

PREP XI RR

STUDY NOTES

OPHTHALMOLOGY

3

VIDEOS

129

PAGES

PREMIUM STUDY MATERIAL

PREP XI RR

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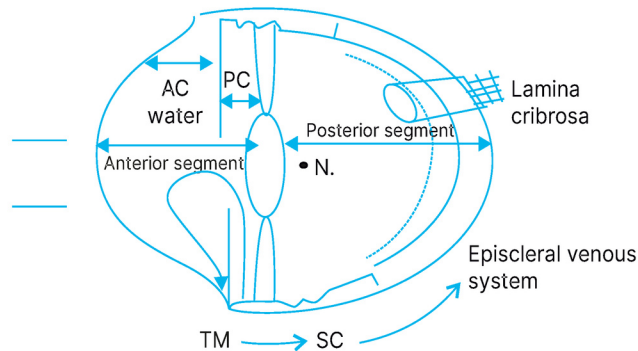


1. OPHTHALMOLOGY PART-1

BIG QUESTION 1: Describe the basic anatomical divisions and key transparent, avascular structures of the eye.

Broad Answer:

- The eye is divided into anterior and posterior segments.
- The eye's **nodal point** is where parallel light rays converge after being bent more by the cornea



DETAILED QUESTIONS

Q1.1: What are the two main segments of the eye, and what structures do they include?

Answer:

- The eye is divided into the
 - o **Anterior segment** (including the lens and structures anterior to it)
 - o **Posterior segment** (structures behind the lens).

Q1.2: What is the "nodal point" and angle of the eye?

Answer:

- The nodal point is a point just behind the lens where parallel light rays, after being bent by the cornea and lens, primarily focus.
- Angle is the peripheral space between the iris and the cornea.

Q1.3: Why does the cornea bend light more than the lens?

Answer:

- The cornea bends light more due to its **greater curvature** on the anterior surface and a **larger difference in refractive index** between air and water compared to the lens.

Q1.4: Which two structures of the eye are avascular to ensure transparency?

Answer: The **cornea** and the **lens** are avascular.

Q1.5: Where is aqueous humor formed, and how does it circulate within the eye?

Answer: Aqueous humor is formed from the **ciliary processes** and flows through the **pupil** into the **anterior chamber**.

Q1.6: What is the normal range for ocular pressure?

Answer: Normal ocular pressure ranges from 10 to 21 mmHg.

Q1.7: What condition results from abnormally high ocular pressure, and what part of the eye does it damage?

Answer:

- When ocular pressure is higher, it damages the **optic nerve**.
- This condition is known as **glaucoma**.

Q1.8: What is the "lamina cribrosa"?

Answer: The lamina cribrosa is the perforated part of the **sclera** at the optic disc where the optic nerve fibers exit the eye.

Q1.9: What is the capacity of the orbit in cubic centimeters, and what is its shape?

Answer: The orbit has a capacity of 30 cc and is **quadrilateral and pyramidal** in shape.

Q1.10: What is the normal axial length of the eye?

Answer: The normal axial length is around 24 mm.

Q1.11: What is the total refractive power of the eye, and how much do the cornea and lens contribute individually?

Answer:

- The total refractive power of the eye is **58-60 D**.
- The **cornea** contributes **43-45 D**, and the **lens** contributes **16-17 D**.

Q1.12: What are the number of ciliary processes?

Answer: There are 70-75 ciliary processes in a single eye.

Q1.13: When the pressure is more, what happens?

Answer: When the ocular pressure is higher, it damages the optic nerve. This condition is known as glaucoma.

Q1.14: The nerve fibre of the retina that aggregates at the disc to form.

Answer: Optic nerve

Q.1.15: What is the depth of the anterior chamber?

Answer: 2.4-2.5 mm.

Q1.16: How is the axial length measured?

Answer: Axial length is measured by an A-scan.

Q1.17: What is the index of the cornea?

Answer: 1.37

Q1.18: What is the index of the lens?

Answer:

- 1.39.
- It is maximum at the centre of the lens (1.4-1.41).

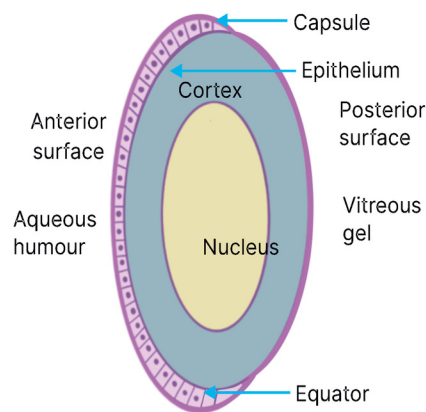
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Q1.19: What is the eyesight of an infant?

Answer: Infants are hypermetropic by 2.5-3 D.

BIG QUESTION 2: Describe the anatomy and physiology of the lens**Broad Answer:**

- The lens is composed of a single layer of anti-epithelial cells, with equatorial cells continually forming new lens fibers throughout life.
- It is encased by a very elastic capsule, and its embryonic origin is the surface ectoderm. Physiologically, the lens is maintained in a dehydrated state to ensure transparency, as hydration can lead to the development of cataracts.
- It is an avascular structure, relying entirely on the aqueous humor for its nutrition. The primary metabolic pathway of the lens is predominantly anaerobic, with 80% of glucose metabolized without oxygen.

**DETAILED QUESTIONS****Q2.1: What is the primary cellular layer that forms the structure of the lens?**

Answer: A single layer of anti-epithelial cells.

Q2.2: Which specific cells are responsible for forming new lens fibres?

Answer: Equatorial cells.

Q2.3: What covers the lens, and what is a key characteristic of this covering?

Answer: It is covered with a very elastic capsule.

Q2.4: From which embryonic germ layer is the lens derived?

Answer: Surface ectoderm

Q2.5: What is considered the thinnest part of the lens?

Answer: The capsule at the posterior pole.

Q2.6: For how long are lens fibres formed in an individual's life?

Answer: They are formed throughout life.

Q2.7: Which part of the lens contains the youngest fibres?

Answer: Cortexes are the youngest fibres.

Q2.8: Why is the lens primarily considered to be in a dehydrated state?

Answer: Because any hydration can cause cataracts, thus hindering transparency.

Q2.9: What is a notable characteristic of the lens's vascular supply?

Answer: It is avascular.

Q2.10: From where does the lens derive its nutrition?

Answer: The aqueous humour.

Q2.11: What is the primary type of metabolism in the lens?

Answer: It is anaerobic.

Q2.12: What percentage of glucose in the lens is metabolized anaerobically?

Answer: 80% of glucose is metabolised anaerobically.

BIG QUESTION 3: What is a cataract? What are its classification and characteristic features?

Broad Answer:

- A **cataract** is any opacity in the lens that hinders optical homogeneity
- classified as **congenital or acquired**.
 - o **Acquired cataracts** include senile (cortical, nuclear, subcapsular), metabolic, complicated, toxic, traumatic, radiational, and those associated with systemic diseases (presenile).
 - o **Other cataracts include**
 - Hypermature/Morgagnian
 - Christmas Tree
 - Diabetic
 - Shield
 - Oil Droplet
 - Sunflower
 - Posterior Lenticonus
 - Anterior Lenticonus
 - Rosette-Shaped
 - Blue Dot
 - Lamellar

DETAILED QUESTIONS**Q3.1: What is the definition of a cataract?**

Answer:

- A cataract is any opacity in the lens that hinders optical homogeneity.

Q3.2: What are the two main classifications of cataracts?

Answer:

- Congenital cataracts and acquired cataracts.

Q3.3: List the different categories of acquired cataracts.

Answer: Senile, Metabolic, Complicated, Toxic, Traumatic, Radiational, and associated with systemic diseases (presenile cataracts).

Q3.4: Name the three types of senile cataracts.

Answer: Cortical cataracts, Nuclear cataracts, and Subcapsular cataracts.

Q3.5: What is another name for a Cortical Cataract?

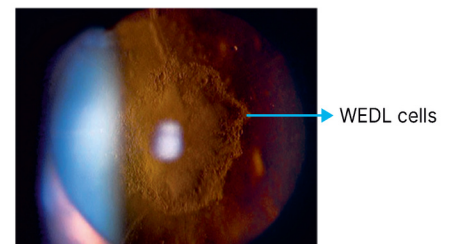
Answer:

- Cuneiform cataract.

**Q3.6: Describe Posterior Subcapsular cataract and its causes**

Answer:

- It is the most common, complicated, and radiational cataract.
- It causes maximum diminution of vision.
- Caused by:
 - o Busulfan
 - o Steroids
 - o Chloroquine

**Q3.7: Describe the appearance and visual effect of a Nuclear Cataract. What is "second sight of old age"?**

Answer:

- It is a central opacity that may lead to day blindness or a further diminution of vision during the daytime.
- "Second sight of old age" refers to an improvement in near vision (reduction in need for reading glasses) due to the increased refractive power of the lens caused by sclerosis.

**Q3.8: What is the pathological process causing nuclear cataracts? Which types of proteins and pigments accumulate?**

Answer: Sclerosis is the cause, involving the accumulation of more insoluble proteins and pigments (Melanin and Urochrome), leading to hardening and an increased refractive index of the lens.

Q3.9: What is the most common complication of a hyper-mature nuclear sclerotic cataract?

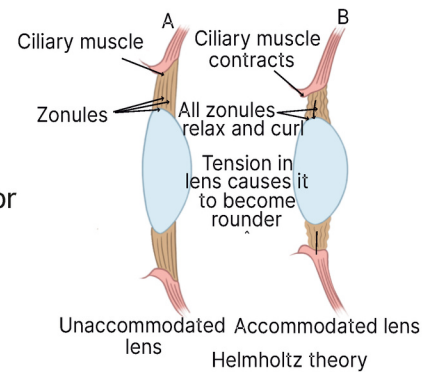
Answer:

- The subluxation of the lens.
- The most common complication of subluxation will be Trauma.

Q3.10: Explain Helmholtz's theory of accommodation.

Answer:

- Accommodation involves the contraction of ciliary muscles, which causes relaxation of the zonules.
- When the zonules relax, there is a mild increase in the curvature of the anterior surface of the lens.



Q3.11: What are the features and complications of hypermature cataract?

Answer:

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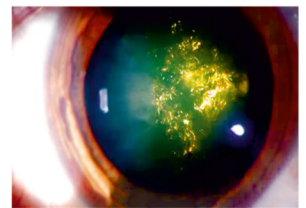
- It's a cataract where the capsule wrinkles and lens proteins leak.
- The most common complication is **Phacolytic glaucoma**, which occurs due to the leakage of lens protein blocking the trabecular meshwork.
- During surgery, if the capsule is not visible properly, trypan blue dye can be used to delineate the anterior capsule.



Q3.12: What are features and systemic association of Christmas tree cataract?

Answer:

- These are needle-like opacities that are colored.
- It is seen in **Myotonic Dystrophy**.
- Ocular features include Ptosis, Low intraocular pressure, Presenile cataract, and Pigmentary Retinopathy.

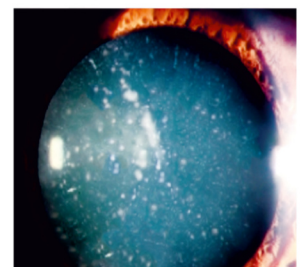


Q3.13: What type of cataract is seen in diabetic patients? Describe its appearance and the metabolic pathway involved in its formation.

Answer:

PYQ: FMGE 2023

- Diabetic cataract is a presenile and metabolic cataract, appearing as a "snowflake" or "snowstorm" cataract, more common in Type 1 Diabetes.
- It develops due to sorbitol accumulation in the lens, mediated by the enzyme **NADPH-dependent aldose reductase**.
- Sorbitol is hyperosmotic and imbibes water, leading to lens opacification.



Q3.14: Explain the cause of fluctuating refractive errors in hyperglycemic patients? Which refractive error is seen in the case of hypoglycemia?

Answer:

- In hyperglycemic patients, fluctuating refractive errors occur due to myopic shifts (increased refractive power) caused by lens swelling, which increases its curvature.

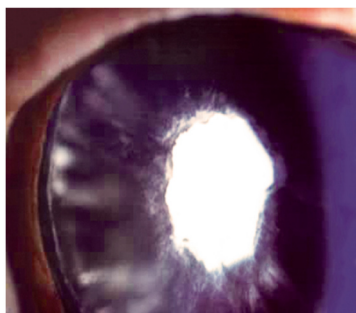
YOURWISH

- Conversely, in hypoglycemia, a hypermetropic shift (towards lesser curvature) is observed.

Q3.15: What type of presenile cataract is associated with Atopic dermatitis?

Answer:

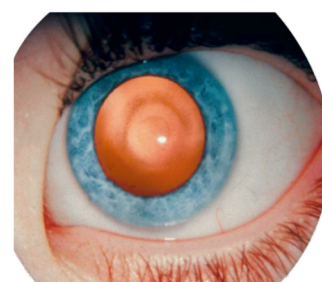
- Shield Cataract.



Q3.16: In which condition is Oil Droplet Cataract seen?

Answer:

- Oil Droplet Cataract is seen in **Galactosemia**, caused by the deficiency of **GPOT** (Galactophosphate Uridyl Transferase).
- It is reversible.

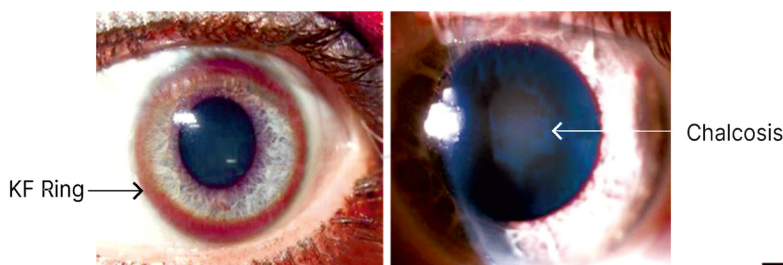


Q3.17: What is chalcosis, and what are its ocular findings?

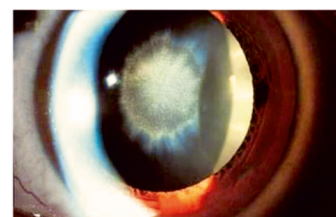
Answer:

- Chalcosis refers to golden-brown copper deposition in the Descemet's membrane, known as the **Keyser-Fleischer** (KF) ring.

PYQ: FMGE 2023



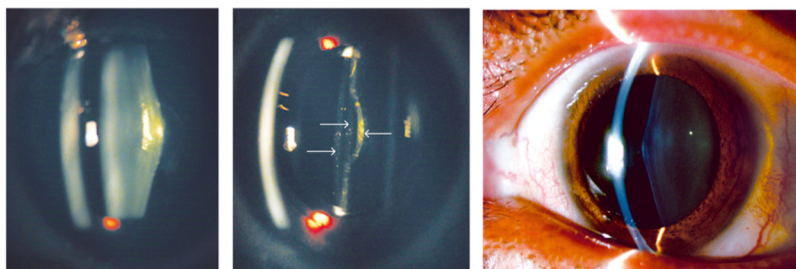
- This ring starts superiorly and inferiorly before becoming a complete circle.
- All patients with neurological complications of Wilson's disease will have a KF ring.
- Only 65-67% of patients with Hepatic involvement can have a KF ring.
- **Sunflower cataract** is a feature of Chalcosis.



Q3.18: What syndrome is characterized by Posterior Lenticonus and Anterior Lenticonus?

Answer:

- **Lowe's Syndrome** (also called Oculo-cerebrorenal syndrome) is characterized by Posterior Lenticonus.
- **Alport's Syndrome** and **Waardenburg Syndrome** are associated with Anterior Lenticonus.
 - o It is more common in males.
 - o The Oil globule reflex is seen on Slit lamp examination on retro-illumination

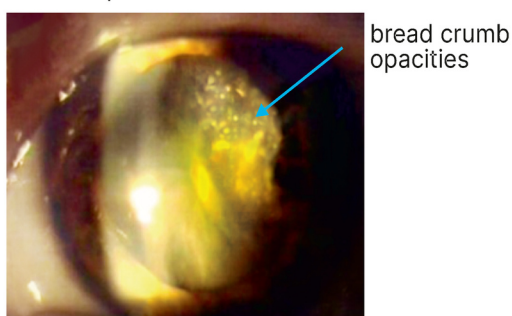


Q3.19: What is the pathognomonic feature, cause, and appearance of a Complicated Cataract?

Answer:

- Caused secondary to diseases of the **anterior or posterior segment** of the eye.
- **Posterior subcapsular cataract** is the most common type seen in these cases.
- The **pathognomonic feature** is a **polychromatic lustre**
- The characteristic appearance resembles **breadcrumb deposits** on the posterior capsule.

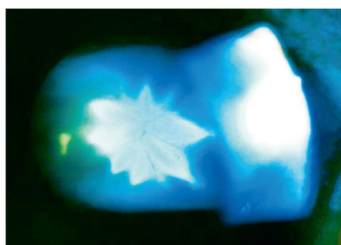
Complicated cataract



Polychromatic lustre and bread crumb appearance

Q3.20: What type of trauma causes a "Rosette-Shaped Cataract," and where does it start in the lens?

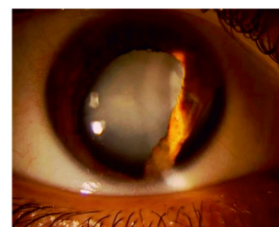
Answer: It is caused by **blunt trauma** and starts from the **Posterior cortex**.



Q3.21: What are "Iridodialysis" and "Vossius Ring," and what type of trauma causes them?

Answer:

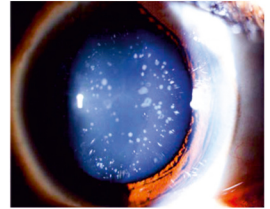
- Both are features of **blunt trauma**.
- **Iridodialysis** is a D-shaped pupil
- **Vossius Ring** is situated on the **anterior capsule of the lens**.



Q3.22: What is the most common congenital cataract overall? Which syndrome is it a feature of?

Answer:

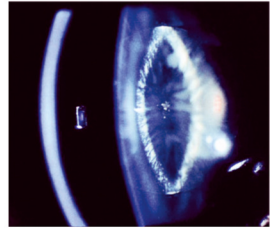
- **Blue Dot Cataract** is the most common congenital cataract.
- It is a feature of **Down syndrome**.



Q3.23: Describe the features of lamellar cataract. What other infection can cause it?

Answer:

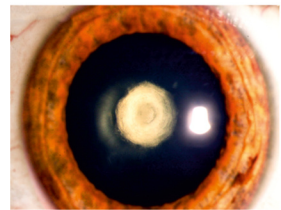
- It is the most common congenital cataract that causes marked diminution of vision.
- The visual activity is markedly reduced.
- Associated with **Vitamin D deficiency**.
- **Riders (additional opacities)** are a feature of Lamellar cataracts.
- Can also be caused by Rubella.



Q3.24: What is the characteristic appearance of a Posterior Polar Cataract

Answer:

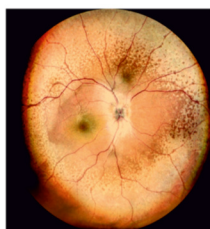
- It has an "onion-peel appearance."
- It is a very tricky cataract to operate on due to the **high risk of posterior capsular tear**.



Q3.25: What is the classic triad of Congenital Rubella Syndrome?

Answer:

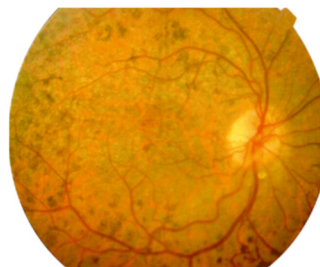
- The triad is **Cataract, Heart defects, and Deafness**.
- The most common ocular feature is "Salt and pepper fundus."
- The most common type of cataract is **Nuclear pearly cataract**.



Signs and Symptoms
Diffuse Pigmentary Retinopathy
/salt-and-pepper Retinopathy



Cataract



Q3.26: What are the most common features of Congenital Rubella Syndrome?

Answer:

- Microphthalmos is defined as an axial length of < 21mm, or < 19mm at the age of 1 year.
- Rubella Keratitis can lead to an angle anomaly, causing impaired drainage and **glaucoma**.

BIG QUESTION 4: What are the various treatment modalities for cataract, and discuss them in detail?

Broad Answer:

- The only treatment for cataracts is surgery, which includes
 - o ICCE (Intracapsular Cataract Extraction)
 - o ECCE (Extracapsular Cataract Extraction)
 - o Small Incision Cataract Surgery (SICS)
 - o Phacoemulsification
 - o Femtolaser Cataract Surgery

DETAILED QUESTIONS

Q4.1: What is ICCE (Intracapsular Cataract Extraction).

Answer:

- ICCE involves removing the whole lens along with its entire capsule.
- **Cryoextraction** is the best method
- The only indication for ICCE is **subluxation of the lens**, especially for > 9 clock hours of subluxation.

Q4.2: Why is ICCE contraindicated in children?

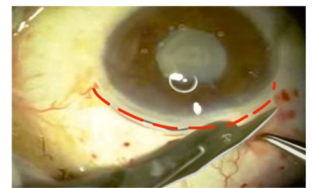
Answer:

- It is contraindicated in children due to the adhesion with the anterior hyaloid membrane, known as the **Weigert's ligament**, which can pull on the membrane, posing a risk of **Retinal detachment**.

Q4.3: What is ECCE (Extracapsular Cataract Extraction)? Name types of non-foldable and foldable IOLs used

Answer:

- ECCE involves removing the cataract while preserving the posterior capsule.
- Non-foldable IOLs are **PMMA (Polymethyl methacrylate)**.
- Foldable IOLs are generally made of **silicone, acrylic, and hydrogel**.



Extracapsular Cataract Extraction (ECCE)

Q4.4: Which foldable IOL has the least chance of posterior capsule opacification (PCO)?

Answer: Hydrophobic acrylic has the least chance of posterior capsule opacification (PCO).

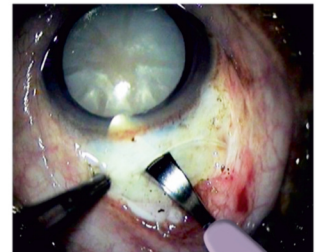
PYQ: INICET 2021

PYQ: FMGE 2023

Q4.5: What is the incision length for Small Incision Cataract Surgery (SICS)? List its advantages.

Answer:

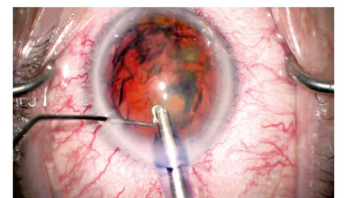
- The incision length is **5-5.5mm**.
- Advantages include
 - o Small incision
 - o No sutures
 - o Negligible postoperative astigmatism.



Q4.6: What is the incision length and phaco probe frequency for Phacoemulsification? What type of IOLs are typically used?

Answer:

- The incision length is **2.75-3.2mm**.
- The frequency of the Phaco Probe is around **40KHz**.
- Generally, **foldable IOLs** are used.

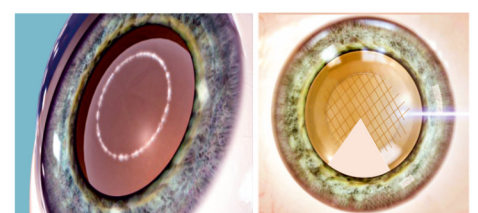


PYQ: FMGE 2020

Q4.7: What are the steps involved in Femtolaser cataract surgery

Answer:

- Latest
- The pulse duration is 10^{-15} sec.
- The wavelength is 1054 nm.



Capsulotomy

Lens Fragmentation

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- Steps
 - Incision, Capsulotomy, and Lens fragmentation.

Q4.8: What are the formulae used for calculating IOL powers?

 PYQ: INICET 2021

Answer:

- **Hoffers** for shorter eyes, **SRK/T** for longer eyes, and **Haigis** for post-Lasik eyes.
- SRK Formula is $P = A - 2.5L - 0.9K$ (L : axial length, K : keratometry readings, A: constant).

Q4.9: What is the ideal time for operating a child with a congenital cataract, and why is early surgery important?

Answer:

- The ideal time is after **1 month**.
- It is done as soon as feasible to avoid any formation of **amblyopia**.

BIG QUESTION 5: What are the examples, causes, and clinical features of complications of cataract surgery?

Broad Answer:

- The most dangerous complication after cataract surgery is **Endophthalmitis**, an intraocular infection presenting with hypopyon, corneal edema, pain, and decreased vision
 - Treatment involves intravitreal antibiotics or Pars Plana Vitrectomy
- The most common long-term complication is **Posterior Capsular Opacification (PCO)**,

DETAILED QUESTIONS

Q5.1: What are the common causes of Endophthalmitis based on onset time?

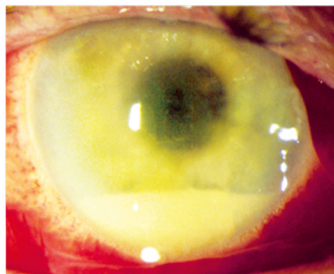
Answer:

- **Immediate Acute onset:** *Staphylococcus epidermidis*.
- **Late onset:** *Propionibacterium acnes* or fungal.

Q5.2: List the key features of Endophthalmitis.

Answer:

- Hypopyon, Corneal hysteresis, Corneal oedema, No fundal glow, Decreased vision, Pain, and Congestion.



Q5.3: What is the treatment of choice for Endophthalmitis? When is Pars Plana Vitrectomy performed?

Answer:

- **Intravitreal antibiotic injections** are the treatment of choice. For antifungal infections, intravitreally allowed drugs are **Amphotericin B** and **Voriconazole**, used only when vision is better than hand movement.
- If vision is less than or equal to hand movement, **Pars Plana Vitrectomy** is done.

Q5.4: What is the most common long-term/late-onset complication after cataract surgery?

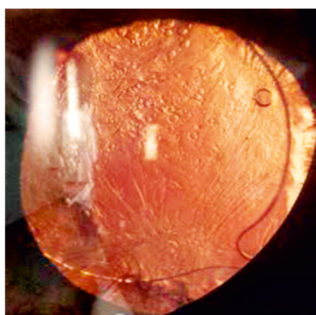
Answer: Posterior Capsular Opacification (PCO).

Q5.5: What are the typical appearances of PCO? Which IOL material has the minimum chance of causing PCO?

Answer:

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- Elschnig pearls, a Soemmerring ring, or just a diffused opacity.
- **Hydrophobic acrylic IOL** has minimum chances of PCO.



Q5.6: What is the treatment of choice for PCO?

Answer:

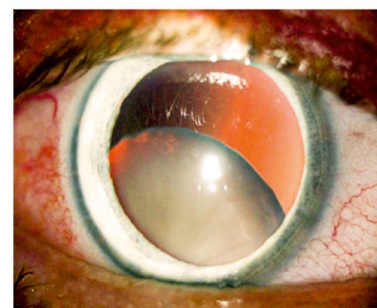
- The treatment of choice is **NdYAG Laser Posterior Capsulotomy**.
- The wavelength is **1064 nm**.
- **Peripheral Iridectomy** is another indication for the NdYAG laser, often done with an **Abraham lens**

Q5.7: What is the most common cause of Subluxation of the Lens? What specific sign is typical for its diagnosis?

Answer:

PYQ: FMGE 2020

- **Trauma** is the most common cause.
- A "golden crescent" is typical for diagnosis.



Q5.8: List other systemic causes of Subluxation of the Lens?

Answer:

- Other causes include Marfan's syndrome, Homocystinuria, Weill-Marchesani syndrome, Ehlers-Danlos syndrome, Hyperlysinaemia, and Sulfite oxidase deficiency.
 - o **Marfan's syndrome:** Superotemporal ectopia lentis.
 - o **Homocystinuria:** Inferonasal.
 - o **Weill-Marchesani syndrome:** Downward and forward subluxation.

BIG QUESTION 6: What is glaucoma? Discuss its pathogenesis, types, clinical features, diagnosis, and management.

Broad Answer:

- **Glaucoma** is damage to the optic nerve caused by raised intraocular pressure (IOP) affecting the optic nerve head, resulting in characteristic morphological changes and visual field defects.

- **Primary Open-Angle Glaucoma (POAG)** involves blockage within the trabecular meshwork, leading to impaired drainage
- **Angle-Closure Glaucoma (ACG)** is primarily due to pupillary block, causing iris bombe and subsequent iridocorneal touch that blocks the angle.
- Glaucoma is classified as congenital (true congenital, infantile, juvenile) or acquired

DETAILED QUESTIONS

Q6.1: What is glaucoma?

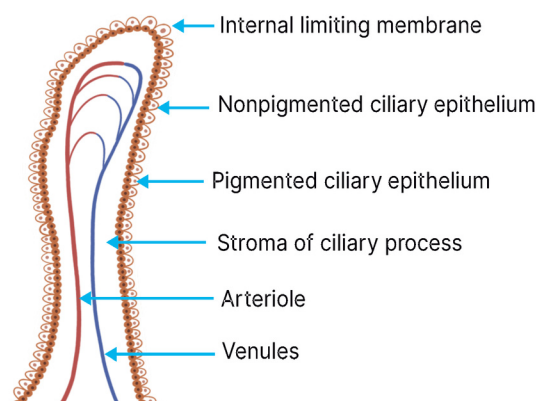
Answer:

- Glaucoma is damage to the optic nerve caused by the effect of raised intraocular pressure on the optic nerve head, resulting in characteristic morphological changes at the optic nerve head and in the retinal nerve fiber layer.
- IOP is a key modifiable factor.

Q6.2: Where is most of the aqueous humor formed? What are the primary mechanisms of its formation?

Answer:

- Most of the aqueous humor is formed from the **non-pigmented ciliary epithelium** through active **secretion** (sodium and potassium ATP pump) and also by ultrafiltration and diffusion.
- The rate of formation of aqueous humour is 2-3 microlitres/min.



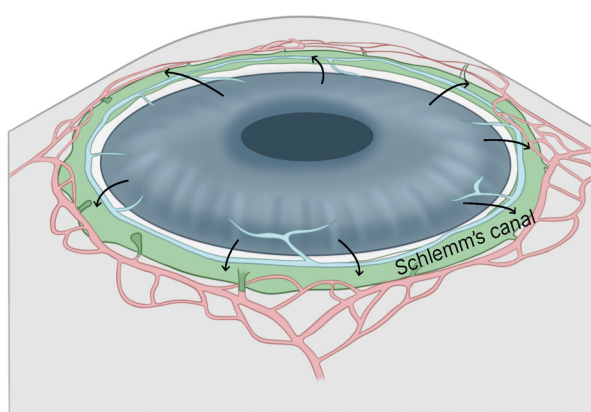
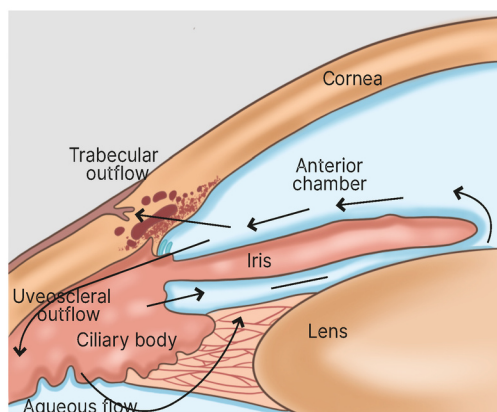
Q6.3: What is "Hypersecretory glaucoma," and in which condition is it seen?

Answer: Hypersecretory glaucoma occurs due to more formation of aqueous humor and is seen in **Epidemic dropsy**.

Q6.4: What are the two major aqueous humor outflow pathways, and what percentage of outflow does each contribute?

Answer:

- **Uveoscleral outflow:** 10%.
- **Conventional outflow:** 90%.

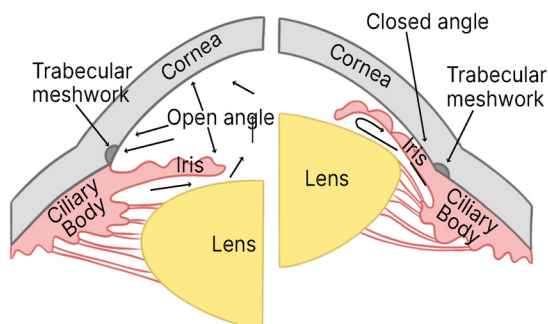


Q6.5: Differentiate between Open-angle Glaucoma (OAG) and Angle Closure Glaucoma (ACG) based on the mechanism of impaired drainage.

PYQ: FMGE 2020

Answer:

- **Open-angle Glaucoma (OAG):** Blockage occurs in the trabecular meshwork, leading to impaired drainage.
- **Angle Closure Glaucoma (ACG):** Caused by **pupillary block**, where the iris pushes forward, abating the space between the iris and cornea, resulting in impaired drainage.



Q6.6: What are the classifications of congenital glaucoma based on age of onset?

Answer:

- Congenital glaucoma can be:
 - **True congenital:** Child is born with the problem.
 - **Infantile:** Less than 3 years of age.
 - **Juvenile:** From 3 years to adolescence.
 - **Buphthalmos** (big eye and large cornea) is a feature of true congenital and infantile disease because the sclera stretches only up to 3 years.

Q6.7: What are the primary risk factors for Primary Open-angle Glaucoma (POAG)?

Answer:

- Increased Intraocular Pressure (IOP)
- Age >40 years
- Positive family history
- High Myopia.

Q6.8: What are the clinical features of Primary Open-angle Glaucoma (POAG)?

Answer:

- IOP changes
- Fundus changes
- Visual field defects

BIG QUESTION 7: What are the various methods of intraocular pressure measurement?

Broad Answer:

- IOP is measured by tonometers:
 - Schiøtz tonometer
 - Goldmann tonometer
 - Tonopen
 - Non-Contact Applanation/Pulsair/air puff
 - Rebound tonometer
 - Pascal's tonometer (latest, not CCT-dependent).

YOURWISH

DETAILED QUESTIONS

Q7.1: What is the normal range for intraocular pressure (IOP), and what is its normal diurnal variation? When is IOP typically recorded higher?

Answer:

- The normal intraocular pressure is **10-21 mm Hg**.
- The normal diurnal variation is up to **5 mm Hg**.
- IOP is recorded more in the morning due to higher steroid levels.

Q7.2: What are the differences between normal-tension glaucoma and ocular hypertension?

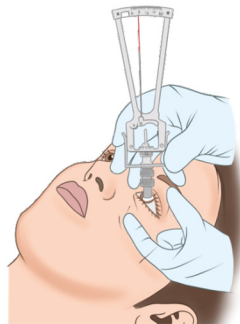
Answer:

- **Normal-Tension Glaucoma:** IOP is normal (10-21mm Hg), but there are fundus changes (optic nerve damage) and visual field defects. It is based on the vascular theory of impaired blood supply.
- **Ocular Hypertension:** IOP is elevated, but the fundus is normal, and there are no visual field defects.

Q7.3: What is the principle and what are the limitations of Schiötz tonometer?

Answer:

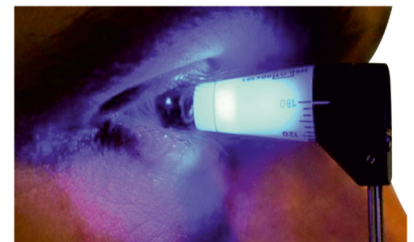
- It is an **indentation tonometer**.
- It indents the cornea. Its readings depend on the scleral rigidity of the patient, making it less reliable.



Q7.4: What are the principles and features of Goldmann tonometer?

Answer:

- It is an **applanation tonometer**, based on the **Imbert-Fick law** ($P = F/A$).
- It is more reliable because the area (diameter of 3.06mm) is fixed.
- Indentation is more reliable because readings of Schiötz depend on the sclera
- rigidity of the patient.



Q7.5: How does central corneal thickness (CCT) affect Goldmann tonometer readings?

Answer:

- In a **thick cornea**, IOP is **overestimated**.
- In a **thin cornea**, IOP is **underestimated**.

Q7.6: Which tonometer is the choice for children?

Answer:

- **Tonopen**
- This can be used in the scarred and irregular cornea.



Q7.7: What are the alternative names for the Non-Contact Applanation tonometer?

Answer:

- Pulsair tonometer or air puff.



Q7.8: Which tonometer can be used for self measurement?

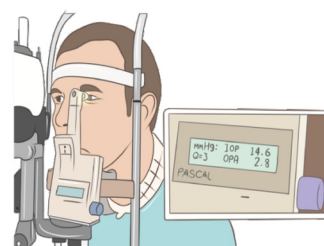
Answer: Rebound tonometer



Q7.9: What is the latest contact-type applanation tonometer that does not depend on central corneal thickness? What principle is it based on?

Answer:

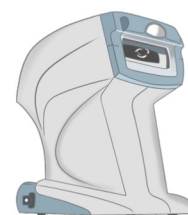
- **Pascals Tonometer.**
- It is based on the principle of the dynamic tonometer and takes the shape of the cornea.
- The reading does not depend on central corneal thickness.
- It is more reliable than Goldmann.



Q7.10: What is "corneal hysteresis," and which recent tonometer is based on this principle?

Answer:

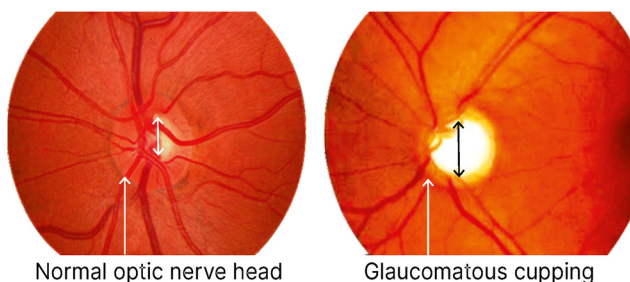
- Corneal hysteresis refers to the cornea's ability to absorb and dissipate energy.
- The **Ocular Response Analyzer** is based on this principle.



Q7.11: What is cupping, and why does it occur?

Answer:

- Cupping refers to an increase in the area of the optic cup.
- It occurs due to the **remodeling of the Lamina Cribrosa**, caused by the proliferation of glial cells changing the shape of the lamina.
- The cup is always vertically oval because the first damage occurs in the arcuate fibers.



