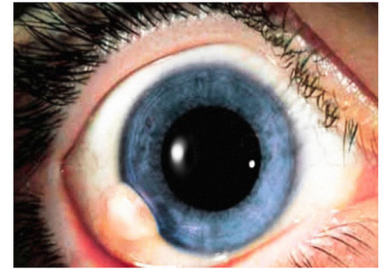
- Horizontal tear in Descemet's membrane → Haab's striae
- Vertical stretch of Descemet's membrane → Vogt's striae
- KF ring → Copper deposition in Descemet's membrane → Wilson disease
- Fleischer ring → Iron deposition in corneal epithelium → Keratoconus
- Stocker's line → Iron deposition in corneal epithelium → Pterygium

CONJUNCTIVA

01.20.15

- M/c cause of Bacterial conjunctivitis → Staphylococcus aureus
- M/c commensal in conjunctiva → Staphylococcus epidermidis
- M/c organism of Epidemic keratoconjunctivitis → Adenovirus
- M/c organism causing Acute hemorrhagic conjunctivitis → Picornavirus
 - Enterovirus 70 > Coxsackie A24
- Cause of conjunctivitis within 1-3 days of birth → Neisseria gonorrhoeae
- Cause of conjunctivitis after 5 days of birth → Chlamydia trachomatis
- Trachoma
 - Bulbar follicles
 - Herbert pits → Scars at the limbus
 - Entropion
 - Pannus → Infiltration along with vascularization
 - Tylosis → Thickening of tarsal plate
 - Poliosis → Greying of eyelashes
 - Madarosis → Falling of eyelashes
 - Trichiasis → Misdirected eyelashes
 - Arlt's line → Fibrous line in the upper palpebral conjunctiva
 - Corneal opacity
- Vernal keratoconjunctivitis - A/K/A Spring catarrh
 - 16 year old male
 - B/L condition
 - More in summers
 - Shield's ulcer
 - Cobblestone papillae
 - Maxwell Lyon sign → Thick ropy discharge with eosinophils
 - Horner tranta dots → Mucoïd nodules at the limbus
 - Pseudogerontoxon → Peripheral corneal opacities
 - Type I and Type IV hypersensitivity reactions
- Phlyctenular conjunctivitis
 - 8 year old girl

- U/L condition
- Limbal nodule
- Fascicular ulcer
- **Type IV** hypersensitivity reaction
- Pterygium → Wing shaped fold of conjunctiva encroaching upon cornea upto anterior stroma, Stocker's line
 - M/c site of pterygium → Nasal side
 - M/c cause of pterygium → UV light
 - TOC for pterygium → Excision with autograft
 - PERFECT Surgery → Pterygium extended resection followed by extended conjunctival transplant
 - Cause of Diplopia in pterygium → Astigmatism (with the rule astigmatism)
- Benign congenital tumors that contain choristomatous tissue more common at inferior temporal part of limbus with hair coming out of it → **Limbal Dermoid**



OCULAR ADNEXA

01:26:05

- Absent lid crease, ptosis more than 1.5mm → SOC: Frontalis Brow sling surgery
- Absent lid crease, ptosis less than 1.5mm → SOC: Fasanella-Servat procedure
- Ptosis improving with ice pack application over eyelid / IV Neostigmine → Myasthenia gravis
- Ptosis recovery is seen while sipping water/eating food → caused by complicated ptosis (Marcus Gunn jaw wink syndrome)
- Jones, Bick, Quickert procedure → Entropion
- V-Y operation, Z plasty, Medial conjunctivoplasty → Ectropion
- Acute painful swelling at the lid margin a/w refractory error in child → Stye
 - Infection of root of hair follicles or gland of zeis
- M/c organism in stye → Staphylococcus aureus
- Chronic non tender swelling away from lid margin → Chalazion

OPTICS

01:28:31

- Parallel light rays focused in front of retina while accommodation at rest → Myopia, concave glasses
- Uncorrected myopia tend to develop → **Exotropia**
- Parallel light rays focused behind the retina while accommodation at rest → Hypermetropia, Convex glasses
- Uncorrected Hypermetropes tend to develop → **Esotropia**



4. PYQ BASED DISCUSSION

1. A 3-month-old child with mucus coming from the eye on pressing the inner corner and watering. What will be the treatment of this condition?

- A. Lacrimal massage
- B. Syringing
- C. DCR
- D. Bowman's probing

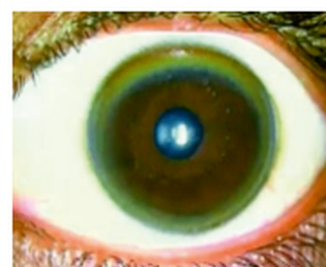
Answer: A

Explanation

- Diagnosis - Congenital dacryocystitis
- Due to the imperforate valve of Hasner (nasolacrimal duct opening into the inferior meatus)
- Rx:
 - Crigler's massage
 - Initial therapy
 - Done from superior to inferior on the nasal side, pushing the fluid through the nasolacrimal duct
 - May tear open the imperforate valve of Hasner
 - Done for about 3 months
 - Syringing
 - Done in case there's no improvement in massaging for 3 months
 - Water pushed through the cannula into the canaliculus
 - A gush of water may open a membranous obstruction
 - Bowman probing
 - Done in case there's no improvement in syringing for 3 months
 - Probe passed through puncta → canaliculus → nasolacrimal duct
 - Dacryocystorhinostomy (DCR)
 - Done after the age of 4 years, because structures are not well developed earlier

2. A person with jaundice and tremors is showing the following finding in the eye. What is the diagnosis

- A. Wilson's disease
- B. Huntington chorea
- C. Sydenham chorea
- D. Heavy metal poisoning



Answer: A

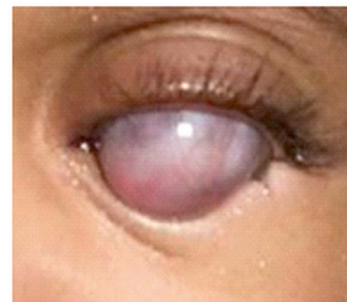
Explanation

- Diagnosis: Kayser-Fleischer ring in Wilson's disease
 - Golden-brown ring at the corneal periphery due to copper deposition in Descemet's membrane

- Starts superiorly and inferiorly, and later spreads circumferentially
- Reversible with treatment indicates a response to therapy
- Wilson disease
 - Genetics: Chromosome 13, Gene ATP7B
 - Biochemical changes
 - Decreased serum ceruloplasmin
 - Increased urinary copper
 - Decreased serum copper
 - Increased deposition of copper in the liver and other organs

3. A child with a history of malnutrition is examined, and the following image is seen. What is the most likely diagnosis?

- A. Megalocornea
- B. Buphthalmos
- C. Anterior staphyloma
- D. Corneal degeneration



Answer: C

Explanation

- Diagnosis - Anterior staphyloma
- Pathogenesis sequence: Malnutrition → vitamin A deficiency → Conjunctival xerosis → Corneal xerosis → Corneal inflammation → Corneal ulceration → Corneal perforation
- Effects of perforation
 - Decompression of the anterior chamber
 - Iris moves anteriorly and plugs the perforation
 - Stem cells in the palisades of Vogt replace the damaged epithelial cells
 - Restoration of IOP leads to the bulging of the epithelial layer
 - Epithelium with uveal tissue incarcerated posteriorly forms an anterior staphyloma
- Option A. Megalocornea
 - Normal corneal diameter 10-11 mm
 - Megalocornea when the diameter is >12 mm
 - The cornea remains transparent and is not associated with malnutrition
- Option B. Buphthalmos
 - An increase in the axial length of the eyeball is seen in congenital glaucoma.
 - Presents with triad of glaucoma: lacrimation, photophobia, buphthalmos
- Option D. Corneal degeneration
 - In the elderly, there is a presentation with arcus senilis (Lipid deposition in the periphery of the cornea)
 - In adults, it might be due to steroid degeneration leading to amber or golden-colored nodules on the cornea.

4. A young male complains of Rhinorrhea, Watery eyes, and itching. The clinical image is provided. What is the diagnosis?

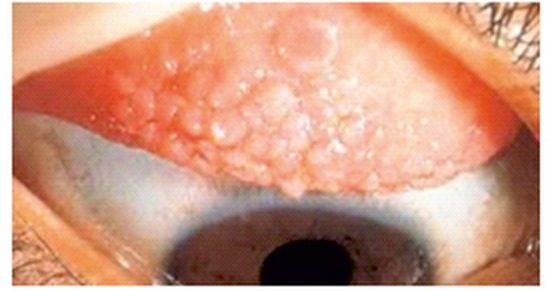
- A. Bacterial conjunctivitis
- B. Trachoma
- C. VKC

D. Angular conjunctivitis

Answer: C

Explanation

- **Vernal keratoconjunctivitis (VKC)**
 - Also called spring catarrh
 - Most common in the summer
 - Bilateral condition
 - Seen in teenagers more common in males than in females
 - Cobblestone papillae
 - Type I + Type IV hypersensitivity
 - Maxwell-Lyons sign - Thick ropy discharge with eosinophils
 - Shield ulcer, shield cataract (cataract associated with an allergic condition)
 - Treatment
 - Olopatadine
 - Sodium cromoglycate
- Option D. Angular conjunctivitis
 - Exfoliation at the angles of the eye
 - More towards the lateral canthus
 - Caused by *Moraxella axenfeld*
- Option B. Trachoma
 - Presence of bulbar follicles
 - Caused by *Chlamydia trachomatis*
- Option A: Bacterial conjunctivitis
 - Purulent discharge
 - Matting of eyelashes
 - Photophobia may occur



5. Which is the treatment of choice for recurrent pterygium?

- A. Treatment with Mitomycin C
- B. Conjunctiva autograft
- C. Simple excision
- D. Observation

Answer: B

Explanation

- Pterygium - Elastotic degeneration of the conjunctiva, which might reach up to the anterior $\frac{1}{3}$ of the stroma.
- The most common site on the nasal side
- Etiology
 - UV radiation exposure
 - Contributing factors
 - Infrared radiation
 - Tropical heat

- Dusty climate
- Clinical effects
 - Astigmatism
 - Astigmatism occurs along the axis of pterygium, causing diplopia
- Rx
 - Simple excision: 80 % chances of recurrence
 - Excision with Mitomycin C 0.02% for 2-3 minutes: Kills the fibroblast and hence prevents recurrence
 - Should be washed off after 2-3 minutes, or else it might lead to scleral necrosis and perforation
 - PERFECT surgery: Pterygium Extended Resection Followed by Extended Conjunctival Transplant
 - Recurrence rate is 0.01%

6. A patient with a vision of $< 3/60$ but $> 1/60$ in his better eye. Which type of blindness does he have?

- A. Low vision
- B. Economic Blindness
- C. Social blindness
- D. Manifest blindness

Answer: C

Explanation

- Blindness criteria
 - Vision $> 6/18$ → not considered blindness
 - Vision $\leq 6/18$ to $6/60$ → low vision
 - Vision $< 6/60$ to $3/60$ → economic blindness
 - Vision $< 3/60$ to $1/60$ → social blindness
 - Vision $< 1/60$ → manifest blindness
 - PL negative → absolute blindness

7. A farmer was hit by a leaf/vegetative matter in his eye a few days back, He visits the eye OPD with pain and photophobia. What is the most likely cause?