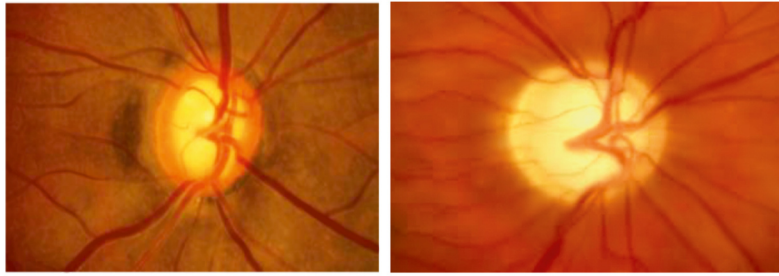
Normal optic nerve head

Glaucomatous cupping

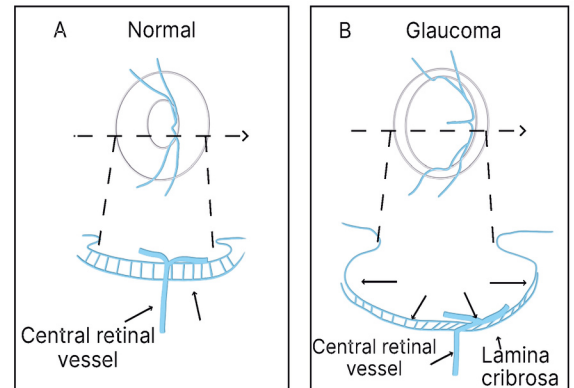
Q7.12: List three specific signs related to disc and vessel changes seen in glaucomatous cupping.

Answer:

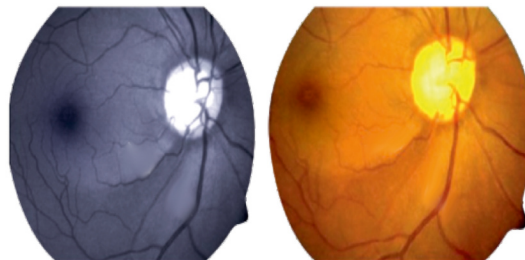
- Laminar dot sign



- Nasal shifting of vessels
- Bayonetting sign (sharp bending of the vessel)



- Retinal Nerve Fibre Defects

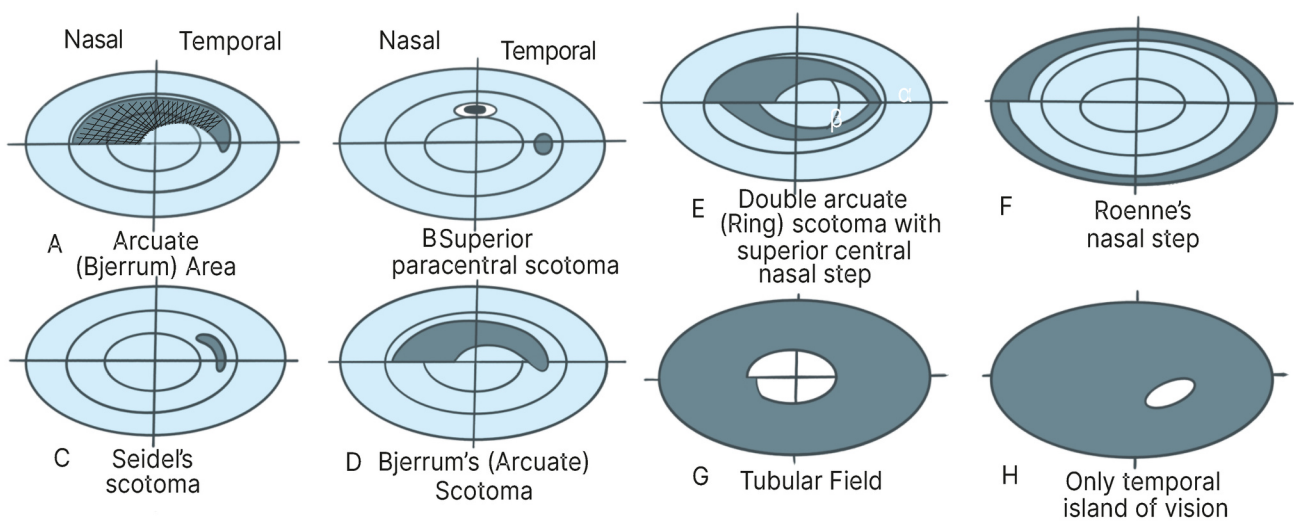


Q7.13: Where is the blind spot situated?

Answer: The blind spot is situated between 10° - 20°

Q7.14: What is the normal extent of the visual field in degrees in different directions

Answer: Temporally: 100° , Inferiorly: 70° , Nasally: 60° , Superiorly: 50° .



Q7.15: What is the earliest visual field defect in glaucoma.

Answer: The earliest field defect is a **Central or paracentral scotoma** in the superonasal part, occurring in **Bjerrum's area** (the area corresponding to the arcuate fibers).

Q7.16: Describe the progression of visual field defects from paracentral scotoma to late-stage defects

Answer:

- Paracentral scotoma joins the blind spot to become **Seidel's scotoma**, which extends into an **Arcuate scotoma** (also known as Bjerrum's scotoma, a late-field defect), then potentially a **Double arcuate scotoma** or **Ring scotoma**.
- **Roenne's nasal step** is a part where there is no scotoma because the fibers are not aligned exactly abutting each other. In late stages, only a central and temporal island of vision remains, and lastly, only the temporal island of vision is left.

BIG QUESTION 8: Explain the primary mechanism of Angle-Closure Glaucoma (ACG) and describe the clinical stages.

Broad Answer:

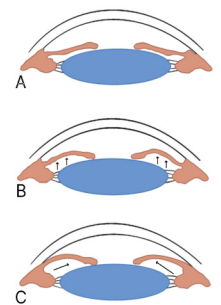
- The main mechanism of ACG is the pupillary **block**, leading to **Iris Bombe** and subsequent iridocorneal touch.
- **Plateau Iris** can also cause iridocorneal touch without pupillary block. Risk factors include small eye, shallow anterior chamber, narrow angle, and female predominance.
- ACG stages range from Primary Angle Closure Suspect (PACS) to Primary Angle Closure (PAC), Acute Primary Angle Closure (APAC), Chronic angle closure glaucoma, and Absolute glaucoma.

DETAILED QUESTIONS

Q8.1: What is the main mechanism of Angle Closure Glaucoma (ACG)? Explain how "Iris Bombe" forms and leads to angle closure.

Answer:

- The main mechanism is **pupillary block**.
- When aqueous humor collects behind the iris due to pupillary block, it pushes the iris forward, forming an "Iris Bombe."
- This eventually adheres to the cornea, blocking the angle.



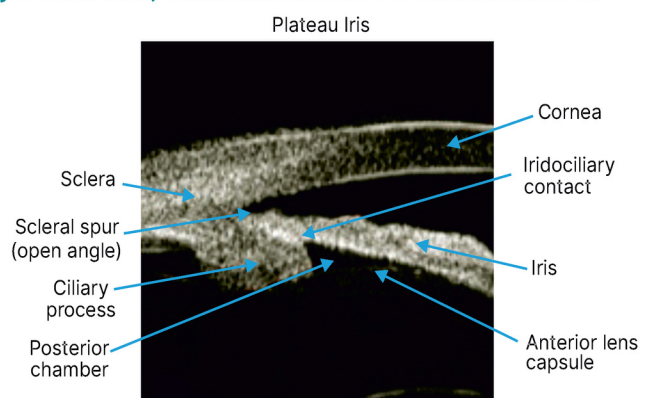
Q8.2: Can iridocorneal touch happen in ACG without a pupillary block? If so, what anatomical variation causes it?

Answer:

- If there is no pupillary block, but still Iridocorneal touch can happen due to Plateau Iris.
- The anteriorly rotated ciliary body can lead to Plateau Iris and can cause further blockage.

Q8.3: What are the key risk factors for ACG?

Answer: Small eye, Shallow anterior chamber, Narrow-angle, and more common in females.



Q8.4: What are the clinical stages of ACG according to its natural history?

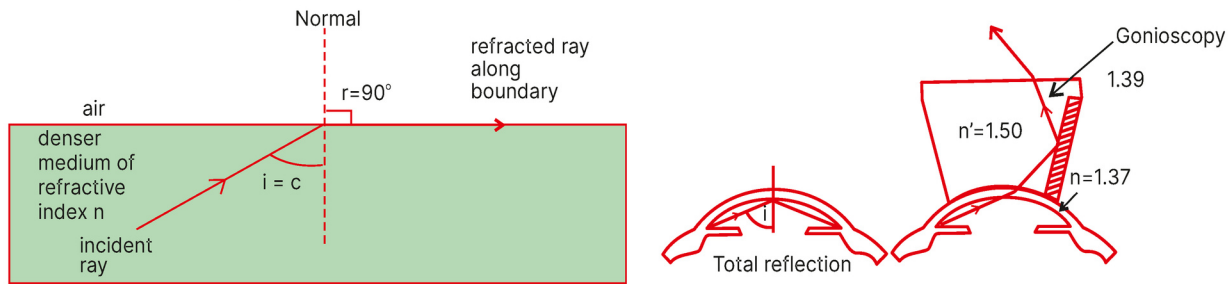
Answer:

- Primary Angle Closure Suspect (PACS): High risk
- Primary Angle Closure (PAC)
- Acute Primary Angle Closure (APAC) or Acute Congestive Glaucoma
- Chronic angle closure glaucoma
- Absolute glaucoma.

YOURWISH

Q8.5: What is "Gonioscopy," and what is its purpose?**Answer:**

- Gonioscopy is the biomicroscopic visualization of the angle.
- The critical angle of the cornea is 46° .
- If the angle of incidence exceeds the critical angle, total internal reflection occurs, preventing direct visualization.
- A goniolens with a higher refractive index is inserted to overcome this, allowing light to go through a reflected mirror (indirect gonioscopy).
- It does not require pupil dilation.

**Q8.6: What are the differences between Primary Angle Closure Suspect (PACS) and Primary Angle Closure (PAC)?****Answer:**

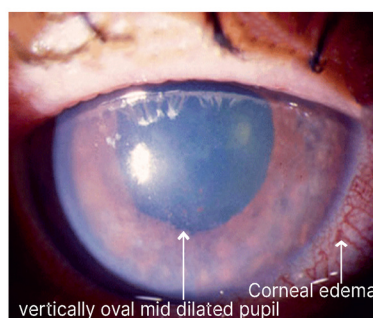
- **PACS:** Occludable angles (≥ 3 quadrants of Iridotrabecular contact), No PAS, Normal IOP.
- **PAC:** Occludable angles, PAS may be seen, Optic neuropathy (damage to the optic nerve), High IOP.

Q8.7: What is the treatment of choice for Primary Angle Closure (PAC) and PACS?

Answer: Peripheral iridotomy by NdYAG laser.

Q8.8: List the key clinical features of Acute Primary Angle Closure (APAC).**Answer:**

- Pain, Redness, Photophobia, Blepharospasm, Corneal oedema, Shallow anterior chamber, Closed angles.
- The pupil is typically **vertically oval and mid-dilated, fixed, and non-reactive to light**.

**Q8.9: What are the common precipitating factors for APAC?**

Answer: Dark environment, Prone position, Mydriasis, Emotional stress, and Medications like **Topiramate** (causing ciliary body effusion) or sympathomimetics.

Q8.10: What are the immediate treatment steps for Acute Primary Angle Closure?**Answer:**

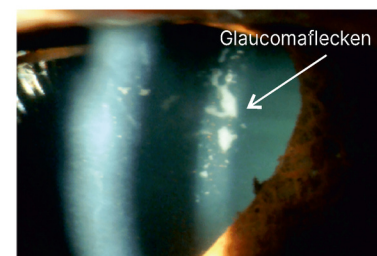
- Supine position, IV Mannitol / Acetazolamide (if IOP $> 50\text{mmHg}$) or oral acetazolamide (contraindicated in sulfa allergy), Pilocarpine, Topical steroids, 10% topical glycerine, and Lens extraction if needed.

? PYQ: FMGE 2021

? PYQ: NEET PG 2022

Q8.11: What is "Vogt's Triad," and what does it indicate?**Answer:**

- Vogt's Triad consists of
 - Pigment dispersion on the cornea
 - Glaucomaflecken (necrotic epithelial cells on the anterior capsule of the lens)
 - Iris atrophy.
- It indicates a resolved APAC episode.

**Q8.12: What are the primary diagnostic features of Primary Angle Closure Glaucoma (PCAG)?**

PYQ: INICET 2022

Answer:

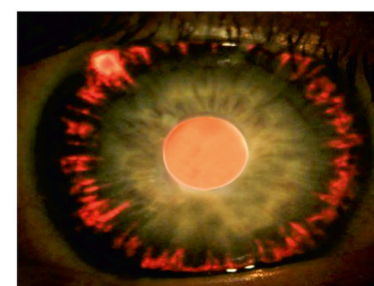
- The primary diagnostic features of PCAG include:
 - Occludable angles
 - Peripheral Anterior Synechiae (PAS)
 - High Intraocular Pressure (IOP)
 - Optic neuropathy (damage of the optic nerve)

Q8.13: How is Chronic Glaucoma (chronic angle closure) diagnosed?**Answer:**

- It is diagnosed by Gonioscopy showing **creeping angle closure**.
- The **Dark Room Prone Provocative Tests (DRPPT)** are helpful, especially if the patient already has Peripheral Iridotomy.
- If there is an increase in IOP, it can be diagnosed as Plateau Iris.

Q8.14: What are the features of Pigmentary glaucoma?**Answer:**

- Pigmentary glaucoma occurs when pigment from the Iris disperses, flows through the aqueous, and blocks the trabecular meshwork.
- A "Transillumination defect" occurs when pigment moves, allowing more light to pass. "Krukenberg spindles" are these pigments deposited at the back of the cornea.
- There is a sudden rise of pressure after exercising due to rubbing the Iris with the suspensory ligament.

**Q8.15: What is Pseudo Exfoliation Syndrome (PEX) ?**

PYQ: NEET PG 2022

Answer:

- PEX is also known as **Glaucoma Capsulare** because proteinaceous secretions are deposited on the capsule of the lens and suspensory ligaments.
- The deposition on the anterior capsule is called the "Hoarfrost sign."
- It is the **most common secondary glaucoma**.

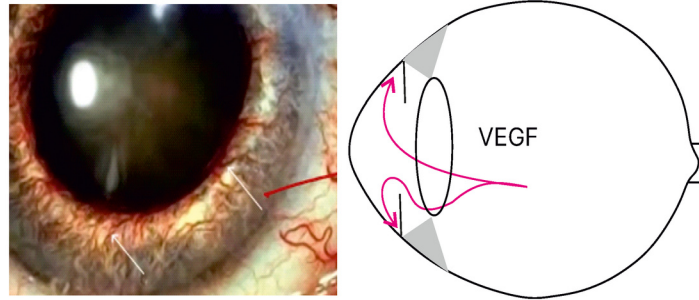


Hoarfrost sign

Q8.16: Explain the mechanism of Neovascular Glaucoma?

Answer:

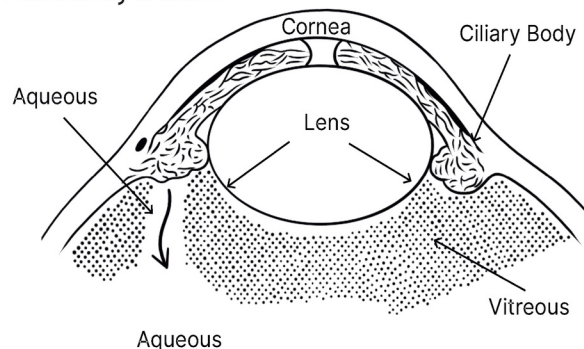
- Any hypoxia in the retina leads to angiogenic factors (mainly **VEGF**) causing neovascularization.
- First, neovascularization occurs in the retina, and later it causes neovascularization in the Iris, known as **Rubiosis Iridis**.
- Rubiosis Iridis grows into the angle, initially causing **open-angle glaucoma**.
- After some time, associated fibrous tissues contract, turning it into **angle closure glaucoma**.
- **Pan Retinal Photocoagulation (PRP)** is the treatment of choice.



Q8.17: What are the features and management of malignant glaucoma?

Answer:

- It is also known as **Ciliary block glaucoma**.
- Any intraocular surgery can complicate the ciliary block, causing the aqueous to flow posteriorly into the vitreous cavity instead of anteriorly, leading to a very shallow anterior chamber.
- "Inverse glaucoma" is treated with **Atropine**, which dilates the ciliary ring, opening the block and maintaining flow.
- If it doesn't respond, openings can be made in the anti-hyaloid membrane by NdYAG.
- If nothing works, Pars plana vitrectomy is done.

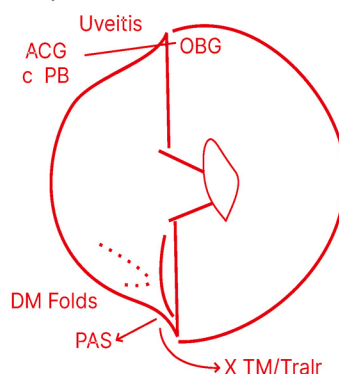


Q8.18: What is Posner-Schlossmann Syndrome? What are its risk factors and primary treatment strategy?

Answer:

- Also known as: Glaucomatocyclitic Crisis
- PSS is a form of recurrent, unilateral anterior uveitis associated with transient episodes of markedly elevated intraocular pressure (IOP).
- Inflammation can lead to:
 - **Angle-closure glaucoma** with or without **pupillary block**.
 - In some cases, it can result in **secondary open-angle glaucoma**.
- When a **pupillary block** occurs:
 - It leads to **iris bombe** (forward bowing of the peripheral iris).
 - This causes **peripheral anterior synechiae** formation.

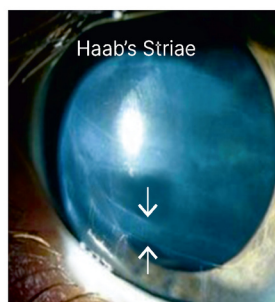
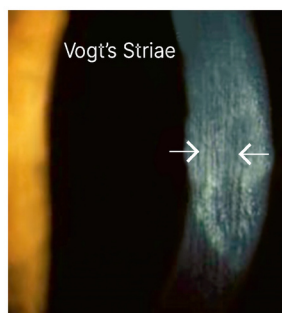
- o Eventually, it results in **angle closure**.
- Risk factors include young males, association with CMV and H. Pylori infections, and HLA association.
- Treatment involves controlling the intraocular pressure and topical steroids under an antiglaucoma cover.



Q8.19: What are Haab's striae and Vogt's striae?

Answer:

- **Haab's striae** are horizontal striae.
- **Vogt's striae** are vertically parallel to the steep axis and are also seen in **Keratoconus**.



? PYQ: INICET 2022

? PYQ: FMGE 2019

Q8.20: What is the treatment of choice (TOC) for Congenital Glaucoma when the cornea is clear?

Answer:

- **Goniotomy** is the TOC when the cornea is clear.
- If there is no clear cornea, then **Trabeculotomy with Trabeculectomy** is performed.

BIG QUESTION 9: What are the modalities used in the management of glaucoma?

Broad Answer:

- The primary goal of glaucoma treatment is to prevent the progression of visual field defects while maintaining quality of life.
- Medical treatment involves topical drugs: **Beta-blockers**, **Alpha-agonists**, **Miotics**, **Prostaglandin analogues**, **Topical CA inhibitors**, and **RHO Kinase inhibitors**
- Systemic drugs include oral CA inhibitors and hyperosmotic agents
- Laser treatment includes **Peripheral Iridotomy** and **Laser Iridoplasty** with NdYAG.
- For open angle, **Trabeculoplasty** is performed.
- For absolute glaucoma, **ciliary body ablation** damages ciliary processes.
- Surgical treatments are non-penetrating or penetrating, and MIGS.

DETAILED QUESTIONS

Q9.1: What are the examples, mechanisms of action, and contraindications of drugs used in the management of glaucoma?

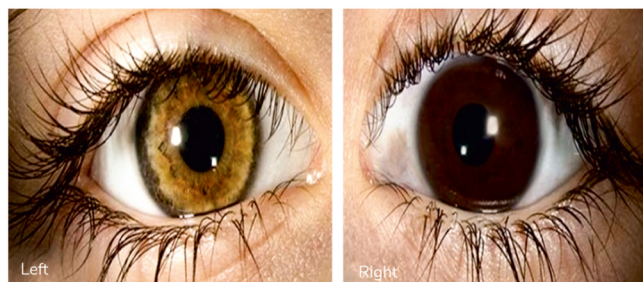
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Drug Class	Mechanism of Action	Contraindication / Side Effects	Example Drugs / Notes
1. Beta-blockers	↓ Formation of aqueous	- C/I in asthma- Timolol causes nasolacrimal duct obstruction	- Timolol- Selective: BetaxololPYQ: INICET 2022, FMGE 2019
2. Alpha-agonists	↑ Drainage + ↓ Aqueous formation	- Brimonidine C/I in children (CNS depression)- Adrenaline: conjunctival pigmentation	- Brimonidine (Selective)- Apraclonidine (Selective)
3. Miotics	↑ Trabecular outflow	C/I in Uveitis	- Pilocarpine
4. Prostaglandin analogues	↑ Uveal scleral outflow	C/I in Uveitis	- Latanoprost- Travoprost- Isopropyl- Bimatoprost ↑ both outflows
5. Topical CA inhibitors	↓ Formation of aqueous	C/I in Sulpha allergies	- Dorzolamide- Brinzolamide
6. RHO Kinase inhibitors	↑ Trabecular outflow	Can lead to Vortex Keratopathy (whorl-like drug deposition)	- Netarsudil

Q9.2: What are the side effects of topical Latanoprost and adrenaline?

Answer:

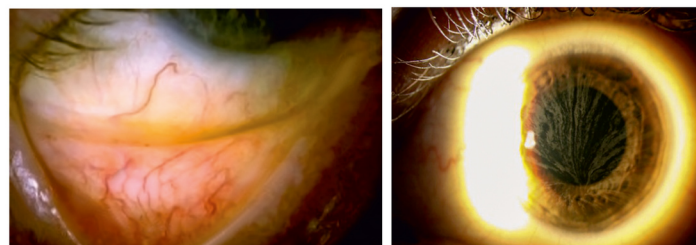
- Latanoprost causes **heterochromia iridis** (iris pigmentation) due to melanin deposition.
- Conjunctival pigmentation is caused by adrenaline/epinephrine.



Q9.3: What is "Vortex Keratopathy," and which glaucoma drug causes it?

Answer:

- Vortex keratopathy (VK) is a side effect of **Netarsudil**, causing drug deposition in a whorl-like manner.
- Other causes include Chloroquine, Amiodarone, Tamoxifen, Indomethacin, and Fabry disease.



Q9.4: Which laser is used for Peripheral Iridotomy, and for what condition is it indicated? For Plateau Iris, what laser treatment is performed?

Answer:

- **NdYAG laser** is used for Peripheral Iridotomy, indicated for angle closure.
- For Plateau Iris, **Laser Iridoplasty** is done.

Q9.5: What is the purpose of Trabeculoplasty in open-angle glaucoma? Name three ways it can be performed.

Answer:

- Trabeculoplasty applies a coagulative laser to the trabecular meshwork to improve aqueous outflow.
- It can be given in three ways:
 - o Argon Laser Trabeculoplasty (ALT)
 - o Selective Laser Trabeculoplasty (SLT) (using yellow NdYAG)
 - o Micropulse Laser Trabeculoplasty (MLT).

Q9.6: What is the treatment of choice for Absolute Glaucoma?

Answer:

- The treatment of choice is **ablation of the ciliary body** (Cyclophotocoagulation).
- It works by damaging the ciliary processes to reduce aqueous formation and control pressure.
- Cyclotherapy can be Cryotherapy or Laser photocoagulation.
 - o It is a diode laser known as DLCP (Diode Laser Photocoagulation).

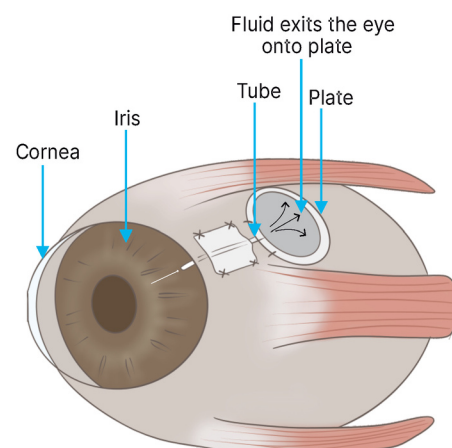
Q9.7: List two types of non-penetrating surgical procedures for glaucoma.

Answer: Deep Sclerectomy and Viscocanalostomy.

Q9.8: What is the main penetrating surgical procedure for glaucoma?

Answer:

- **Trabeculectomy.**
 - o Drugs: Mitomycin C and 5-fluorouracil.
 - o Implant: Express implant (Titanium)
 - o **Ahmed Glaucoma Valve.**

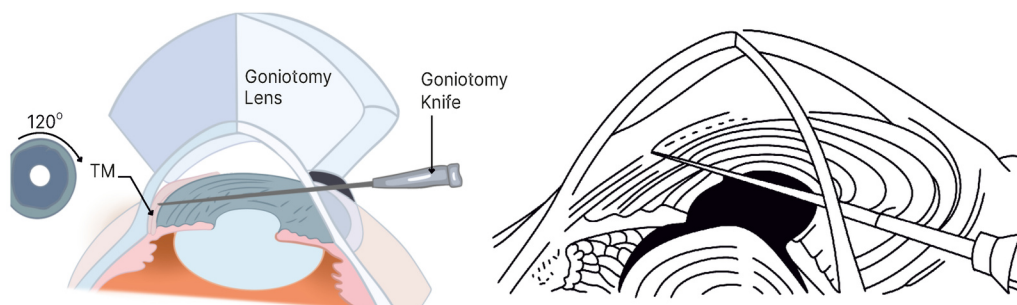


Q9.9: What is "MIGS"?

Answer: MIGS stands for Minimal Incision Glaucoma Surgery

Q9.10: What surgical procedure is the treatment of choice for Congenital Glaucoma, and what instrument is used?

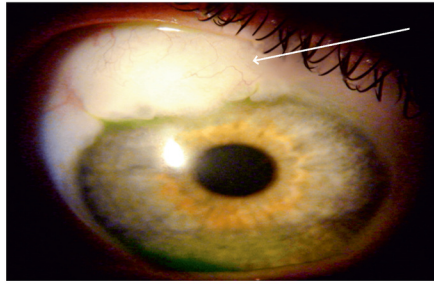
Answer: Goniotomy, done with a Goniotomy knife



Q9.11: What is a "BLEB," and what does its presence indicate?

Answer:

- A BLEB is a filtration bleb (a small blister-like fluid collection under the conjunctiva).
- Its presence tells the success of the procedure, indicating that the fistula is working and aqueous is draining.



Q9.12: What are the uses of Ahmed Glaucoma Valve

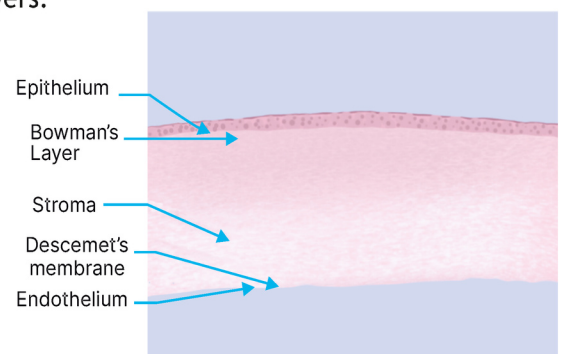
Answer:

- It is used during Trabeculectomy.
- The Ahmed Glaucoma Valve is a commonly used aqueous drainage implant

BIG QUESTION 10: Describe the key structural components of the cornea, including its recently discovered layer.

Broad Answer:

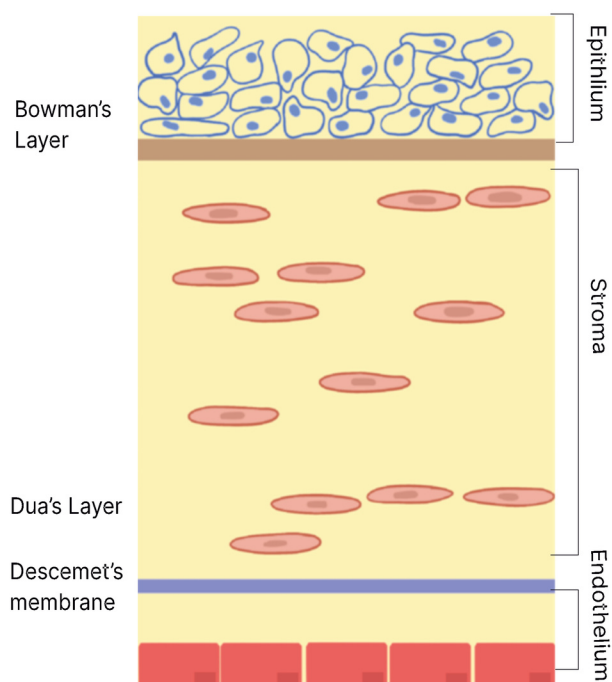
- The cornea is a transparent, avascular structure with five main layers:
- Epithelium - multilayered
- Bowman's membrane
- Stroma
- Descemet's membrane
- Endothelium
- Recently discovered **Dua's layer** (between stroma and Descemet's, considered strongest).



DETAILED QUESTIONS

Q10.1: Describe the composition of the corneal epithelium.

Answer: The epithelium is of squamous, stratified, and non-keratinized epithelium.



Q10.2: What is Dua's layer, where is it located, and what is its significance?

Answer: Dua's layer is a recently discovered layer located just between the stroma and Descemet's membrane. It is considered the strongest layer of the cornea.

Q10.3: List the five main layers of the cornea in order from anterior to posterior.

Answer:

1. Epithelium
2. Bowman's membrane
3. Stroma
4. Descemet's membrane
5. Endothelium

Q10.4: Which blood vessels supply the cornea?

Answer:

- The cornea is avascular to maintain transparency.
- **Exception:** The **limbus**, located at the corneoscleral junction, contains blood vessels and provides a limited vascular supply.

Q10.5: What is the primary metabolism of the cornea, and how does it obtain oxygen and nutrition?

Answer:

- Primary metabolism is aerobic.
- It gets its oxygen from the air and nutrition from the aqueous humour.

Q10.6: How does the cornea maintain its transparency, and what specific pump is involved in this process?

Answer:

- The cornea is dehydrated due to the barrier function of the endothelium and pump function.
- It has Na⁺, K⁺, and ATPase pump which pumps water back into the aqueous, thus maintaining dehydration for transparency

Q10.7: Which corneal layers do not regenerate?

Answer: Endothelial cells, Bowman's membrane, and stroma do not regenerate

Q10.8: What is the normal endothelial cell count in a healthy adult cornea?

Answer:

- In a normal adult, there are 2500-3000/mm² cells.
- If it goes less than 500 cells, it cannot maintain the dehydrated state.
- This will lead to stromal hydration, epithelial hydration, and ultimately **Bullous Keratopathy** (bullae filled with fluid), which is a sign of corneal decompensation.

Q10.9: List the organisms that can penetrate an intact corneal epithelium.

Answer:

- Neisseria gonorrhoea
- Neisseria meningitidis
- Listeria

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- Diphtheria
- Haemophilus
- Shigella

 PYQ: FMGE 2020

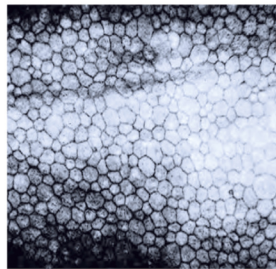
Q10.10: What are the two main investigations mentioned for assessing corneal health, and what does each measure or examine?

Answer:

- **Pachymetry** measures the thickness of the cornea.
- **Specular Microscopy** examines the endothelial cells.



Specular Microscopy



Endothelial cells



Pachymeter

Q10.11: What is Keratitis?

 PYQ: FMGE 2022

Answer:

- Keratitis is inflammation of the cornea.
- It can be bacterial, fungal, viral, acanthamoebal, or interstitial.

Q10.12: What are the common presenting symptoms for all types of Keratitis?

Answer:

- Pain, redness (conjunctival congestion), photophobia, and diminution of vision (and blepharospasm if corneal involvement is there).

Q10.13: How does a bacterial corneal ulcer typically stain with fluorescein?

 PYQ: FMGE 2020, 2022

Answer:

- Fluorescence-stained +ve ulcer.
- The hypopyon is sterile.



Q10.14: What are the most common bacteria causing bacterial keratitis generally, and specifically in India?

Answer:

- Most common generally: ***Staphylococcus aureus***.
- In India: *Staphylococcus epidermidis*.
- Pneumococcus is associated with Hypopyon corneal ulcer and Ulcus serpens (ulcer presents in a serpentine manner).

Q10.15: What is "Pseudocornea," and what significant condition can it lead to?

Answer: Pseudocornea is a feature of a sloughing ulcer and an important cause of anterior staphyloma.

Q10.16: What can perforating corneal ulcers lead to, and what is the management for them?

Answer: Perforating corneal ulcers can lead to leucoma adherens. Management is Cyanoacrylate glue.

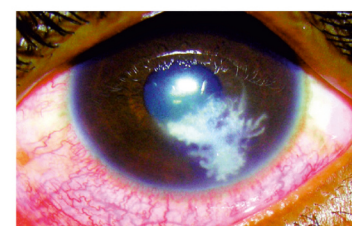
Q10.17: Which bacterium can cause rapid corneal perforation (within 48 hours) and is the most common infection after contact lens use?

Answer: *Pseudomonas*.

Q10.18: What is Keratomycosis? Describe the characteristic appearance of a fungal corneal ulcer.?

Answer:

- Keratomycosis is a fungal corneal ulcer.
- The ulcer has a dry and rough look.
- The projecting ends are hyphae.
- If there is a hypopyon, it is always unsterile.
- Signs are more than symptoms.



Hyphae

Q10.19: What is the common cause of fungal keratitis?

Answer: Trauma by vegetative methods.

PYQ: FMGE 2021

Q10.20: What is the most common causative agent of fungal keratitis? Name another common one.

Answer: *Aspergillus fumigatus* > *Fusarium*.

Q10.21: Name a fungus primarily infecting the eyelids, orbit, and causing endophthalmitis.

Answer:

- Infecting lids: *Candida albicans*.
- Infecting orbit: *Mucormycosis*.
- Endophthalmitis: *Candida albicans*.

Q10.22: What are "satellite nodules"?

Answer: Satellite nodules are smaller lesions away from the main lesions.

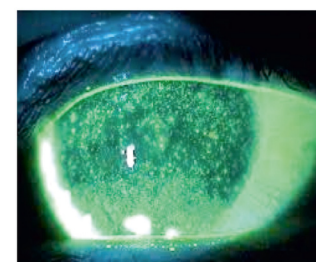
Q10.23: What is the treatment of choice for fungal keratitis, and which fungus is it most effective against?

Answer: The treatment of choice is 5% **Natamycin**, which is most effective against *Aspergillus*.

Q10.24: What is superficial punctate keratitis?

Answer:

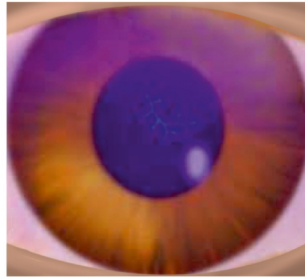
- Superficial punctate keratitis can be caused by the **Herpes simplex** or **Herpes zoster virus**.
- Herpes simplex is more common than **Herpes zoster ophthalmicus (Shingles)**.
- **Decreased corneal sensation** is the **pathognomonic feature** of viral keratitis.
- **Diabetes** and **Leprosy** are causes of decreased corneal sensation.



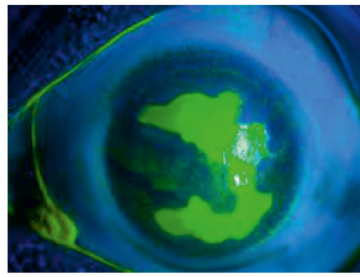
Q10.25: What are the features, causes, and drugs contraindicated in dendritic ulcer?

Answer:

- It has knobbed ends.
- It is a feature of **Herpes simplex infection**.
- **Steroids are contraindicated** in dendritic ulcers.
- It can later lead to a geographical ulcer or corneal perforation.



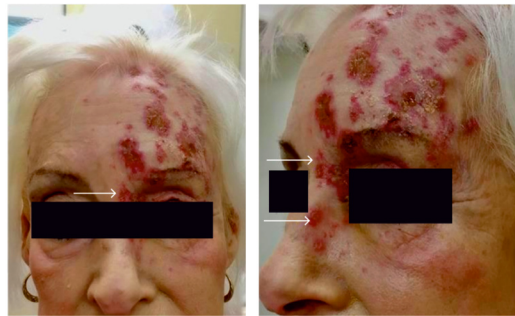
Dendritic ulcer



Geographical ulcer

Q10.26: What are the clinical features of Herpes Zoster?

Answer: 1. Eye involvement, 2. Skin involvement, 3. Trigeminal Neuralgia.



HZO-skin lesion

Q10.27: Explain "Hutchison's rule" in the context of Herpes Zoster.

Answer:

- Hutchison's rule states:
- If the tip of the nose is involved, the eye will be involved due to the involvement of the nasociliary nerve.

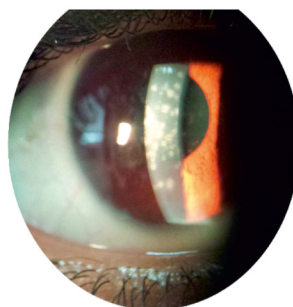
Q10.28: What specific corneal lesion is a feature of Herpes Zoster?

Answer:

- Pseudodendrites in epithelium are a feature of Herpes Zoster.
- Nummular Keratitis in stroma



Pseudo dendritis



Nummular keratitis

- Disciform keratitis in the endothelium (Disc shaped): Seen in Herpes Zoster and Herpes Simplex
 - o Involving a **Type IV hypersensitivity reaction**.

Q10.29: What is the treatment for Herpes Simplex keratitis vs. Herpes Zoster keratitis?

Answer:

- For Herpes Simplex, topical antivirals (e.g., 3% Acyclovir 5 times a day)
- For Herpes Zoster, topical antivirals + oral treatment
- All these treatments are required only for 14 days.