- A. Herpes simplex keratitis
- B. Acanthameba Keratitis
- C. Fungal Keratitis
- D. Bacterial keratitis

Answer: C

Explanation

- Option c. **Fungal keratitis**
 - Organic or vegetative matter injury suggests fungal keratitis
 - Signs are more than symptoms
 - Satellite lesions
 - Dry-looking ulcer with feathery margins or non-defined margins
 - Wessely's immune ring
 - Ring at the junction of the healthy cornea and the infected cornea

Yourwish

- Due to the antigen-antibody reaction
 - Also seen in viral keratitis (herpes simplex keratitis and herpes zoster ophthalmicus)
- Option a. Herpes simplex keratitis
 - Seen with low immunity, Chronic illness, Recent surgery, Chemotherapy
- Option b. Acanthamoeba keratitis
 - Contact lens wear
 - Washing contact lenses with tap water
 - Swimming in a pond
- Option d. Bacterial keratitis
 - History of bacterial conjunctivitis
 - Mobile and sterile hypopyon present
 - Fungal keratitis hypopyon will be fixed and unsterile
 - Fungus can penetrate intact cornea

8. A girl with ptosis when eats food and sips fluid, her ptosis is decreased. What is the most common cause?

- A. Mechanical ptosis
- B. Horner's syndrome
- C. Blepharophimosis syndrome
- D. Complicated ptosis

Answer : D

Explanation

- Option d. Case of Marcus gun jaw winking syndrome
 - Nerve supplying lateral pterygoid also supplies levator palpebrae superioris
 - Chewing movement activates lateral pterygoid
 - Due to synkinesis levator palpebrae superioris also stimulated
 - Eyelid moves up with jaw movement giving appearance of winking
- Option a. Mechanical ptosis
 - Mass on upper eyelid
 - Example: large chalazion or lid tumor
- Option b. Horner syndrome
 - Oculosympathetic palsy
 - Partial ptosis about 2 mm, due to paralysis of Muller's muscle
 - Pseudoenophthalmos
 - Miosis
 - Preganglionic Horner syndrome may show anhidrosis
- Option c. Blepharophimosis syndrome (BPES)
 - Blepharophimosis
 - Decreased horizontal length of eyelid (Reduced distance between lateral canthus and medial canthus)
 - Epicanthus inversus

9. Which of the following technique is gold standard for measuring IOP

- A. Schiottz tonometer
- B. Goldmann's applanation tonometer

- C. Tonopen
- D. Pulse air tonometer

Answer : B

Explanation

- Option a. Schiottz tonometer
 - Indentation tonometry
- Option b. Goldman tonometer
 - Applanation tonometry
- Option c. Tonopen
 - Used for edematous or scarred corneas
- Option d. Pulsair tonometer
 - Non-contact tonometry used for screening

10. A newborn child presents with watering, photophobia. On examination the following image is seen. What is the diagnosis

- A. Buphthalmos
- B. Congenital Cataract
- C. Megalocornea
- D. Congenital dacryocystitis



Answer : A

Explanation

- Option a. Congenital glaucoma
 - Triad of
 - Lacrimation
 - Photophobia
 - Blepharospasm
- Option c. Megalocornea
 - Large cornea but not associated with watering and photophobia
- Option d. Congenital dacryocystitis
 - Watering and photophobia may occur
 - Usually medial canthal swelling is present, which is absent here
- Option b. Congenital cataract
 - Leukocoria present
 - Not associated with watering and photophobia

11. A lady suffers sudden painful loss of vision in her eye with worsening pain during eye movements. RAPD is present. Perimetry shows Central Scotoma. What is your diagnosis?

- A. CRVO
- B. Papilledema

- C. Optic neuritis
- D. Retinoblastoma

Answer : C

Explanation

Diagnosis - Optic neuritis

- Option c. **Optic neuritis**
 - Central scotoma and RAPD suggest the optic nerve is involved
 - Optic neuritis might present as papillitis, neuroretinitis or retrobulbar neuritis
 - Papillitis- Inflammation of intraocular portion of optic nerve
- Papillitis might be painful
 - Retrobulbar neuritis - Inflammation posterior to eyeball
- Pain on ocular movements is more related to retrobulbar neuritis
 - Because the sheath of superior rectus is in continuous with optic nerve sheath
 - Pain on ocular movements, particularly elevation
 - Neuroretinitis - Inflammation of neuroretinal rim
 - Relative afferent pupillary defect is seen in optic neuritis
 - Afferent limb formed by optic nerve
 - Efferent limb formed by oculomotor nerve
 - Causes bilateral constriction of pupil
 - Central scotoma/ Altitudinal visual field defects are in favor of optic neuritis
- Option a. CRVO
 - Sudden painless loss of vision
 - RAPD may be present in ischemic CRVO
- Option b. Papilledema
 - Disc edema due to raised intracranial tension
 - No loss of vision in early stages
 - RAPD absent
 - Associated with occipital headache and projectile vomiting
- Option d. Retinoblastoma
 - Most common intraocular malignant tumor in children
 - Usually painless

12. What could be the site of lesion in a person with macula sparing Homonymous Hemianopia?

- A. Optic chiasma
- B. Optic tract
- C. Optic nerve
- D. Occipital cortex

Answer : D

Explanation

- Visual pathway
 - Nasal fibers cross at optic chiasma

- Temporal fibers remain on same side
- Damage at optic chiasma → both the sides nasal fibres are damaged → bitemporal hemianopia
- Damage at optic tract; IL temporal and CL nasal fibres are damaged → contralateral homonymous hemianopia
- Parietal lobe lesion
 - Superior fibres pass through parietal lobe
 - Right parietal lobe receives right superotemporal and left superonasal fibres → → Left inferior (contralateral) homonymous quadrantanopia
- Temporal lobe lesion
 - Inferior fibres pass through temporal lobe
 - Right temporal lobe receives right inferotemporal and left inferonasal fibres → → Left superior (contralateral) homonymous quadrantanopia
- Occipital lobe lesion
 - Functionally occipital lobe is divided onto right and left lobe
 - Fibers from optic tract terminate in occipital lobe
 - Macular fibers go deeper into core occipital cortex which has dual blood supply: posterior cerebral artery and middle cerebral artery
 - In right PCA stroke macular fibers survive due to MCA supply and present as left homonymous hemianopia with macular sparing

13. A man suffered a trauma in his right eye with a punch. Which of the following will most commonly occur in this case.

- A. Inferior orbital wall fracture
- B. Medial wall fracture
- C. Lateral wall fracture
- D. Subluxation of lens

Answer : A

Explanation

- Blunt trauma to orbit commonly fractures inferior orbital wall
- Inferior wall is weak due to air sinuses beneath it
- Compression of eyeball forces inferior pole against inferior wall
- Tear drop sign seen on X-ray AP view

14. A patient presented with painless loss of vision with the given fundus findings. What is the diagnosis?

- A. NPDR
- B. PDR
- C. CRAO
- D. CRVO



Answer : A

Explanation

- Option a. NPDR
 - Fundus findings

Yourwish

- Dot-blot hemorrhages
- Soft exudates
- Hard exudates
- Intraretinal microvascular abnormalities
- Venous beading may occur
- Option d. CRVO
 - Splash tomato appearance
 - Multiple flame-shaped hemorrhages
- Option c. CRAO
 - Pale or milky white retina
 - Cherry red spot
- Option b. PDR
 - Presence of neovascularization

15. A 10-year-old child is diagnosed with amblyopia in one eye. What will be the best treatment?

- A. Observation
- B. Penalisation
- C. Occlusion
- D. None of the above

Answer: C

Explanation

- Amblyopia = stimulus-deprived loss of vision
 - MC cause - Anisometropia
 - Anisometropia: Difference in refractive error between two eyes
 - Significant anisometropia ≥ 2.5 diopters
 - Management
 - Correct underlying refractive error first then occlusion (patching)
 - Occlusion is patching normal eye to stimulate amblyopic eye
 - Ratio of number of days the normal eye is patched to number of days abnormal eye is patched
 - At 1 year = 1:1
 - At 2 years = 2:1
 - At 3 years = 3:1
 - Intermittent patching: patch normal eye 8–10 hours/day
 - Bynocs therapy: based on video games
 - Video games with red green glasses are seen for 30 min daily for 50–60 sessions
 - Amblyopia beyond 12–13 years can be corrected.