Q10.30: What is "Metaherpetic keratitis," its cause, and management?

Answer:

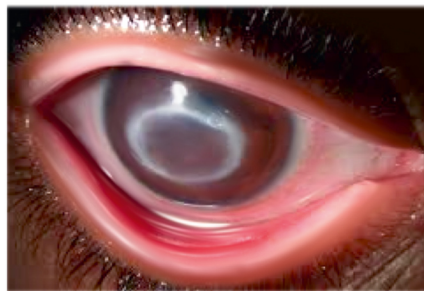
- Metaherpetic keratitis is a non-healing corneal epithelial defect that occurs due to the **toxic effects of prolonged antiviral use** (i.e., over-treatment).
- **Cause:** Toxicity from prolonged topical antivirals.
- **Management:** Discontinue antiviral treatment and initiate **lubricating eye drops** to promote healing.

Q10.31: What are the causes, clinical features of Acanthamoeba Keratitis?

 PYQ: FMGE 2020

Answer:

- It can present as a **ring lesion**.
- Pain is disproportionately much more.
- It causes **Perineuritis** because it invades the nerves, which can also lead to the thickening of the corneal nerve.



Ring lesion of acanthamoeba keratitis

Q10.32: What is the specific culture media for Acanthamoeba? What is the drug of choice for its treatment?

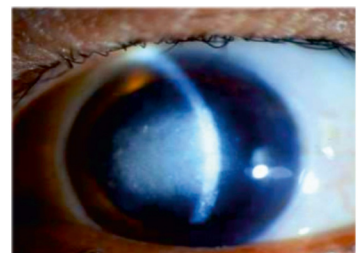
Answer:

- The culture media is non-nutrient agar with *E. coli*.
- **PHMB (Polyhexamethylene Biguanide)** is the drug of choice.

Q10.33: What is interstitial keratitis, and what are its causes and associations?

Answer:

- **Definition:** Interstitial keratitis is inflammation limited to the **corneal stroma**, with **normal epithelium and endothelium**.
- **Main Causes:**
 - o Syphilis
 - o Tuberculosis (TB)
 - o Leprosy
 - o Sarcoidosis
- **Associated Syndrome:**
 - o Seen in **Cogan's syndrome**, which includes **interstitial keratitis with deafness**.

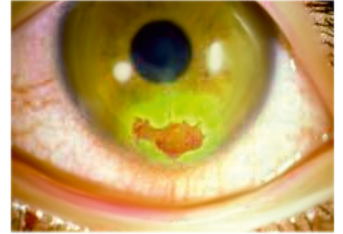


Q10.34: What is a "Salmon patch," and Where is it seen?

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Answer:

- A patch of bleeding in the stroma.
- It is a feature of **Syphilis**.

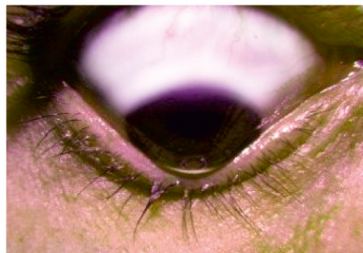
**Q10.35: What are the features of keratoconus?****Answer:**

- It is the **ectatic dystrophy** of the cornea.
- It causes **irregular astigmatism** due to the irregularity of the cornea, leading to marked diminution of vision.

Q10.36: Describe the signs seen in Keratoconus:**Answer:**

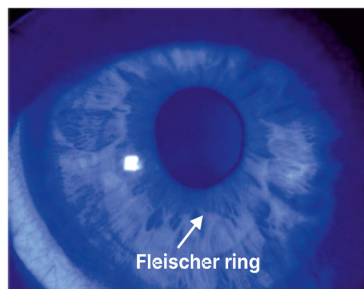
A. **Munson's sign:** There is a V-shaped deformity of the lower lid (seen on downgaze).

PYQ: NEET PG 2021



V Shaped Deformity

B. **Fleischer's ring:** Iron deposition at the base of the cornea, mainly seen in the epithelium.

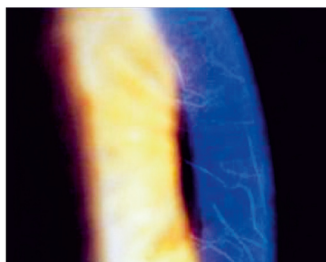


PYQ: NEET PG 2019

C. **Oil droplet reflex:** It is seen under distant direct ophthalmoscopy at a distance of 25 cm.



D. **Prominent corneal nerve:** Due to thinning of the cornea.



E. **Scissors reflex:** A finding of Retinoscopy, where two reflexes are seen like two blades of a pair of scissors.

Q10.37: What causes thickening of corneal nerves?**Answer:**

- The thickening of corneal nerves is due to Leprosy, NF1, and Acanthamoeba.

Q10.38: What is the treatment of choice for progressive Keratoconus? What type of contact lenses are often used for vision correction?**Answer:**

- For the progressive type of keratoconus, the treatment of choice is **C3R (Corneal Collagen cross-linking with Riboflavin)**.
- For vision correction, **Rigid gas-permeable lenses** are used.

Q10.39: What is the ideal timeframe for obtaining a cadaveric cornea for Keratoplasty? What is the minimum acceptable endothelial cell count for a donor cornea?**Answer:**

- Cornea is obtained from the Cadaver's eye within 6 hours.
- Endothelial cells should be more than 1500-2000/mm².

Q10.40: What is the most common infection after keratoplasty?

Answer: Staphylococcus epidermidis.

Q10.41: What is the typical graft size for a donor cornea in Keratoplasty?

Answer: The graft size of the donor is around 7.5mm.

Q10.42: Describe the signs of graft rejection after Keratoplasty:**Answer**

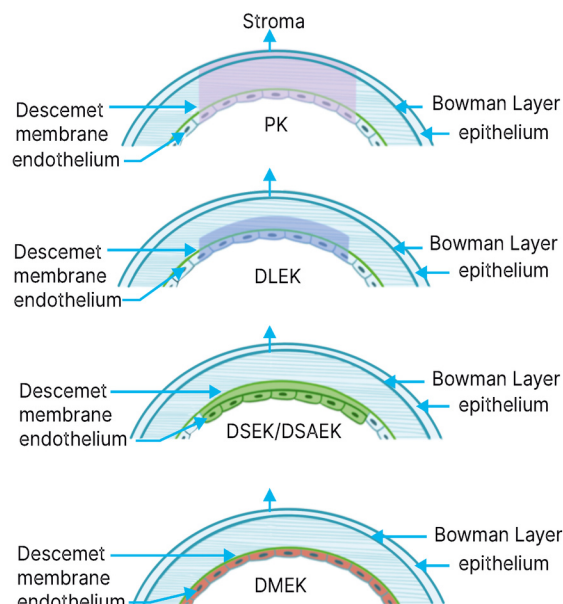
- A. Khodadoust line: Endothelial graft rejection.
- B. Krachmer spots: Subepithelial infiltrations.
- C. Kayes dots: Epithelial infiltrations.
- D. Other general signs: Corneal edema, Corneal vascularization.

Q10.43: What are the two main classifications of Keratoplasty based on thickness, and what are their subtypes?**Answer:**

- **Full thickness:** Penetrating (PKP).
- **Partial thickness:** Lamellar.
 - **Lamellar types:**
 - Deep Anterior Lamellar Keratoplasty (DALK)
 - Posterior Lamellar Keratoplasty (PLK)

Q10.44: Differentiate between SALK and DALK based on the proportion of stroma replaced.**Answer:**

- **SALK (Superficial Anterior Lamellar Keratoplasty)** replaces 1/3rd of the stroma.
- **DALK (Deep Anterior Lamellar Keratoplasty)** replaces more than 1/3rd of the stroma.



Q10.45: What are the types of Posterior lamellar keratoplasty?

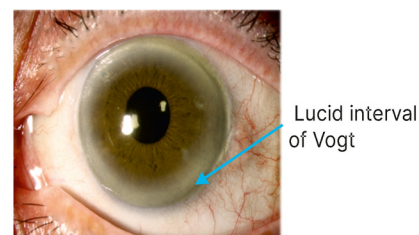
Answer: PLK is also called Deep Endothelial Lamellar Keratoplasty (DELK).

- DELK subtypes:
 - DSEK (Descemet's Stripping Endothelial Keratoplasty): Very minimal stroma is disturbed.
 - DMEK (Descemet's Membrane Endothelial Keratoplasty): No stroma is disturbed.

Q10.46: What is Arcus Senilis?

Answer:

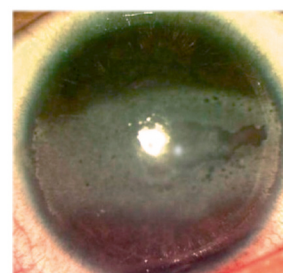
- It is corneal degeneration, specifically **lipid deposition in the stroma**.
- It starts superiorly and inferiorly and then becomes a circle.
- The **black strip** is a clear space between the arcus and the limbus called the **Lucid interval of Vogt**.



Q10.47: What are the features, causes and management of band-shaped keratopathy?

Answer:

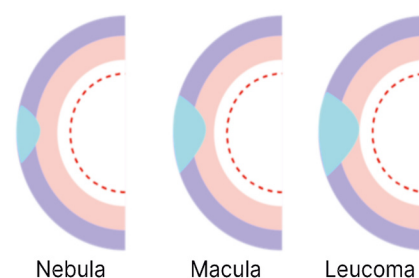
- It is the band-shaped deposition of **calcium**.
- Calcium is generally deposited on the sub-epithelial, Bowman's membrane, and can also be on the anterior stroma.
- The most common cause is **idiopathic**.
- Other causes are chronic uveitis (especially in children with JRA), phthisis bulbi, and hypercalcemia (e.g., in Sarcoidosis).
- Treatment is **chelation with EDTA**.



Q10.48: List and describe the three types of corneal opacities based on their depth of involvement.

Answer:

- **Nebula:** Very superficial, less than 1/3rd is involved. It causes maximum diminution of vision due to the scattering of light and interferes with normal corneal function.
- **Macula:** 1/3rd to 2/3rd is involved.
- **Leucoma:** Full thickness involvement. It primarily obstructs light.



Q10.49: Which type of corneal opacity (Nebula, Macula, Leucoma) causes maximum diminution of vision, and why?

Answer: Nebula causes maximum diminution of vision due to the scattering of light.

BIG QUESTION 11: Describe the anatomical parts of the conjunctiva and the general clinical presentation of conjunctivitis.

Broad Answer:

- The conjunctiva is divided into three parts:
 - o **Bulbar conjunctiva** - covers the eyeball.
 - o **Palpebral conjunctiva** - lines the inside of the eyelids.
 - o **Fornix** - the fold between the bulbar and palpebral conjunctiva.
- Conjunctivitis is the inflammation of the conjunctiva.
- **Common clinical features of conjunctivitis are**
 - o **Pain** (especially in severe cases)
 - o **Redness** due to conjunctival congestion
 - o **Photophobia**
 - o **Blepharospasm** (seen if the cornea is involved)
 - o **Discharge** (can vary in type depending on the cause)

DETAILED QUESTIONS

Q11.1: Differentiate the type of discharge associated with bacterial, chlamydial, and viral/allergic conjunctivitis.

Answer:

- Bacterial: Purulent discharge.
- Chlamydial: Mucopurulent discharge.
- Viral and allergic: Watery discharge.

Q11.2: What are the two main types of inflammatory reactions seen in ?

Answer:

- Follicular (more typical of a viral infection)
- Papillary (when there are raised papillae)

Q11.3: What is the general treatment approach for bacterial, chlamydial, viral, and allergic conjunctivitis?

Answer:

- For bacterial: antibiotics.
- For chlamydial: antibiotics.
- For viral: antibiotics
- For allergic: anti-allergic and mild steroids.

Q11.4: Which type of conjunctivitis is typical of viral infections?

Answer:

- Follicular conjunctivitis (including COVID-19)



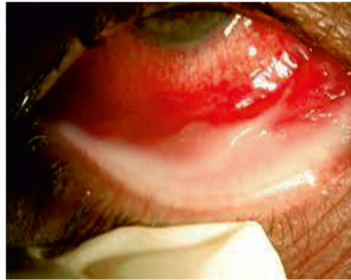
Follicle in lower palpebral conjunctiva

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Q11.5: What are the causes, features and treatment of membranous conjunctivitis?

Answer:

- It involves membrane formation along with conjunctivitis features.
- **Bleed-on peeling** is a sign of a true membrane.
- *Corynebacterium diphtheriae* is the cause, and an anti-diphtheritic serum is given to treat this.



Q11.6: How does "Pseudomembranous conjunctivitis" differ from membranous conjunctivitis in appearance? List its various causes.

Answer:

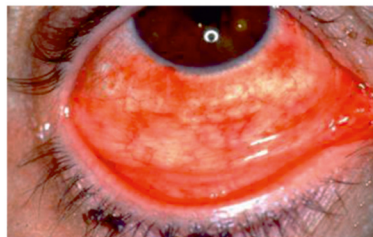
- There is membrane formation that **does not bleed on peeling**.
- Causes include: Mild Diphtheria and *Streptococcus haemolyticus*, severe adenoviral infections, even chronic irritants, and other viruses (Herpes simplex) or bacteria (Gonococcus).



Q11.7: What is "Hemorrhagic Conjunctivitis," and what are its common bacterial and viral causes?

Answer:

- It includes all features of conjunctivitis with subconjunctival haemorrhage.
- Bacterial causes: *Pneumococcus* and *Haemophilus*.
- Viral causes: Enterovirus-70, Adenovirus, Coxsackie-24, and Echovirus-34.
- Other common causes of subconjunctival haemorrhage: trauma, hypertension, bleeding diathesis, and Pertussis (whooping cough).



Q11.8: What are the causative agents of trachoma?

Answer:

- It is caused by *Chlamydia trachomatis* strains A, B, Ba, and C. D-K causes adult inclusion conjunctivitis, also called swimming pool conjunctivitis.
- Swimming pool conjunctivitis is also caused by adenovirus.

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Sago grain / follicles

Q11.9: What types of inflammatory reactions are seen in Trachoma? What are the characteristics of intracellular inclusion bodies?

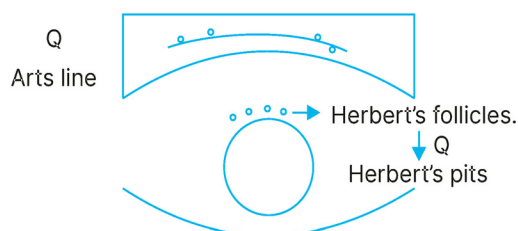
Answer:

- It has both papillary and follicular reactions.
- Intracellular inclusion bodies are **HP bodies**.

Q11.10: Describe the characteristic conjunctival lesions seen in trachoma, and mention the main complication of the disease?

Answer:

- Follicles on the upper palpebral conjunctiva and upper limbus are called **Herbert follicles**.
- When there is scarring, there is a linear scar called the **Arts line**, and a scar at Herbert's follicles is called **Herbert's pits**.



- The only complication of Trachoma mentioned is a **corneal ulcer**.

Q11.11: List the five stages of Trachoma according to the WHO classification.

Answer:

- Stage I (Follicles): ≥ 5 follicles at upper palpebral conjunctiva.
- Stage II (Inflammatory): When there is itching and watering.
- Stage III (Scarring): Arts line and Herbert's pits.
- Stage IV (Trichiasis): Misdirection of eyelashes.
- Stage V (Corneal opacity): Due to rubbing of the lashes and the cornea.

Q11.12: What is the WHO's SAFE Strategy for Trachoma control? Explain each letter.

Answer:

- **S** - Trichiasis surgery/Entropion surgery.
- **A** - Antibiotics (either oral azithromycin or topical tetracycline-1%).
- **F** - Facial hygiene.
- **E** - Environmental cleanliness.

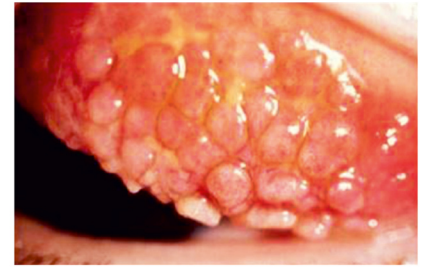
Q11.13: What is the treatment for trachoma in children aged (1-9yrs) and when is it indicated?

Answer: If prevalence of trachoma follicles observed in 1-9 years of age is more than 10% for children, then Azithromycin is the TOC.

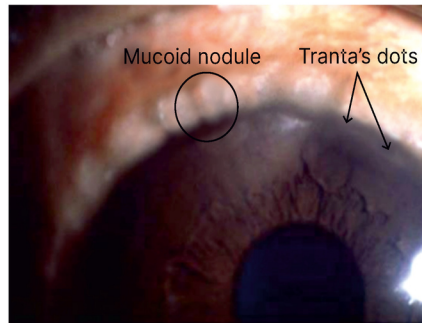
Q11.14: What is Vernal Keratoconjunctivitis? Describe its characteristic appearance and the type of hypersensitivity reaction involved.

Answer:

- Also called **Spring Catarrh**.
- It has a **cobblestone appearance**.



- It is a **Type 1 hypersensitivity reaction** to exogenous allergens (dust and pollen).
- When papillary hyperplasia is at the upper limbus, there are central dots known as **Horner Trantas spots**, which are Eosinophils.



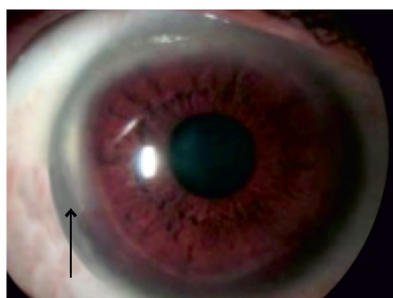
Q11.15: What is an important association of vernal keratoconjunctivitis?

Answer: It can also be associated with **Keratoconus**.

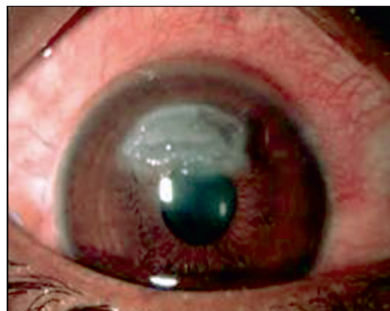
Q11.16: What are the characteristic corneal and conjunctival signs seen in vernal keratoconjunctivitis?

Answer:

- There is corneal involvement.
- It is known as **Pseudogerontoxon** (pseudo because gerontoxon is another name for arcus senile, which it resembles).
- Cupid's Bow refers to the shape of the limbal papillae



- Ashield ulcer



Q11.17: What is the "Maxwell-Lyon Sign"?

Answer: The **Maxwell-Lyon sign** refers to the presence of a **pseudomembrane** overlying the **papilla** on the conjunctiva, seen in vernal keratoconjunctivitis.



Q11.18: What is phlyctenular keratoconjunctivitis, what immune mechanisms are involved?

Answer:

- It is an allergy towards **endogenous antigens** (Staph aureus and TB).
- It is a **Type IV hypersensitivity reaction**.
- When there is corneal involvement, these Phlyctens may lead to an ulcer formation called **Fascicular ulcer**, which may further extend into a ring ulcer.



Q11.19: What is "Xerophthalmia," and what nutritional deficiency causes it, ?

Answer: Xerophthalmia is a condition caused by **Vitamin A deficiency**.

Q11.20: List the WHO Grading of Xerophthalmia stages, including primary and secondary signs.

Answer:

- **XN:** Nyctalopia (Night blindness).
- **XIA:** Conjunctival xerosis.
- **XIB:** Bitot spot (most common temporally).

? PYQ: FMGE 2020,2021

? PYQ: NEET PG 2019,2022



- **XII:** Corneal xerosis.
- **XIIIA:** Melting of the cornea (Keratomalacia involving 1/3rd of the cornea).



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- **XIIIB:** Keratomalacia involving more than 1/3rd of the cornea.
- **XS:** Corneal scarring.
- **XF:** Xerophthalmic fundus (white spotted fundus).

Q11.21: Describe the primary and secondary signs of xerophthalmia

Answer:

Primary	Secondary
• XI: A,B • XII • XIII: A,B	• XN • XS • XF

Q11.22: What is the standard treatment for Vitamin A deficiency based on age?

Answer:

- Patients > 1 year old, injectable vitamin A 1 lakh IU is given on 0, 1, and 14 days.
- Patients < 1 year, half the dose is given.

Q11.23: What is the cause of nyctalopia?

Answer:

- Oguchi's disease
 - o Congenital stationary night blindness with a pale fundus.



Q11.24: What is Mizou's phenomenon?

Answer:

- **Mizou's phenomenon** occurs when a patient with Oguchi's is asked to sit in the dark for 1 hour.
- After 1 hour, there is no night blindness, and the fundus appears normal.
- This happens due to the overstimulation of rods, and everything reverses after prolonged dark adaptation.



2. OPHTHALMOLOGY PART-2

BIG QUESTION 1: What is pterygium, how does it present, and what are the management options available?

Broad Answer: Pterygium is a fibrovascular growth caused by elastotic degeneration of conjunctival stroma, usually due to UV-B exposure. It presents nasally and can lead to astigmatism or vision loss if it progresses. Treatment is surgical, with autografting being preferred to prevent recurrence.

DETAILED QUESTIONS

Q1.1: What is the pathology and typical location of pterygium?

Answer:

🔍 PYQ: NEET PG 2019 🔍 PYQ: INICET 2022 🔍 PYQ: FMGE 2020

- Pterygium is a connective tissue disorder.
- Pathology: Elastotic degeneration of conjunctival stroma.
- Most commonly presentation: Nasally.

Q1.2: What are the clinical features of pterygium?

Answer:

- It is a subconjunctival fibrovascular triangular tissue encroaching on the cornea.
- Has 3 parts: Head, cap (cellular infiltration), and body.
- Initially, it is a cosmetic problem, but in later stages of life, it may lead to astigmatism.
- If it covers the pupillary area, it may cause diminished vision.



Q1.3: What is the exact cause of pterygium?

Answer:

- It is mainly seen in tropical countries.
- The exact cause: Exposure to UV-B rays.

Q1.4: What are the treatment options for pterygium?

Answer:

- Excision: Bare sclera technique (has a high rate of recurrence).
- Methods to prevent the recurrence: Mitomycin-C and Autografting.
 - Disadvantage of Mitomycin-C: Scleral necrosis.
- Treatment of choice: Autografting.

Q1.5: What is the perfect surgery in pterygium treatment?

Answer:

- **PERFECT surgery:** Pterygium Extended Resection Followed by Extended Conjunctiva Transplantation.
- Pterygium is removed from the large area of the sclera, and an extended piece of graft is cut from the same eye (superior temporal).

Q1.6: How to differentiate pterygium from pseudo-ptyerygium?

Answer:

- Glass Rod Test: The glass rod test will not pass through the pterygium, whereas in pseudopterygium it will can.

BIG QUESTION 2: What are the layers affected, diagnostic methods, and treatment options for Dry Eye?

Broad Answer: Dry eye involves deficiency or dysfunction of the tear film layers: mucin, aqueous, and lipid. It is diagnosed using tests like Schirmer's, Phenol Red Thread, BUT, and Rose Bengal staining. Management involves lubricants like carboxymethyl cellulose and tear osmolarity monitoring.

DETAILED QUESTIONS

Q2.1: What are the layers of the tear film, and their sources?

Answer:

- The lowermost layer is the mucin layer, then the aqueous layer (thickest layer), and lastly the lipid layer.
- The aqueous layer is made by the lacrimal and accessory lacrimal glands.
- The lipid layer is made by the Meibomian gland, and the mucin layer is made by the goblet cells of the conjunctiva.

Q2.2: What is the function of the lipid layer?

Answer:

- Lipid layer prevents evaporation of the tear.

Q2.3: What is Schirmer's test, and how is it performed?

Answer:

- In conjunctivitis, a dry eye test (Schirmer's test) is performed on Whatman Paper 41.
- The tear strip is put on the lower lid for five minutes, and then the reading is taken.
- Normally, reading should be at least 15mm, and < 5 mm indicates severe dry eye.



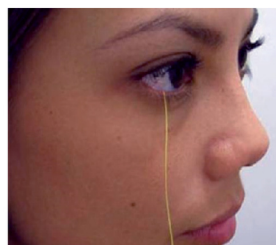
Q2.4: Where are the maximum goblet cells found?

Answer:

- Goblet cells are found most frequently in the inferonasal quadrant.

Q2.5: What is the phenol red thread test, and how is it done?

Answer:



Phenol Red Thread Test:

- A quicker test.
- A phenol-coated thread (reddish-brown) is placed in the eye for 15 seconds; color change occurs due to pH. A reading < 9 mm indicates severe dry eye.

Q2.6: What is the Break-up time test (BUT), and how is it interpreted?

Answer:

- After the last blink, the patient stares, and the number of seconds is calculated when the first dry spot appears on the cornea.
- Reading < 10 seconds in BUT indicates dry eye.

Q2.7: What is the Rose Bengal test?

Answer:

- Rose Bengal test is another test for dry eye (stain is shown in the eye).



Rose Bengal Stain

Q2.8: What is the treatment for dry eye?

Answer:

- Lubricating eye drops (carboxymethyl cellulose).
- Different concentrations of carboxymethyl cellulose can be used, like hyaluronic acid.

Q2.9: What is the role of the tear osmolarity test?

Answer:

- Tear osmolarity measurement is an important biomarker for detecting dry eye.

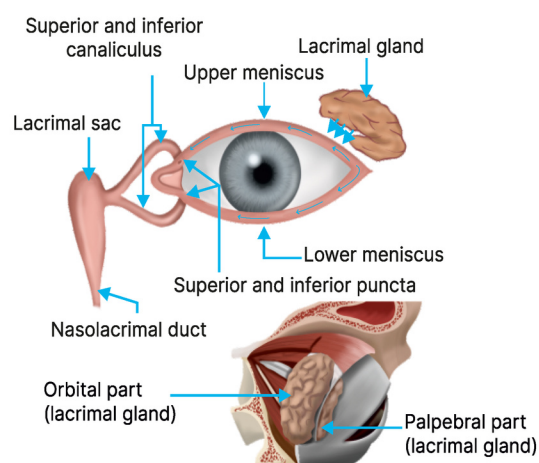
BIG QUESTION 3: What is the anatomy, function, disorders, and diagnostic approach related to the lacrimal drainage system?

Broad Answer: The lacrimal drainage system channels tears from the eye surface into the nasal cavity via a defined anatomical path. Disorders like lacrimal obstruction cause watering (epiphora) or discharge due to stagnation. Investigations include the regurgitation test, syringing, and imaging, like dacryoscintigraphy.

DETAILED QUESTIONS

Q3.1: What is the anatomical pathway of tear drainage?

Answer:



A tear that is formed by the lacrimal gland passes to the upper and lower menisci



Then it passes through the inferior and superior puncta



YOURWISH

Then, passes to the superior-inferior canaliculus that forms the common canaliculi



Finally, passes through the lacrimal sac and nasolacrimal duct

Q3.2: Nasolacrimal gland opens into?

Answer:

- Inferior meatus of the nose.

Q3.3: Where is the inferior meatus present?

Answer:

- Anteriorly.

Q3.4: What is the alignment of the upper and lower puncta?

Answer:

- The upper puncta is medial to the lower puncta.

Q3.5: What are the types of watering of the eyes?

Answer:

- Watering is of two types:
 - o Lacrimation: Hypersecretion
 - o Overflow: Epiphora
- When there is a problem in the drainage system, it will either cause epiphora or discharge.
- Because of stagnancy, there will be a discharge of water in the eyes.

Q3.6: How is the Regurgitation test used to evaluate lacrimal drainage?

Answer:

- In the Regurgitation test, the medial canthus of the eye is pressed to determine whether there is any regurgitation, which is an indication of blockage.

Q3.7: What is the slit lamp finding seen in the overflow of the eyes?

Answer:

- On the slit lamp examination in a patient presenting with watery eyes, if the meniscus height is too high, it indicates it there is an overflow, and the problem is in the drainage.

Q3.8: What is syringing?

Answer:

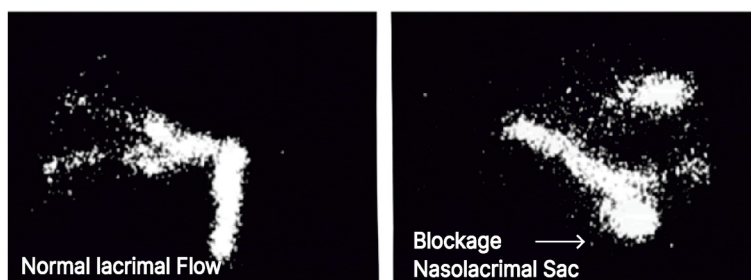
- On examination, if the examiner gets a hard stop, it indicates there is no problem in the upper lacrimal passage.
- On examination, if the examiner gets a soft stop, it indicates a problem in the upper lacrimal passage.
- In the hard stop, fluid is injected. Once the fluid is injected, two things can happen:
 - o If it is patent, fluid will reach inside the mouth of a patient, and the patient can taste it.
 - o If the patient has epiphora and water reaches inside the mouth, it indicates he may have some punctal problems like punctal stenosis or partial obstruction, or pump failure.
- Two tests can be performed to diagnose it: Dacryoscintigraphy and John Titus test.

Q3.9: What is Dacryoscintigraphy?

PYQ: FMGE 2021

PYQ: NEET PG 2022

PYQ: INICET 2023

Answer:

- It is a simple, non-invasive, and physiological assessment of the nasolacrimal system.
- Dacryoscintigraphy uses the radioactive labelling of tears and follows it with a γ -counter.

Q3.10: What is the treatment strategy to diagnose the lacrimal pump failure?**Answer:**

- Dacryoscintigraphy

Q3.11: What is the treatment strategy to diagnose the lacrimal drainage system?**Answer:**

- John Titus test

BIG QUESTION 4: What is dacryocystitis, and how are its types managed?

Broad Answer: Dacryocystitis is the inflammation of the lacrimal sac and can be congenital or acquired. It presents with epiphora or discharge and may lead to complications like lacrimal fistula or fibrosis. Treatment varies by age and severity, including massage, probing, DCR, or laser procedures.

DETAILED QUESTIONS**Q4.1: What is dacryocystitis?****Answer:**

- Inflammation of the lacrimal sac

PYQ: FMGE 2020,2021,2023

Q4.2: What are the types of dacryocystitis and how does it present?**Answer:**

- It can be classified into:
 - Congenital
 - Acquired
- In any type of Dacryocystitis, the patient will ultimately present with epiphora or discharge.

**Q4.3: What is the treatment approach in congenital dacryocystitis?****Answer:**

- In a child < 9 months- massaging produces the best results for the treatment.
- After nine months- Probing (Best option for probing is within 18 months)
- Probing: The steel bombing probes that push through the sac to the pathway.
- The last option after 4 years of age is Dacryocystorhinostomy (DCR), which works by connecting the sac with the nose.

Q4.4: Where is the opening made in DCR?**Answer:**

- Medial meatus

Q4.5: What is the direction of the probe?**Answer:**

- In the nose's direction (downward, more laterally, and backward).

Q4.6: What are the features and complications of acute dacryocystitis?**Answer:**

- In Acute Dacryocystitis, the area around the tear sac is painful, red, swollen, and oozes pus.
- Sequelae → Lacrimal fistula

**Q4.7: What is the treatment for lacrimal fistula?****Answer:**

- Dacryocystorhinostomy (DCR)

Q4.8: Which is the most common organism for the pathogenesis of lacrimal fistula?**Answer:**

- Staphylococcus aureus

Q4.9: What happens in chronic dacryocystitis?**Answer:**

- Mucocele → Pyocele → Lacrimal fibrosis.
- In lacrimal fibrosis, the two walls of the sac adhere to each other.

**Q4.10: What is the treatment for Chronic Dacryocystitis?****Answer:**

- Dacryocystorhinostomy (DCR)

Q4.11: Chronic Dacryocystitis is more common in?**Answer:**

- Females

Q4.12: The most common organism for pathogenesis is?**Answer:**

- Staphylococcus aureus

Q4.13: What is the treatment of choice for lacrimal fibrosis?**Answer:**

- Dacryocystectomy

Q4.14: Identify the procedure performed in the image below.

Answer:



- Transcatheter Laser DCR

BIG QUESTION 5: What are the types, clinical features, complications, and treatment options for uveitis?

Broad Answer: Uveitis is the inflammation of the uveal tissue and can be anterior or intermediate. It presents with keratic precipitates, aqueous cells, and complications like synechiae and glaucoma. Treatment includes topical or systemic steroids, cycloplegics, and, in some cases, vitrectomy.

DETAILED QUESTIONS

Q5.1: What is uveitis?

Answer:

- Uveitis is an inflammation of the uveal tissue.

Q5.2: What are the types of anterior uveitis?, and their characteristic keratin precipitates?

PYQ: FMGE 2020

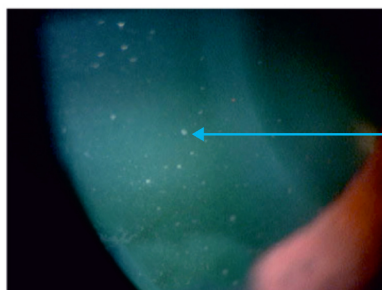
Answer:

- Non-granulomatous
- Granulomatous

Q5.3: What is the characteristic keratin precipitates seen in non-granulomatous uveitis?

Answer:

- **Non-granulomatous uveitis** will be associated with fine Keratin precipitates (these are the deposits at the back/lower part of the cornea).

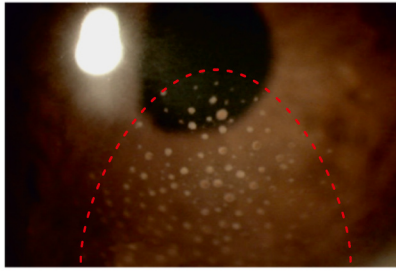


Keratic
Precipitates

Q5.4: What is the characteristic keratin precipitates seen in granulomatous uveitis?

Answer:

- In **granulomatous uveitis**, keratic mutton fat precipitates (KPs) are seen, and are found maximum in the imaginary triangular area of the eyes called Arlt's triangle.



Mutton Fat Keratic precipitates

Q5.5: Why are keratin proteins always present at the lower cornea?

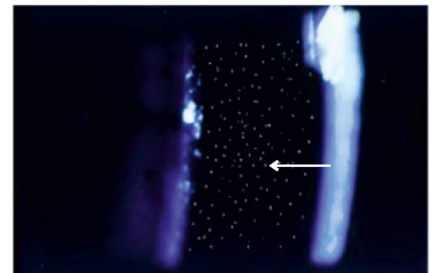
Answer:

- Due to the convection current of aqueous humour.

Q5.6: What are the key signs of active inflammation in anterior uveitis?

Answer:

- Presence of Aqueous cells are a sign of active inflammation.
- These cells can come to the iris, and the pupil is always miotic, called a muddy iris.
- In non-granulomatous, Koeppe nodules can be seen.
- In granulomatous, Bussaca nodules can be seen.



Aqueous cells

Q5.7: What are the consequences of the active inflammation?

Answer:

- If the aqueous cells adhere to the lens, it's called posterior synechiae
- If these cells cover all around the aqueous humor, it's called ring synechia.
- This ring synechiae prevents the flow of aqueous humour into the anterior chamber.
- If aqueous collects here, it moves the iris forward and then adheres to the cornea, leading to peripheral anterior synechiae (PAS).
- PAS causes angle-closure glaucoma.
- When everything fills, it is called occlusion pupillae.

Q5.8: What are the signs of active inflammation?

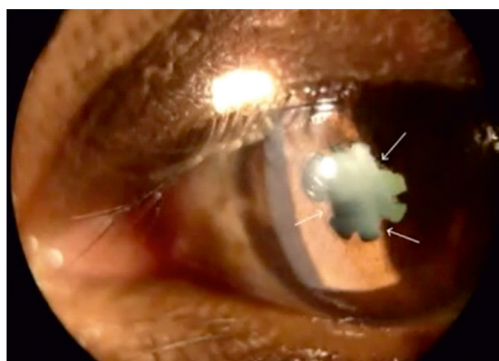
Answer:

- Presence of Aqueous cells

Q5.9: At which point do the aqueous cells adhere or not move?

Answer:

- Festoon shape pupil



Q5.10: What is the treatment of choice for anterior uveitis?**Answer:**

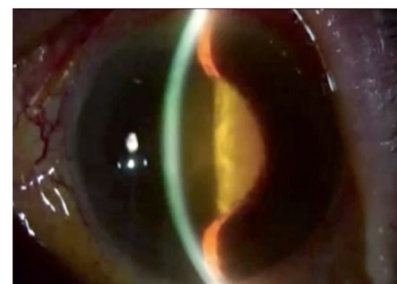
- Topical steroids and Topical cycloplegic
- Topical cycloplegic relaxes the muscles by relieving the ciliary spasm and preventing posterior synechiae.

Q5.11: What is the Luminate program?**Answer:**

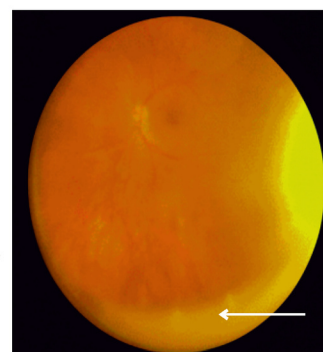
- The Luminate program assesses the safety and efficacy of voclosporin for the treatment of all forms of uveitis.

Q5.12: Identify the image given below?**Answer:**

- Iris Bombe
 - o Leads to angle closure

**Q5.13: What are the features of Intermediate Uveitis?****Answer:**

- Also known as PARS Planitis
- It is the inflammation of the vitreous, pars plana, and peripheral retina.
- In the thalamus cocci, magnification is very low.
- In the periphery, snow banking (deposition of inflammatory cells) is seen.
- 70-75% is idiopathic intermediate uveitis.
- In the surroundings of the Pars plana (retrolental flare), inflammatory cells are found.
- Some inflammatory exudates float in the vitreous, called snowballs and some Kps.