16. A lady presents with pain, proptosis and loss of vision. On examination, the given image is seen. Diagnosis?

- A. Preseptal cellulitis
- B. Blepharitis
- C. Stye
- D. Orbital cellulitis



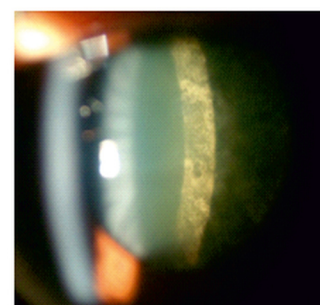
Answer : D

Explanation

- Option d. Orbital cellulitis
 - Clinical findings
 - Lid edema
 - Conjunctival chemosis
 - Conjunctival congestion
 - Mid-dilated non-reacting pupil
 - Proptosis
 - Inflammation posterior to orbital septum
 - It is a closed space: inflammation leads to increased intraorbital pressure → Compression of optic nerve and ocular structures → Causes vision loss, proptosis and restricted eye movements
- Option a. Preseptal cellulitis
 - Inflammation is anterior to orbital septum , no increased intraorbital pressure → no compression of optic nerve and ocular structures → no vision loss, proptosis and restricted eye movements

17. A patient is presented with a complicated cataract and the findings on slit lamp are as shown in the image. What type of cataract is present in the patient?

- A. PSC
- B. Senile cataract
- C. Rosette cataract
- D. Oil drop cataract



Answer: A

Explanation

- Option a: Opacity located between posterior lens surface and posterior capsule: Posterior subcapsular cataract
 - Complicated cataract presents most commonly as posterior subcapsular cataract
 - Causes of complicated cataract
 - Uveitis
 - Retinitis pigmentosa
 - High myopia
 - Glaucoma
- Option c. Rosette cataract
 - Seen in blunt trauma
 - Posterior cortical cataract
 - Appearance like rose petals
- Option d. Oil droplet cataract
 - Seen in galactosemia
 - Only reversible cataract

18. A 60 year old diabetic male patient has a history of breathlessness, pyrexia, Tachypnea and malaise. His RT PCR report came out to be positive for SARS-CoV2 virus. On day 10 the patient develops B/L orbital swelling and right eye proptosis. What could be the causative organism?

- A. Mucor
- B. Aspergillus
- C. Pseudomonas
- D. Candida

Answer : A

Explanation

- Diabetes → decreased immunity → Fungal infection
- In COVID-19 diabetic patients the common fungus affecting orbit is Mucor (black fungus)
- Complication of orbital mucormycosis → central retinal artery occlusion (CRAO)

19. In which of the following, V-Y procedure is used?

- A. Ankyloblepharon
- B. Ectropion
- C. Entropion
- D. Symblepharon

Answer : B

Explanation

- Ectropion - Outward rolling of eyelid
- Entropion - Inward rolling of eyelid
- Ankyloblepharon - Adhesion between upper and lower eyelid
- Symblepharon - Adhesion between palpebral and bulbar conjunctiva

20. A 10-year-old boy with intentional tremors, hepatosplenomegaly and CNS changes came to OPD. On examination on Slit lamp this picture was seen. What can be the provisional diagnosis?

- A. Copper
- B. Zinc
- C. Iron
- D. Selenium



Answer : A

Explanation

- Diagnosis - Wilson disease
- Golden brown ring at corneal periphery: Kayser-Fleischer ring
- Due to copper deposition in Descemet's membrane

21. S in SAFE strategy of trachoma stands for?

- A. Symptom
- B. Surgery
- C. Spectacles
- D. Symbol

Answer : B

Explanation

- SAFE strategy in trachoma
 - S - Surgery for trichiasis \gg entropion
 - A - Antibiotic prophylaxis
 - Azithromycin - 1g stat dose or 20 mg/kg
 - F - Facial hygiene
 - E - Environmental sanitation
- SAFE strategy is initiated when trachoma (bulbar follicles) prevalence $\geq 10\%$

22. A 34-year-old male working as a welder, came with complaint of pain, redness & watery eyes. The image is shown. What is the management?

- A. Removal with 26 G needle
- B. Antibiotics
- C. Keratoplasty
- D. None of the above



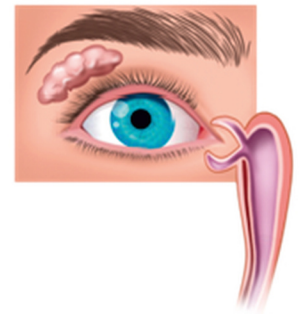
Answer : A

Explanation

- Diagnosis - Corneal foreign body
 - Management
 - Removal using 26G needle under slit lamp
 - Topical anesthetic (proparacaine 0.5%) used before removal
 - Foreign body scraped from corneal surface with 26G needle

23. What is the position of lacrimal sac in the orbit?

- A. Medial wall
- B. Lateral wall
- C. Roof of the wall
- D. Floor of the wall



Answer : A

Explanation

- Lacrimal bone lies between maxilla and ethmoid
- Nasolacrimal sac is located on the medial (nasal) side of the orbit

24. A patient had diabetic cataract for a few months which compounds are accumulated in lens, responsible for cataract.

- A. Lactose + glucose
- B. Sorbitol + fructose
- C. Glucose
- D. Fructose

Yourwish

Answer: B

Explanation

- In diabetes → increased sorbitol and fructose accumulation in lens
- Lens metabolism pathways
 - Glycolysis - 85%
 - Hexose monophosphate shunt - 5%
 - Krebs cycle - 5%
 - Sorbitol pathway - 5%

25. Which of the following is synergistic muscle of Right lateral rectus?

- A. Left Superior Oblique
- B. Right Inferior Oblique
- C. Left medial rectus
- D. Left lateral rectus

Answer : B

Explanation

- Synergism → muscles assisting movement of another muscle of same side
- Lateral rectus and obliques → abduction of eye

26. A patient presented with loss of vision in both eyes on same side with central sparing. What is the diagnosis?

- A. Homonymous hemianopia with macular sparing
- B. Heteronymous hemianopia
- C. Homonymous hemianopia
- D. None of the above

Answer: A

Explanation

- Bitemporal hemianopia
 - MC cause → pituitary macroadenoma (Pituitary tumor ≥ 1 cm in sella turcica)
 - The earliest visual field defect in pituitary macroadenoma is BL supero temporal quadrantopia
 - Later leads to compression of both superior and inferior nasal fibres presenting as bitemporal hemianopia

27. Xerophthalmia causes dry eyes due to deficiency of which of the following vitamin?

- A. Vitamin E
- B. Vitamin A
- C. Vitamin C
- D. Vitamin B

Answer: B

Explanation

- Vitamin A supplementation schedule: Day 0, 1, Day 14
- Dose (oral)
 - 0-6 months → 50,000 IU
 - 6-12 months → 1 lakh IU
 - 12 months → 2 lakh IU
- Dose (i.m)
 - Half the oral dose
- Xerophthalmia is due to a lack of the mucin component in the tear film
- Keratoconjunctivitis sicca is due to a deficiency of the aqueous component in the tear film
 - Due to autoimmune destruction of lacrimal and accessory lacrimal glands in Sjogren's syndrome

28. A 70-year-old male presents with decreased vision; on examination, he had sclerotic changes of the nucleus. The retina is WNL. What is the probable diagnosis?

- A. Index hypermetropia
- B. Index myopia
- C. Presbyopia
- D. None of the above

Answer : B

Explanation

- Nuclear sclerosis features
 - Index myopia
 - Cataract of second sight: Improvement in near vision due to changes in RI of nucleus
 - Improves presbyopia i.e. index hypermetropia

29. A 10-year-old child is diagnosed with anisometropic amblyopia in one eye. What will be the best treatment?

- A. Occlusion therapy
- B. Observation
- C. Refraction with occlusion
- B. Radial keratotomy

Answer : C

Explanation

- First correct refractive error, then patching therapy

30. A 3 year old boy comes to eye OPD with no vision in one eye. Enucleation is planned. Which gene mutation can be seen in the child.

- A. Myoc Gene
- B. RB gene

- C. CryG gene
- D. CYP1B1 gene

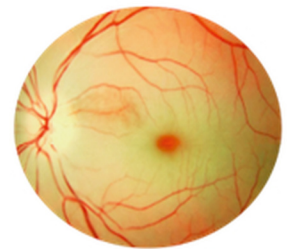
Answer : B

Explanation

- **Diagnosis - Retinoblastoma**
 - The RB gene on Chromosome 13 affected
 - Retinoblastoma is MC malignant intraocular tumor of childhood
 - Indications for enucleation in retinoblastoma
 - Secondary glaucoma
 - Tumor cells in anterior chamber
 - 75% vitreous involvement
 - Hyphema covering >50% anterior chamber
- Option d. CYP1B1 gene is involved in congenital glaucoma
- Option c. CryG gene is for congenital leucokoria
- Option a. Myoc gene is for juvenile open angle glaucoma

31. Below image with diagnostic finding of cherry red spot can be seen in?

- A. CRAO
- B. CRVO
- C. CME
- D. None of the above



Answer : A

Explanation

- **Diagnosis - Central retinal artery occlusion (CRAO)**
 - Fundus findings
 - Pale or milky white retina
 - Cherry red spot
 - Cattle tracking: column of blood
- Option b. CRVO
 - Fundus finding: Splash tomato appearance
 - Leads to 100 day glaucoma
- Option c. CME
 - CME is associated with
 - Irwingass syndrome
 - Pars planitis
 - CRVO
 - DM
 - Anti glaucoma drugs: PGF2 alpha analogues or sympathomimetic in aphakics
 - Fundus finding: Flower petal appearance on macula

32. A 65-year-old male underwent cataract surgery 2 years back, now coming to you with complaints of a decrease in vision for 3 months? What laser is used for this treatment

- A. NdYAG
- B. Femtolaser
- C. Argon fluoride
- D. Argon

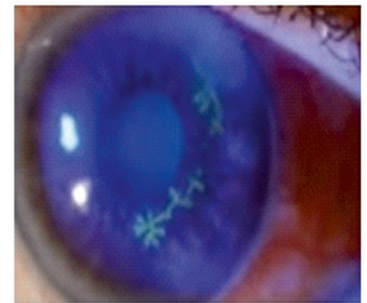
Answer : A

Explanation

- After cataract
 - MC late complication of cataract surgery
 - Due to the proliferation of equatorial epithelial cells behind the IOL between the posterior surface of lens and posterior capsule
 - These cells block light from reaching retina
 - Seen as Elschnig pearls (pearl-like) or Soemmerring's ring (peripheral ring)
 - Treatment is Nd:YAG posterior capsulotomy