**Q5.14: What are the treatment options for intermediate uveitis?****Answer:**

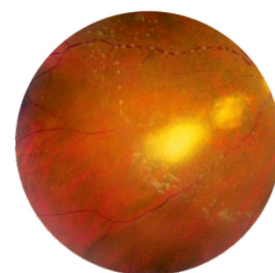
- Local steroids
- Systemic steroids
- Immunosuppressive therapy
- Pars plana vitrectomy
 - o Aim - remove inflammatory exudates.

BIG QUESTION 6: What are the special types and syndromes associated with uveitis, and how do they present?

Broad Answer: Special types of uveitis include systemic granulomatous and infectious conditions like sarcoidosis, CMV retinitis, and toxoplasmosis. Autoimmune responses may lead to conditions like sympathetic ophthalmitis and VKH syndrome. Each type has distinct features like candle wax drippings, heterochromia, headlight-in-fog, and Dalen-Fuchs nodules.

DETAILED QUESTIONS**Q6.1: What are the ocular features of sarcoidosis-related uveitis?****Answer:**

- Sarcoidosis can occur in any part of the body, like the lungs, lymph nodes, and skin.



- The granulomatous inflammation of uveitis can affect any part of the eye and can progress to severe visual impairment.
- It causes sarcoid nodules on the sclera and episclera.
- It can also cause interstitial keratitis and leading to band-shaped keratopathy in the cornea.
- Behind the cornea, it leads to grains in the uveal tissue called granulomatous panuveitis.

Q6.2: What are the characteristic features of granulomatous panuveitis?

Answer:

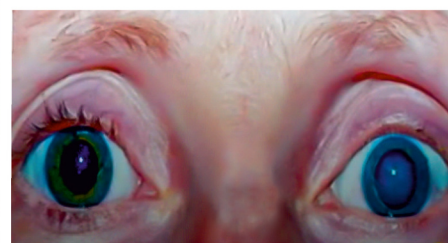
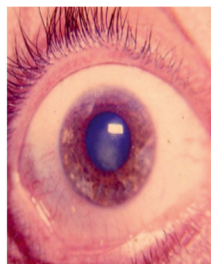
- Characteristic features of granulomatous panuveitis:
 - If it is posterior uveitis, venous is mainly involved, called peri-phlebitis, shown as sheathing.
 - This sheathing is very thick and appears as candle wax, called candle wax drippings.

Q6.3: Describe the clinical features and significance of Fuchs' heterochromic iridocyclitis (FHI).

Answer:

Fuchs' Heterochromic Iridocyclitis (FHI):

- Indicates difference in iris colour
- Atypical chronic anterior uveitis (no pain or redness).
- Usually **unilateral**.
- **Iris findings:**
 - Hypochromic (lighter) iris in the affected eye.
 - Patchy iris atrophy.
 - No posterior synechiae.
- **Lens:** Posterior subcapsular cataract common.
- **Cornea:** Stellate (star-shaped) keratic precipitates (Kps).
- **Etiology:** Viral infection, commonly herpes.



Q6.4: What is Amsler sign?

Answer:

- Exposed iris blood vessels can be seen in Fuchs' Heterochromic Iridocyclitis, which is responsible for the Amsler sign.
- Amsler sign is described as the presence of blood in the aspirated aqueous fluid and is caused due to iris atrophy usually seen in FHI.

Q6.5: What is the complication of FHI?

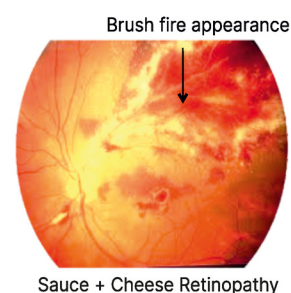
Answer:

- Complicated cataract (particularly posterior subcapsular cataract) and secondary glaucoma

Q6.6: What are the features of CMV retinitis?

Answer:

- Cytomegalovirus Retinitis causes hemorrhage and necrosis.
- It looks like a margarita pizza.
- This picture indicates sauce and cheese retinopathy.

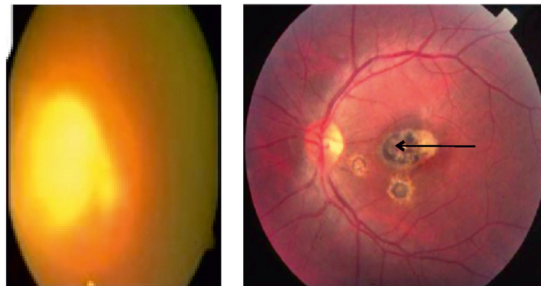


Q6.7: What is the most common opportunistic infection in HIV?**Answer:**

- CMV retinitis

Q6.8: What is the most common feature of HIV?**Answer:**

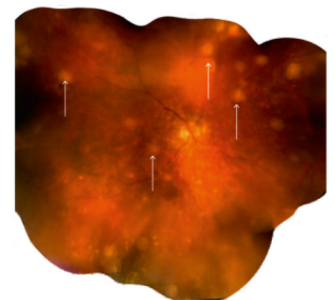
- Microangiopathy, microscopic examination reveals cotton wool spots.

Q6.9: Headlight in fog appearance is a characteristic finding in which condition?**Answer:**

- Foggy lesions (intense vitritis); lesions look like fog, which is the characteristic feature of toxoplasmosis and the most common cause of anterior or posterior uveitis.
- When it heals, it leads to punched-out pigmented lesions, especially in the macula area, and vision goes down.

Q6.10: What is sympathetic ophthalmitis?**Answer:**

- Sympathetic Ophthalmitis (SO) is a rare, diffuse granulomatous uveitis characterised by Dalen-Fuchs (DF) nodules.
- It is a perforated injury in one eye, causing uveitis in the other eye due to an autoimmune reaction.
- More towards the uveal antigen- Retinal-S antigen is present in pigmented tissue.

**Q6.11: What is the time duration of SO?****Answer:**

- Never before 2 weeks because it is an autoimmune reaction, and it will take time to occur.

Q6.12: What type of uveitis is SO?**Answer:**

- Granulomatous Panuveitis.

Q6.13: Where are the nodules present?**Answer:**

- These nodules are present between Bruch's membrane and retina.

Q6.14: What is the first sign of SO?**Answer:**

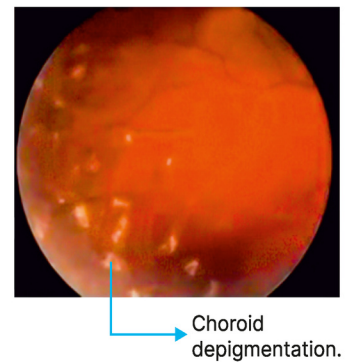
- Aretrolental flare is the first sign; difficulty in near vision is the first symptom.

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Q6.15: What are the features of VKH Syndrome?**Answer:**

- It is a granulomatous panuveitis.
- Systemic features associated with VKH syndrome
 - o Encephalitis
 - o Vestibular dysfunction - tinnitus
 - o Alopecia
 - o Poliosis (greyish eyelashes)
 - o Choroid and Fundus depigmentation.
 - This depigmentation appears as a sunset glow in patients with VKH syndrome.
- Sugiura's sign: Perilimbal depigmentation

SUNSET GLOW FUNDUS

**BIG QUESTION 7: How are optic nerve disorders diagnosed and classified based on anatomical, functional, and visual signs?**

Broad Answer: Optic nerve disorders are assessed by evaluating visual acuity, pupillary reactions (RAPD), and field defects. The most common first sign is a relative afferent pupillary defect (RAPD), diagnosed using the swinging flashlight test. Various scotomas and vision deficits help in localizing the cause, such as glaucoma, ischemia, or toxic injury.

DETAILED QUESTIONS**Q7.1: What is the length of the optic nerve?****Answer:**

- 3.5 to 5 cm

Q7.2: Which is the longest part of the optic nerve?**Answer:**

- Intraorbital part

Q7.3: What is the length of the intraorbital part?**Answer:**

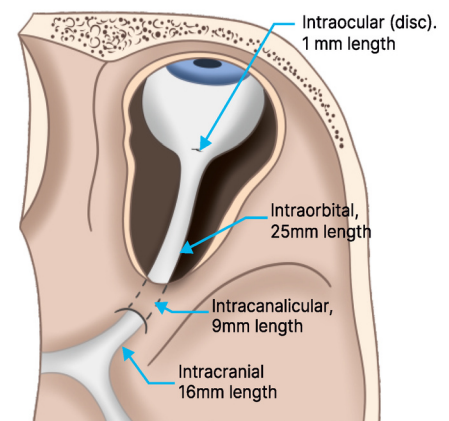
- 25-30 mm long

Q7.4: What is the first sign of optic nerve disease?**Answer:**

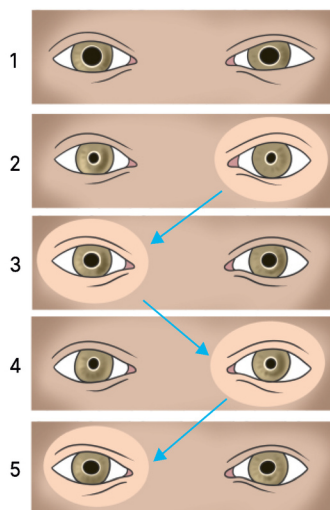
- Relative afferent pupillary defect (RAPD)

Q7.5: How is RAPD (Relative afferent pupillary defect) diagnosed?**Answer:**

- It can be diagnosed by swinging a torch between both eyes over and over.
- When the doctor first shines light into the eye, it causes constriction again and again, but after so many attempts, suddenly, it causes dilatation instead of constriction in one of the eyes, which is abnormal.
- Marcus Gunn pupil- another name for RAPD.
- Diagnostic test- Swinging flashlight test.



🔍 PYQ: INICET 2019 🔍 PYQ: FMGE 2021



Marcus Gunn pupil

- When the torchlight moves from the left eye to the right eye, nothing will happen to the pupil.
- When it goes back to the lens, each pupil constricts, which affects the right eye, called the Swinging flashlight test.

Q7.6: Why does the pain occur on eye elevation when there is retrobulbar neuritis?

Answer:

- The superior rectus muscle is contracted while the eyes are up, which pulls the nerve and causes pain in retrobulbar neuritis.



Central Scotoma

Centrocecal Scotoma

Nerve Fiber Defect
(Bjerrum Scotoma)

Sector Defect

Altitudinal Defect

Q7.7: What can be the field effects when the nerve is involved?

Answer:

- Central scotoma
 - **Note:** When the scotoma joins the blind spot and macula, it is called the centrocecal scotoma.

Q7.8: What is the main cause of centrocecal scotoma?

Answer:

- Tobacco, due to the presence of cyanide in it, destroys the optic nerve and is called tobacco amblyopia.

Q7.9: Nerve fibre defect (Bjerrum Scotoma) can be seen in?

Answer:

- Glaucoma

Q7.10: Altitudinal defect is the key feature of?

Answer:

- Anti-ischemic optic neuropathy (AION)

Q7.11: How does the patient present with an optic nerve disorder?

Answer:

- Decreased visual acuity.
- Visual field defect.
- Relative afferent pupillary defect (first sign)
- Decrease in a red-green color called Dyschromatopsia (Exception: Glaucoma).
- Decrease in brightness.

Q7.12: What is a total afferent pupillary defect?

Answer:

- When there is total atrophy and no reaction at all, this is the feature of optic atrophy.

BIG QUESTION 8: How can different types of optic neuropathies be distinguished based on clinical features, visual field changes, fundoscopic findings, and underlying etiology?

Broad Answer: Optic neuropathies refer to disorders affecting the optic nerve, presenting with vision loss, field defects, and fundoscopic changes. They can result from inflammation, ischemia, raised intracranial pressure, or genetic mutations. Differentiating them depends on clinical signs like RAPD, disc appearance, pain, and systemic associations.

DETAILED QUESTIONS

Q8.1: What is papillitis, and its characteristic features?

Answer:

- Inflammation of the optic nerve head is called "Papillitis" or "Intraocular Optic Neuritis".
- Blurring of disc margins due to mild edema is characteristic of Papillitis.
- If the leakage occurs at the macula called neuroretinitis.
- Hard exudates can be seen on the macula, called a macular star.
- When the fundus is normal, it's called Retrobulbar neuritis.

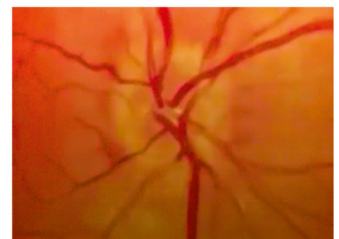


Q8.2: What are the features of Papilledema?

Answer:

- Blurring of the disc margin and dilatation of the veins.
- Papilledema → any edema around the disc
- **Visual field defect:** Enlargement of the blind spot or edema around the optic disc and constriction of the visual field because of the damage to the optic nerve.
- **First sign of papilledema:** Venous dilatation
- There is an imbalance of pressure; either the preliminary pressure is less, or the retrolaminar pressure (intraocular area) is more.
- Disturbance in the gradient causing stasis of axoplasmic flow, → Drainage stasis, in turn, causes leakage and causes papilledema.

PYQ: FMGE 2021, 2022



Q8.3: What are the types of Anterior Ischemic Optic Neuropathy (AION)?

Answer:

- Anterior ischemic optic neuropathy is generally categorised into

- o Arteritic AION (or AAION)
- o Non-arteritic AION (NAION)

Q8.4: What are the causes of Arteritic AION (or AAION)?

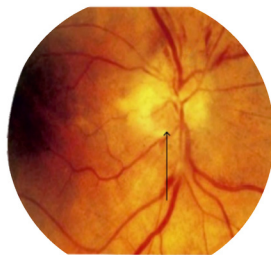
Answer:

- Arteritic AION (or AAION) occurs due to
 - o Giant cell arteritis (GCA)
 - o Inflammatory disease of the arteries.

Q8.5: How does Arteritic AION clinically present?

Answer:

Anterior ischemic optic neuropathy (AION)



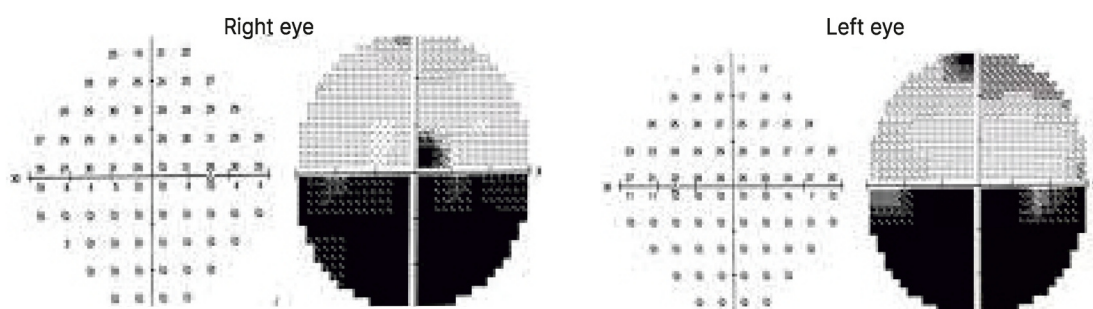
A superior and inferior segments of the margins of the optic disk are obscured (arrows) due to edema. This is a typical morphologic sign of AION.

- Presents as a sudden, painful diminution of vision
- Altitudinal field effect, RAPD is seen.
- Blurring of the disc margin.
- Amaurosis: Transient loss of vision in a curtain-like manner.
- It is caused by to blockage of the Short Posterior Ciliary Artery
- Other causes of amaurosis are carotid arteritis diseases, uraemia, central retinal artery occlusion, and some effects on the visual cortical cell.

Q8.6: What are the clinical features of NAION?

Answer:

- The patient generally complains of early morning slight diminishing vision after waking up because of nocturnal hypotension.
- The altitudinal field effect is more associated with (NAION).
- It is sudden, slightly diminished vision, and it is painless.
- RAPD is seen, decreases color, and decreases brightness.
- Blurring of the disc margin
- It is caused by to blockage of the Short Posterior Ciliary Artery



YOURWISH

Q8.7: What is Foster Kennedy and Pseudo-Foster Kennedy Syndrome?**Answer:**

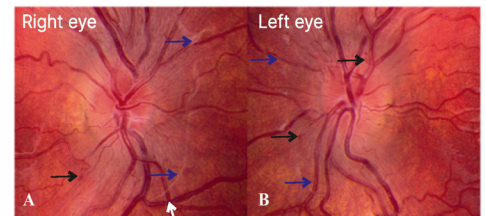
- Foster Kennedy is due to an olfactory groove tumor of the frontal lobe.
- Pseudo-foster due to non-arteritic AION.

Q8.8: What is the treatment for GCA?**Answer:**

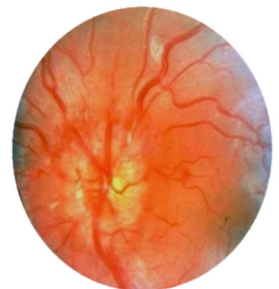
- Treatment of choice: Steroids (methylprednisolone).
- Patients with acute visual changes from GCA can be started on intravenous (IV) methylprednisolone, and then an oral dose can be used.
- Methylprednisolone is used in NAION to control vasogenic Edema.

Q8.9: What are the characteristic features of Leber's Hereditary Optic Neuropathy?**Answer:**

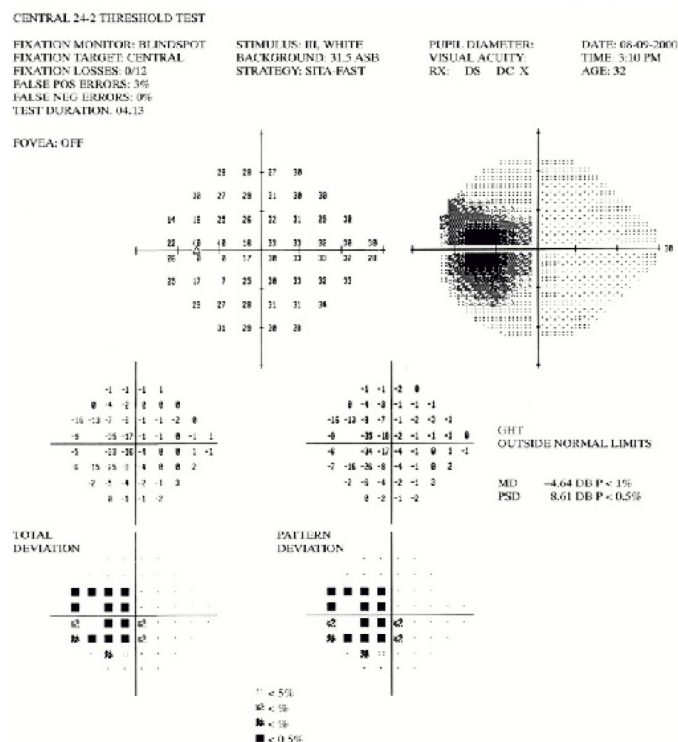
- Blue arrows indicate Pseudoedema and black arrows indicate telangiectatic vessels.
- A mutation is found in Maternal mitochondrial DNA.
- It is a genetically controlled disorder; hence cannot be stopped.
- There is neuritis in one eye and slow atrophy in the other eye.
- Pupillary reactions are normal, and no APD.
- No definitive treatment

**Q8.10: Identify the condition from the given image.****Answer:**

- Dilatation of the vein and blurring of the disc margin are the features of papilledema.



Papilledema

Q8.11: What is the finding seen in the given image?**Answer:**

- This diagram shows the enlargement of the blind spot.
- Causes of enlargement of the blind spot are papilledema, myelinated nerve fibre, and optic disc edema.

BIG QUESTION 9: What are the different types of optic atrophy, and how are they differentiated based on the disc appearance and associated causes?

Broad Answer: Optic atrophy refers to the degeneration of the optic nerve leading to vision loss, and it can be classified into several types based on fundoscopic findings, disc color, and margin appearance. Each type is associated with specific underlying etiologies such as demyelinating diseases, infections, trauma, nutritional deficiencies, or retinal pathologies.

DETAILED QUESTIONS

Q9.1: What are the types of optic atrophy?

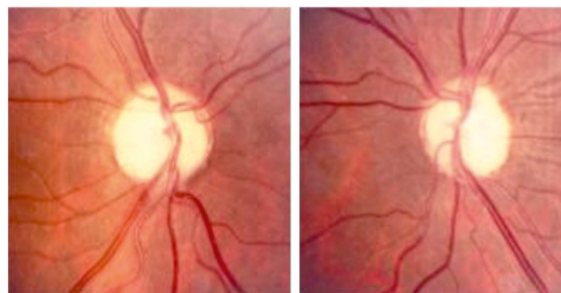
Answer:

- Types of Optic Atrophy
 - o Primary Optic Atrophy
 - o Secondary Optic Atrophy
 - o Consecutive Optic Atrophy

Q9.2: What are the key features of primary optic atrophy?

Answer:

- Clear disc margin
- Color: chalky white.



Q9.3: Elaborate on the causes of primary optic atrophy.

Answer:

- Multiple sclerosis
- Neurosyphilis
- Traumatic avulsion of the disc
- Hereditary optic neuropathy
- Toxic/ nutritional neuropathy

Q9.4: What are the features of Secondary Optic Atrophy?

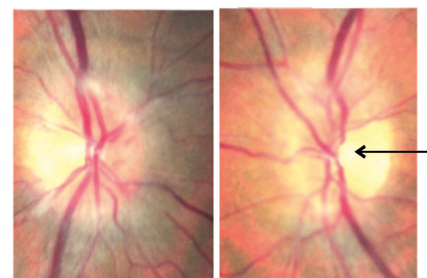
Answer:

- Blurred disc margin and dirty white colour, which indicates temporal pallor.

Q9.5: What are the causes of Secondary Optic Atrophy?

Answer:

- The cause can be any optic nerve disease (after papillitis and papilledema)



Q9.6: What are the fundus findings of Consecutive Optic Atrophy?

Answer:

- Pale waxy discs
- Clear margins

Q9.7: What retinal disease is associated with Consecutive Optic Atrophy?

Answer:

- Retinitis pigmentosa.
- Triad:
 - o Bony spicules
 - o Attenuated arteries
 - o Pale waxy disc

Q9.8: What is the disc appearance in Glaucomatous Optic Atrophy?

Answer:

- Increased cupping of the optic disc due to loss of retinal ganglion cells.
- The disc appears pale with a vertically enlarged cup.



Glaucomatous Optic Nerve

BIG QUESTION 10: How are normal and abnormal pupillary reflexes classified, and what do they indicate about underlying neurological or ocular conditions?

Broad Answer: Normal pupillary reflex includes both direct and consensual light responses, mediated through afferent and efferent pathways. Abnormalities in these reflexes help localize lesions to specific parts of the reflex arc, such as the pretectal area, ciliary ganglion, or sympathetic chain. Specific syndromes like Argyll Robertson pupil, Holmes Adie pupil, and Horner's syndrome illustrate these defects.

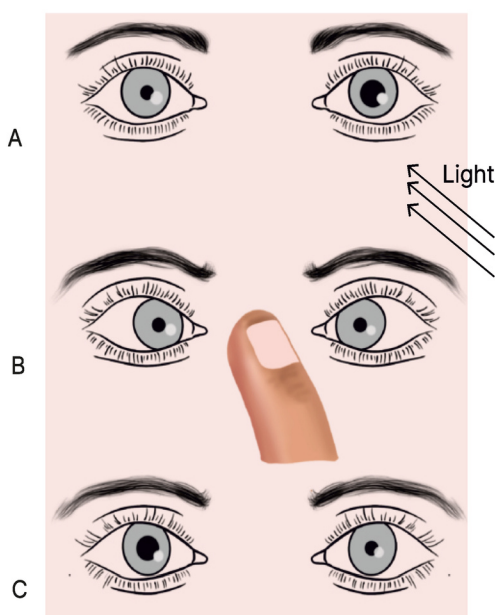
DETAILED QUESTIONS

Q10.1: What is the normal pupillary reflex, and how does it function?

Answer:

🔍 PYQ: FMGE 2021

🔍 PYQ: NEET PG 2021



- Normal action is the light reflex, which can be direct and consensual; the same eye is direct, and the other eye is consensual.
- Normally, light that is directed into one eye produces pupil constriction in both eyes. The direct response is the change in pupil size in the eye to which the light is directed (e.g., if the light is shown in the right eye, the right pupil constricts).

- A consensual light reflex occurs because even when the light is shone in only one eye, a consensual response occurs in the other eye. The Afferent is through the third nerve.

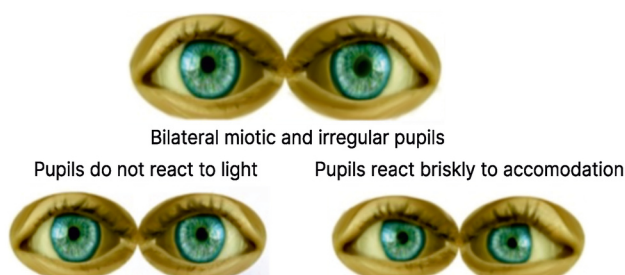
Q10.2: What happens if there is a lesion in the afferent pathways?

Answer:

? PYQ: FMGE 2020, 2021

? PYQ: NEET PG 2021

? PYQ: INICET 2020



- If there is any lesion in the afferent pathway (in the pretectal area), it results in Argyll Robertson Pupils.
- Argyll Robertson pupils (ARP) are characterized by small and irregular pupils that have little to no constriction to light but constrict briskly to near targets (light-near dissociation).
- In other words, light reflexes are absent and near reflexes are present, and the accommodation reflex is present in light-near dissociation.
- This term (ARP) is mainly used for neurosyphilis; otherwise, it is called light near dissociation.

Q10.3: What happens when the efferent pathway is affected, and how does the Holmes-Adie pupil present?

Answer:

- When the lesion is found in the efferent pathway, the ciliary ganglion is affected.
- Sluggish light reflex or little light reflex is present, and sluggish accommodation.
- Holmes-Adie pupil is a unilateral condition with a mid-dilated pupil; it is a tonic pupil because it takes time to come back to normal.
- Generally present in middle-aged females.
- If one eye is mid-dilated, then there is a chance of photophobia.

Q10.4: What is anisocoria, and how is it interpreted in light?

Answer:

- If pupil size is different, it is called anisocoria.
- If anisocoria is more prominent in light, then the abnormal eye is the dilated one because light has constriction.

Q10.5: How is anisocoria diagnosed?

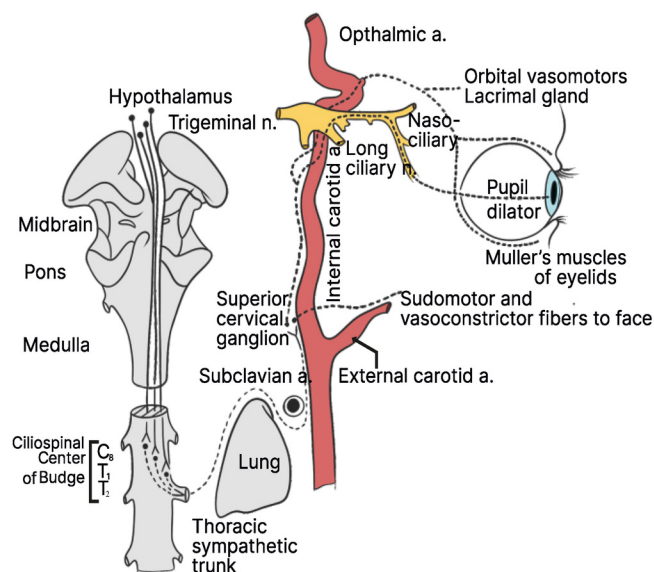
Answer:

- Once we know the abnormal eye, a slit lamp examination is done to find any sphincter damage or the cause of why it is dilated.
- If it appears normal, then pilocarpine is administered at a dose of 0.125%.
- If the pupil reacts at such a small dose and the pupil constricts, then it indicates Holmes-Adie.
- If a pupil is not constricted, then the dose of pilocarpine is increased to 1% and if the pupil is constricted at this dose, it is considered normal.
- If not constricted at this dose, it indicates that the patient has pharmacological mydriasis.

YOURWISH

Q10.6: What is the sympathetic pathway involved in Horner's Syndrome?

Answer:



Pathway: Hypothalamus → Midbrain → Pons → medulla → Cilio spinal centre of budge → apex of lungs

Q10.7: What are the causes of Horner's syndrome?

Answer:

- Horner's can be both congenital and acquired.
- One of the main causes of the Sympathetic chain lesion is a Pancoast tumour.
- Loss of pseudo-spinal reflex.
- If heterochromia iridis is present, then it is called Congenital Horner's.

Q10.8: What are the features of Horner's syndrome?

Answer:

- Features: Ptosis and Miosis
 - o Ptosis is due to Müller's muscle
 - o Miosis occurs due to the uninhibited action of the iris sphincter.

BIG QUESTION 11: What are the effects and key features of lesions at different levels of the visual pathway?

Broad Answer: Lesions in the visual pathway cause specific types of visual field defects depending on their location, from the optic nerve to the visual cortex. Each lesion has characteristic field defects such as hemianopia, quadrantanopia, or keyhole vision. The lateral geniculate body is organized into different cellular layers responsible for visual processing. Vascular or traumatic lesions at different points lead to distinct clinical signs, including macular sparing or Optokinetic Nystagmus abnormalities.

DETAILED QUESTIONS

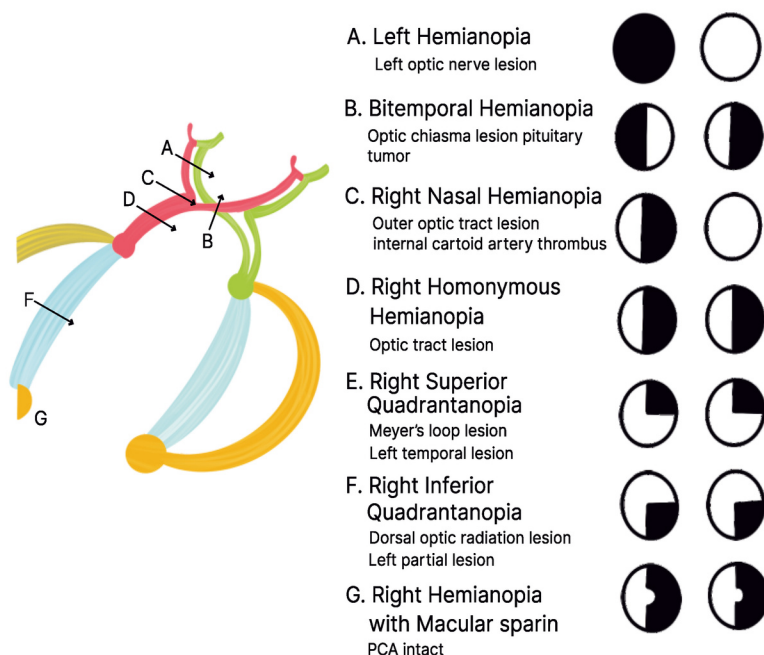
Q11.1: What are the various lesions of the visual pathway?

Answer:

🔍 PYQ: NEET PG 2021, 2023

🔍 PYQ: FMGE 2019

🔍 PYQ: INICET 2022



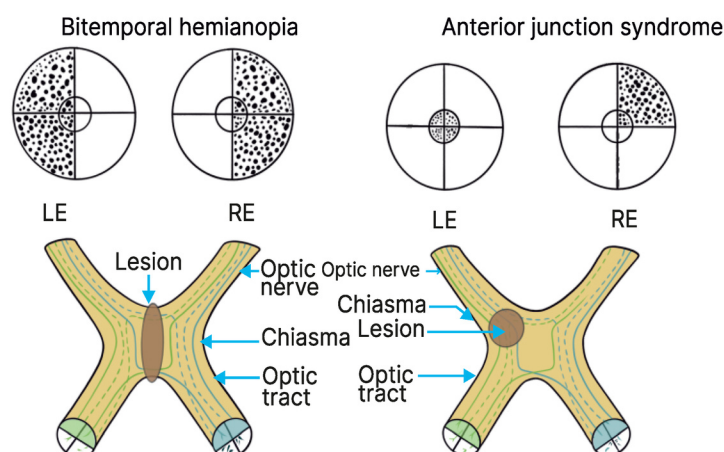
- A: indicates a lesion in the optic nerve: Left Hemianopia.
- B: indicates a lesion in the chiasma: Bitemporal Hemianopia.
- C: indicates a lesion at the junction of chiasma.
- D: indicates a lesion at the optic tract: Right-sided homonymous hemianopia.
- E: indicates a lesion at the temporal radiation fibre: Pie in the sky.
- F: indicates a lesion at the parietal radiation fibre: Pie in floor.
- G: indicates a lesion at the visual cortex: Congruous homonymous hemianopia (shows Macula sparing → Key-hole vision)
 - o Note: In keyhole vision, the lateral geniculate body is seen.

Q11.2: What are the key features of lesions near the junction of the chiasma?

PYQ: FMGE 2019

PYQ: FMGE 2021

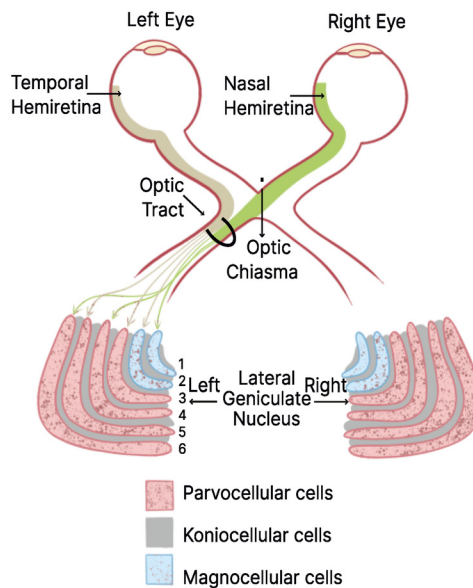
Answer:



- In the Junctional scotoma at the junction of the chiasma, some part of the nerve has gone.
- If the lesion is at the back, the inferonasal nerve fibres are involved, called Willebrand's knee.
- If inferonasal fibers are involved, a superior temporal field effect is seen due to Willebrand's effect.
- Macular heteronymous hemianopia or posterior junction syndrome is a visual field defect in which vision in either the left or right half of both eyes is absent due to a lesion in the optic chiasm.

Q11.3: What are the features of the Lateral Geniculate Body (LGB) lesions?

Answer:



- 1 and 2 in blue color represent magnocellular cells, and 3 to 6 represent parvocellular cells (responsible for colour vision).
- Magnocellular cells consist of larger cells that are responsible for gross movement and motion.
- Koniocellular cells (lamellae) are located in the koniocellular layer of the lateral geniculate nucleus (LGN) (greyish colour), responsible for the blue colour.

Q11.4: Which cells are responsible for colour vision?

Answer:

- Parvocellular cells.

Q11.5: 1,4,6 and 2,3,5 layers are responsible for which supply?

Answer:

- Layers 1, 4, and 6 (opposite side-nasal fibers) are in charge of the contralateral eye, while Layers 2, 3, and 5 (same side-temporal fibres) are in charge of the ipsilateral eye.

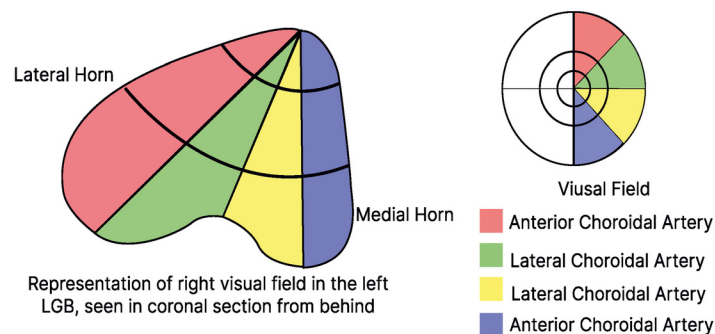
Q11.6: Where is the keyhole visual defect seen?

Answer:

- LGB lesion

Q11.7: Which vessel is involved in the keyhole visual defect?

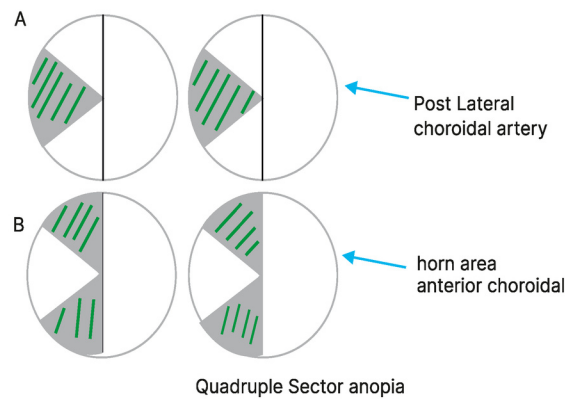
Answer:



- The posterior choroidal lateral artery is involved in the keyhole visual defect.

Q11.8: What defect is seen when the anterior choroidal artery is blocked?

Answer:



- Sectoral quadrantanopia

Q11.9: What are the effects of deep parietal lobe lesions?

Answer:

- Deep in the parietal lobe: Complete homonymous hemianopia (Congruous)
- Defective OKN: Defective pursuit towards the side of the lesion, but normal in the opposite direction
- Defective Optokinetic Nystagmus is a slow eye movement in the direction of a moving object and a rapid return of eye position in the opposite direction.
- If there is an asymmetric defect with homonymous hemianopia, then it is a parietal lobe lesion.
- If there is a symmetric defect, then it is an occipital lobe lesion.

Q11.10: What are the characteristic lesions of the temporal and the parietal lobes?

Answer:

- Temporal lobe lesions
 - o Pie-in-sky
 - o Olfactory and Gustatory hallucinations
 - o Formed visual hallucinations
- Parietal lobe lesion
 - o If the anterior part is involved, Pie floor (incongruous)
 - o Acalculia, Agraphia

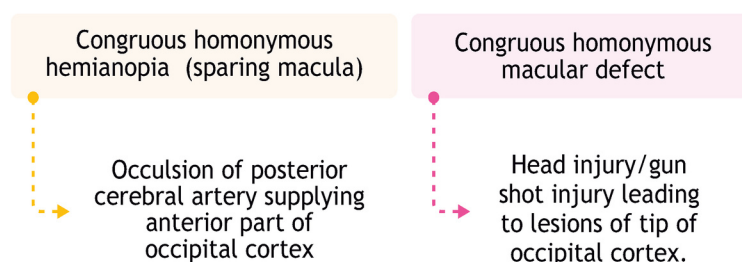
Q11.11: Defective Optokinetic Nystagmus (DON) is seen in?

Answer:

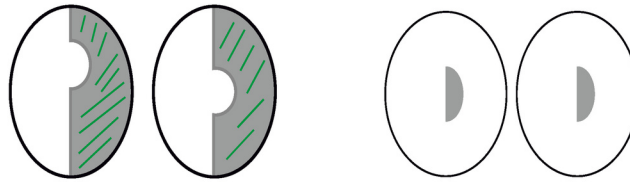
- Deep parietal lobe lesion.

Q11.12: What are the lesions of the visual cortex?

Answer:



YOURWISH



- When the posterior cerebral artery is damaged, Macular sparing hemianopia is seen.
- In radial and cortical lesions, pupillary reactions are normal because the pupillary light reflex deviates from the optic tract and then goes to the predictor.
- If the middle cerebral artery is damaged, no complete macular hemianopia.
- It is only trauma (head injury) that is going to damage the tip of the visual cortex and cause Macular homonymous hemianopia.

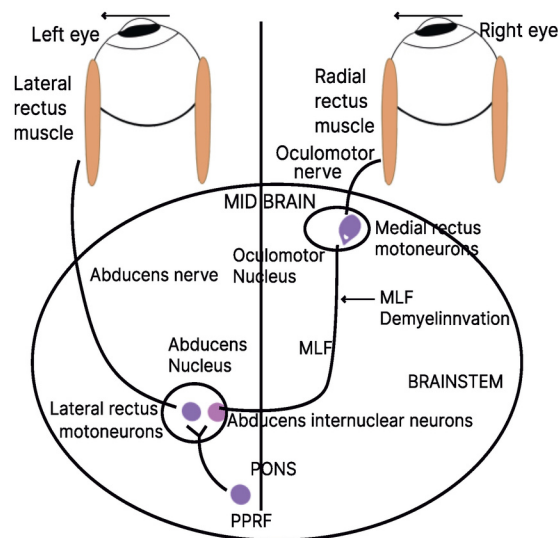
BIG QUESTION 12: How is horizontal gaze associated with neural pathways, and eye movement disorders?

Broad Answer: The horizontal gaze centre (PPRF), medial longitudinal fasciculus (MLF), and other brainstem structures coordinate horizontal eye movements, with disruptions leading to specific clinical syndromes like internuclear ophthalmoplegia. Reflexes such as the oculocephalic reflex and optokinetic nystagmus help evaluate brainstem function or malingering.

DETAILED QUESTIONS

Q12.1: What is the horizontal gaze center, and how does it function?

Answer:



- The paramedian pontine reticular formation (PPRF) or horizontal gaze centre is a collection of local circuit neurons near the midline in the pons responsible for generating horizontal eye movements.
- When the person looks right, the PPRF orders the right lateral, and in the opposite direction, not directly but through the MLF, innervation goes to the left-sided medial rectus muscle.

Q12.2: How are horizontal saccades generated, and what is the role of the PPRF?

Answer:

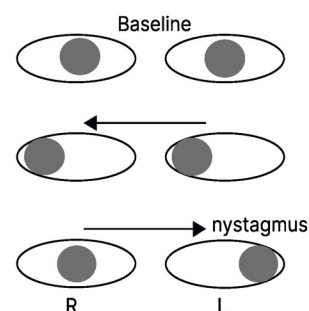
- Horizontal saccades are generated in the frontal eye field, which activates the contralateral PPRF.

- Burst neurons in the PPRF stimulate the ipsilateral abducens nucleus.
- PPRF is managed opposite the frontal eye field.
- Any lesion will lead to internuclear ophthalmoplegia.

Q12.3: What are the features of internuclear ophthalmoplegia?

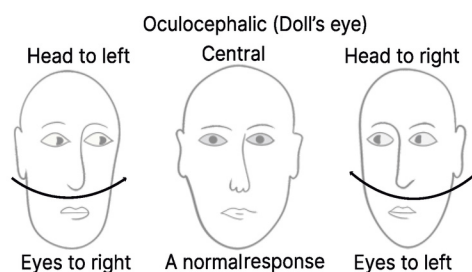
Answer:

- When the person is asked to look at one side, if he looks to the right side, he finds it, but when he looks to the left side, then the right eye is not abducted.
- Abducted eyes show nystagmus.
- This condition is called internuclear ophthalmoplegia (ocular movement disorder caused by a lesion of the medial longitudinal fasciculus. It is characterised by impaired adduction of the ipsilateral eye with nystagmus of the abducting eye.
- It is a right MLF lesion because the right eye is defective.



Q12.4: What is the Oculocephalic reflex (Doll's Eye)?

Answer:



- When the head turns to the left, then the eyes turn to the right, and when the head turns to the right, then the eyes turn to the left.
- When the head is in the center, then it is normal. This is called the vestibular ocular reflex.

Q12.5: What are the nerves involved in the oculocephalic reflex?

Answer:

- Nerves involved in the pathway: 3, 6, 8.

Q12.6: What is Weber syndrome?

Answer:

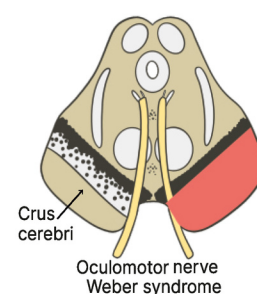
- III nerve palsy with contralateral hemiplegia.

Q12.7: What are Benedict, and Millard-Gubler's syndromes?

Answer:

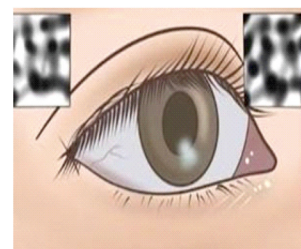
- III nerve palsy with contralateral hematoma is Benedict syndrome.
- VI nerve palsy with contralateral hemiplegia is Millard-Gubler syndrome.

? PYQ: FMGE 2019



Q12.8: What is Optokinetic Nystagmus (OKN)?

Answer:



- Optokinetic nystagmus is the eye movement elicited by the tracking of a moving field. It differs from a smooth pursuit, which is the eye movement elicited by tracking a single distinct target.
- An optokinetic drum can be used to find malingering, or it can be used to assess the vision in a small child.

BIG QUESTION 13: What are the anatomical, diagnostic, and pathological features related to the orbit, proptosis, thyroid eye disease, and associated myopathies?

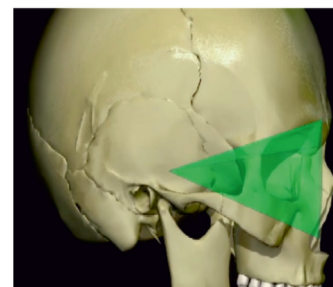
Broad Answer: The orbit has specific anatomical landmarks, capacity, and nerve pathways relevant to trauma and diagnostics. Proptosis and thyroid eye disease involve measurable clinical findings and immune-mediated mechanisms. Myopathy in thyroid disease presents with characteristic muscle involvement, diagnostic tests, and early signs such as lid retraction.

DETAILED QUESTIONS

Q13.1: What are the structural components of the orbit?

Answer:

- Orbit has a base and apex.
- At the apex, a supraorbital fissure, the structure passes through it.



Q13.2: What is the capacity of the orbit?

Answer:

- 30cc

Q13.3: What is the shape of the orbit?

Answer:

- Quadrilateral or pyramidal in shape.

Q13.4: Which is the weakest wall of the orbit?

Answer:

- The medial wall is affected because of the presence of the lamina propria.

Q13.5: Which is the weakest wall of the floor?

Answer:

- Posteromedial part.

Q13.6: Any fracture in the orbit is called?

Answer:

- Blowout fracture.

Q13.7: What structures pass through the superior orbital fissure and annulus of Zinn?

PYQ: FMGE 2021

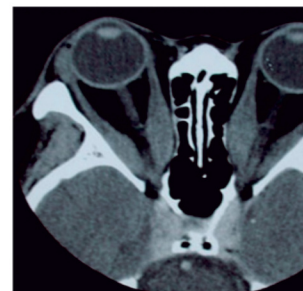
Answer:

- Superior orbital fissure (vertical) and annulus of Zinn (horizontal).
- Lacrimal, frontal, and trochlear nerves (LFT) are the nerves passing outside the annulus of Zinn and inside the annulus of Zinn. There are both the divisions of the 3rd nerve, nasociliary nerve, and 6th nerve (nasociliary and VI nerve are inside).

YOURWISH

Q13.14: What are the features of myopathy in thyroid eye disease?**Answer:**

- Only the belly of the muscle is involved, and tendons are not involved.
- It's a restrictive myopathy that involves fibrosis.

**Q13.15: Which is the first and the muscle to be involved in myopathy?****Answer:**

- First-Inferior rectus muscle and the last muscle, the inferior oblique muscle, are involved.

Q13.16: Which is the first defective movement seen in myopathy?**Answer:**

- Defective elevation because of the fibrosis of the inferior rectus muscle.

Q13.17: Which test is used to diagnose palsy and fibrosis?**Answer:**

- In the Forced duction test, hold the superior rectus muscle, and try to move the eye up.
- If it moves easily with the forceps, it moves easily, then it is a case of palsy; Even with the forceps, it is stuck in one position, then it is fibrosis (positive).

Q13.18: What is the first sign?

Answer: Lid sign, which is retraction.

BIG QUESTION 14: What are the key features, complications, and treatments of orbital cellulitis and mucor mycosis?

Broad Answer: Orbital cellulitis is an emergency condition involving inflammation behind the orbital septum due to bacterial infection, with serious complications like cavernous sinus thrombosis. Mucor mycosis, seen in immunocompromised patients, causes tissue necrosis due to vascular invasion and requires aggressive antifungal therapy.

DETAILED QUESTIONS

PYQ: NEET PG 2021

PYQ: FMGE 2021

Q14.1: What is orbital cellulitis?

Answer: Any cellulitis/inflammation behind the orbital septum.

**Q14.2: Why is orbital cellulitis considered an ocular emergency that requires hospital admission?**

Answer: Because there is a risk of cavernous sinus thrombosis (CST).

Q14.3: What is the first sign of cavernous sinus thrombosis (CST), and what is its anatomical relationship?**Answer:**

- VI nerve palsy.
- 3,4,5 nerves pass through the wall of the sinus, and the 6th nerve passes through the body along with the internal carotid artery.

Q14.4: What is Tolosa-Hunt syndrome?

Answer: Any granulomatous idiopathic inflammation of the cavernous sinus along with the superior orbital fissure and orbital apex is called Tolosa-Hunt Syndrome.

Q14.5: How is orbital cellulitis treated?

Answer: Patient is admitted and treatment starts with I.V. antibiotics (both aerobic and anaerobic), then I.V. anti-inflammatory.

Q14.6: What is the aetiology of orbital cellulitis?

Answer: Streptococcus, Staph aureus, and in children, it is Haemophilus.

Q14.7: What are the features and management of mucor mycosis?

Answer:

- Spread when the patient is immunocompromised.
- It is bloody red or black because it is invading blood vessels, which causes necrosis of tissue.
- Treatment: I.V. Amphotericin-B.



BIG QUESTION 15: What are the important orbital pathologies associated with proptosis and optic nerve involvement, and what are their clinical and radiological features?

Broad Answer: Orbital tumors and vascular malformations can present with different types of proptosis and neurological signs. Understanding their location, effect on nearby structures, and radiologic findings helps in diagnosis.

DETAILED QUESTIONS**Q15.1: What type of proptosis does a lacrimal gland tumor produce?**

Answer: Lacrimal gland tumour leads to non-axial proptosis.

Q15.2: What is the direction of dystopia in a lacrimal gland tumor?

Answer: Dystopia is down and in because the lacrimal gland is up and out.

Q15.3: What is the most common type of lacrimal gland tumour?

Answer: Pleomorphic adenoma

Q15.4: What is the most common type of Malignancy?

Answer: Adenoid cystic carcinoma

Q15.5: Which is the most dangerous malignancy?

Answer: Adenoid cystic carcinoma is characterized by perineural invasion.

Q15.6: What does the presence of a corkscrew blood vessel indicate?

Answer: It is a typical Carotid-cavernous fistula.



PYQ: NEET PG 2021

Q15.7: What are the features and consequences of a carotid-cavernous fistula?**Answer:**

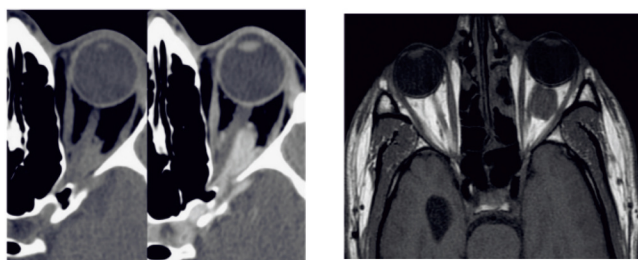
- It is characterised by pulsating proptosis, chemosis, and a whooshing sound in the head.
- Episcleral venous drainage is also affected because the superior-inferior ophthalmic vein drains to the cavernous sinus. Now the pressure in the cavernous sinus is high enough, causing a fistula.
- As a result, the blood supply to the 3,4,5,6 nerve is affected, → neurological symptoms.
- When the pressure is higher, glaucoma may happen, and venous pressure is higher, it may cause venous stasis retinopathy.

**Q15.8: What orbital condition causes intermittent proptosis****Answer:** Orbital Varices**Q15.9: What are the causes of pulsating proptosis?****Answer:**

- Fracture roof
- NF-1.

Q15.10 Which is the most common intraorbital tumor of adults?

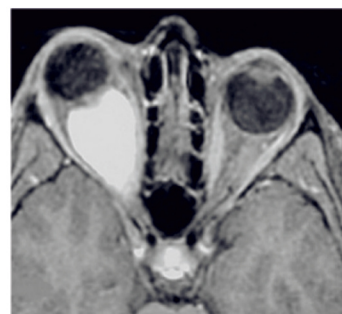
PYQ: FMGE 2023

Answer:

- Cavernous haemangioma
- Cavernous haemangioma is encapsulated, intraconal, and leads to axial proptosis.

Q15.11: What are the features of fusiform enlargement of the Optic Nerve?**Answer:**

- Initially, the presentation will not be the proptosis when the nerve is involved. Five signs of optic nerve disease are manifested initially.
- When the size of a tumour increases, it pushes the eye out and causes proptosis.
- Meningioma is more common in middle-aged women.
- Optico ciliary shunt (temporal fullness) and psammoma body are the features of meningioma.

**Q15.12: Optic nerve glioma is more common in?****Answer:** Patients with NF-1

Q15.13: Which is the most common pathology?**Answer:** Pilocytic astrocytoma**Q15.14: What is the finding of fusiform enlargement on CT-scan and MRI?****Answer:** Fusiform enlargement of the optic nerve**Q15.15: What are the ocular features of Neurofibromatosis-1?****Answer:** Mnemonics: **OCULAR**

- Orbit: Optic nerve glioma
- Cornea: Prominent corneal nerves
- Uvea: Lisch nodules (hyperpigmented nodules)
- Lid: Neurofibroma
- Angle: Glaucoma
- Retina: Choroidal naevi and Astrocytoma

**Q15.16: What is the most common ocular feature of NF-2?****Answer:** Posterior subcapsular cataract**BIG QUESTION 16: What are the important clinical conditions related to trauma, metallic foreign bodies, chemical burns, and their ocular consequences?**

Broad Answer: Several external injuries—such as orbital fractures, foreign body impacts, and chemical burns—have distinct ocular manifestations. These may affect muscles, the retina, or cornea and can lead to conditions like proptosis, diplopia, pigmentary changes, or cataract. Diagnosis and treatment depend on the exact pathology, with surgical intervention reserved for refractory or severe cases.

DETAILED QUESTIONS**Q16.1: What is a blow-out fracture, and what are its key features?****Answer:**

- A blow-out fracture shows a teardrop sign due to trauma in CT or MRI
- Patient complains about decreased sensation on the cheeks, a black eye called periorbital ecchymosis.
- If there is a medial wall fracture, it may cause subsequent emphysema.
- The indication of surgery is when there is no improvement in diplopia and enophthalmos even after ten days of medical therapy.
- Surgery is needed because the muscle is entrapped in the fracture site.

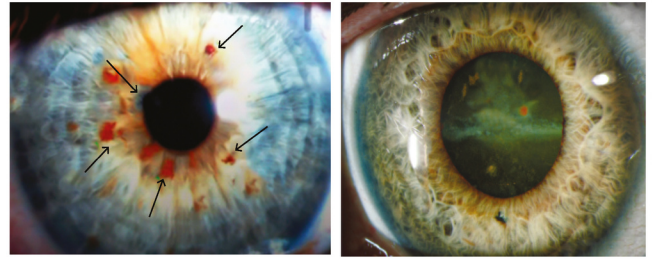
**Q16.2: Which is the most common muscle involved?****Answer:**

- Inferior rectus muscle/inferior oblique muscle

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Q16.3: What is siderosis, and its ocular signs?**Answer:**

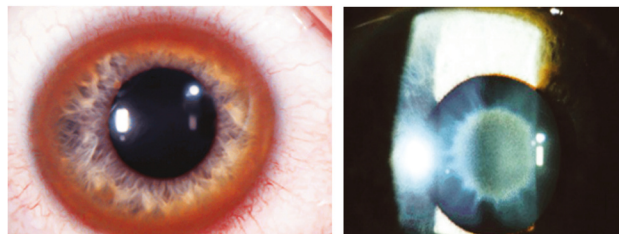
- Lens and iris pigmentation
- Retinal involvement
- Iron deposition on the medial-lateral 1/3rd of the cornea is called the Hudson-Stahli line.
- Iron deposition at the head of the pterygium is called the Stocker's line.
- Iron deposition around the filtering bleb is called Ferry's line
- Iron deposition in Keratoconus → Fleischer ring

**Q16.4: Which is the most dangerous foreign body?****Answer:**

- Copper that leads to phthisis bulbi.
- The most common mode of injury is a chisel and hammer.

Q16.5: How can siderosis be diagnosed?**Answer:**

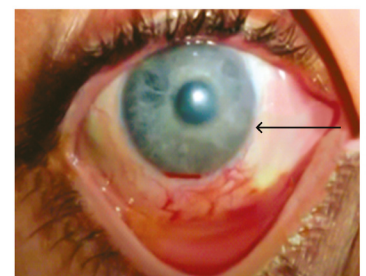
- The serial electroretinogram (ERG), mainly the B-wave, is diminished.

Q16.6: What is Sunflower Cataract?**Answer:**

- Chalcosis is due to copper in the eye, due to any foreign body, or Wilson's disease.
- KF ring deposition in the Descemet membrane, which starts superiorly and inferiorly, then becomes a circle.
- The KF ring can be present in all patients with neurological disorders with Wilson disease, but not hepatic involvement.

Q16.7: Which is more dangerous, an alkali or acid burn?**Answer:**

- Alkali, but only because alkali can enter the eye and cause damage.
- Acid will coagulate the proteins that form the layer and, therefore, will not go into the eye.
- The image shows limbal ischemia, which is seen after an alkali burn.

**Q16.8: What is the medical treatment for alkali burn?****Answer:**

- Antibiotics

- Cycloplegics
- Steroids
 - o For only the initial 7 days, as it reduces collagen synthesis and impairs healing.
- Ascorbic acid
 - o Promotes collagen synthesis.
 - o Improves wound healing.
 - o 10% eye drops two-hourly.
- Citrate
 - o Powerful inhibitor of neutrophils
 - o Controls inflammation.
 - o Chelates extracellular calcium, hence inhibiting collagenase.
 - o 10% eye drops two-hourly for 10 days.
- Tetracycline
- Acetylcysteine 10% - acts as an anti-collagenase.

Q16.9: What is the surgical treatment for alkali burns?

Answer:

- Limbal cell transplantation
- Amniotic membrane grafting
- Advancement of the tenon capsule
- For late cases (Symblepharon)
 - o Division of bands in symblepharon
 - o Conjunctival grafting
 - o Mucous membrane grafting

BIG QUESTION 17: What are the features and management of functional disorders of the eyelids?

Broad Answer: Functional eyelid disorders arise due to neuromuscular dysfunction, anatomical defects, trauma, or age-related changes. Among them, lagophthalmos (inability to close eyelids) and ptosis (drooping of the upper eyelid) are common clinical presentations. Understanding their types, causes, and management is essential to prevent ocular surface damage and visual impairment.

DETAILED QUESTIONS

Q17.1: What is lagophthalmos?

Answer:

- Lagophthalmos is the incomplete or abnormal closure of the eyelids.

Q17.2: Which muscle and nerve are responsible for eyelid closure?

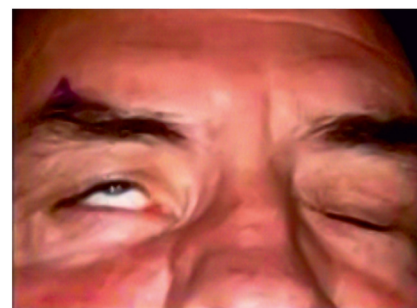
Answer:

- The orbicularis oculi muscle closes the eyelids and is supplied by the 7th cranial nerve.

Q17.3: What causes lagophthalmos?

Answer:

- 7th nerve palsy leads to lagophthalmos.



Q17.4: What are the complications of lagophthalmos?**Answer:**

- Lagophthalmos can lead to exposure keratopathy due to exposure to the cornea.

Q17.5: Any exposure keratopathy due to 7th nerve palsy is called?**Answer:**

- Neuroparalytic keratitis

Q17.6: What are the treatment options for lagophthalmos?**Answer:**

- Gold implants can be put in so the lid can come down, or tarsorrhaphy can be done.

Q17.7: What is ptosis?**Answer:**

- Ptosis is known as the drooping of the upper eyelid.

**Q17.8: Which muscles are involved in eyelid elevation, and how do they cause ptosis?****Answer:**

- Drooping of the eye can occur due to dysfunction in the LPS muscle and the Muller's muscle.

Q17.9: What are the types of ptosis?**Answer:**

- Ptosis can be of 2 types:
 - Congenital
 - o Simple: Only ptosis is seen
 - o Blepharitis syndrome
 - Acquired.
 - o Neurogenic (III nerve palsy or Horner's syndrome)
 - o Aponeurotic (Post-operative or evolutionary (old age))
 - o Mechanical (any swelling that pushes the lid down or any scar pulling the eyelids)
 - o Myogenic (Myasthenia gravis, Lambert-Eaton syndrome, which is a variant of myasthenia)

Q17.10: What is the lid crease, and how is it affected in ptosis?**Answer:**

- The lid crease is an attachment of the levator to the skin.
- In a congenital, absent lid crease, and lid lag on the ptotic side.
 - o When the patient is asked to look up, if there is a ptotic lid, then it cannot go out.
- In aponeurotic ptosis, there is a high lid crease.

Q17.11: What is the most common type of ptosis?**Answer:**

- Aponeurotic

BIG QUESTION 18: What are the congenital syndromes and inflammatory conditions affecting the eyelids?

Broad Answer: Several syndromes and conditions affect eyelids, including blepharophimosis syndrome, blepharitis (both squamous and ulcerative), and complications like tylosis, poliosis, madarosis, trichiasis, and structural deformities like symblepharon and ankyloblepharon.

DETAILED QUESTIONS

Q18.1: What is the cause and features of blepharophimosis syndrome?

🔍 PYQ: NEET PG 2019

🔍 PYQ: FMGE 2021,2022

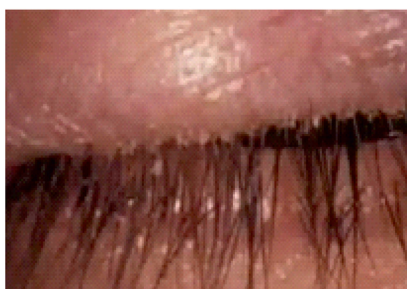
Answer:

- It occurs due to the FOXL-2 gene.
- Features
 - o Shortening of horizontal lids
 - o A fold of skin from the lower lid is called epicanthus inversus.
 - o Ptosis
 - o Increase in the distance between the 2 medial canthi
 - o Congenital ectropion of the lower lid.



Q18.2: What is Squamous Blepharitis?

Answer:

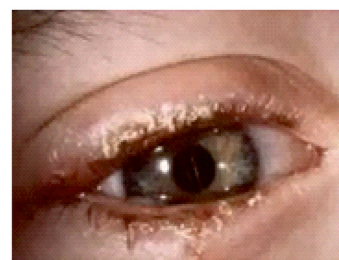


- Squamous Blepharitis is inflammation of the eyelid margins. Blepharitis usually affects both eyes along the edges of the eyelids.
- Antibiotics and steroid combinations can be used to treat it.

Q18.3: What are the features of ulcerative blepharitis?

Answer:

- Ulcerative blepharitis is characterised by matted, hard crusts around the eyelashes that occur due to staphylococcus infection, which, when removed, leave small sores that ooze or bleed.
- Only antibiotic ointments can be given.

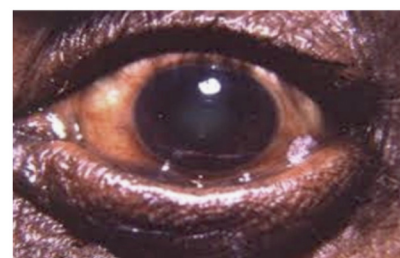


Crusting and ulcerative blepharitis

Q18.4: What is Tylosis?

Answer:

- Chronic blepharitis can lead to the thickening of the lid margin called Tylosis.



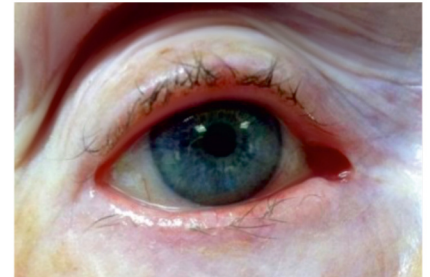
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Q18.5: What is poliosis, and its causes?**Answer:**

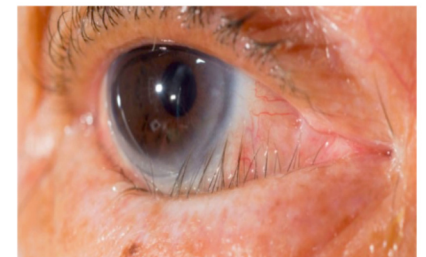
- Greyish colour of eyelashes.
- Causes
 - o Chronic blepharitis
 - o VKH syndrome
 - o Waardenburg syndrome

**Q18.6: What is Madarosis and its causes?****Answer:**

- Loss of Eyelashes or Loss of Eyebrows
- Causes
 - o Local: Chronic blepharitis, trachoma tumours, burns
 - o Skin: Psoriasis, Generalized alopecia
 - o Systemic: Myxoedema leprosy
 - o Following removal: Trichotillomania iatrogenic

**Q18.7: Elaborate on the features and complications of Trichiasis.****Answer:**

- Misdirection of eyelashes
- Clinical features: Irritation, pain, lacrimation, and blepharospasm
- Complications
 - o Punctate epithelial erosions
 - o Corneal ulcer
 - o Pannus
 - o Pseudo Trichiasis (entropion)

**Q18.8: What is entropion?****Answer:**

- Entropion is the inward turning of the lid margin.

Q18.9: What is Distichiasis, and how is it managed?**Answer:**

- Distichiasis is the double row of eyelashes; one row is anterior to the grey line, and one row is posterior to the grey line.
- Congenital anomaly
- Treatment
 - o Diathermy
 - o Cryo (-20)

 PYQ: NEET PG 2020

**Q18.10: What is symblepharon, and what causes it?****Answer:**

- Symblepharon is a pathological condition where the bulbar and palpebral conjunctiva forms an abnormal adhesion to one another.



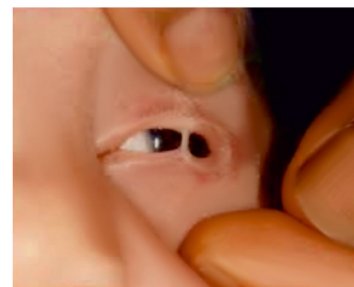
- Any burn, chemical injury, or surgery can lead to symblepharon.
- Treatment:** Cut the bands and perform mucus membrane grafting or conjunctiva grafting.

 PYQ: INICET 2022

Q18.11: What is Ankyloblepharon, and how is it treated?

Answer:

- It is defined by partial or complete adhesion of the ciliary edges of the superior and inferior eyelids.
- Treatment- Break the adhesion.



BIG QUESTION 19: What are the key methods and principles used in assessing visual acuity and diagnosing refractive or pathological causes of poor vision?

Broad Answer: Visual acuity assessment is primarily done using tools like Snellen's chart, LogMAR chart, and Optokinetic drum. Principles like the angle of resolution and the role of tools like pinhole tests help differentiate refractive from pathological vision loss.

DETAILED QUESTIONS

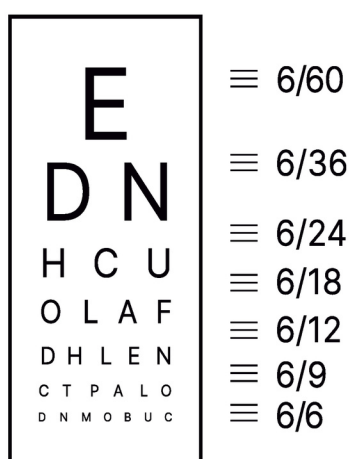
Q19.1: What is Snellen's visual acuity test, and how is it interpreted?

Answer:

- An eye test is done by Snellen's visual acuity test.
- Denominator remains the same, which indicates that a person can normally read letters written.

Q19.2: What are the constructive details and angular principles behind the Snellen chart?

Answer:



- Every letter in the Snellen chart should be constructed at 5 degrees
- The minimum angle of resolution (MAR) (margin of the letter) should be subtended at an angle of 1 min, whereas the whole letter subtended at an angle of 5 min.
- Angle is made at the nodal site of the patient's eye.
- Only the distance between the angles varies.

Q19.3: What are the advantages of the Log MAR chart and LEA test over Snellen's chart?

Answer:

- Log MAR chart and LEA test are much better than the Snellen chart.

- These are tested at a 4-metre distance, and the number of letters in each row is constant.
- This fact avoids any factor of the crowding phenomenon (Crowding or visual crowding is a perceptual phenomenon where the recognition of objects presented away from the fovea is impaired by the presence of other neighbouring objects).

Q19.4: What is the angle subtended by the largest letter in the Snellen's charts on a person's eye who is reading it from a distance of 6 metres?

Answer:

$$\begin{aligned} \text{MAR} &= \frac{60}{6} = 10 \text{ min} \\ &= \times 5 = 50 \text{ min} \\ \frac{6}{12} &= \frac{12}{6} = 2 \text{ min} \end{aligned}$$

Q19.5: What is the function of the Optokinetic Drum or Ok Drum Test in assessing vision?

Answer:

- It is used to check the visual acuity or the visual activity of infants and for the diagnosis of functional blindness.
- When the patient is busy talking with a doctor, he looks at the drum. If his pathway is fine and the drum is rotating, then he will be able to see the optokinetic nystagmus.
- When optokinetic nystagmus is elicited in the eyes, it represents functional blindness.



Q19.6: What is the role of a pinhole in diagnosing refractive errors?

Answer:

- The size of a pinhole is 1-1.25mm.
- The pinhole test helps to diagnose whether there is any refractive error left or correction is perfect.
- If you put the pinhole and the vision improves, it means there is a need for more refractive error, which is not corrected because it cuts all the peripheral rays.
- The vision is improving on putting pinhole → the cause is refractive errors.
- If the vision is not improving but decreasing, → presence of central opacity or macular disease



Q19.7: What is the amount of dioptre that can be compensated for by using the pinhole?

Answer:

- 3D

Q19.8: What is the width of the stenopic slit?

Answer:

- 1 mm

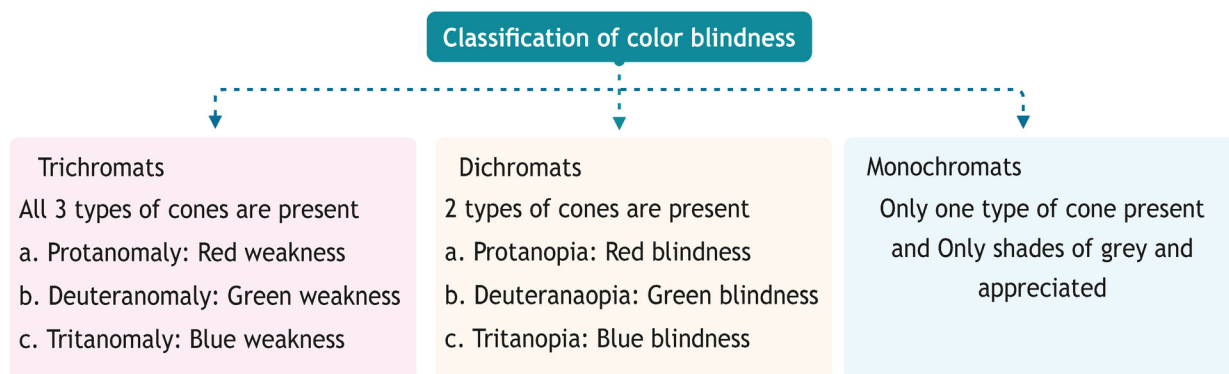
BIG QUESTION 20: What are the different types of color blindness, and how are they clinically assessed?

Broad Answer: Color blindness may result from optic nerve diseases and is most commonly of the red-green type. Green blindness is the most frequent. The Ishihara chart is used for screening, particularly for red-green deficiencies.

DETAILED QUESTIONS

Q20.1: Describe the classification of color blindness.

Answer:



Q20.2: What type of color blindness is caused by optic nerve disease?

Answer:

- If it is an optic nerve disease, it causes red-green blindness
- Exception: Glaucoma.

Q20.3: Which is the most common colour blindness?

Answer:

- Green blindness

Q20.4: What is the purpose of the Ishihara chart?

Answer:

- The Ishihara chart is used for screening purposes (red-green blindness)

BIG QUESTION 21: What are the differences and clinical uses of indirect and direct ophthalmoscopes, and what are angles α and κ ?

Broad Answer: The indirect ophthalmoscope is used for viewing the peripheral retina and forms a real, inverted image. The direct ophthalmoscope is used for viewing the central retina and has a higher magnification but a smaller field. Angles α and κ are anatomical angles formed due to the fovea's temporal location relative to the disc and have clinical significance in strabismus evaluation.

DETAILED QUESTIONS

Q21.1: What is the main use of an indirect ophthalmoscope?

Answer:

- An indirect ophthalmoscope is primarily used to examine the peripheral retina.

Q21.2: Where is the image formed in an indirect ophthalmoscope?

Answer:

- An image is formed between the examiner and the lens.



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Q21.3: What type of image is formed?

Answer:

- Real/inverted, magnification is around 3 or 5 times.

Q21.4: What is the field?

Answer:

- 8DD ($8 \times 1.5\text{mm}$)

Q21.5: How do you calculate the magnification of an indirect ophthalmoscope?

Answer:

- Power of eye / Power of lens

Q21.6: What is the use of a direct ophthalmoscope?

Answer:

- It is used to examine the posterior subcapsular cataract.
- Oil droplet reflex is seen.

Q21.7: Magnification of the direct ophthalmoscope is calculated by?

Answer:

- Power / 4

Q21.8: If magnification is more, then the field will be?

Answer:

- Less, which is around 2 DD

Q21.9: If you examine the right eye of the patient, which eye will you use?

Answer:

- Always the same eye, and the patients are instructed to look straight.

Q21.10: The direct ophthalmoscope is generally used to see?

Answer:

- Central retina

Q21.11: What is a distance direct ophthalmoscope?

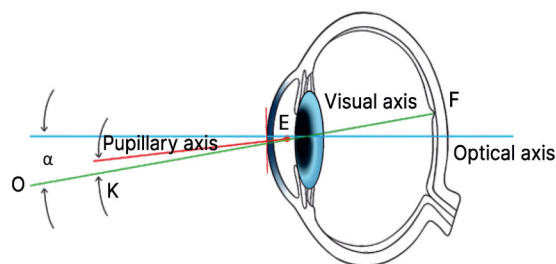
Answer:

- When it is done through a distance of 25 cm.

Q21.12: Why are angles α and κ formed?

Answer:

- These angles are formed because the fovea is slightly temporal to the disc.



Q21.13: What are the variations in the kappa angle, and their relevance?

Answer:



- A large positive kappa angle is the cause of pseudoexotropia and is seen in hypermetropia.
- A large negative kappa angle is the cause of pseudoesotropia and is seen in myopia.

Q21.14: What are the angles α and κ ?

Answer:

- α is made between the optical axis and visual axis at the nodal point, and κ is made between the pupillary line and visual axis at the cornea.

BIG QUESTION 22: How do you classify astigmatism and manage aphakia, and what are the related optical phenomena?

Broad Answer: Astigmatism arises when one principal meridian of the eye has more curvature than the other. It is classified as with-the-rule or against-the-rule based on axis orientation. Aphakia, the absence of the lens, leads to specific optical effects like ring scotoma and the Jack-in-the-box phenomenon when corrected with spectacles. The pin-cushion effect is due to spherical aberration. The preferred treatment for aphakia is posterior chamber IOL implantation. Accommodation calculations require understanding focal length and the relationship between near and far points.

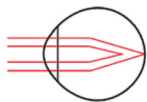
DETAILED QUESTIONS

Q22.1: Classify astigmatism.