33. Identify the given lesion

- A. Viral keratitis
- B. Bacterial keratitis
- C. Fungal keratitis
- D. Interstitial keratitis



Answer : A

Explanation

- Fluorescein stains epithelial defects green; under cobalt blue light
- Herpes simplex keratitis:
 - Dendritic lesions seen in with knob ends
 - Multiple dendrites may merge → geographic keratitis
 - Endothelial involvement → disciform keratitis (endotheliitis)
 - Due to antigen similarity → antibody reaction against endothelium (Type IV hypersensitivity)
 - Steroids are avoided in the active dendritic stage and are used in disciform keratitis and endothelitis
- Herpes zoster ophthalmicus
 - Pseudodendrites with no knob ends are seen
 - Nummular keratitis: Coin shaped lesions in the anterior stroma of cornea
 - Disciform keratitis
 - Oral acyclovir

34. Koeppe nodules are seen in

- A. Iris
- B. Cornea
- C. Sclera

Yourwish

D. Conjunctiva

Answer : A**Explanation**

- Granulomatous uveitis
 - Koeppe nodules → small, at pupillary margin
 - Busacca nodules → large, at base of iris
- MC ocular manifestation of tuberculosis → phlyctenular conjunctivitis

Granulomatous uveitis	Non-granulomatous uveitis
<ul style="list-style-type: none"> • Chronic • Less painful 	<ul style="list-style-type: none"> • Acute • More painful
<ul style="list-style-type: none"> • Mutton fat KPs, Iris nodules 	<ul style="list-style-type: none"> • Small/medium KPs
<ul style="list-style-type: none"> • Thick synechiae 	<ul style="list-style-type: none"> • Thin synechiae

35. Identify the image:

- Orbital floor fracture
- Medial wall fracture
- Lateral wall fracture
- Posterior wall fracture

**Answer : A****Explanation**

- Teardrop sign on X-ray
- Seen in blunt trauma
- Represents orbital floor fracture

36. A 60-year-old man is being treated with an antiglaucoma drug, and his bronchial asthma got worsened. What could be the probable cause?

- Brimonidine
- Brinzolamide
- Timolol
- Latanoprost

Answer : C**Explanation**

- Option c. Timolol is Non-selective beta blocker
 - Blocks both beta-1 and beta-2 receptors
 - Beta-2 blockade leads to bronchoconstriction → worsens asthma
- Option a. Brimonidine is selective alpha 2 agonist

- DOC in pregnancy
- Category B drug
- CI in newborns due to respiratory apnea
- Option b Brinzolamide is carbonic anhydrase inhibitor
 - Corneal decompensation because slows down the Na and K pump on the endothelium
 - It is a neuroprotective drug
- Option d. Latanoprost is prostaglandin analogue
 - DOC in POAG, PACG, NTG
 - S/E: Uveitis, CME, Iris hyperpigmentation, Trichomegaly

37. A lady presents with grade 2 pterygium. What would be the best treatment in this case?

- A. Excision
- B. Keratoplasty
- C. Excision with conjunctival autograft
- D. None of the above

Answer : C

Explanation

- Diagnosis: Grade 2 pterygium
 - Grade 1 → up to 2 mm
 - Grade 2 → 2-4 mm
 - Grade 3 → >4 mm
- Simple excision has high recurrence (~80%)
- Preferred treatment is excision with limbal-conjunctival autograft

38. A patient presents with symptoms of floaters, flashes and then a curtain like shadow in front of the eye. What could be the probable diagnosis?

- A. Corneal Ulcer
- B. Glaucoma
- C. Retinal Tumor
- D. Retinal Detachment

Answer : D

Explanation

- Diagnosis: Rhegmatogenous retinal detachment
 - Features include floaters, flashes and curtain falling sign.
 - Shaffer's sign is pigment dispersion in vitreous causing floaters.
 - Etiology includes high myopia (>6D), aphakia and trauma.
 - Most common site is **superotemporal** and tear is **horseshoe-shaped**.
 - Treatment includes scleral buckling, pneumoretinopexy (SF6, best C3F8) and silicone oil.
 - Silicone oil in anterior chamber forms inverse hypopyon.
- Option a. Corneal ulcer
 - Presents with pain, photophobia, watering eyes

- Option b. Glaucoma
 - Slow progressive painless loss of vision
 - No floaters, flashes and curtain falling sign.
- Option c. Retinal tumor
 - Slow progressive painless loss of vision
 - No floaters, flashes and curtain falling sign.

39. A child is being considered for IOL implantation, what should be kept in mind in such a case while choosing IOL power?

- A. Hyperopic shift
- B. Myopic shift
- C. Growth of lens capsule with age
- D. Length of the lens capsule

Answer : B

Explanation

- Biometry includes keratometry and axial length measurement.
- Axial length increases from childhood to adult leading to posterior shift of retina.
- Fixed IOL leads to myopic shift as eye grows.
- Undercorrection done → <2 years: 20%, 2-8 years: 10%

40. A child from poor socioeconomic background presents with white foamy spots in both the eyes. What could be the reason

- A. Conjunctival xerosis
- B. Vit D deficiency
- C. Vit B deficiency
- D. Vit C deficiency

Answer: A

Explanation

- Bitot's spots are white foamy spots on temporal conjunctiva
- Seen in xerophthalmia (conjunctival xerosis) due to vitamin A deficiency

41. A 3 year old boy presents with itching and red eyes which is more in summer. There is also ropy discharge from the eyes. What is the possible diagnosis?

- A. Spring catarrh
- B. GPC
- C. Keratoconjunctivitis sicca
- D. Corneal ulcer

Answer : A

Explanation

- Option a. Spring catarrh

- Occurs in summer, bilateral and more common in teenage males.
- Ropy discharge is Maxwell Lyons sign.
- Cobblestone papillae present.
- Option b. Giant papillary conjunctivitis
 - Seen in contact lens users due to solution preservatives and occurs throughout the year.

42. A girl uses the contact lens shared by another person and develops painful red eye. What could be the most likely cause?

- A. Acanthamoeba keratitis
- B. Candidiasis
- C. Conjunctivitis
- D. Pseudomonas infection

Answer : D

Explanation

- Diagnosis : Pseudomonas keratitis
 - MC infection in contact lens users is pseudomonas
- Acanthamoeba associated with pond water exposure or washing lenses with tap water

43. The following image shows the findings of a patient when retinoscopy was done at a distance of 1 meter and under Homatropine. (+3.50 at X axis & + 2.50 at Y axis). What will be the glass prescription in this case?

- A. +1.0 Dcyl at 90 deg
- B. +1.0 Dcyl at 180 deg
- C. -2.0 Dcyl at 90 deg
- D. +2.0 Dcyl at 180 deg

Answer : A

Explanation

- Correction factor for distance is 1 and for homatropine is 0.5
- Final values after correction are +1.00 D in the Y axis and +2.00 D at the X axis: with-the-rule astigmatism
- Prescribed:
 - +1D spherical with +1D cylindrical at 90*
 - +2D spherical with -1D cylindrical at 180*
- Cylindrical lens is placed opposite to the required axis

44. An elderly man who is one-eyed got punched in his only seeing eye. He presents with painful decrease in vision, what could be the diagnosis?

- A. Optic neuritis
- B. Retrobulbar neuritis
- C. Sympathetic ophthalmitis
- D. Conjunctival haemorrhage

Answer : B

Yourwish

Explanation

- Painful vision is associated with retrobulbar neuritis than the optic neuritis in general
- Conjunctival hemorrhage does not cause vision loss.
- Sympathetic ophthalmia presents with bilateral non suppurative granulomatous panuveitis

45. A child is brought by parents with white pupillary reflex. On examination, a cauliflower-like mass with calcification is seen growing from the retina. What is the most likely diagnosis?

- Cataract
- Retinoblastoma
- Retinal detachment
- Rhabdomyosarcoma

Answer : B

Explanation

- DD for leukocoria
 - Retinoblastoma
 - Persistent hyperplastic primary vitreous
 - Coats disease
 - ROP
 - Fungal endophthalmitis
 - Coloboma
 - Toxocariasis
- Retinoblastoma shows cauliflower-like mass with calcification.
 - Chromosome defect 13q14.
 - Usually at 18 months
 - Histopathology → Flexner-Wintersteiner rosettes.
 - First investigation → USG (B-scan)
 - Investigation of choice → NCCT (calcification)
 - Metastasis detection → MRI (via optic nerve)
 - Earliest sign → leukocoria.
 - Treatment → chemotherapy (VAC regimen), intra-arterial/intravitreal melphalan.

46. A young boy suffered blunt trauma and develops monocular diplopia. What could be the reason?

- Iridodialysis
- Cataract
- Strabismus
- Hyphema

Answer : A

Explanation

- Monocular diplopia persists even when one eye is closed.
 - Causes → cataract, iridodialysis.
 - Iridodialysis → tearing of iris from root causing D-shaped pupil.

- Strabismus causes binocular diplopia.
- Hyphema does not cause diplopia.

47. A patient suffers trauma with vegetative matter and presents with ulcer with hypopyon and satellite lesions. What is the most likely diagnosis?

- A. Fungal keratitis
- B. Bacterial keratitis
- C. Viral keratitis
- D. Acanthamoeba keratitis

Answer : A

Explanation

- Fungal keratitis
 - Signs >> Symptoms
 - Satellite lesions and feathery margins are present
 - Wessely immune ring may be present
- Acanthamoeba keratitis
 - Symptoms >> Signs: Ring ulcer, severe pain, perineuritis
 - Acanthamoeba associated with contact lens + pond/tap water
 - Pseudodendrites are seen
 - Culture → non-nutrient agar with E. coli
 - Treatment → PHMB

48. Patient has distress on reading. On examination, there is no problem of shortsightedness or longsightedness, but Schirmer test reading is 5 mm. What is the treatment in this case?