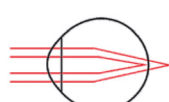
PYQ: NEET PG 2019, 2023

Answer:

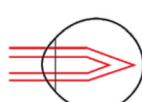
A. Simple myopic



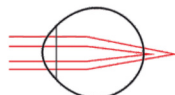
B. Simple hypermetropic



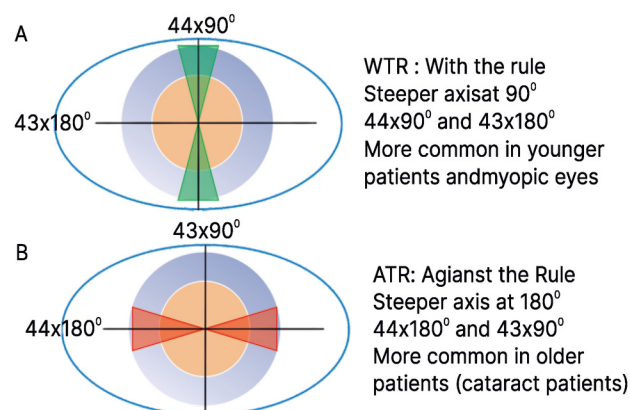
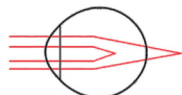
C. Compound myopic



D. Compound hypermetropic

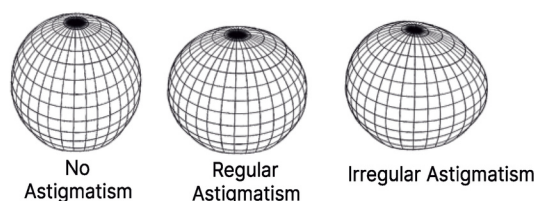


E. Mixed



Q22.2: What is Astigmatism?

Answer:



- If one axis curvature is more than the other, it represents astigmatism; when the principal axis is more, it is not astigmatism.

Q22.3: What is with-the-rule astigmatism?

Answer:

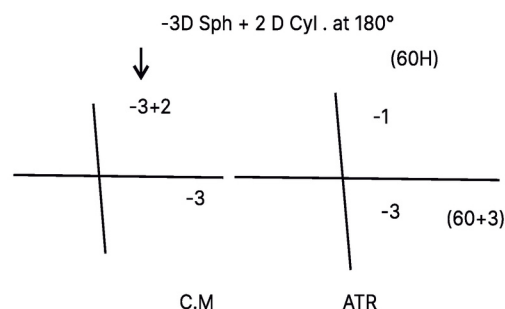
- When the vertical axis has more curvature than the horizontal, it is called with-the-rule astigmatism.

Q22.4: What is against-the-rule astigmatism?**Answer:**

- When the horizontal axis has more curvature than the vertical, it is called against-the-rule astigmatism.

Q22.5: If the patient has -3 D spherical and +2 D cylinder at 180°, then what is the type of astigmatism?**Answer:**

- First, change it into a retinoscopic reading, make two lines (-3 D), and the +2 D cylinder at 180° will be at 90°.
- Now, the retinoscopic reading will be $-3+2 = -1$ and -3. Hence, astigmatism will be compound myopia.

**Q22.6: What kind of spectacle correction is used in aphakia?****Answer:**

- Aphakic spectacles with a power of +10 to +14.
- With such a high convex lens, there is a high prismatic effect, leading to a ring scotoma.

**Q22.7: What is the Jack-in-the-box phenomenon?****Answer:**

- Ring scotoma constricts the vision of the patient, leading to the “Jack in the Box” phenomenon.
- E.g., Suppose two people are in front of a patient wearing aphakic spectacles, he can see one person, and the other person is out of sight.

Q22.8: Pin-cushion effect is due to?**Answer:**

- Pin- High spherical aberration.

Q22.9: What is the treatment of choice for aphakia?**Answer:**

- Ideally, it is a PC IOL.

Q22.10: With the near point of 20 cms, a hypermetrope of +4 has to exercise accommodation of:

- A. +11D
- B. +9D
- C. +1D
- D. None of the above

Answer: B. +9D

- In the above MCQ, the amplitude of accommodation is the difference between par at the near point, i.e., proximum (P), and par at the far point, i.e., remotum (R).
- Thus, $A = P - R$
- Any par is inversely proportional to focal length in millimetres.
- From the given data, with a near point of 20 cm, the par is the inverse of focal length millimetres, so it is $100/20$, i.e., 5D.
- The par at the far point of the hypermetrope is given as +4, but it was always depicted with a negative sign.

- o In hypermetropia, the light focus is behind the retina, and the far point is behind the retina. Therefore, it is depicted by a negative sign.
- Hence, $A = 5D - (-4) = +9D$.

BIG QUESTION 23: How is retinoscopy used to assess refractive errors and prescribe corrective lenses?

Broad Answer: Retinoscopy helps estimate refractive errors by observing the movement of the red reflex when light is shone into the eye. The direction of reflex movement guides whether the error is hypermetropia or myopia, and trial lenses are used to neutralize this movement. Correction factors (distance and cycloplegia-based) must be subtracted to derive the final prescription. This prescription can be written in spherical-cylindrical notation, and transposition is applied when needed.

DETAILED QUESTIONS

Q23.1: How is the retinoscope used during examination?

Answer:

- At 1 metre or $2/3^{\text{rd}}$ of the distance, the retinoscope is placed in front of the patient, and light reflects.
- The reflection needs to be noticed, whether it is with the movement or against it.
- Based on these findings, the glass should be selected and kept in front of the patient's eye to neutralise the movement.
- The retinoscopic reading is the lens that can neutralise the movement.

Q23.2: What does the direction of red reflex movement indicate?

Answer:

- If retinoscopy was performed at 1 m distance, the inference could be:
 - o If the movement was observed, the conclusion was that myopia was greater than 1.
 - o In case the movement was noticed, the inference is hypermetropia, myopia <1 .
 - o In the absence of movement, the inference was myopia $+1$.

Q23.3: What are the distance correction factors for retinoscopy?

Answer:

- When retinoscopy was done at 1m $\rightarrow$, the correction factor was 1 and 1.5.
- $2/3$ m distance $\rightarrow$ the correction factor is 1.5

Q23.4: What are the cycloplasia correction factors?

- In cases of atrophy, the correction factor is 1, and in other atrophic cells, it is 1.5.
- If the retinoscopy is performed at a distance of two-thirds of a metre from any other atrophic cell, the correction factor is two.

Q23.5: If the retinoscopy readings were -5 and -4. And the correction factor is 2. What are the corrected values?

Answer:

Subtract 2 from the readings -5 and -4 to get the corrected readings -7 and -6.

Q23.6: How is the final spectacle prescription written from retinoscopic readings?

Answer:

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- Based on this, the spectacle prescription is written in the following way:
 - 6D sph -1 cyl at 180°C
 - It means -6D is horizontal, vertical, and everywhere. At vertical, an additional -1 is needed, which is only at one axis; hence, cylindrical is mentioned in the prescription at 180°C.
 - By transposing the prescription, it can be written as -7D sph +1D cyl at 90°C.
 - As the sum of the two is spherical, it can be written as -7D sph; for the cylinder, change the sign to “+”, and the axis is changed to 90.

BIG QUESTION 24: What is amblyopia, and how is binocular single vision assessed and treated?

Broad Answer: Amblyopia is a partial vision loss due to abnormal visual input in childhood, with no organic eye pathology. It can be caused by strabismus, deprivation, or uncorrected refractive errors. Treatment involves occlusion of the normal eye. Binocular single vision is the ability of the brain to fuse images from both eyes into one and is tested using specific tests like the Worth four dot test and the Titmus fly test. It has three graded levels of function.

DETAILED QUESTIONS

Q24.1: What is Amblyopia?

Answer:

- It is the decrease in BCVA caused by form vision deprivation and/or abnormal binocular interaction for which there is no identifiable pathology of the eye or visual pathway.

Q24.2: What is the clinical threshold for diagnosing amblyopia?

Answer:

- A difference of 2 Snellen lines or more between the two eyes.

Q24.3: What are the types of amblyopia?

Answer:

- Strabismic
- Stimulus Deprivation
- Refractive
 - Anisometropic
 - Ametropic: High refractive error
 - Meriodonal: Astigmatism

Q24.4: What is amblyopia also known as?

Answer:

- It is called Lazy Eye.
- It is a partial loss of vision.
- All these causes are due to errors that are not corrected in time, leading to amblyopia.

Q24.5: What is the treatment of choice in amblyopia?

Answer:

- The treatment of choice in amblyopia is occlusion of the normal eye by patching or atropine as a means of occlusion, generally tapering one drop a week.

Q24.6: What is binocular single vision?**Answer:**

- When a person looks, both images found in the eyes are fused by the brain. This is known as binocular single vision.

Q24.7: When is binocular single vision fully diagnosed?**Answer:**

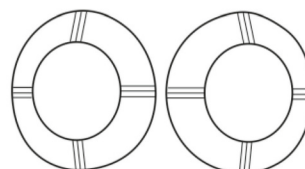
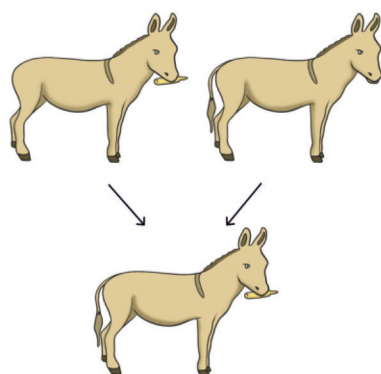
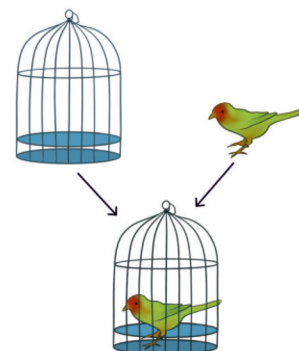
- Between the ages of 6 to 8 years.

Q24.8: What are the grades of binocular vision?**Answer:**

- Grade I: Simultaneous Perception
- Grade II: Fusion
- Grade III: Stereopsis
 - Depth perception (takes 6 months to 6 years).

Q24.9: What are the tests used to assess binocular single vision?**Answer:**

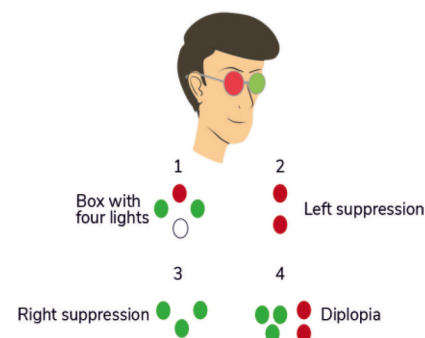
- Simultaneous Perception
 - In the image, a cage and a bird are two images, which can be seen as a reflex.
- Fusion
 - Almost similar images
- Stereopsis
 - Ability to obtain an impression of depth.



Sliding for testing stereoscopic vision (Buckets)

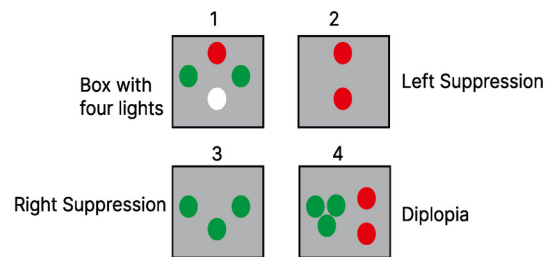
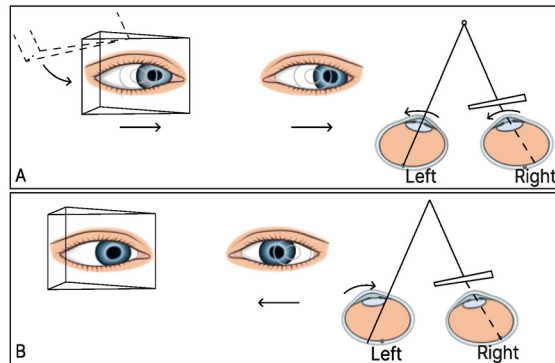
Q24.10: What are the tests to check binocular single vision, and how is it performed?**Answer:**

- **Worth four dot test**
 - To do the test, patients need to wear green and red spectacles.
 - With his right eye, he can see only white and red colours, as well as red.
 - With his left eye, he will see two green and white colours as green colours.
 - It means with his right eye, he can see two reds and with his left eye, three greens.
 - If the patient can describe all four boxes shown in the image, he is considered normal, with both eyes working.



Q24.11: What is the interpretation of the Worth four-dot test?**Answer:**

- If the patient can see
 - o Only two red colours mean his left eye is not working.
 - o Only three greens have left-eye and right-eye suppression.
 - o More than two or three greens (or) reds, diplopia.

**Q24.12: What is the 4 prism base out test?****Answer:**

- When a person is looking straight, if a prism is placed with the base facing out, then the left eye moves inside as a conjugate movement, and the right eye also first moves inside. But to look straight with the right eye, come back and focus. Hence, there is a recovery movement; it means that both eyes are working and normal.

Q24.13: What is Synoptophore (or) Amblyoscope?**Answer:**

- By this instrument, the binocular single vision and the grades of binocular single vision can be proved and clarified.

**Q24.14: What is the Titmus Fly Test?****Answer:**

- It is the test for stereopsis.
- For this test, as shown in the image, the patient is made to wear polarised glasses to see if he can feel that the fly is above the surface and flying. Then his depth of perception, or Stereopsis, is fine.

**BIG QUESTION 25: What are the types of refractive surgeries, and how are they performed?**

Broad Answer: Refractive surgeries are procedures used to correct refractive errors by altering the corneal curvature. The two main techniques include LASIK and SMILE. Each has specific steps and uses different laser technologies. These surgeries are only done in adults over the age of 18.

DETAILED QUESTIONS**Q25.1: What is the minimum age requirement for refractory surgery?****Answer:**

- Age should be >18 years.

Q25.2: What does LASIK stand for?

Answer:

- LASIK means laser-assisted in situ keratomileusis.

Q25.3: What are the steps involved in LASIK eye Surgery?

Answer:

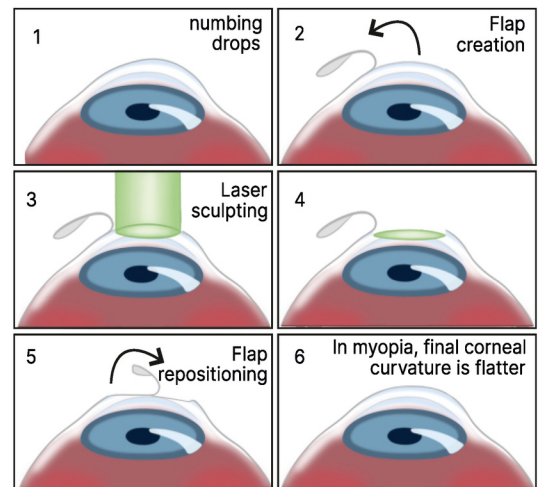
- A laser flap is created.
- Laser sculpting is done by the corneal stroma.
- A deeper stroma was done.
- Flap repositioning
- The curvature is altered.

Q25.4: What type of laser is used in LASIK surgery?

Answer:

- The laser is an excimer at 193 nm.

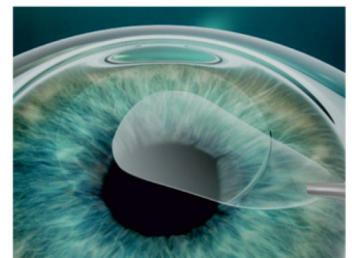
LASIK EYE SURGERY



Q25.5: What is the Smile Procedure?

Answer:

- A femto laser is used to cut a piece of stroma, which is then taken outside through a small incision to alter the cornea's curvature.
- It is called "small incision lenticule extraction".



BIG QUESTION 26: How are eye movements controlled, and what are the roles of the extraocular muscles?

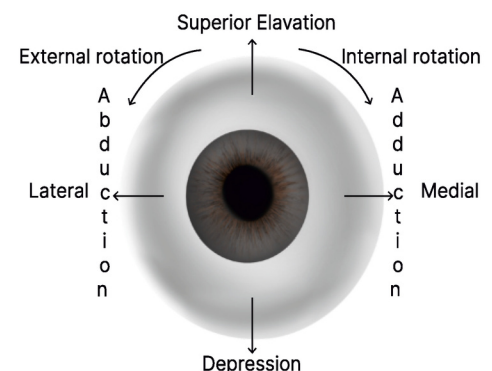
Broad Answer: Eye movements like elevation, depression, adduction, abduction, intorsion, and extorsion are controlled by specific extraocular muscles. Each muscle has primary, secondary, and tertiary actions. Depending on the position of the eyeball (abducted or adducted), different muscles are responsible for vertical movement. Coordinated movements between eyes are controlled by yoke muscles, which act as contralateral synergists.

DETAILED QUESTIONS

Q26.1: What are the basic movements of the eye?

Answer:

- Elevation
- Depression
- Adduction
- Abduction
- Intorsion
- Extorsion



Q26.2: What are the actions of the extraocular muscles?

Answer:

- Horizontal muscle
 - o Lateral rectus: Abduction

YOURWISH

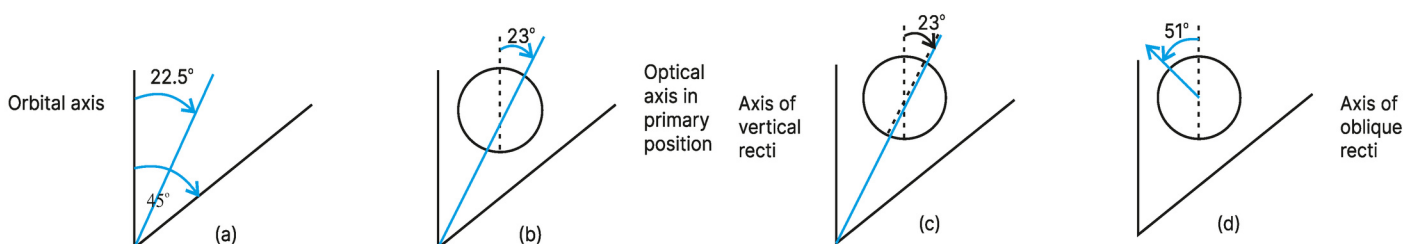
- o Medial rectus: Adduction
- Vertical muscle
 - o Superiors: Intorters
 - o Recti: Adductors.
- Primary, secondary, and tertiary actions of muscles are described in the table below.

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	SR	IR	SO	IO
Primary	Elevation	Depression	Intorsion	Extorsion
Secondary	Intorsion	Extorsion	Depression	Elevation
Tertiary	Adduction	Adduction	Abduction	Abduction

Q26.3: What is the axis of Oblique and Axis of Vertical Recti?

Answer:



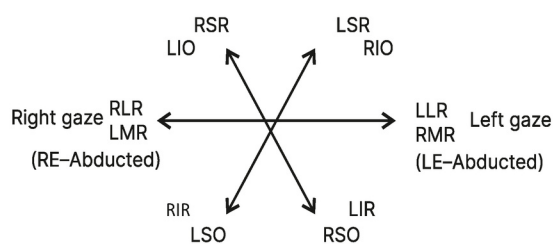
- The angle between the visual axis and the vertical recti is 23°.
- When the eye is abducted 23°, the recti muscles are in line with the visual axis; therefore, in the abducted position, the vertical recti are responsible for elevation and depression.
- When the eye is adducted 51°, the axis of the oblique recti is responsible for elevation and depression.

Q26.4: What are the Yoke muscles, and what is their function?

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Answer:

- It is also called “contralateral synergist.”
- It means two muscles working together in two different eyes; if it is right, it is dextro, and if it is left, it is levo.
- Muscles that elevate for dextro-elevation are
 - o RSR
 - o LIO
- Muscles that depress in cases of levodepression are
 - o LIR
 - o RSO



BIG QUESTION 27: What is squint (strabismus), and how is it classified with its common types?

Broad Answer: Squint, also known as strabismus, is the misalignment of the visual axis. It can be latent (only revealed on testing) or manifest (visible misalignment). Manifest squints are further divided into concomitant (same deviation in all gazes) and incomitant (variable deviation). Concomitant squints include types like infantile esotropia and accommodative esotropia. Various reflexes and neurological signs help identify and classify the condition.

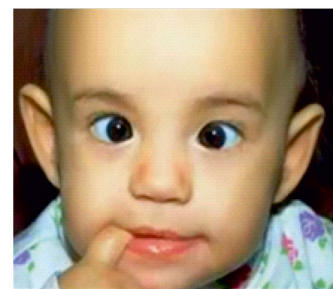
DETAILED QUESTIONS

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Q27.1: What is Squint?

Answer:

- It is the misalignment of the visual axis.
- It is also called strabismus.



Q27.2: What is Latent squint, and how is it detected?

Answer:

- It is normal, but when the cover-and-cover test is done, it manifests.
- It can be exophoria, esophoria, or hyperphoria.

Q27.3: What is Manifest squint?

Answer:

- It can be seen.
- Manifest squint can be exotropia, esotropia, or hypertropia.
- It can be
 - **Concomitant**
 - The degree of squint is the same in all gazes.
 - The primary deviation is equal to the secondary deviation.
 - **In concomitant**
 - These are also called “restricted squints”.
 - Secondary deviation is greater than primary deviation (due to Hering's law).

Q27.4: What is Hering's Law?

Answer:

- Hering's Law: There is equal innervation in yoke muscles.

Q27.5: What are the common types of Concomitant Squint?

Answer:

- Esotropia
 - Infantile esotropia
 - Accommodative esotropia
 - Non-accommodative esotropia
- Exotropia

Q27.6: What percentage deviation is there for infantile esotropia?

Answer:

- There is a large percentage of deviation, up to 30% D.

Q27.7: How many months does infantile esotropia manifest?

Answer:

- It can manifest after 6 months.

Q27.8: What is latent nystagmus?**Answer:**

- When one eye is covered, there is nystagmus in the child's eye.

Q27.9: What is dissociated vertical deviation (DVD)?**Answer:**

- When the eye is covered, one eye goes up and out. It is a neurological defect.
- It does not obey Hering's law.

Q27.10: What are the types of Accommodative Esotropia?**Answer:**

- Refractive type
- Non-refractive type
- Mixed type of accommodative esotropia

Q27.11: What is refractive accommodative esotropia, and how is it managed?**Answer:**

- There will be high hypermetropia, which is not corrected.
- To compensate, the eyes exert a lot of accommodation that causes squint.
- Treatment
 - Correct the hypermetropia so that the eyes become straight.

Q27.12: What is Non-refractive accommodative esotropia and its management?**Answer:**

- Hypermetropia is not a factor.
- Refraction is normal.
- Increased AC/A ratio
- Treatment
 - Near glasses are given to wear for relaxation.
 - Pilocarpine is the drug of choice.

Q27.13: What is mixed accommodative esotropia?**Answer:**

- Hypermetropia is a factor.
- Increased AC/A ratio

Q27.14: What is diplopia, and how is it classified?**Answer:**

- It is double vision.
- It is classified as:
 - Horizontal diplopia
 - Vertical diplopia
 - Torsional diplopia.

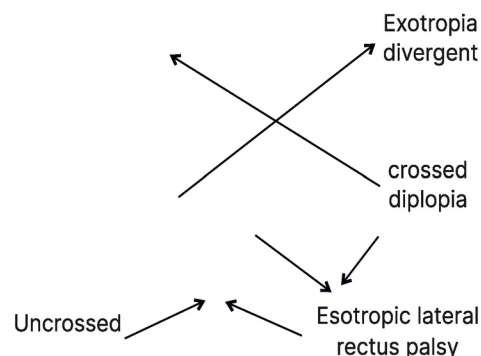


Q27.15: What is another classification of diplopia?**Answer:**

- Uniocular diplopia
 - A common cause is subluxation of the lens.
- Binocular diplopia
 - The most common cause is paralytic squint.

Q27.16: What type of diplopia is seen in exotropia?**Answer:**

- In exotropia, which is a divergent squint, there is crossed diplopia
- Vertical squints are crossed.

**Q27.17: What type of diplopia is seen in esotropia?****Answer:**

- Esotropic lateral rectus palsy is uncrossed.

BIG QUESTION 28: What are the key features and clinical findings in IIIrd, IVth, and VIth cranial nerve palsies?

Broad Answer: These cranial nerve palsies present with distinct ocular motor deficits, abnormal eye postures, diplopia, and specific patterns of ptosis or gaze involvement. The pupillary involvement and the direction of diplopia help differentiate between nuclear, medical, or compressive causes of nerve palsies.

DETAILED QUESTIONS**Q28.1: What is a key finding in IIIrd nerve palsy?****Answer:**

- There is ptosis.
- If it is bilateral ptosis, it is a nuclear lesion.

Q28.2: What ocular movement is defective in IIIrd nerve palsy, and why?**Answer:**

- Defective adduction.
- It is defective because the medial rectus is gone.

Q28.3: What kind of diplopia is seen in IInd nerve palsy?**Answer:**

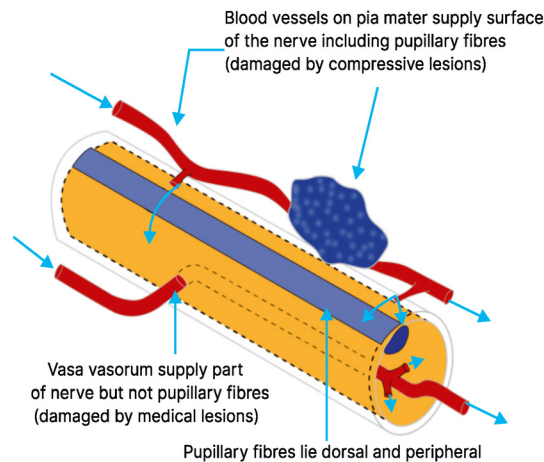
- Crossed diplopia: fixed dilated pupil.

Q28.4: What pupillary abnormality is associated with IIIrd nerve palsy?**Answer:**

- There is a fixed dilated pupil.

Q28.5: What is the role of the vasa vasorum in 3rd nerve palsy?

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Answer:

- The core of the vessel is supplied by vasa vasorum. Because of vasa vasorum, these are affected by medical causes like hypertension and diabetes. In these causes, there is pupillary sparing.

Q28.6: How are pupillary fibres supplied, and what happens in compressive lesions?**Answer:**

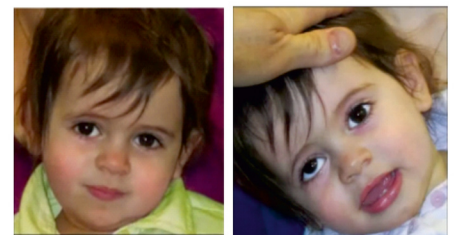
- Blood vessels on the pia mater supply the surface of the nerve, including pupillary fibres.
- If there is any damage from compressive lesions, it may also affect the pupillary fibre. Initially, it causes miosis.
- After miosis, when there is total damage to the fibres, it causes mydriasis. It is called a Hutchinson pupil.

Q28.7: What are the features of VIth nerve Palsy?**Answer:**

- Esotropia
- Defective abduction
- Diplopia is horizontal
- Diplopia is uncrossed
- The mandatory head posture is the face turned to the affected side

Q28.8: What are the features of IVth nerve palsy?**Answer:**

- Hypertropia.
- Increase in hypertropia in the opposite gaze or the same size head tilt. This is due to SO palsy.
- This is called Bielchowsky's sign.



BIG QUESTION 29: What are the diagnostic tests used in strabismus and oculomotor evaluation, and how is the oculocardiac reflex managed?

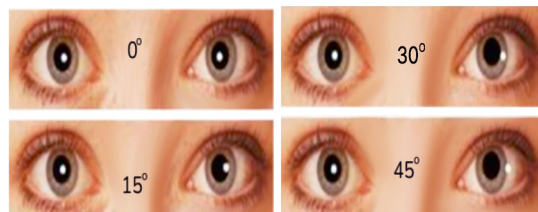
Broad Answer: Various tests help evaluate squint (strabismus), ocular misalignment, and diplopia through corneal reflexes, prisms, and dissociative methods. Some tests are for near vision phorias, others for charting muscle action. During ocular surgery, the oculocardiac reflex can induce bradycardia and must be appropriately managed.

DETAILED QUESTIONS

Q29.1: What does the Hirschberg test evaluate, and what are its findings?

Answer:

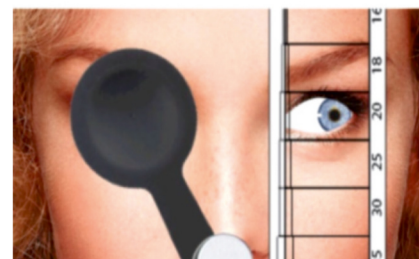
- Corneal reflections are usually symmetrical in the absence of squint
- In esodeviation, the reflex falls on the temporal cornea.
- 1 mm shift is approximately 7° , which is 14-15 prism dioptres.
- Normally, the corneal reflection should be at the centre.
- It starts deviating at 18° , 25° , 35° , and 45° .



Q29.2: What is the Prism cover test, and how is it interpreted?

Answer:

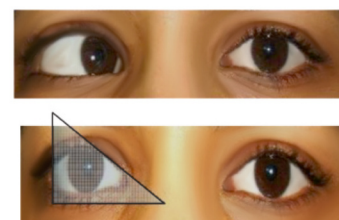
- In the prism cover test, one eye is covered, and the movement of the uncovered eye is measured.
- The prism dioptre strength, where there is no movement of the uncovered eye, is the exact amount of the squint.
- In this test, the prism should be placed so that the base is opposite the direction of the squint.
- E.g., for esotropia, the base should be out, and for exotropia, the base should be in.



Q29.3: What is the Prism reflection test also known as?

Answer:

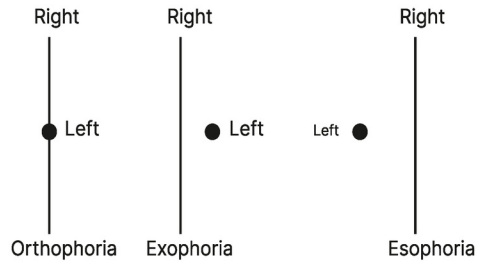
- It is also called the Krimsky test.



Q29.4: How is the differential image test conducted and interpreted?

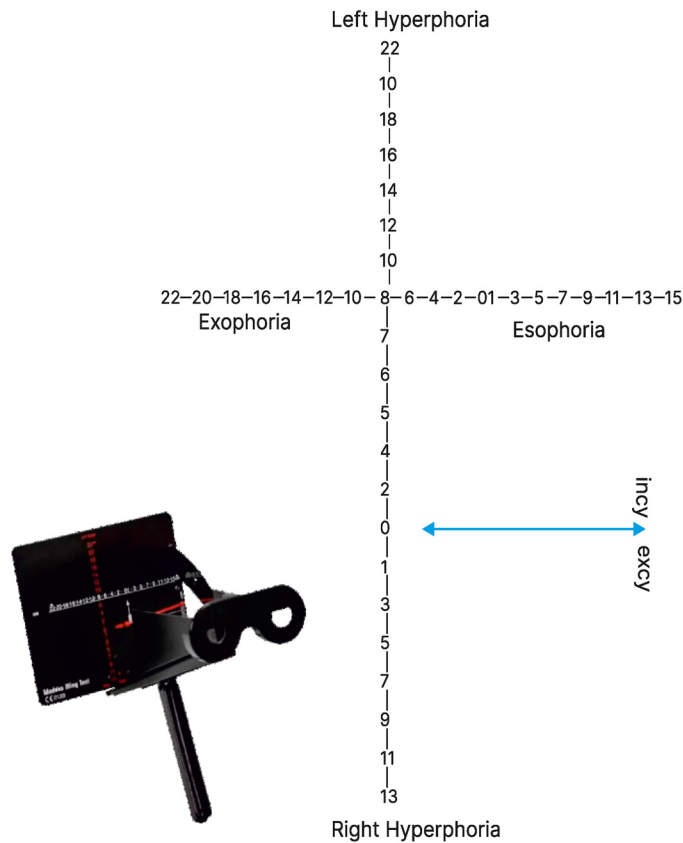
Answer:

- To diagnose phoria, a differential image test is done by placing a Maddox rod 6 inches away from the patient's eye horizontally and making it sit in front of the light.
- From the right eye, the patient can see a line and a spot from the left eye.
- If the patient infers that, as depicted in the image below, if:
 - o The line that crosses the spot is normal.
 - o The line belongs to the right eye; it is called crossed diplopia or exophoria.
 - o The line belongs to the right eye and the spot to the left eye; it indicates uncrossed diplopia or esophoria.
 - o The line is left of the spot; it is crossed diplopia.



Q29.5: What is Maddox Wing?

Answer:



- It is used mainly for near vision.
- To diagnose phoria by creating an artificial diplopia.
- By using the tool depicted in the image, patients need to see through their right eye and left eye. From the right eye, he can see only arrows, and from the left eye, only numbers.

Q29.6: How is the Maddox wing test interpreted?

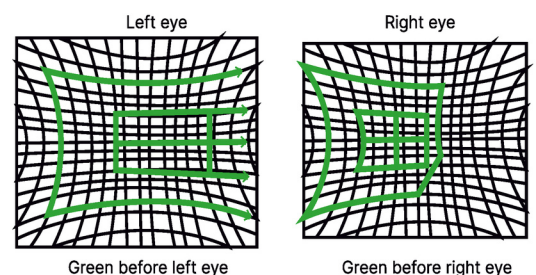
Answer:

- If the patient infers that
 - Arrows in the middle of the image depicted are normal.
 - Arrows towards right; it is an uncrossed diplopia, Exophoria.
 - Arrows towards the left indicate a crossed diplopia or esophoria.
 - Arrows in the lower numbers indicate right hyperphoria.
 - Arrows in the upper number indicate left hyperphoria.

Q29.7: What is the Hess Chart used for?

Answer:

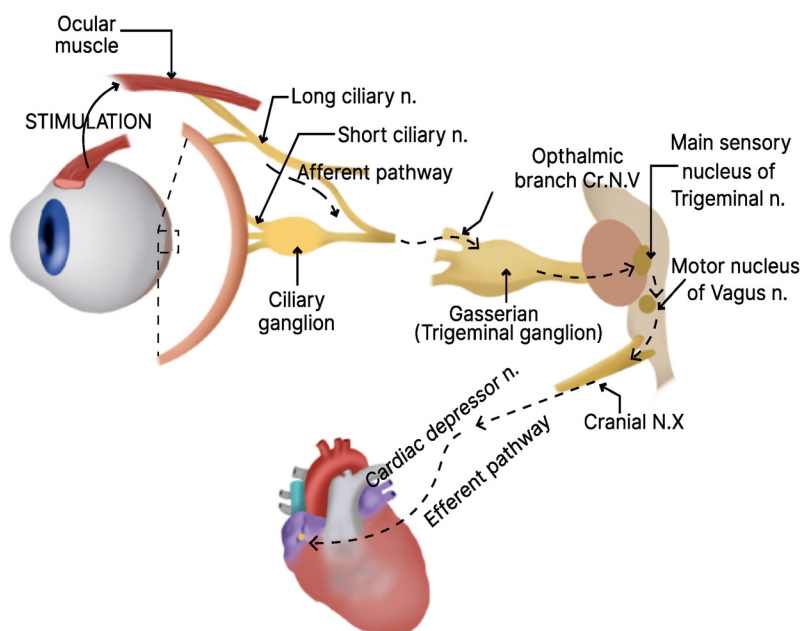
- It is used mainly for charting the action of muscles.



- It helps to diagnose which muscle is underacting and which muscle is overacting.
- Patient is made to sit on a red and green task. He needs to match the green with the red on the board.
- When the green is in front of the left eye, the left eye is tested, and if it is in front of the right eye, the right eye is tested.
- It is based on the Haploscopic principle.

Q29.8: What is the Oculocardiac Reflex?

Answer:



- The oculocardiac reflex is a trigeminal-vagal reflex triggered by ocular manipulation, leading to bradycardia.

Q29.9: When you are operating on the patient, the patient starts to have bradycardia. What will be the next step?

Answer:

- We need to stop the surgery.

Q29.10: How to prevent bradycardia in patients during surgery?

Answer:

- Bradycardia can be prevented by two steps.
 - o By giving retro tubular anaesthesia to block the ciliary ganglion.
 - o Give an atropine injection.

BIG QUESTION 30: What is the layered structure of the retina, and how are its vascular and pathological features organized?

Broad Answer: The retina is a multilayered structure composed of 10 histological layers, extending from the retinal pigment epithelium to the internal limiting membrane. It lies adjacent to the vitreous on the inner side and to the choroid and Bruch's membrane on the outer side. The retinal blood supply runs in different orientations depending on the layer, and pathology, such as hemorrhages and detachment, is characterized by specific patterns related to these layers. The retina also maintains a blood-retinal barrier, which, when disrupted, leads to distinct clinical conditions.

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DETAILED QUESTIONS

Q30.1: What are the layers of the retina?

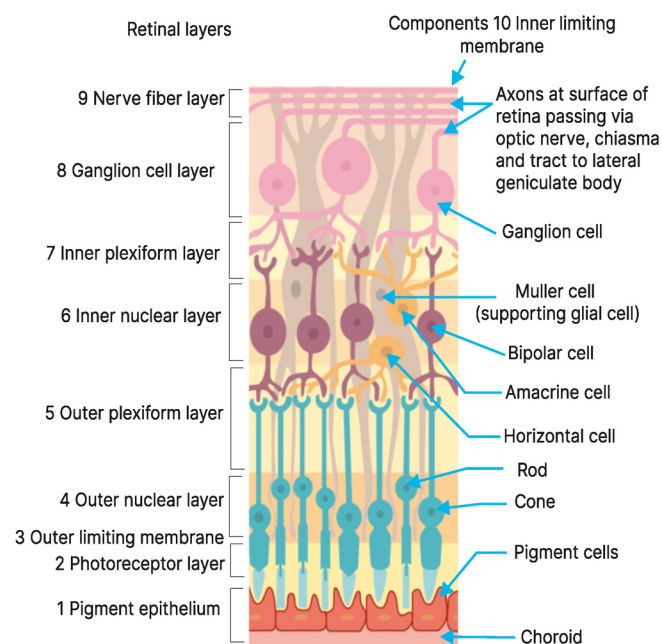
Answer:

There are 10 layers of the retina (outermost to innermost)

- Retinal pigment epithelium
 - o Subretinal space
- Layers of rods and cones
- External limiting membrane
- Outer nuclear
- Outer plexiform
- Inner nuclear
- Inner plexiform
- Ganglion cell layer
- Nerve fibre layer
- Internal limiting membrane

Q30.2: Describe the diagrammatic representation of the layers of the retina.

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Q30.3: What lies beyond the retina on both outer and inner sides?

Answer:

- Inner side: Condensed part of the vitreous and then the lens.
- Outside the RPE: Choroid, and the innermost layer of the choroid is the Bruch's membrane. It is a membrane between the choroid and the retinal pigment epithelium.

Q30.4: What is the orientation of retinal blood vessels, and their clinical significance?

Answer:

- The blood vessels are in two layers
 - o **OP and IN** (outer plexiform and inner nuclear): The blood vessels are perpendicular to the surface of the retina. Bleeding at this level will lead to dot and blot haemorrhages.

- o **Along the nerve fibre layer:** The blood vessels are parallel to the surface of the retina. Bleeding at this layer looks like a flame-shaped hemorrhage.

Q30.5: What is retinal detachment, and at what level does it occur?

Answer:

- Retinal detachment is the separation of all the neurosensory retina (NSR) from the Retinal pigment epithelium.
- The detachment takes place at the level of the subretinal space because it is embryologically weak.

Q30.6: What are the main types of retinal cells, and their respective layers?

Answer:

- The outer segment of the rods and cones is present below the subretinal space.
- The outer nucleus contains the nuclei of rods and cones.
- The axons of rods and cones are in synapses with the dendrites of bipolar cells in the outer plexiform layer.
- The inner nuclear layers contain the bipolar cells, amacrine cells, horizontal cells, and Müller cells (glial cells), which support the whole NSR.

Q30.7: What is the blood-retinal barrier?

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Answer:

- The outer blood-retinal barrier is made up of strong adhesion of the retinal pigment epithelium. It gets broken in central serous retinopathy (CSR), and there is a mild collection of fluid, which leads to shallow retinal detachment.
- The Inner blood-retinal barrier is between the outer plexiform and inner nuclear layers.
- Whenever there is an increase in permeability, it leads to leakage and break of the inner blood-retinal layer, and it generally happens in cystoid macular oedema (CME).

BIG QUESTION 31: What is Retinitis Proliferans and how does it lead to vision-threatening complications?

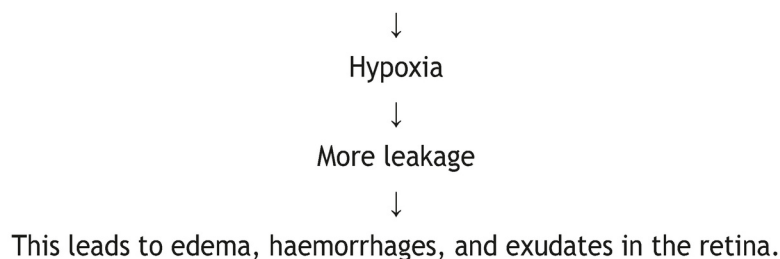
Broad Answer: Retinitis Proliferans is a condition resulting from retinal hypoxia due to microangiopathic changes, starting with the breakdown of the inner blood-retinal barrier. This cascade leads to leakage, edema, hemorrhages, and eventually neovascularization, resulting in major blinding complications if untreated. Management primarily involves reducing retinal hypoxia using laser therapy.

DETAILED QUESTIONS

Q31.1: Describe the pathogenesis of Retinitis Proliferans?

Answer:

All vascular pathologies/microangiopathy pathology start with the breaking of the inner barrier and its leakage.



Q31.2: What happens when the hypoxia increases in retinitis proliferans?**Answer:**

- When the hypoxia keeps increasing, there is a release of chemotactic factors (like VGF), and this will lead to neovascularization in the retina.
- This is known as NVD (neovascularization at the disc) and NVE (neovascularization elsewhere).

Q31.3: What are the complications of retinitis proliferans?**Answer:**

- Retinitis proliferans leads to 3 blinding complications:
 - o Vitreous haemorrhage
 - o Tractional retinal detachment
 - o Neovascular glaucoma

Q31.4: What is the treatment of retinitis proliferans?**Answer:**

- Pan Retinal Photocoagulation (PRP) is a type of laser that is used to treat hypoxia and anoxia.

BIG QUESTION 32: What is the principle and diagnostic significance of the Photostress test, and how is visual pigment regenerated?

Broad Answer: The photostress test evaluates the functional recovery of the macula by assessing the time required to regain vision after photobleaching of visual pigments. It helps in differentiating between macular lesions and optic nerve disease. The regeneration of these pigments is part of a physiological mechanism known as Wald's visual cycle.

DETAILED QUESTIONS**Q32.1: What is the principle of the Photostress test?****Answer:**

- The principle of this test involves exposing the macula to a light source bright enough to bleach a significant proportion of the visual pigments.
- The return of normal retinal function and sensitivity depends on the regeneration of the visual pigments.
- The time it takes the patient to see again after exposure to a bright light is the photostress test.

Q32.2: What is the normal value of PSRT?**Answer:**

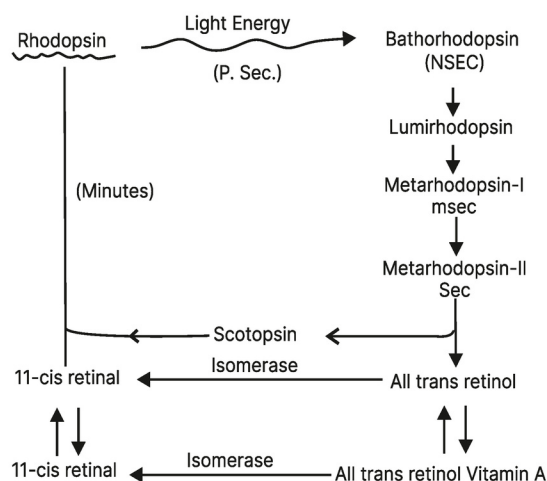
- The normal value of PSRT is 30-50 seconds; anything more than this indicates pathology.

Q32.3: What is the clinical significance of the PSRT?**Answer:**

- In the case of a macular lesion, PSRT increases, but it does not in optic nerve disease.
- So, PSRT helps in differentiating between optic nerve disease and macular lesions/disease.

Q32.4: What is Wald's Visual Cycle?**Answer:**

- This cycle illustrates the process of visual pigment regeneration.



BIG QUESTION 33: What are the features and risk factors of background diabetic retinopathy?

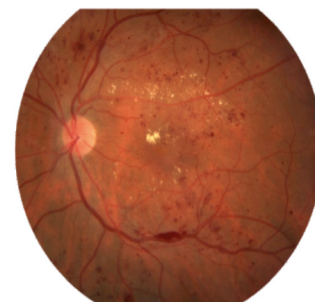
Broad Answer: Background diabetic retinopathy is an early form of retinal microangiopathy seen in diabetes, identified by hard exudates and dot-blot hemorrhages. The two most important risk factors are the duration of diabetes and glycemic control. Retinopathy tends to be more severe in Type 1 diabetes, and screening recommendations differ for Type 1 and Type 2 diabetes.

DETAILED QUESTIONS

Q33.1 What are the hallmark features of background diabetic retinopathy?

Answer:

- Hard exudates and dot & blot hemorrhages.



Q33.2: What are the two most important risk factors for diabetic retinopathy?

Answer:

- Duration of diabetes (most important)
- Glycemic control (second most important)

Q33.3: In which type of diabetes is proliferative retinopathy more common?

Answer:

- Type 1 Diabetes.

Q33.4: When should the first fundus examination be done for each type of diabetes?

Answer:

- Type 1 Diabetes: After 5 years
- Type 2 Diabetes: Immediately at diagnosis (since it is often diagnosed late)

Q33.5: How does follow-up frequency change with the stage of retinopathy?

Answer:

- Mild NPDR: Annual follow-up if glycemic control is maintained
- As severity increases, Follow-up shortens to 8, 6, or 4 months

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Q33.6: When can both Type I and Type II diabetic patients be kept on yearly follow-up?**Answer:**

- When everything appears stable during the follow-up visit.

Q33.7: What are additional risk factors for diabetic retinopathy?**Answer:**

- Hypertension
- Diabetic nephropathy
- Pregnancy

BIG QUESTION 34: What is Fluorescein Angiography, and how is it used in diabetic retinopathy?

Broad Answer: Fluorescein angiography involves injecting a fluorescent dye into the vein and capturing fundus images at a specific time interval to detect abnormalities like microaneurysms, capillary non-perfusion, leakage, and ischemic areas. It helps in diagnosing and staging diabetic retinopathy.

DETAILED QUESTIONS**Q34.1: How is fluorescein angiography performed?****Answer:**

- The dye is injected into the antecubital vein, and photographs are taken after 8-11 seconds to report hyperfluorescence or hypofluorescence.

Q34.2: What does hyperfluorescence indicate in fluorescein angiography?**Answer:**

- Hyperfluorescence occurs due to leakage or RPE defect, where the background choroid becomes visible.

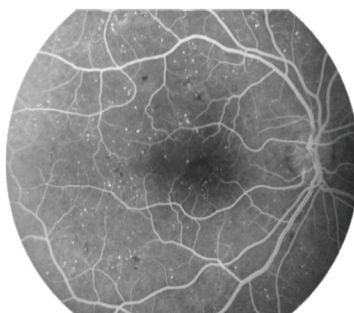
Q34.3: What does hypofluorescence indicate in fluorescein angiography?**Answer:**

- Hypofluorescence suggests capillary block or the presence of haemorrhage that blocks the view.

Q34.4: What do hyperfluorescent spots on fluorescein angiography suggest in a diabetic retina?**Answer:**

- These spots indicate microaneurysms, typically associated with mild or very mild Non-Proliferative Diabetic Retinopathy (NPDR).

 PYQ: FMGE 2020



BIG QUESTION 35: What are the clinical features of Pre-Proliferative Diabetic Retinopathy (Moderate NPDR)?

Broad Answer: Pre-proliferative DR indicates worsening hypoxia and ischemia in the retina, characterized by new lesions like cotton wool spots, flame-shaped hemorrhages, and venous abnormalities. These changes reflect progression toward proliferative stages.

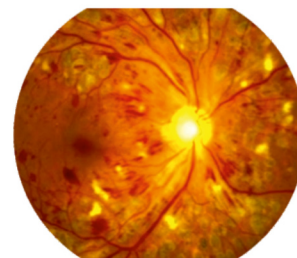
DETAILED QUESTIONS

 PYQ: FMGE 2020

Q35.1: What are cotton wool spots, and what do they indicate in DR?

Answer:

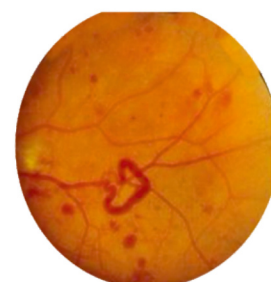
- Cotton wool spots are axonal debris representing localized retinal hypoxia. They are considered hard exudates and a hallmark of worsening disease.



Q35.2: What haemorrhages are typically seen in moderate NPDR?

Answer:

- Flame-shaped haemorrhages and large blot haemorrhages are seen, indicating significant retinal damage.



Q35.3: What is the significance of venous beading/looping in DR?

Answer:

- Venous beading or looping is a sign of pre-proliferative DR and is a part of microangiopathy.

Q35.4: What is the basic pathology in diabetic microangiopathy?

Answer:

The basic pathology in diabetic microangiopathy is the loss of Pericytes.

- Pericytes are the cells that support the endothelial cells, and they are responsible for autoregulation.
- In the case of non-proliferative DR, the first line of treatment is intravitreal anti-VEGF agents.

BIG QUESTION 36: What are the clinical features and treatment strategies in Proliferative Diabetic Retinopathy (PDR)?

Broad Answer: Proliferative DR is marked by neovascularization due to extensive retinal ischemia. This leads to serious vision-threatening complications such as vitreous haemorrhage, retinal detachment, and neovascular glaucoma. Management includes PRP laser and intravitreal anti-VEGF agents.

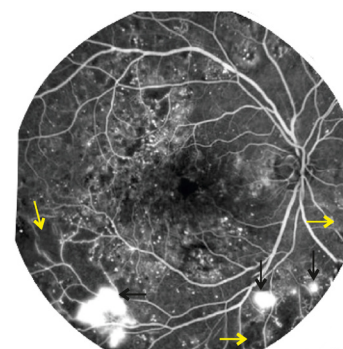
DETAILED QUESTIONS

 PYQ: NEET PG 2019

Q36.1: What does fluorescein angiography show in PDR?

Answer:

- It reveals both hyper- and hypofluorescent areas, including:
 - New blood vessels (tufts)
 - Ischemic patches leading to new vascularisations (yellow arrow)
 - Microaneurysms.



Q36.2: What is the first-line treatment for PDR?**Answer:**

- Pan Retinal Photocoagulation (PRP) is the first-line treatment.

Q36.3: What is the second-line treatment for PDR?**Answer:**

- Intravitreal anti-VEGF agents.

Q36.4: How many laser burns are typically given in PRP?**Answer:**

- 2500-3000 burns.

Q36.5: Why is PRP started in the inferior quadrant?**Answer:**

- Because if bleeding occurs, it settles down and does not obscure the view. Starting in the superior quadrant may lead to obscured visualization if bleeding occurs, and PRP has to be postponed.

Q36.6: PRP is not given in which area?**Answer:**

- Macular region.

BIG QUESTION 37: What are the features and management implications of Hypertensive Retinopathy?

Broad Answer: Hypertensive retinopathy presents with signs of vascular leakage in the retina, including cotton wool spots, hemorrhages, hard exudates, and papilledema. In pregnancy-induced hypertension (PIH), retinal changes can influence decisions about pregnancy termination. Blood pressure control is essential for prevention.

DETAILED QUESTIONS**Q37.1: What condition in pregnancy can lead to hypertensive retinopathy?****Answer:**

- Pregnancy-Induced Hypertension (PIH).

Q37.2: When can hypertensive retinopathy in PIH be an indication for pregnancy termination?**Answer:**

- At any stage of PIH where there is hemorrhage, exudate, or oedema.

Q37.3: What is the main preventive strategy for hypertensive retinopathy?**Answer:**

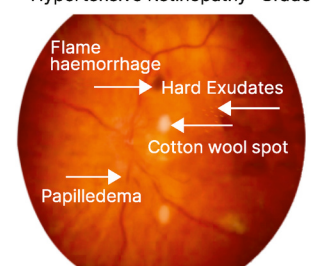
- Control of blood pressure and the pathogenesis contain different types of leakages in the retina.

 PYQ: FMGE 2023

Q37.4: What are the retinal findings in hypertensive retinopathy as seen in the image?**Answer:**

- Cotton wool spots
- Flame-shaped haemorrhages
- Hard exudates
- Papilledema

Hypertensive Retinopathy- Grade 4



Q37.5: How are hypertensive retinopathy and diabetic retinopathy differentiated based on the hemorrhages?**Answer:**

- In the case of hypertensive retinopathy, soft exudates and flame-shaped haemorrhages are more common.
- In the case of diabetic retinopathy, hard exudates and dot and blot haemorrhages are more common.

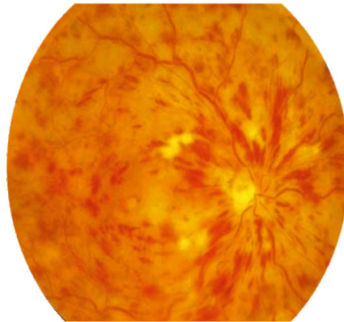
BIG QUESTION 38: What are the clinical features and related concepts in Central Retinal Artery and Vein Occlusion?

Broad Answer: CRVO presents with a “splashed sauce” appearance and cotton wool spots, while CRAO is identified by a cherry red spot and is an ophthalmic emergency. CRAO has a critical treatment window of 90 minutes, and may spare vision in some due to a cilio-retinal artery. Both conditions are associated with serious complications, including neovascular glaucoma and irreversible retinal damage.

DETAILED QUESTIONS**Q38.1: What is the characteristic fundus finding in Central Retinal Vein Occlusion (CRVO)?****Answer:**

- Splashed sauce appearance with cotton wool spots.

 PYQ: FMGE 2021

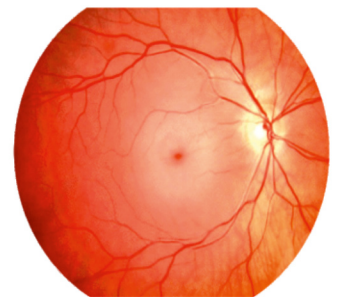
 PYQ: NEET PG 2022
**Q38.2: What is “100-day glaucoma,” and in which condition is it seen?****Answer:**

- It is neovascular glaucoma occurring 100 days after CRVO.

 PYQ: NEET PG 2019

 PYQ: FMGE 2020
Q38.3: What is the hallmark appearance of Central Retinal Artery Occlusion (CRAO)?**Answer:**

- Cherry red spot.

**Q38.4: What are the two most common causes of CRAO?****Answer:**

- Embolism (most common), followed by mucormycosis.

Q38.5: What is the critical time window to treat CRAO to prevent irreversible damage?**Answer:**

- 90 minutes.

Q38.6: What are the methods to manage CRAO within the critical window?**Answer:**

- Decrease intraocular pressure

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- Ocular massage
- Inhale carbogen to vasodilate

Q38.7: Why might a patient with CRAO not be completely blind?

Answer:

- Due to the presence of a cilio-retinal artery, which provides a dual blood supply in ~14% of people, preserving central vision (tunnel vision).



Q38.8: What are the causes of tunnel vision?

Answer:

- Presence of cilio-retinal artery
- Bilateral PCA obstruction (occipital lobe involvement)
- Late-stage retinitis pigmentosa
- Quinine toxicity
- Vigabatrin

Q38.9: What are the causes of cherry red spots in the retina?

Answer:

- Central Retinal Artery Occlusion (CRVO)
- Berlin's oedema / Commotio retinae
- Depositions (e.g., gangliosidosis, sphingolipidoses, Gaucher's disease)
- GM2 gangliosidosis

BIG QUESTION 39: What is Retinopathy of Prematurity (ROP) and how is it classified and managed?

Broad Answer: Retinopathy of Prematurity is a retinal disorder in premature infants caused primarily by oxygen-induced free radical injury to immature retinal vessels, leading to hypoxia and neovascularization. It progresses in stages and zones, and screening and treatment are time-sensitive. Laser photocoagulation is the treatment of choice, and classification includes stages, zones, plus disease, and threshold disease.

DETAILED QUESTIONS

Q39.1: What is the primary cause of Retinopathy of Prematurity (ROP)?

Answer:

- Premature infants, when given oxygen therapy, leads to free radical injury of incompletely formed retinal blood vessels, causing hypoxia.
- The most important etiological factor is prematurity.

Q39.2: When is the ideal time for screening for ROP?

Answer:

- The ideal time of screening is by adding 4 weeks to the postnatal age or between 31-33 weeks, whichever one is later.

Q39.3: Why can't ROP screening be done earlier?

Answer:

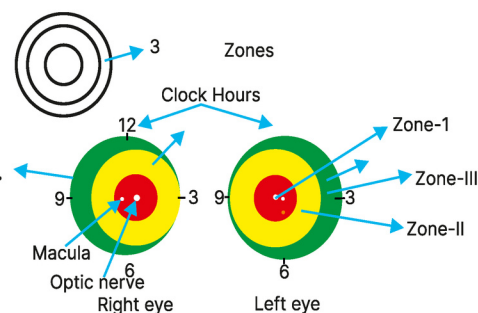
- Because the pupil is difficult to dilate early on, the tunica vasculosa lentis lies behind it.

Q39.4: What is the treatment of choice for ROP?**Answer:**

- Laser photocoagulation of the hypoxic retina.

Q39.5: How are the retinal zones in ROP defined?**Answer:**

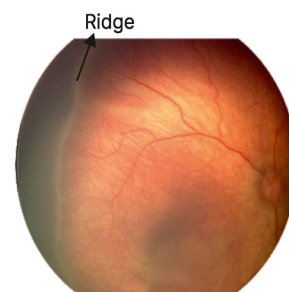
- Zone 1 (Red): 6 mm in diameter.
- Zone 2 (Yellow): Tangential circle extending from the nasal side of zone 1.
- Zone 3: Temporal crescent beyond zone 2.

**Q39.6: What occurs in Stage 1 of ROP?****Answer:**

- A demarcation line forms between the normal and hypoxic retina due to differential blood vessel orientation and arcades. The line appears in the temporal extremity.

Q39.7: What is observed in Stage 2 of ROP?**Answer:**

- The demarcation line becomes elevated, forming a ridge.

**Q39.8: What change marks Stage 3 of ROP?****Answer:**

- Neovascularization develops in the hypoxic retina.

Q39.9: What happens in Stage 4 of ROP?**Answer:**

- Subtotal retinal detachment.

Q39.10: What defines Stage 5 of ROP?**Answer:**

- Total retinal detachment.

Q39.11: What is Plus Disease in ROP?**Answer:**

- A severe form of ROP with tortuous arteries and veins, especially in the central retina, indicates poor prognosis and disease progression.

Q39.12: What is Threshold Disease in ROP?**Answer:**

- Threshold disease is stage 3, zone 1 and 2, and plus disease with the extent of 5 contiguous clock hours or 8 non-contiguous clock hours.

Q39.13: What is the significance of Threshold Disease in ROP management?**Answer:**

- Only when a child meets the criteria for threshold disease is treatment administered (though early treatment is now being considered).

BIG QUESTION 40: What are the key features of Cystoid Macular Edema (CME)?

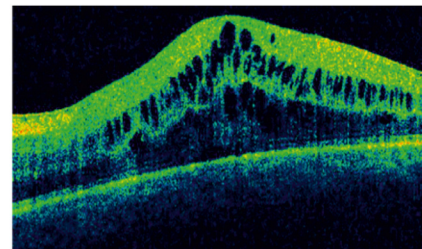
Broad Answer: Cystoid Macular Edema is characterized by cystic spaces in the macula due to breakdown of the inner blood-retinal barrier, and shows a distinctive flower-petal pattern on fluorescein angiography.

DETAILED QUESTIONS

Q40.1: What is seen in OCT in CME?

Answer:

- Cystoid spaces are seen in optical coherence tomography (OCT).



Q40.2: What is the pathological process that happens in CME?

Answer:

- The inner blood-retinal barrier is broken in CME.

Q40.3: What is the pattern seen in fluorescein angiography in CME and why?

Answer:

🔍 PYQ: NEET PG 2019, 2022

🔍 PYQ: FMGE 2020, 2021



- A flower-petal pattern is seen on fluorescein angiography due to leakage in a radial manner.
- This is because the outer plexiform layer (Henle's layer) in the macula is radially arranged.

BIG QUESTION 41: What are the key features and treatment considerations of Central Serous Retinopathy (CSR)?

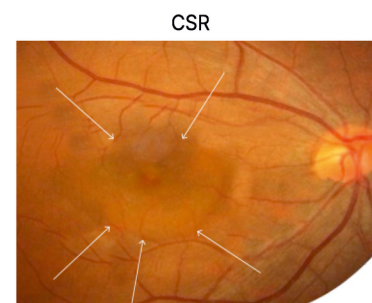
Broad Answer: CSR is characterized by outer blood-retinal barrier breakdown and subretinal fluid collection, mainly affecting young males, and may resolve spontaneously or require photodynamic therapy in chronic cases.

DETAILED QUESTIONS

Q41.1: What does the ring reflex seen in CSR indicate?

Answer:

- It marks the collection of fluid in the subretinal space and is a characteristic finding in CSR.
- The outer blood-retinal barrier is broken in CSR.



Q41.2: What is the consequence of barrier breakdown in CSR?

Answer:

- Fluid accumulates in the subretinal space, leading to shallow retinal detachment.

Q41.3: What is the gender predilection in CSR?**Answer:**

- CSR is more common in young males with a 3:1 male-to-female ratio.

Q41.4: How is acute CSR typically managed?**Answer:**

- Acute CSR is usually self-limiting and resolves without intervention.

Q41.5: What is the treatment of choice for chronic CSR?**Answer:**

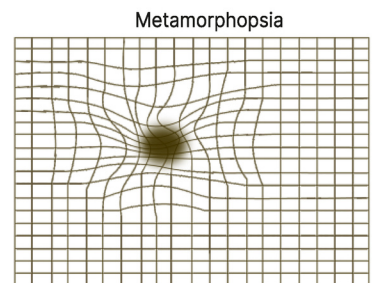
- Photodynamic therapy (PDT) using Verteporfin is the treatment of choice in chronic CSR with RPE damage.
- The diode laser activates Verteporfin, a photosensitising agent, which damages the neovascular membrane.

Q41.6: Why are steroids contraindicated in CSR?**Answer:**

- Steroids are contraindicated because they aggravate the disease.

Q41.7: What does the Amsler Grid Test assess, and what is metamorphopsia?**Answer:**

- It assesses the central 20° of the visual field.
- Metamorphopsia is the distortion of the image, commonly seen in CSR and ARMD.

**Q41.8: How many squares are present in the Amsler Grid?****Answer:**

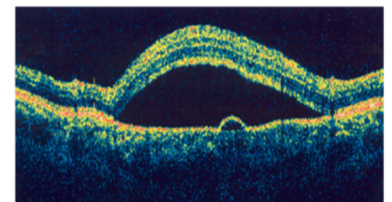
- There are 400 squares.

Q41.9: What is the primary treatment for wet ARMD, and how is it related to CSR treatment?**Answer:**

- Photodynamic therapy is the primary treatment for wet ARMD; the same or half dose is used in chronic CSR.

Q41.10: What can be seen on OCT in CSR?**Answer:**

- OCT shows shallow retinal detachment and helps in diagnosis.

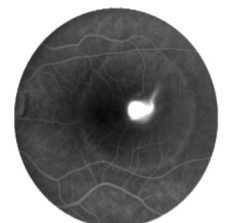
**Q41.11: What is the 'ink-blot' appearance in CSR?**

🔍 PYQ: NEET PG 2019,2022

Answer:

🔍 PYQ: FMGE 2020,2021

- It is a pattern seen in fluorescein angiography, indicating dye leakage from RPE.

**Q41.12: What is the 'smoke-stack' appearance in CSR?****Answer:**

- It is another fluorescein angiography pattern where dye ascends vertically before spreading.



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BIG QUESTION 42: What are the fundus features and complications associated with pathological myopia?

Broad Answer: Pathological myopia is defined by the presence of degenerative fundus changes along with myopia. It can lead to characteristic changes in the retina and choroid due to axial elongation of the eyeball, and may predispose to serious complications like retinal detachment.

DETAILED QUESTIONS**Q42.1: What defines pathological myopia?**

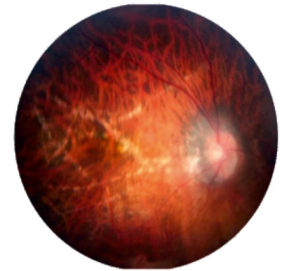
Answer:

- Any myopia that is associated with fundus changes is considered pathological myopia.

Q42.2: What is the Tigroid fundus, and what does it represent?

Answer:

- The Tigroid fundus is a prominent appearance of choroidal blood vessels due to thinning of the retina and RPE, commonly seen in pathological myopia.
- The grey shadow seen in pathological myopia is called the Annular crescent.

**Q42.3: What are lacquer cracks, and how are they formed?**

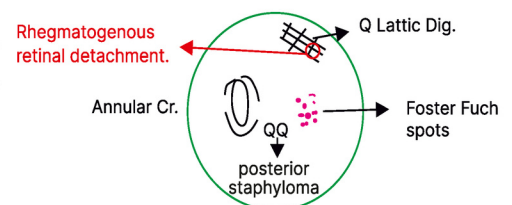
Answer:

- Lacquer cracks are white streaks representing breaks in Bruch's membrane due to excessive stretching of the eyeball.

Q42.4: What are the other features of pathological myopia?

Answer:

- Foster Fuch spots, posterior staphyloma, and lattice degeneration are seen in the peripheral retina, which can lead to hole formation. Any hole will cause rhegmatogenous retinal detachment.

**Q42.5: Which membrane is broken in the case of corneal stretching?**

Answer:

- In the case of corneal stretching, Descemet's membrane is broken.

Q42.6: What is another reason for Bruch's membrane breakage?

Answer:

- Another reason for Bruch's membrane breakage is angioid streaks, where there is a collagenous disorder.

Q42.7: What is the most common cause of angioid streaks?

Answer:

- Pseudoxanthoma elasticum

BIG QUESTION 43: What are the clinical features, associations, and diagnostic findings in Retinitis Pigmentosa (RP)?

Broad Answer: Retinitis Pigmentosa is a progressive inherited retinal dystrophy that primarily affects the photoreceptors and retinal pigment epithelium, leading to gradual vision loss. It is commonly sporadic and presents with a characteristic triad of fundus changes, systemic associations, and specific perimetry and electrophysiological findings.

DETAILED QUESTIONS

Q43.1: What is the most common pattern of inheritance in Retinitis Pigmentosa?

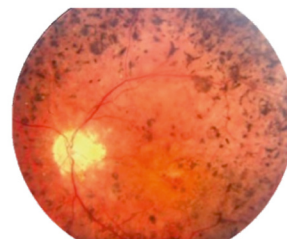
Answer:

- It is most commonly sporadic.

Q43.2: What is the classic triad of Retinitis Pigmentosa?

Answer:

- Pale waxy optic disc
- Bony spicule pigmentation
- Attenuation of retinal arteries



Q43.3: What is inverse retinitis pigmentosa?

Answer:

- Inverse RP is a pericentric variant where the disease starts from the central retina rather than the periphery.

Q43.4: What is the most common systemic association of RP?

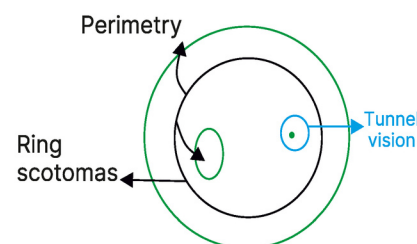
Answer:

- Usher's syndrome, which is the combination of RP with deafness.

Q43.5: What are the visual field findings in RP on perimetry?

Answer:

- Early stage: Ring scotomas
- Late stage (posterior and anterior spread): Tubular or tunnel vision



Q43.6: What is the investigation of choice for Retinitis Pigmentosa?

Answer:

- Electroretinogram (ERG), which shows decreased amplitude of both a and b-waves.

BIG QUESTION 44: What are the clinical features, genetics, imaging findings, and diagnostic tests in Stargardt's disease?

Broad Answer: Stargardt's disease is an inherited dystrophy of the retinal pigment epithelium (RPE) characterized by progressive vision loss, distinctive fundus and angiographic findings, and abnormal electrodiagnostic tests. It typically presents in childhood or adolescence and progresses rapidly.

DETAILED QUESTIONS

Q44.1: What is Stargardt's disease, and which part of the eye does it affect?

Answer:

- Stargardt's disease is a dystrophy affecting the retinal pigment epithelium (RPE).

Q44.2: What is the fundus appearance seen in Stargardt's disease?

Answer:

- It shows a "beaten bronze" appearance of the retina.



Q44.3: How is vision affected in Stargardt's disease?**Answer:**

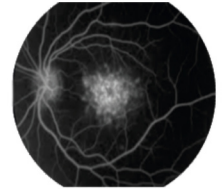
- Vision drops to $>6/60$ even in early cases.

Q44.4: What is the genetic basis of Stargardt's disease?**Answer:**

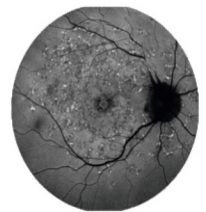
- It is an autosomal recessive disease caused by a mutation in the ABCA4 gene.

Q44.5: What is the fluorescein angiography finding in Stargardt's disease?**Answer:**

- It shows a dark choroid sign (silent choroid) due to lipofuscin deposition, which blocks the background fluorescence of the choroid, making retinal vessels appear prominently over a dark background, and also shows RPE atrophy.

**Q44.6: What does fluorescein autofluorescence show in Stargardt's disease?****Answer:**

- In autofluorescence (where no dye is used), lipofuscin deposits show intrinsic autofluorescence.

**Q44.7: What are the electrodiagnostic findings in Stargardt's disease?****Answer:**

- The electrooculogram (EOG) is abnormal.
- EOG measures the standing potential of the eye.
- The Arden ratio is normally 1.85, but it is decreased in Stargardt's disease.

Q44.8: What is the Arden ratio?**Answer:**

- The ratio of the maximum potential in the light and the minimum potential in the dark is called the ratio.

BIG QUESTION 45: What are the clinical features, diagnostic markers, and progression stages of Best Vitelliform Dystrophy?

Broad Answer: Best Vitelliform Dystrophy is a form of retinal pigment epithelium (RPE) dystrophy marked by characteristic lipofuscin accumulation and a progressive course that includes distinctive fundus appearances, electrodiagnostic abnormalities, and staged vision loss.

DETAILED QUESTIONS**Q45.1: What type of retinal disorder is Best Vitelliform Dystrophy?****Answer:**

- It is a dystrophy of the retinal pigment epithelium (RPE).

Q45.2: What is the Arden ratio in Best Vitelliform Dystrophy?**Answer:**

- Arden's ratio is decreased to >1.5 , which is below the normal value.

Q45.3: What is the characteristic fundus appearance in Best disease, and what causes it?

Answer:

- Lipofuscin accumulation gives an egg yolk appearance in the retina.



Q45.4: What is the role of vitamin A in Best Vitelliform Dystrophy?

Answer:

- Vitamin A is contraindicated as it enhances lipofuscinosis.

Q45.5: How does the disease progress through various stages?

Answer:

- The lipofuscin gets reabsorbed, leading to the pseudohypopyon stage.
- This progresses to the Vitelli eruptive stage, followed by atrophy.
- During this period, vision may decline to 6/60.



BIG QUESTION 46: What are the types of retinal detachment, and how are they identified through clinical and image-based signs?

Broad Answer: Retinal detachment (RD) is classified into rhegmatogenous, exudative, and tractional types. Each has unique clinical signs and imaging features such as grey reflex, presence or absence of photopsia and floaters, fluid mobility, and tear morphology. Post-surgical findings like inverse hypopyon may also occur with silicone oil use.

DETAILED QUESTIONS

Q46.1: What happens when the retina is detached from the choroid, and how does it appear?

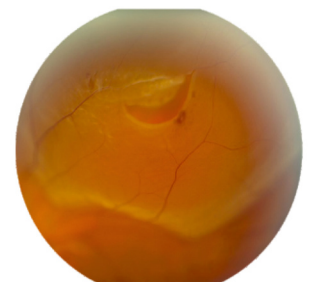
Answer:

- The retina appears grey instead of red when it is detached from the choroid.

Q46.2: What does the grey reflex in the image suggest?

Answer:

- It indicates rhegmatogenous retinal detachment.



Q46.3: What is the most common type of retinal detachment?

Answer:

- Rhegmatogenous RD

Q46.4: What are the symptoms of rhegmatogenous RD?

Answer:

- Photopsia (due to traction on rods and cones)
- Floaters (due to pigment dispersion into the vitreous cavity)

Q46.5: What leads to rhegma formation in rhegmatogenous RD?

Answer:

- Traction on the retina causes the formation of a rhegma (tear).

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Q46.6: What is the characteristic tear seen in the rhegmatogenous RD image?

Answer:

- Agiant horse-shoe-shaped tear.

Q46.7: What is Schaffer's sign, and what does it indicate?

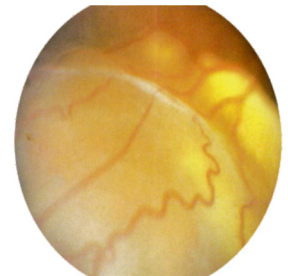
Answer:

- Also called tobacco dust
- Refers to pigment dispersion into the vitreous, indicating a retinal tear

Q46.8: What are the features of exudative retinal detachment?

Answer:

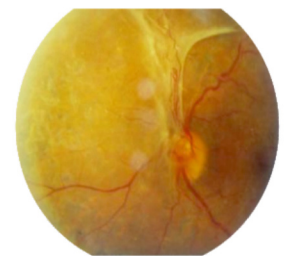
- Convex configuration of the grey reflex
- Very mobile due to subretinal fluid: Shows the Shifting fluid sign
- No photopsia, but floaters present



Q46.9: What are the features of tractional retinal detachment?

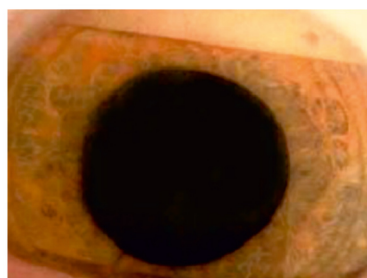
Answer:

- Concave configuration
- Photopsia present, but floaters absent



Q46.10: What happens if silicone oil is used in RD surgery?

Answer:



- In surgery for retinal detachment is done and silicone oil is used as the vitreous substitute, and there are chances that the silicone can percolate into the anterior chamber and settle, as shown in the image, because the oil is lighter than water.
- This creates inverse hypopyon or hyperpyon

BIG QUESTION 47: What are the clinical features, pathology, genetic basis, and classification of retinoblastoma?

Broad Answer: Retinoblastoma is a pediatric intraocular tumor that presents with leukocoria, squint, and other ocular signs. It spreads mainly via the optic nerve and has both histological features, like rosettes, and genetic mutations involving the 13q14 locus. It may also be part of syndromes like trilateral retinoblastoma and 13q syndrome, and its severity is graded by the International Classification from Group A to E.

DETAILED QUESTIONS

Q47.1: What is leukocoria, and what condition is indicated by its presence in the image?

Answer:

- Leukocoria is a white pupillary reflex (white eye defect).
- It indicates retinoblastoma in this image.



Q47.2: What is the most common age of presentation for retinoblastoma?

Answer:

- Approximately 18 months.

Q47.3: What is the most common mode of presentation in retinoblastoma?

Answer:

- Leukocoria.

Q47.4: What is the second most common mode of presentation in retinoblastoma?

Answer:

- Squint (strabismus).

Q47.5: What are the other possible presentations of retinoblastoma?

Answer:

- Pseudo-hypopyon (tumor cells in the anterior chamber)
- Uveitis
- Glaucoma
- Orbital cellulitis

Q47.6: What is the most common route of spread for retinoblastoma?

Answer:

- Through the optic nerve.

Q47.7: What is the most common non-ocular malignancy associated with retinoblastoma?

Answer:

- Osteosarcoma

PYQ: NEET PG 2019, 2021, 2022

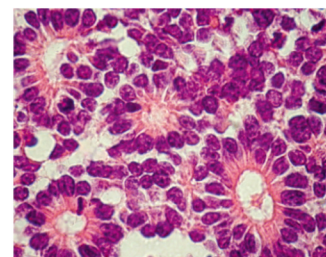
PYQ: FMGE 2019, 2021

PYQ: INICET 2023

Q47.8: What microscopic feature is shown in the image of retinoblastoma?