- A. Lubricants
- B. Steroids
- C. Antiallergics
- D. Glasses

Answer : A

Explanation

- Schirmer test assesses aqueous tear component
- Done using watmanns paper. Wetting of the paper is checked.
 - Normal >15 mm
 - Dry eyes
 - Borderline 10-15 mm
 - Mild 7-10 mm
 - Moderate 5-7 mm.
 - Severe <5 mm
 - 5 mm → moderate to severe dry eye
- Treatment options → lubricants, cyclosporine, N-acetylcysteine

49. A patient presents with a hard, painless nodule growing externally away from the lid margin. What is the most likely cause?

- A. External hordeolum
- B. Internal hordeolum
- C. Chalazion
- D. Entropion

Answer : C

Explanation

- Option c. Chalazion
 - Lipogranulomatous inflammation of meibomian gland
 - Painless, chronic, away from lid margin
 - Treatment → incision and curettage, intralesional steroid
- Option a.
 - Hordeolum externum (stye) → Infection of hair follicle. Painful, acute, at lid margin
- Option b.
 - Hordeolum internum → meibomian gland infection
- Option d.
 - Entropion: inward rolling of eyelid

50. A patient presents with bilateral ptosis which is variable during the day and reduces on putting the ice packs. What is the most likely diagnosis?

- A. Horner syndrome
- B. Myasthenia gravis
- C. Chronic Progressive external ophthalmoplegia
- D. Third nerve palsy

Answer : B

Explanation

- Option b. Myasthenia gravis
 - Shows diurnal variation and improvement with ice pack
 - Neostigmine improves symptoms (AChE inhibition)
- Option a. Horner syndrome
 - Partial ptosis, miosis, anhidrosis, no improvement on icepack
- Option d. Third nerve palsy
 - Complete ptosis, no improvement on icepack

51. Visual acuity of a person improves on looking through the pinhole. This indicates:

- A. Retinal disease
- B. Macular disease
- C. Refractive error
- D. Astigmatism

Answer : C

Explanation

- Pinhole allows only central rays and cuts peripheral rays
- Improvement indicates refractive error (myopia/hypermetropia)
- No improvement or worsening → central opacity (e.g., nuclear cataract)

52. A farmer presented with pain, photophobia & watering from the eye for last 36 hours. On examination, an ulcer is seen as shown. Identify the lesion marked.

- A. Satellite lesion
- B. Hypopyon
- C. Dendritic ulcer
- D. Ring infiltrate



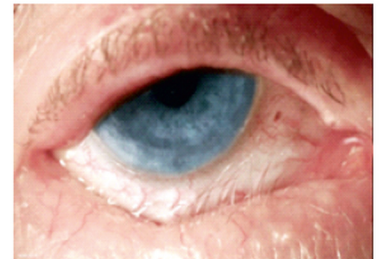
Answer : A

Explanation

- Option a. Satellite lesions
 - Seen in fungal keratitis
- Option b. Hypopyon
 - pus in anterior chamber
- Option c. Dendritic lesion
 - Seen in Herpes simplex keratitis
- Option d. Ring infiltrate
 - Seen in Acanthamoeba keratitis

53. Identify the given condition with inward rolling of lid inwards:

- A. Ectropion
- B. Entropion
- C. Distichiasis
- D. Trichiasis



Answer : B

Explanation

- Option b. Entropion → inward rolling of eyelid
- Option a. Ectropion → outward rolling of eyelid
- Option d. Trichiasis → misdirected eyelashes
- Option c. Distichiasis → extra row of eyelashes

54. A child presents with a defect in vision, but on examination, the fundus is normal. What could be the diagnosis?

- A. Astigmatism
- B. Amblyopia
- C. Myopia

Yourwish

D. Hypermetropia

Answer : B

Explanation

- Vision defect with normal fundus → organic causes excluded
- Refractive errors (myopia, hypermetropia, astigmatism) are correctable with glasses
- Amblyopia is not corrected with glasses

55. A child aged 1.5 years old is brought by parents with leukocoria as shown & flexer wintersteiner rosettes. The most probable diagnosis is:

- A. Retinoblastoma
- B. Rhabdomyosarcoma
- C. Congenital cataract
- D. Congenital glaucoma



Answer : A

Explanation

- Option a. Retinoblastoma
 - Leukocoria is most common sign
 - Flexner-Wintersteiner rosettes → diagnostic
 - Most common secondary tumor → osteosarcoma (head of femur)
- Option c. Congenital cataract → leukocoria but no rosettes
- Option b and d. Congenital glaucoma and rhabdomyosarcoma do not cause leukocoria

56. After an accident from metal works, a mechanic got injured from metallic foreign body. Investigation of the choice is:

- A. MRI
- B. CT scan
- C. B scan
- D. Nuclear radiology

Answer : B

Explanation

- MRI contraindicated in metallic foreign body
 - Because metal may move in magnetic field and damage eye
- B-scan is usually first, but CT is IOC

57. A person comes with paralysis of all extraocular muscles. Most probable site of lesion is:

- A. Upper medulla
- B. Lower medulla
- C. Pons
- D. Midbrain

Answer : D

Explanation

- CN III and IV in the midbrain, CN VI in the pons
- SO4, LR6, rest 3
- Midbrain lesion → most extraocular muscles affected

58. There is a difference in visual acuity between the two eyes; the cause of decreased vision is

- Anisometropia
- Anisometropic Amblyopia
- Refractive error
- Anisokenia

Answer: B

Explanation

- Here, the cause of decreased vision is asked, hence the answer is anisometropic amblyopia rather than anisometropia
- MC cause of amblyopia → anisometropia (Difference in refractive power between two eyes)
 - Other causes → high refractive error, congenital cataract, ptosis, strabismus

59. A biconcave lens is used in treatment of

- Myopia
- Hypermetropia
- Astigmatism
- Presbyopia

Answer : A

Explanation

- Myopia → concave lens
- Hypermetropia → convex lens
- Astigmatism → cylindrical lenses
- Presbyopia → biconvex lens (physiological loss of near vision due to loss of accommodation)
 - Accommodation includes 3 components
 - Increased anterior curvature of lens
 - Miosis
 - Convergence due to ciliary zonules contraction

60. The most common cause of blindness in children is

- Cataract
- Glaucoma
- Trachoma
- Vitamin A deficiency

Answer : D

Explanation

- MC cause of blindness
 - In Children → Vitamin A Deficiency
 - Adults >50 → cataract
 - Adults <50 years → Refractive error
 - Preventable blindness → cataract
 - Overall → cataract > glaucoma > ARMD > trachoma > onchocerciasis
 - Infectious cause → trachoma

61. Patient had a fight, following which he presents with non-reactive pupil and painful ocular movements. The most probable diagnosis is

- A. Cataract
- B. Optic neuritis
- C. Glaucoma
- D. Pupil sphincter tear

Answer : B

Explanation

- Option d. Pupil sphincter tear → Non reactive pupil but no pain with movements
- Option c. Glaucoma is painful but not associated with painful eye movements
- Option a. Cataract has got painless loss of vision.
- Retrobulbar neuritis causes pain on eye movement

62. A mother brings her child to eye OPD with complaint of difficulty in watching blackboard. What could be the most probable reason?

- A. Myopia
- B. Hypermetropia
- C. Amblyopia
- D. Anisometropia

Answer : A

Explanation

- Difficulty seeing distant objects
- Not amblyopia or anisometropia based on history

63. Patient had a fight & is brought with a non-reactive pupil with painful ocular movements. Most probable diagnosis.

- A. Cataract
- B. Papilloedema
- C. Glaucoma
- D. Optic neuritis

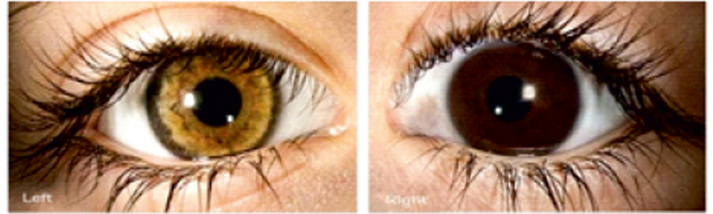
Answer : D

Explanation

- Papilloedema
 - No loss of vision
 - B/L disc edema with raised ICT

64. A 55-year-old male has been diagnosed with open-angle glaucoma and is on treatment. He has been prescribed eye drops, which he has been putting in his eyes for the last 2 years. He visits eye opd for the concerns regarding the different colour of iris. Identify the drug that has caused this.

- A. Timolol
- B. Dorzolamide
- C. Apraclonidine
- D. Latanoprost



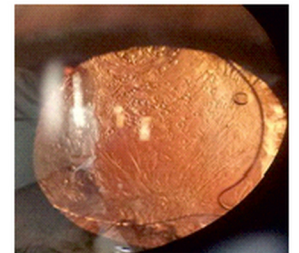
Answer : D

Explanation

- Option d. Prostaglandin analog
 - Causes iris hyperpigmentation
 - Also causes uveitis, cystoid macular edema, trichomegaly
- Option a. Timolol: Non selective beta blocker
- Option b. Dorzolamide: Carbonic anhydrase inhibitor
- Option c. Apraclonidine: Non selective alpha agonist
 - Upper eyelid retraction
 - Tachyphylaxis

65. A patient who was operated for cataract four months back comes to you with foggy vision. On examination the following is found, which mode of treatment is most useful.

- A. Photodynamic therapy
- B. YAG-Laser
- C. Diode laser cyclophotocoagulation
- D. Femtolasercataract surgery



Answer : B

Explanation

- Elschnig pearls → posterior capsular opacification
 - Treated with YAG laser capsulotomy

66. A patient has a field defect where he cannot see on the left side from the left eye and left side from the right eye with preserved central vision. What is the visual field defect?

- A. Quadrantanopia
- B. Heteronymous hemianopia
- C. Homonymous hemianopia

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D. Homonymous hemianopia with macula sparing

Answer : D

Explanation

- Left homonymous hemianopia with macular sparing
- Seen in occipital cortex lesions

67. Which is the most common Intraocular malignancy in adults?

- A. Retinoblastoma
- B. Choroidal melanoma
- C. Uveal melanoma
- D. Choroidal metastasis

Answer : B

Explanation

- MC intraocular tumor in children → retinoblastoma
- MC Intraorbital tumor
 - Adults: -cavernous hemangioma(benign) lymphoma/metastasis(malignant)
 - Children: dermoid cyst (benign), rhabdomyosarcoma (malignant)

68. What dye is used in staining the anterior capsule of a lens?

- A. Fluorescein green
- B. Trypan blue
- C. Brilliant blue
- D. Rose Bengal

Answer : B

Explanation

- Fluorescein, rose bengal, lissamine green → corneal staining
 - Fluorescein seen in cobalt blue light
 - Lissamine green and rose bengal seen in normal light

69. A patient who works in an iron factory presents with visual disturbances and is found to have iron deposits in the eye. Which of the following conditions is most likely responsible for this ocular finding?

- A. Siderosis bulbi
- B. Chalcosis
- C. Retinitis pigmentosa
- D. Kayser Fleischer ring

Answer : A

Explanation

- Iron foreign body → siderosis bulbi

- Copper foreign body → chalcosis
- Kayser-Fleischer ring → copper in Descemet's membrane
- Retinitis pigmentosa
 - Sporadic » hereditary (MCAD)
 - Rods are affected earlier than cones, hence early presenting complaints is nyctalopia

70. In which type of cataract surgery is suturing with nylon 10-0 commonly performed?

- A. Phacoemulsification
- B. Extracapsular cataract extraction (ECCE)
- C. FLACS
- D. Manual small incision cataract surgery (MICS)

Answer : B

Explanation

- Phaco/FLACS → small incision 2.8 to 3.2 mm, no sutures
- MSICS → 5-6 mm
- ECCE → 10-11 mm → requires suturing
- Suturing required in ECCE » MSICS
- For cornea 10.0 nylon and conjunctiva vicryl 6-0, 7-0, 8-0 is used

71. What is the drug used for refraction in a child with squint?

- A. 1% Atropine
- B. Tropicamide
- C. Homatropine
- D. Cyclopentolate

Answer : A

Explanation

- Used to completely relax accommodation because a child has strong ciliary muscle tone

72. What are the yoke muscles for levodepression?

- A. RLR and LMR
- B. RSR and LIR
- C. RSO and LIR
- D. RIO and LSO

Answer : C

Explanation

- Levodepression → eyes move left, then depression
- In levoversion
 - Left eye depression in abducted → inferior rectus
 - Right eye depression in adducted → superior oblique
- Yoke muscles follow Hering's law (equal innervation)

- Sherrington's law → in one eye, one muscle contracts, antagonist relaxes

73. Oil Droplet cataract is seen in

- A. Myotonic dystrophy
- B. Galactosemia
- C. Wilson' disease
- D. Diabetes mellitus

Answer : B

Explanation

- Myotonic dystrophy → Christmas tree cataract
- Wilson disease/chalcosis → sunflower cataract
- Diabetes → snowflake (in type 1 DM:specific), early senile (most common overall)

74. The patient presents with vertical diplopia while walking downstairs. To correct that he tilts the head on one shoulder. Which nerve palsy should be suspected?

- A. 3 CN palsy
- B. 4 CN palsy
- C. 6 CN palsy
- D. 7th CN palsy

Answer : B

Explanation

- Difficulty looking down → SO or IR involvement
- Head tilts towards the action of lost eye muscle
- Head tilt indicates oblique muscle involvement because superior oblique causes intorsion → head tilt compensation
- Inferior rectus involvement → chin down

75. A 60-year-old presents with chronic dacryocystitis. What should be the treatment of choice?

- A. Lacrimal sac massage
- B. Syringing
- C. Dacryocystorhinostomy
- D. Probing

Answer : C

Explanation

- Dacrocystitis
 - Inflammation of nasolacrimal sac
 - Massage, syringing, probing not useful
 - Most common organism → Staph aureus
 - DCR is treatment of choice

76. On retinal examination of a hypertensive patient, multiple flame shaped hemorrhages, cotton wool spots and disc edema was seen. Which grade of hypertensive retinopathy will it be classified as?

- A. Grade 1
- B. Grade 2
- C. Grade 3
- D. Grade 4

Answer : D

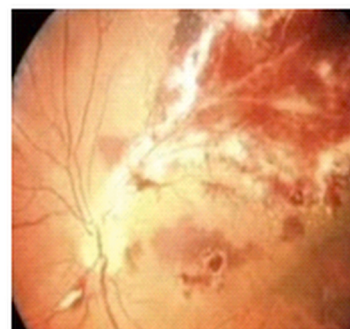
Explanation

- Flame-shaped hemorrhages → nerve fiber layer
- Dot blot hemorrhages are in OPL
- Microaneurysms are in nerve fibre level
- Grades of HTN retinopathy
 - Grade 1 → arteriolar attenuation
 - Grade 2 → AV crossing signs: Salus sign, Hump sign, banking, guns sign
 - Grade 3 → Grade 2 + copper wiring
 - Grade 4 → Grade 3 + silver wiring + disc edema

77. A patient of HIV with low CD4 count presented with the following finding.

What is the treatment of choice?

- A. Gancyclovir
- B. Valcyclovir
- C. Acyclovir
- D. Triflourothymidine



Answer : A

Explanation

- Diagnosis: CMV retinitis
 - Pizza-pie / tomato ketchup appearance

78. Visual blurring in Papilledema is called as

- A. Amaurosis fugax
- B. Blindness
- C. Malingering
- D. Hamarlopia

Answer : A

Explanation

- Papilledema
 - Amourosis fugax, transient loss of vision: seconds to few hours
 - Visual field → enlarged blind spot
 - Earliest sign → loss of venous pulsation >> Increased tortuosity

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- Other features → peripapillary hemorrhages, tortuous vessels, Champagne cork appearance of optic nerve head, Paton's lines (stretch lines on retina)
- No vision loss early, no RAPD, no dyschromatopsia
- Treatment → acetazolamide
- Option D hamarlopia: Day blindness, seen in nuclear cataract

79. In which condition is the pupillary light reaction absent and accommodation reaction present?

- A. Neurosyphilis
- B. Horner's syndrome
- C. Papilledema
- D. Optic neuritis

Answer : A

Explanation

- Argyll Robertson pupil seen
 - Cause: Neurosyphilis
 - Light reflex absent
 - Accommodation reflex present
 - Typically BL constricted pupils
- Adies pupil
 - UL dilated of pupil
 - Cause: ciliary ganglionitis
 - Pupil constricts on 0.125% pilocarpine because of hypersensitivity

80. In a patient presenting with recurrent chalazion, which cancer is suspected?

- A. Sebaceous cell carcinoma
- B. Squamous cell carcinoma
- C. Basal cell carcinoma
- D. Kaposi's sarcoma

Answer : A

Explanation

- Chalazion
 - lipogranulomatous inflammation
 - Recurrent cases suggest sebaceous cell carcinoma.
- A recurrent styne suggests refractive error

81. Normal flora in conjunctiva

- A. Staph aureus
- B. Staph epidermidis
- C. Strep pneumonia
- D. Staph pneumonia

Answer: A

Explanation

- MC cause of bacterial keratitis in the world - Staph aureus
- MC cause of bacterial keratitis in India - Staph epidermidis
- MC cause of orbital cellulitis - Staph aureus
- MC cause of early onset post op endophthalmitis: Staph epidermidis
- MC cause of late onset post op endophthalmitis: Propionibacterium acne

82. Sudden Painful loss of vision with mid-dilated pupil

- A. ACG
- B. Optic Neuritis
- C. CSR
- D. Cataract

Answer : A**Explanation**

- Acute angle-closure glaucoma
 - Sudden painful vision loss with mid dilated pupil
 - Sudden painful vision loss with constricted irregular pupil is in acute anterior uveitis
- CSR
 - Sudden painless vision loss
- Optic nueritis
 - Sudden painful loss of vision with dilated pupil
- Cataract
 - Gradual progressive painless loss of vision

83. H/O intake of ATT with Loss of vision. Most probable drug is

- A. Isoniazid
- B. Ethambutol
- C. Rifampicin
- D. Thiazinamide

Answer : B**84. Vitamin A deficiency is seen in?**

- A. Pinguecula
- B. Bitot Spots
- C. Pterygium
- D. Stocker's Line

Answer : B**Explanation**

- Vitamin A deficiency causes xerosis - bitots spot
- Pinguecula -

- Precursor of pterygium
- Yellow-white patch on nasal conjunctiva
- Stocker's line - Iron deposition on corneal epithelium ahead of pterygium
- Fleisher ring: iron at the base of cone in keratoconus.

85. History of Blunt trauma?

- A. Rosette cataract
- B. Sunflower cataract
- C. Christmas tree cataract
- D. Complicated cataract

Answer: A

Explanation

- Sunflower cataract → chalcosis / Wilson disease
- Christmas tree cataract → myotonic dystrophy
- Complicated cataract → uveitis, RP, high myopia, glaucoma
- Rosette cataract → blunt trauma (posterior cortical)
- Penetrating trauma → anterior cortical cataract

86. Difference in refractive powers in 2 eyes- +5D in one eye and + 1D in another eye. Diagnosis is

- A. Refractive Errors
- B. Amblyopia
- C. Anisometropic amblyopia
- D. Malingering

Answer : C

Explanation

- Difference of 4 diopters → anisometropia
- Can lead to amblyopia

87. Curtain falling sign is seen in

- A. Retinal detachment
- B. Macular degeneration
- C. Optic atrophy
- D. Acute anterior uveitis

Answer : A

Explanation

- Retinal detachment
 - Associated with photopsia and Shafer's sign
 - Sudden painless loss of vision

88. Which of the following is not a local anaesthetic?

- A. Lignocaine 2%
- B. Bupivacaine 0.5%
- C. Prilocaine 2.5%
- D. Proparacaine 0.5%

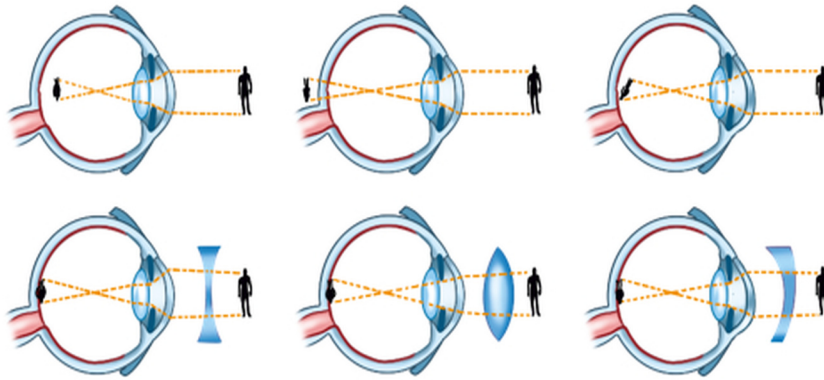
Answer : C

Explanation

- Lignocaine, bupivacaine → injectable local anesthetics
- Prilocaine, proparacaine → topical anesthetics

89. Which of the following is the not corrected refractory error:

- A. Myopia
- B. Hyperopia
- C. Presbyopia
- D. Astigmatism



Answer : C

Explanation

- Hypermetropia → biconvex lens
- Myopia : Biconcave lens
- Astigmatism → cylindrical lens
- Presbyopia → not a corrected refractive error

90. Cherry red Spot is Seen in:

- A. Tay Sach's disease
- B. Gaucher's d/s
- C. Fabry's d/s
- D. Wilson's disease

Answer : A

Explanation

- CRAO seen in : Tay-Sachs, Niemann-Pick, GM1 gangliosidosis, Gaucher, Sandhoff
- Trauma → Berlin's edema
- GM1 → pseudo cherry-red spot

91. Sudden loss of vision with no fundal glow, there is no history of trauma:

- A. Vitreous Haemorrhage

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- B. optic atrophy
- C. AAU
- D. ACG

Answer : A

Explanation

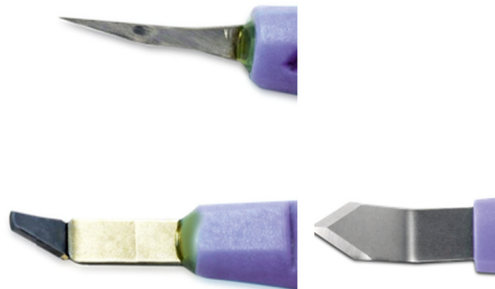
- In Vitreous hemorrhage: no fundal glow due to hazy media
- Other conditions have fundal glow present

92. Name of the instrument:

- A. Keratome
- B. Crescent
- C. Speculum
- D. Sideport



Answer : C



93. A corneal wisp test was performed, and the corneal reflex was elicited. Which of the following nerves is responsible for the afferent limb of this reflex?

- A. Facial Nerve
- B. Trigeminal Nerve
- C. Oculomotor Nerve
- D. Abducens Nerve

Answer : B

Explanation

- Pathway of blink reflex
- Afferent: cornea → Subepithelial plexus → Long posterior ciliary nerves → nasociliary → ophthalmic division → CNV
- Efferent limb: → facial nerve → orbicularis oculi

94. The cover-uncover test is performed to diagnose various eye conditions. Which of the following is NOT detected by this test?

- A. Latent Squint
- B. Manifest Squint

- C. Latent Nystagmus
- D. Amblyopia

Answer : D

Explanation

- Detects manifest squint, latent squint, latent nystagmus
- Does not detect amblyopia

95. Which of the following is a side effect of PG analogue?

- A. Uveitis
- B. Orbital cellulitis
- C. Hyperemia
- D. Keratitis

Answer : A

Explanation

- Hyperemia → rho-kinase inhibitors
- Keratitis leads to activation of herpes simplex virus

96. A 5 -year-old child presents with a refractive error of +1D in the left eye& -2D in the right eye. Fundus examination reveals normal visual acuity and retinal findings. What is the most likely diagnosis?

- A. Myopia
- B. Hyperopia
- C. Anisometropia
- D. Amblyopia

Answer: C

Explanation

- Difference of 3 diopters: Anisometropia
- If the vision is deficient after refractive error correction, then amblyopia can be present

97. A patient presents with right sided field defects in both eyes, but central vision remains unaffected. What is the most likely diagnosis?

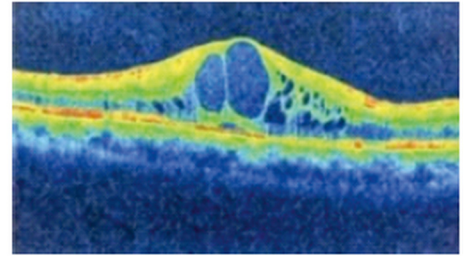
- A. Homonymous Hemianopia with Macular Sparing
- B. Heteronymous Hemianopia with Central Sparing
- C. Optic Chiasm Lesion
- D. Optic Tract Lesion

Answer : A

98. A patient presents with vision problems and has a history of cataract surgery. OCT finding is shown below. What is the syndrome most likely associated with these findings?

- A. Posner-Schlossman Syndrome
- B. Irvine-Gass Syndrome
- C. Central Serous Retinopathy
- D. Elschnig Pearls

Answer : B

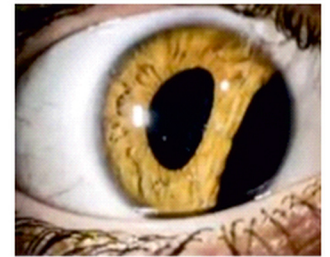


Explanation

- Irvine-Gass syndrome: Intraretinal cysts in outer plexiform layer (Henle's layer/Watershed layer)
- Posner Scholssman syndrome: Raised Intraocular pressure with uveitis
- Elsching pearls is after cataract
- CSR is exudative retinal detachment

99. A patient sustained blunt trauma to the eye 6 months ago and now presents with blurring of vision. What is the most likely condition?

- A. Iridodialysis
- B. Ankyloblepharoon
- C. Vossius Ring
- D. Cycloiriditis



Answer : A

Explanation

- Iridodialysis
 - Tearing of iris from root
 - Leads to monocular diplopia
- Vossius ring
 - Pigment on anterior lens capsule

100. A 5-month-old baby is brought by the mother with complaints of the left upper eyelid moving up and down during breastfeeding or thumb sucking, which disappears when the baby is not being fed. What is the most likely diagnosis?

- A. Marcus Gunn Jaw-Winking Syndrome
- B. Lagophthalmos
- C. Myasthenia Gravis
- D. 3rd CN palsy

Answer : A

Explanation

- Marcus Gunn jaw-winking syndrome
 - Synkinesis between jaw and eyelid movement
- Lagophthalmos: Unable to close eyes

101. A patient with a long-standing history of diabetes presents with cataracts. Which of the following metabolic products is primarily responsible for cataract formation in this condition?

- A. Mannitol
- B. Galactitol
- C. Sorbitol
- D. Fructose

Answer : C

102. A patient has a history of a flying foreign body injury to the eye. Ocular findings revealed iris pigmentation. Which of the following substances is most likely involved in the deposition?

- A. Iron
- B. Aluminum
- C. Wood
- D. Glass

Answer : A

Explanation

- MC foreign body: Iron
- Most toxic foreign body: Copper → chalcosis
- Inert FB → glass, porcelain

103. Which of the following statements is correct regarding indirect ophthalmoscopy?

- A. The image is erect and real.
- B. The condenser lens needs to be kept close to the eye.
- C. It provides 15x magnification.
- D. It provides 3-5x magnification.

Answer : D

Explanation

- Direct ophthalmoscopy → 15x magnification, indirect → 3-5x
- Direct → single view (no stereopsis), indirect → binocular (stereopsis present)
- Direct used for central retina (2DD), indirect for peripheral retina (up to 8 disc diameters)
- Indirect uses condenser lens and forms a real, inverted image; indirect Virtual and inverted image

104. A patient presents with breathlessness and is diagnosed with a Pancoast tumor. Which of the following findings is not typically associated with this condition?

- A. Anhidrosis
- B. Miosis
- C. Ptosis
- D. Exophthalmos

Answer : D

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Explanation

- Pancoast tumor compresses sympathetic fibers → Horner's syndrome
 - Features → miosis, ptosis, anhidrosis (preganglionic), pseudo-enophthalmos
 - Exophthalmos is not seen

105. A patient presents with proptosis that increases when bending down. What is the most likely diagnosis?

- Orbital Varices
- Thyroid Eye Disease
- Cavernous Sinus Thrombosis
- Orbital Cellulitis

Answer : A

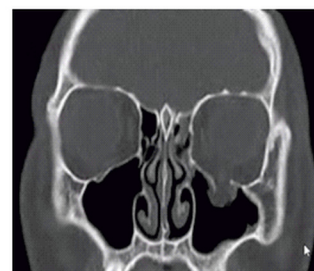
Explanation

- Orbital varices: Venous malformation → increases with bending
- MC cause of proptosis
 - Adults → thyroid eye disease
 - Children → unilateral (orbital cellulitis), bilateral (neuroblastoma)
 - Pulsatile proptosis → carotid cavernous fistula, Sphenoid dysplasia, NF 1 due to sphenoid dysplasia

106. A patient visits an emergency with a history of trauma and the following radiological image is obtained.

What is the diagnosis?

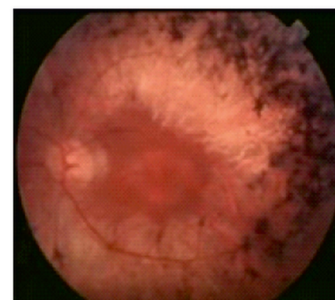
- Inferior wall fracture
- Orbital cellulitis
- Lateral wall fracture
- Osteomeatal fracture



Answer : A

107. The 25 year old is presented with gradual loss of vision at night and the funduscopy image is shown. What is the diagnosis?

- Retinitis pigmentosa
- Retinitis punctata albescens
- Retinal hemorrhage
- Fundus flavimaculatus



Answer : A

Explanation

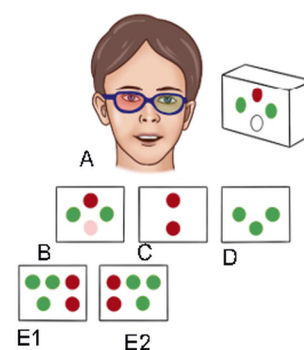
- Retinitis pigmentosa
 - Triad → bony spicule pigmentation, pale waxy disc, arteriolar attenuation
 - Feature → nyctalopia (night blindness)
 - Disease of rods followed by cones
- Retinitis punctata albescens
 - Form of RP with white dots on fungus

- Fundus flavimaculatus
 - Form of Stargardts disease
 - Stargardts and best disease are dystrophies of RPE
 - Bests disease
 - Autosomal Dominant.
 - Onset: ~6 years
 - Macular Appearance:
 - Early: Egg Yolk Appearance
 - Late: Scrambled Egg Appearance (Associated with vision loss)
 - EOG (Electro-oculogram): Abnormal
 - Light Peak / Dark Trough:
 - Normal (Arden's Index): ≥ 1.85 (185%).
 - Abnormal: < 1.85 (or $< 160\%$)
 - Stargardt Disease
 - Autosomal Recessive.
 - Onset: ~21 years.
 - Early loss of vision is present.
 - Flecks are seen on retina: beaten bronze appearance
 - Bulls maculopathy
 - Fluorescein angiography: Dark choroid is diagnostic
 - In early stages: Normal ERG and EOG
 - Late stages: abnormal EOG
 - Symptoms > signs

108. Worth four dot test:

- A. Right eye suppression
- B. Left eye suppression
- C. crossed diplopia
- D. Uncrossed diplopia

Answer : A



Explanation

- The Worth 4 dot test is used in diplopia, ARC, and suppression testing
- Right eye sees red, left eye sees green
- Normal → 4 dots (fusion)
- Diplopia → 5 dots
- Suppression → only one eye's image seen
- Right eye suppression → only green dots visible

109. Ptosis in horner's syndrome is due to:

- A. Muller muscle
- B. Orbicularis oculi
- C. LPS

D. Horner muscle

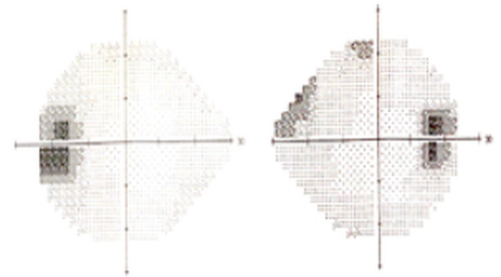
Answer : A

Explanation

- Sympathetic supply lost → Muller's muscle paralysis
- Leads to partial ptosis

110. Identify the image:

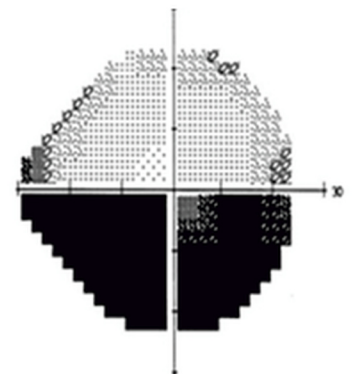
- A. Arcuate scotoma
- B. Roennes nasal step
- C. Altitudinal VFD
- D. Enlarged blind spot



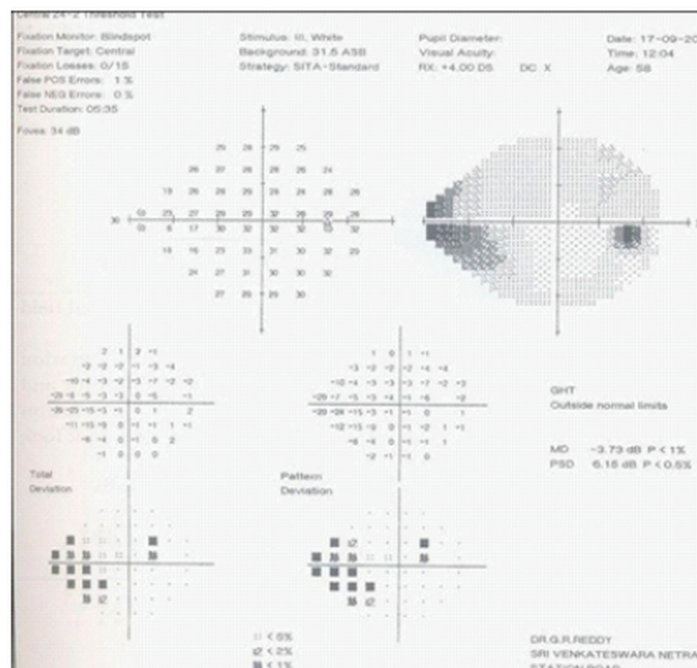
Answer : D

Explanation

- Enlarged blind spot is characteristic of Papilledema
- Optic neuritis → Altitudinal visual field defect



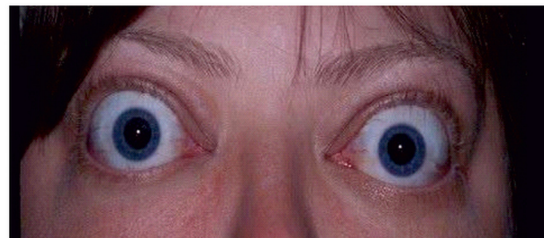
- Glaucoma → arcuate scotoma, Roenne's nasal step



111. Which of the following is a false statement regarding the image?

- A. Can be seen in 10% patients without hyperthyroid state

- B. NOSPECS grading is used
- C. Can sometime lead to vision loss
- D. Eye finding reversal correlates with thyroid hormone status



Answer : D

Explanation

- Eye findings do not correlate with hormone levels
- Can occur in euthyroid patients
- NO SPECS classification used
- Can be sight-threatening due to optic nerve compression

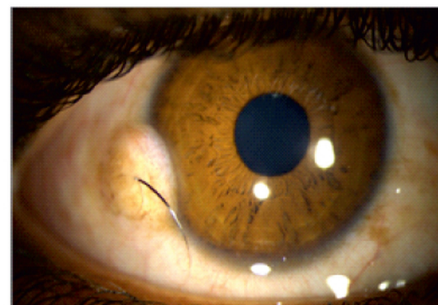
112. A 15 year old presented with growth in eye. What is the diagnosis?

- A. Papilloma
- B. Pyogenic granuloma
- C. Limbal Dermoid
- D. Pinguecula

Answer: C

Explanation

- Choristoma → normal tissue at an abnormal location
 - Hair present → confirms limbaldermoid
 - Benign tumor
 - Treatment → simple excision
- Papilloma is the most common benign eyelid tumor



113. A patient has a history of cataract surgery 3 months back with progressive deterioration of vision:

- A. Posterior capsular opacity
- B. Pseudophakic keratopathy
- C. Corneal opacity
- D. Subluxation of lens

Answer : A

Explanation

- Pearls seen behind IOL → PCO
- Not corneal opacity (would be anterior to IOL)
- Not pseudophakic keratopathy (corneal edema)
- Not lens subluxation



114. WOF is not the treatment for amblyopia:

- A. Refractive error correction
- B. Strabismus surgery
- C. Patching

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D. Video games

Answer : B

Explanation

- Amblyopia treatment → patching, video games
- Refractive correction and strabismus surgery : treat the cause

115. A farmer with cataract surgery presented after 2 weeks with decreased vision. On examination, there were anterior chamber cells and flare with hazy vitreous. What can be the cause in this patient:

- A. Endophthalmitis with Staphylococcus
- B. Endophthalmitis with Propiobacterium
- C. Sympathetic ophthalmia
- D. Toxic anterior segment syndrome

Answer : A

Explanation

- Endophthalmitis
 - Features → painful vision loss, lid edema, AC cells/flare, vitreous exudates
 - <6 weeks → Staph epidermidis / aureus
 - Treatment → intravitreal antibiotics (vancomycin + 3rd gen cephalosporin)
- Option d. Hazy vitreous → rules out TASS (anterior only)

116. In advanced cases of Diabetes mellitus, the cause of retinal detachment is?

- A. Exudative
- B. Tractional
- C. Rhegmatogenous
- D. No detachment

Answer : B

Explanation

- PDR → neovascular membrane formation → Fibrovascular membrane contracts → Pulls retina → tractional RD

117. The medium used for storage of cornea and the sutures applied are :

- A. Moist chamber, silk
- B. Mearney Kaufman's, Nylon
- C. Optisol, Vicryl
- D. Polyethylene glycol, nylon

Answer : B

Explanation

- Option a. Moist chamber → short duration

- Option b. MK medium → 5-7 days
- Option c. Optisol/Cornisol → ~14 days
- Option d. Sutures
 - For cornea → 10-0 nylon
 - For conjunctiva → Vicryl

118. Definition of Blindness as per WHO:

- A. Visual acuity less than 3/60 after correction in the better eye
- B. Visual acuity less than 6/60 after correction in the better eye
- C. Visual acuity less than 3/60 without correction in the better eye
- D. VF < 10 degree in any eye.

Answer : A

Explanation

- WHO → best corrected vision
- NPCBVI → presenting vision (unaided)
- Alternative → visual field < 10°

119. Acute haemorrhagic conjunctivitis is caused by-

- A. Cox sackie B
- B. Cox sackie A 24
- C. Enterovirus 70
- D. Poliovirus

1. b,c
2. a,b,c
3. a,b,c,d
4. b,c,d

Answer : 1

Explanation

- Epidemic keratoconjunctivitis:
 - AKA pink eye/Eye flu
 - MC by Adenovirus
 - C/F: Subepithelial infiltrates, Preauricular lymphadenopathy, congestion, photophobia
- Acute haemorrhagic conjunctivitis
 - Similar to adenoviral conjunctivitis clinically
 - Features → subconjunctival hemorrhage, congestion, photophobia
 - MC: Picorno viridae family- pox virus << Enterovirus 70

120. Best test to visualise all layers of retina:

- A. OCT
- B. FFA

- C. B scan
- D. Perimetry

Answer : A

Explanation

- Option a. OCT
 - Shows retinal layers in detail
 - Hyperreflective, red color → nerve fiber layer, RPE
- Option b. FFA → vascular study
- Option c. B-scan → ultrasound
- Option d. Perimetry → visual fields