Answer:

- Flexner-Wintersteiner rosettes, which are formed by differentiated tumour cells of RB.



PYQ: FMGE 2021

Q47.9: What are other histological patterns found in retinoblastoma?

Answer:

- Homer-Wright pseudorosettes (no lumen)
- Fleurettes

Q47.10: What is the genetic mutation responsible for retinoblastoma?

Answer:

- 13q14 gene mutation (chromosome 13, Q is the long arm, 14th band)

Q47.11: What is 13q syndrome?**Answer:**

- If mutation extends beyond the 14th band, → causes dysmorphic features:
- Frontal prominence
- Broad nasal bridge

Q47.12: What is trilateral retinoblastoma?**Answer:**

- Bilateral retinoblastoma with pinealoma.

Q47.13: How is retinoblastoma classified in the international classification system?**Answer:**

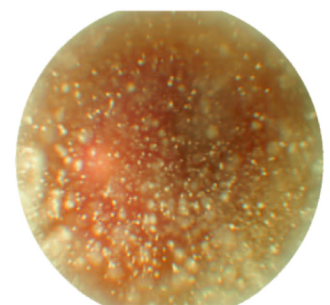
Group	Description
A	Small tumors (<3 mm), away from the macula and optic disc
B	Larger than 3 mm or near optic disc/foveola, still within retina
C	Well-defined tumours with small amounts of spread under the retina (subretinal seeding) or into the jelly-like material that fills the eye (vitreous seeding).
D	Large or poorly defined tumor with widespread seeding or retinal detachment. The retina may have become detached from the back of the eye.
E	Very large tumor with anterior extension, bleeding, glaucoma, or poor prognostic features

BIG QUESTION 48: What are the types, remnants, compositions, and pathologies related to the vitreous body?

Broad Answer: The vitreous body has embryological origins (primary), adult structure (secondary), and zonular components (tertiary). Its strong retinal attachment is at the vitreous base, and it plays a protective antioxidant role. Pathologies include asteroid hyalosis and synchysis scintillans, both presenting with floaters. Developmental remnants like the Bergmeister papilla and persistent hyperplastic primary vitreous (PHPV) are also important.

 **PYQ: FMGE 2019**
DETAILED QUESTIONS**Q48.1: What is the structure shown in the image, and what does it represent?****Answer:**

- The image shows a floater in the vitreous.

**Q48.2: What is asteroid hyalosis, and what is it composed of?****Answer:**

- Appears like stuck particles.
- Composed of calcium and lipid.
- Not associated with myopia.

Q48.3: What is synchysis scintillans, and what is it composed of?**Answer:**

- Appears like free-falling particles.
- Composed of cholesterol bodies.

Q48.4: What are the three types of vitreous, and what do they represent?

Answer:

Type	Description
Primary	Embryonic vitreous; hyaloid vessels + mesodermal tissue Derived from mesoderm.
Secondary	Adult vitreous; composed of hyaluronic acid and type II collagen
Tertiary	Forms the ciliary zonules/suspensory ligaments of the lens

Q48.5: What is shown in the image as a remnant of hyaloid tissue?

Answer:

- Bergmeister papilla



Q48.6: Where is the strongest attachment of vitreous to the retina?

Answer:

- At the vitreous base, located at the ora serrata.

Q48.7: What is the ratio of ascorbic acid in vitreous to plasma, and what is its significance?

Answer:

- Ratio = 9:1 (vitreous: plasma)
- Significance = Antioxidant effect to protect the retina

Q48.8: What is persistent hyperplastic primary vitreous (PHPV), and what are its features?

Answer:

- A remnant of hyaloid tissue
- Leads to amblyopia
- Associated with microphthalmia
- Not associated with calcifications

BIG QUESTION 49: How does the eye develop embryologically, and what are the sources of its various structures?

Broad Answer: Eye development begins from the forebrain around day 22 of gestation, involving interactions between the optic vesicle and surface ectoderm. Multiple embryonic germ layers contribute to different eye structures—surface ectoderm, neuroectoderm, neural crest, and mesoderm. Malformations like coloboma result from failed fusion events.

DETAILED QUESTIONS

Q49.1: From which part of the brain does the eye develop, and which gene is responsible?

Answer:

- Develops from the forebrain (prosencephalon)
- Gene: PAX-6

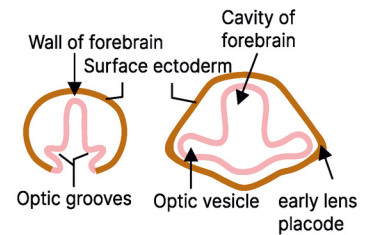
YOURWISH

Q49.2: When does eye development begin?**Answer:**

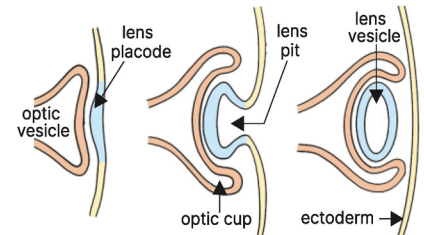
- Starts from the 22nd day of gestation.

Q49.3: What structure arises from the optic grooves, and what do they contact?**Answer:**

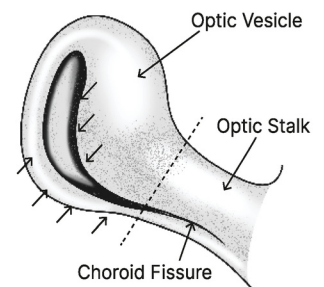
- Optic grooves develop from the forebrain.
- Optic grooves develop into the optic vesicle.
- The optic vesicle contacts the surface ectoderm to form the early lens placode

**Q49.4: Describe the sequence of lens formation.****Answer:**

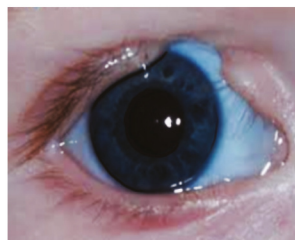
- The lens placode forms from the surface ectoderm
- Invaginates to form the lens pit
- Becomes a lens vesicle
- Differentiates into the lens
 - o Though internal, the lens is derived from surface ectoderm

**Q49.5: What is the gap in the optic stalk called, and what happens if it fails to close?****Answer:**

- Gap = Choroid fissure
- Closes by 6th-7th week of gestation
- Failure to close → Coloboma

**Q49.6: What abnormalities are shown in the images?****Answer:**

- Lid coloboma



- Iris coloboma

**Q49.7: What structures are derived from the surface ectoderm?****Answer:**

(Mnemonic: SLEEK)

Mnemonic	Structure
S	Skin appendages
L	Lens
E	Epithelial lining of the conjunctiva
E	Epithelial lining of the cornea
K	– (Mnemonic filler for completion)

Q49.8: What structures are derived from the neuroectoderm?

Answer:

(Mnemonic: STORME)

Mnemonic	Structure
S	Secondary vitreous
T	Tertiary vitreous
O	Optic nerve
R	Retina
M	Muscles of the iris (sphincter & dilator pupillae)
E	Epithelium of the iris & ciliary body

Q49.9: What structures are derived from the neural crest?

Answer:

- Sclera (except the temporal part)
- Choroid
- Corneal stroma and endothelium
- Trabecular meshwork
- Ciliary muscles

Q49.10: What structures are derived from the mesoderm?

Answer:

(Mnemonic: PSME)

Mnemonic	Structure
P	Primary vitreous
S	Temporal part of the sclera
M	Extraocular muscles
E	Endothelium of blood vessels

BIG QUESTION 50: What are the key causes, definitions, and public health strategies in community ophthalmology, especially in the Indian context?

Broad Answer: Community ophthalmology addresses avoidable blindness through definitions, prevalence estimates, and school screening programs. The causes of blindness vary globally, with cataracts being the most common overall,

and refractive errors as a major contributor to ocular morbidity. Definitions differ slightly between WHO and NPCB based on the kind of visual acuity considered.

DETAILED QUESTIONS

Q50.1: What is the most common cause of blindness globally and in India?

Answer:

- Cataracts are the most common cause of blindness in both India and the world.

Q50.2: What is the most common cause of blindness in developed countries?

Answer:

- Most common: Glaucoma
- Second most common: Age-related macular degeneration (ARMD)

Q50.3: How do the WHO and NPCB definitions of blindness differ?

Answer:

Criteria	WHO	NPCB
Visual acuity reference	Best corrected visual acuity (BCVA)	Best available/presented visual acuity
Cutoff	< 3/60 in the better eye or visual field <10°	< 3/60 in the better eye or visual field <10°

- The only difference is in whether BCVA or presented vision is used.

Q50.4: What is the current prevalence of blindness in India?

Answer:

- 0.36% (Previously it was 1%)

Q50.5: In the school screening programme, when should a child be referred to an ophthalmologist?

Answer:

- When visual acuity is <6/9, the teacher should refer the child to an ophthalmologist.

Q50.6: What is the most common cause of preventable blindness in India?

Answer:

- Glaucoma

Q50.7: What is the most common cause of childhood blindness in India?

Answer:

- Vitamin A deficiency > Refractive errors

Q50.8: What is the most common cause of ocular morbidity in India?

Answer:

- Refractive errors



3. RAPID FIRE DISCUSSION

BIG QUESTION 1: What are the key distinguishing ocular signs in anterior lenticonus, keratoconus, and congenital glaucoma, and how do they guide diagnosis?

Broad Answer: Anterior lenticonus shows a conical protrusion of the anterior lens surface, keratoconus presents with corneal thinning and conical shape, and congenital glaucoma is characterised by an enlarged cornea and Haab's striae. These key signs help differentiate the conditions and guide diagnosis.

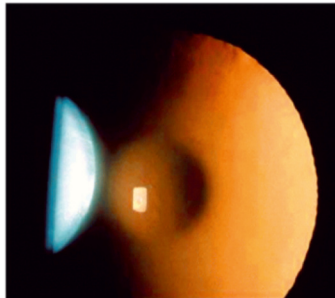
DETAILED QUESTIONS

Q1.1: What reflex is seen in anterior lenticonus?

PYQ: FMGE 2021

Answer:

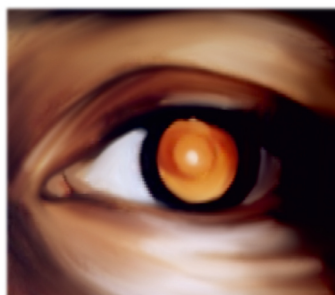
- Oil globule reflex



Q1.2: Which ocular condition shows oil droplet reflex on distant direct ophthalmoscopy?

Answer:

- Keratoconus



Q1.3: Which metabolic disorder is associated with oil droplet cataract?

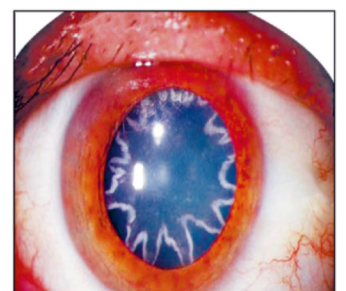
Answer:

- Galactosemia (irreversible cataract)

Q1.4: What are stellate opacities in the lens, and what is their clinical significance?

Answer:

- Stellate opacities are seen in Anterior subcapsular opacities
- These are electric cataracts



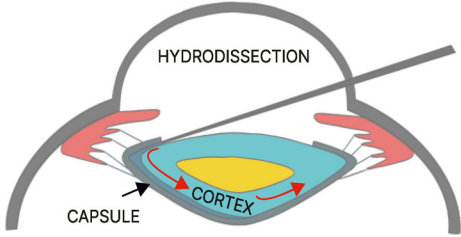
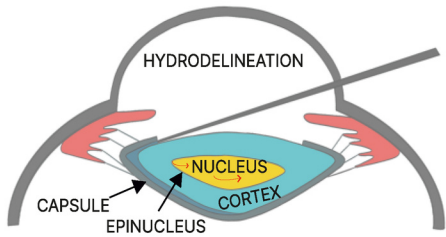
YOURWISH

BIG QUESTION 2: What are the important surgical and diagnostic techniques used in ophthalmology?

Broad Answer: Various methods are employed in ophthalmology to aid in surgery, lens implantation, and diagnosis. These techniques help improve outcomes and provide better visualisation and correction.

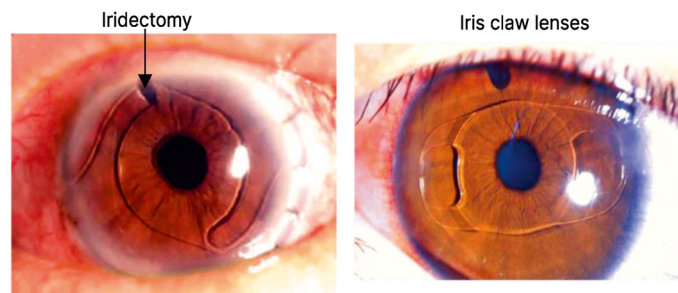
DETAILED QUESTIONS**Q2.1: Differentiate between Hydrodissection and Hydrodelineation**

Answer:

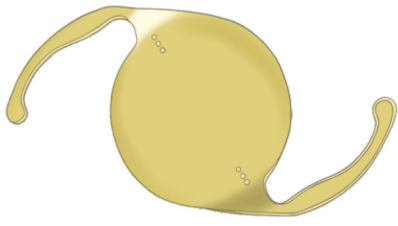
Hydrodissection	Hydrodelineation
- We inject between the capsule and the cortex. - The capsule is separated from the lens	- The water is between the nucleus, epinucleus, cortex - The layers are being separated
	

Q2.2: What is the role of iridectomy in lens implantations?

Answer: Iridectomy is required in AC-IOL and iris claw lenses to facilitate proper aqueous drainage.

**Q2.3: What are the features of multifocal lenses and toric lenses?**

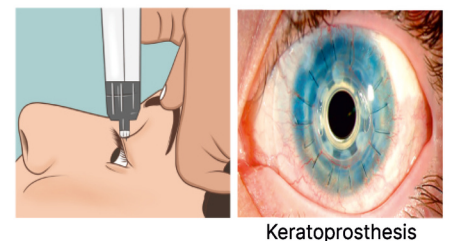
Answer:

	
- These are Multifocal lens - It takes care of near, intermediate and far vision	These are Toric lenses for cylindrical correctio

Q2.4: What is a transpalpebral tonometer, and what are its clinical applications?

Answer:

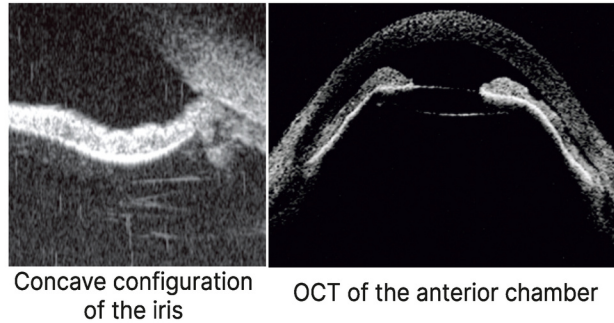
- Transpalpebral tonometer (like digital tonometry)
- It is also known as Diaton
- It is useful for patients with a Keratoprosthesis



Keratoprosthesis

Q2.5: What are the uses of ultrasound biomicroscopy?

Answer:



First image: It shows that the configuration of the Iris is concave

- This is pigmentary glaucoma
- This is also called reverse glaucoma

Second image: Anterior segment OCT

- It shows a very shallow anterior chamber
- This is aqueous misdirection syndrome/malignant glaucoma

BIG QUESTION 3: What are some important clinical conditions and findings in ophthalmology related to trauma, congenital disorders, and dystrophies?

Broad Answer: Ophthalmology includes several conditions that may arise due to trauma, congenital anomalies, or corneal changes. Recognising these findings is essential for proper diagnosis and management.

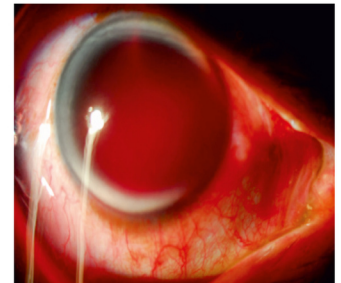
DETAILED QUESTIONS

PYQ: FMGE 2019

Q3.1: What can blunt trauma to the eye cause?

Answer:

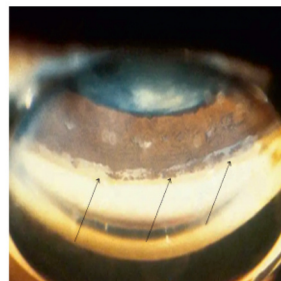
- Blunt trauma can lead to hyphema.
- Hyphema can lead to glaucoma and even permanent corneal staining.
- Treatment: Keratoplasty.



Total Hyphema

Q3.2: What does this image indicate?

Answer: It shows a tear in the base of the iris due to a tear in the ciliary body.

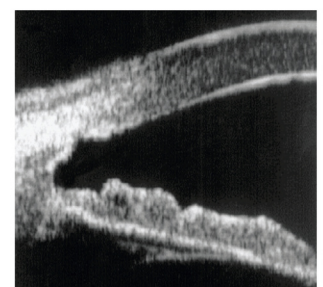


Tear in the ciliary body

Q3.3: What does this image show?

Answer:

- This is the image of angle recession glaucoma (the angle has gone back).



Angle recession glaucoma

Q3.4: What ocular findings are associated with Sturge-Weber syndrome?**Answer:**

- Sturge-Weber syndrome:
 - o This capillary hemangioma is called Naevus flammeus.
 - o Triad: Naevus flammeus, glaucoma, hemangioma.

**Q3.5: What ocular feature is seen in Neurofibromatosis type I?****Answer:**

- Shows an S-shaped deformity.
- It can cause an angle anomaly leading to glaucoma.

**Q3.6: What do Sturge-Weber syndrome and Neurofibromatosis type I have in common?****Answer:**

- Both are examples of secondary congenital glaucoma.

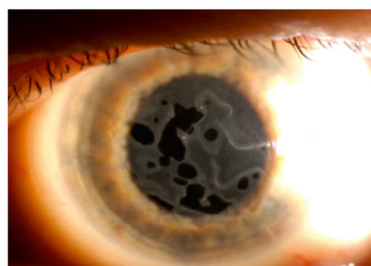
Q3.7: What is the most common intraorbital tumour in children?**Answer:**

- Capillary hemangioma is the most common intraorbital tumour in children.
- It is blanchable.
- Treatment: Propranolol.

**Q3.8 Which is the most common corneal dystrophy?****Answer:**

- Microcystic (Map-dot-fingerprint) dystrophy.
- Also known as Finger print dystrophy

PYQ: NEET PG 2021

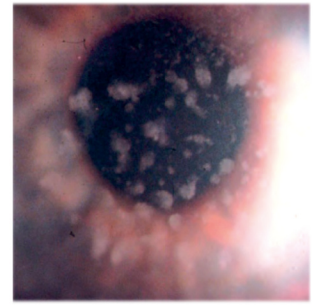
**BIG QUESTION 4: What are the types, features, and associations of corneal stromal dystrophies?**

Broad Answer: Corneal stromal dystrophies are a group of rare, inherited eye disorders that cause abnormal protein or other material to build up in the cornea's middle layer, the stroma. This buildup can lead to a gradual loss of vision due to clouding of the cornea, and the specific type of dystrophy determines the unique pattern and composition of these deposits.

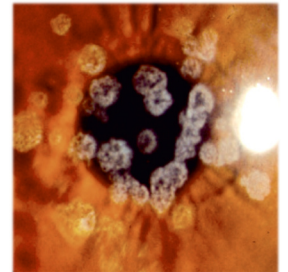
DETAILED QUESTIONS

Q4.1: What are the features of macular dystrophy?**Answer:**

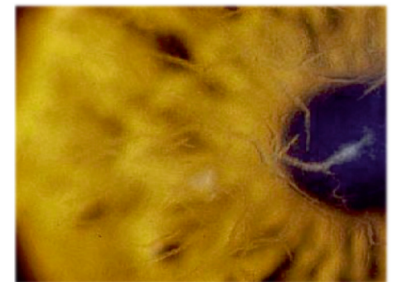
- Between the lesions, the cornea is hazy
- Colloidal iron/calcium blue is used for Macular dystrophy
- The least common macular dystrophy
- Autosomal recessive (All other are Autosomal dominant)
- It is associated with Mucopolysaccharidosis

**Q4.2: What are the features of granular dystrophy?****Answer:**

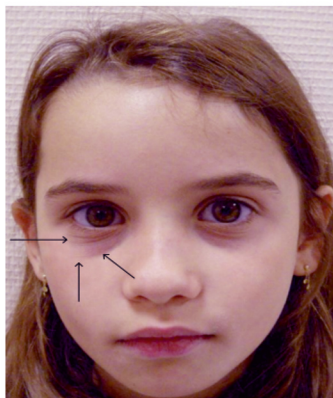
- Between the lesions, the cornea is clear
- Mason Trichrome stain is used for Granular dystrophy

**Q4.3: What are the salient features of lattice dystrophy?****Answer:**

- Between the lesions, lattice strands are seen
- The most common stromal dystrophy is lattice type 1
- Type 2 lattice is associated with Amyloidosis
- Congo red stain is used for Lattice dystrophy

**Q4.4: What are Dennie-Morgan folds, and in which conditions are they seen?****Answer:**

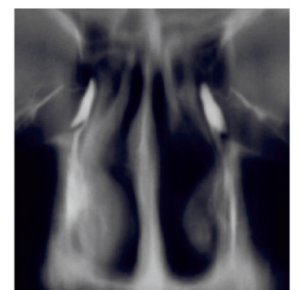
- The arrows show the folds that are formed due to intense rubbing
- It is seen in Vernal keratoconjunctivitis/Atopic dermatitis, and allergies



Dennie Morgan folds

Q4.5: What is dacryocystography, and what structures does it visualise?**Answer:**

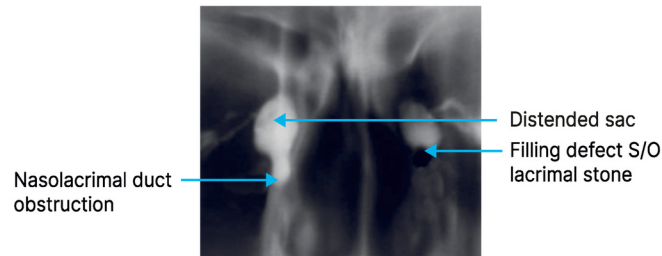
- A dye is put, and radiography is taken
- Lower and upper canaliculi, sac, and the nasolacrimal duct are seen



Normal Dacryocystography

Q4.6: What are the radiological findings of mucocele and dacryolithiasis on dacryocystography?**Answer:**

- A mucocele is seen, and a block in the nasolacrimal duct is seen
- A filling defect is seen on the other side, which shows a Lacrimal stone



BIG QUESTION 5: What are the tests used for the assessment of lacrimal drainage? Write a note on various minor ophthalmological diseases.

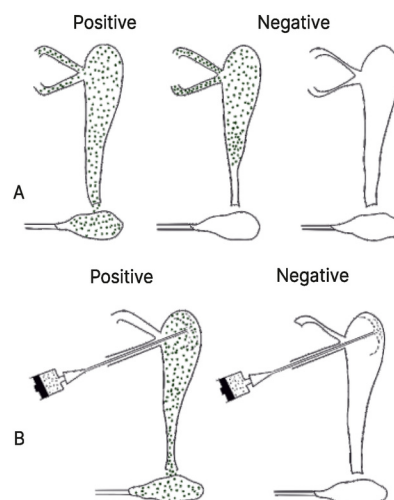
Broad Answer: The Jones Dye Test is used to assess lacrimal drainage. Fluorescein dye is instilled into the conjunctival sac, and cotton is placed in the nose. Test I is positive if the cotton becomes stained, indicating a patent lacrimal passage. If negative, Test II involves irrigating the system with a saline solution. Recovery of fluorescein-stained fluid indicates a normal upper passage, while the absence of fluorescein suggests obstruction or lacrimal pump failure. Dacryoscintigraphy is the most reliable test for detecting pump failure.

DETAILED QUESTIONS

Q5.1 Describe the procedure, interpretation, and clinical importance of Jones Dye Test I and II.

Answer:

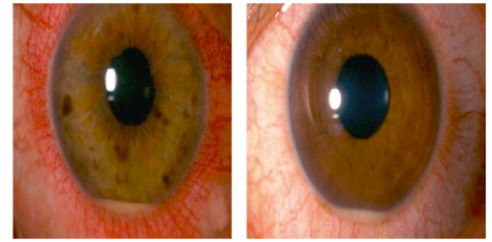
- Fluorescein is put in the eye, and cotton is put in the nose
- After some time, we look whether the fluorescein has reached the cotton (whether the cotton is stained with fluorescein)
- If everything is fine, this is positive
- If the Jones dye test 1 (primary test is negative), then water has to be injected through a syringe into the upper passage.
- Suppose there is filling of the sac with the fluorescein-stained tear, when water is injected, the fluorescein-stained water is seen.
 - o This means that the upper lacrimal passage is normal
 - o That's why it got filled with the sac, and when injected, fluorescein-stained fluid is seen
- Suppose we didn't get the fluorescein-stained fluid, it means that there was some problem in the upper lacrimal passage or lacrimal pump failure
- Jones test 1 and 2 negative: Pump failure
- The most reliable test to detect pump failure is Dacryoscintigraphy, where radioactive dye is used to see the flow under physiological conditions.



Q5.2: What are the key ocular and systemic features of Behcet's disease?

Answer:

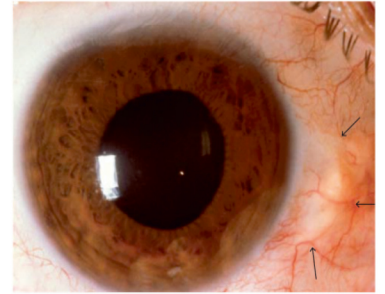
- Recurrent hypopyon is seen
- This is also called transient hypopyon syndrome
- It is associated with **HLA B5/HLA B51**
- It causes obliterative vasculitis due to circulating immune complexes
- This causes oral ulcers, genital ulcers, positive skin test, and eye involvement (non-granulomatous anterior and posterior uveitis)



Q5.3: What is the Sugiura sign?

Answer:

- A ring of limbal depigmentation is seen in chronic VKH syndrome.



Q5.4: What is Iris Roseola, and how is it related to ocular syphilis?

Answer:

- Dilated capillaries forming a nodule
- It's a feature of Syphilis
- It can be anterior, posterior, granulomatous or non-granulomatous
- Secondary syphilis causes these manifestations
- Salt and pepper fundus is the feature of Posterior uveitis

Q5.5: What are the causes of Salt and pepper fundus?

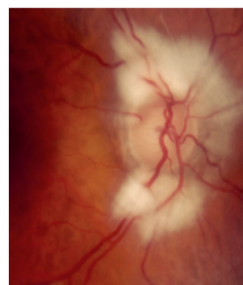
Answer:

- Rubella
- Syphilis
- Retinitis pigmentosa
- Sine pigmento
- Myotonic dystrophy

Q5.6: What is the clinical significance of myelinated nerve fibres in relation to the blind spot? PYQ: INICET 2022

Answer:

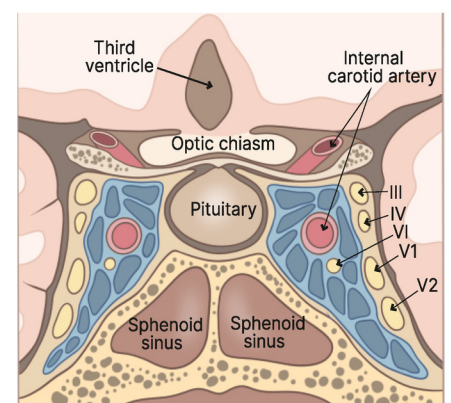
- Myelinated nerve fibre, Papilledema, and Optic disc drusen are causes of enlargement of the blind spot.
- The size of the blind spot is smaller when there is Optic nerve hypoplasia.



Q5.7: Name the structures passing through the cavernous sinus.

Answer:

- The nerves 3,4,5 are passing through the wall, and six passes through the center along with the Internal carotid artery.



Q5.8: What is the first sign of cavernous sinus thrombosis?**Answer:**

- Sixth nerve palsy

BIG QUESTION 6: What are Dalrymple and Kocher's signs, and why are they important in thyroid eye disease?

Broad Answer: In thyroid eye disease (Graves' ophthalmopathy), lid retraction is the earliest and most common sign. Dalrymple sign refers to the upper eyelid being abnormally retracted, giving a "wide-eyed" appearance. Kocher sign occurs when the lid retraction is so marked that the upper sclera becomes visible, producing a staring look. These signs result from sympathetic overactivity and inflammation of the extraocular muscles, commonly affecting the levator palpebrae superioris and Müller's muscle.

DETAILED QUESTIONS**Q6.1: Which is the first sign of Thyroid eye disease?****Answer:**

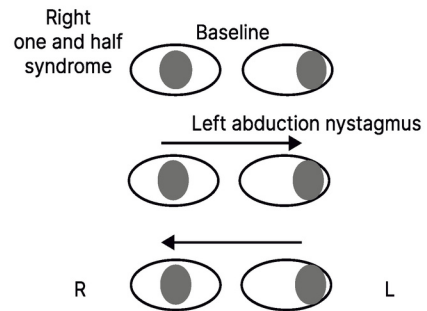
- Lid retraction

Q6.2: What is One-and-a-Half syndrome, and how does Eight-and-a-Half syndrome differ?

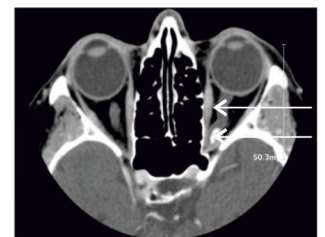
PYQ: NEET PG 2022

Answer:

One-and-a-Half syndrome	Eight-and-a-Half syndrome
• No abduction and adduction and on the other side, there is no adduction • Same side PPPRF and same side MLF are gone	• No abduction and adduction and on the other side, there is no adduction • Same side PPPRF and same side MLF are gone • Along with these features, there is seventh nerve palsy on the same side

**Q6.3: What are the key imaging features and clinical relevance of optic nerve meningioma?****Answer:** Optic nerve meningiomas:

- Tubular enlargement of the optic nerve, which is typically seen in a CT scan
 - o Calcifications are also seen

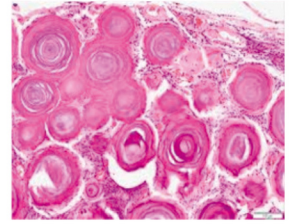


Q6.4: What is an optociliary shunt, and in which condition is it commonly seen?**Answer:**

- Optociliary shunt: There is an anastomosis between the retinal and ciliary systems
 - When the pressure is higher, it opens up
 - This is seen in CRVO

**Q6.5: What are Psammoma bodies?****Answer:**

- Calcified lamellar lesions

**Q6.6: What is Meibomitis (Posterior Blepharitis) and how is it managed?****Answer:**

- Opening of the Meibomian glands, oil glands are seen
- This is a sign of Meibomitis/Posterior blepharitis (Blepharitis is inflammation of the lid margin)
- This is associated with Acne rosacea
- Treatment is by thermal pulsation in order to soften it so that the oil trapped in the Meibomian gland can be expressed.

Q6.7: What is the primary cause of dry eye in Meibomitis?**Answer:**

- Blockage of Meibomian glands prevents lipid secretion into the tear film.

Q6.8: How is dry eye treated?**Answer:**

- Dry eye is treated with lubricating eye drops and subsides the inflammation in the Meibomian gland so that the oil comes into the tear film.

Q6.9: What is a styte, and how is it treated?**Answer:**

- Styte is a staphylococcal infection of the hair follicle: gland of Zeiss>gland of Moll.
- Hot fomentation is given
- Oral antibiotics are not needed



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Q6.10: What is Hordeolum internum?**Answer:**

- If the lesion is in the tarsal plate and is painful, then it is called Hodeolum internum (Acute inflammation of Meibomian gland)

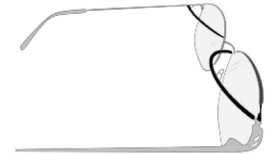
**Q6.11: What is a chalazion?****Answer:**

- If it is a lipogranulomatous chronic inflammation, it would be a painless swelling in the tarsal plate called a Chalazion.
 - It is treated with Incision and Curettage.
 - The incision should be vertical. Otherwise, the ducts of the Meibomian glands will be damaged.
 - Recurrent chalazion should be suspected of Sebaceous cell carcinoma

YOURWISH

Q.6.12: What is used for the temporary treatment of ptosis?**Answer:**

- Crutch glasses

**Q6.13: What is a LOG-MAR chart, and why is it preferred over the Snellen chart?****Answer:**

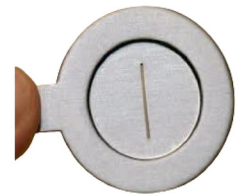
- This is an image of a LOG-MAR chart
- It is more accurate because the number of letters in each line is the same
- It excludes the process of the crowding phenomenon
 - In amblyopic patients, if a same-sized letter is present singly, they will read it
 - If same same-sized letter is present in a sequence, he will not read it
- To exclude the crowding phenomenon, the LOG-MAR chart and the ETDRS charts are used.

**Q6.14: What is the key difference in letter distribution between Snellen and LOG-MAR charts?****Answer:**

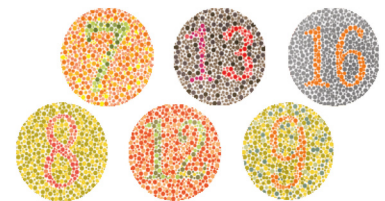
- The Snellen chart has a different number of letters in each line, whereas the LOG-MAR chart has the same number of letters per line.

Q6.15: Describe the stenopic slit and its clinical use.**Answer:**

- Stenopic slit is 1mm wide and 15 mm long
- It is used for Fincham's test to know where the Iridectomy should be done

**Q6.16: Describe the Ishihara chart and its clinical significance.****Answer:**

- Used to screen colour blindness
- It screens red and green colour blindness

**Q6.17: What is spherical aberration?****Answer:**

- Bending of peripheral rays more than central rays, leading to image distortion.

Q6.18: What visual effect does spherical aberration produce with plus lenses?**Answer:**

- Pincushion effect.

Q6.19: What visual effect does spherical aberration produce with minus lenses?**Answer:**

- Barrel effect

Q6.20: Which type of bifocal lens is preferred for children with accommodative esotropia and a high AC/A ratio?**Answer:**

- Executive bifocal lens

Q6.21: Explain the role of executive bifocal lenses in children with accommodative esotropia.

Answer:

- These are executive bifocals for children
- These are used in cases of accommodative esotropia, where the AC/A ratio is higher
- Near vision is corrected using this



Executive bifocals

BIG QUESTION 7: What are the key imaging and clinical features of retinoblastoma and age-related macular degeneration (ARMD)?

Broad Answer: Retinoblastoma shows intraocular calcifications on imaging, often detected via USG B-scan or CT. ARMD is of two types: Dry ARMD (more common), characterized by drusen deposits, and Wet ARMD associated with macular neovascularization, which leads to rapid vision loss. Antioxidants (Vitamins C, E, Zinc, Copper, Lutein) help slow dry ARMD progression.

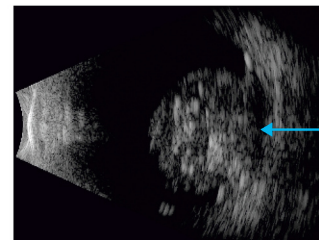
DETAILED QUESTIONS

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Q7.1: What imaging feature is characteristic of retinoblastoma?

Answer:

- Intraocular calcifications.

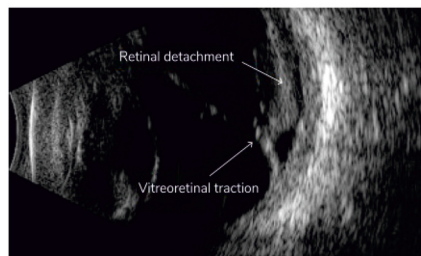


Retinoblastoma

Q7.2 What is the T-sign in posterior scleritis?

Answer:

- T sign is seen in posterior scleritis, where there is thickening of Tenon's capsule and fluid under the subtenon's space.

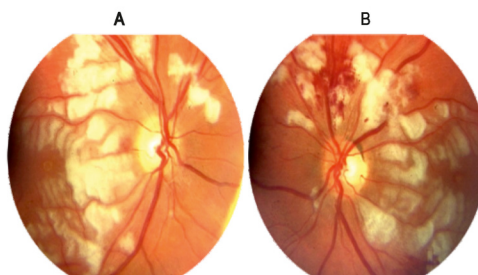


Retinal Detachment

Q7.3: What is Purtscher's retinopathy, and what are its causes?

Answer:

- Multiple cotton wool spots are seen around the disc, and some **Purtscher's flecks** are seen.
- Purtscher's retinopathy is due to embolism after trauma
- Due to embolism, there is marked diminution of vision and acute hypoxia in the retina
- Another cause can be Acute pancreatitis or renal failure



Q7.4: Which type of ARMD is more common?**Answer:**

- Dry ARMD

Q7.5: What is the main pathological feature of wet ARMD?**Answer:**

- Choroidal neovascularization in the macula

Q7.6: What supplements are used in the prevention of ARMD progression?**Answer:**

- Vitamin E and Zinc (also Vitamin C, Copper, and lutein)

Q7.7: Where are drusen seen?**Answer:**

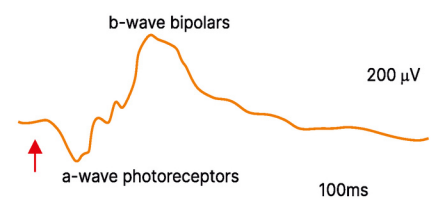
- Age-related Macular degeneration

**Q7.8: What is Bull's Eye Maculopathy, and what are its common causes?****Answer:**

- The image shows alternate dark and light areas.
- Bull's eye maculopathy means the pathology is in the macula
- Hypopigmentation is damage to the retinal pigment epithelium
- Causes
 - o Chloroquine
 - o Hydro chloroquine
 - o Cone dystrophy

**Q7.9: Describe the electroretinogram.****Answer:**

- A wave-negative wave corresponds to photoreceptors.
- B wave-bipolar cells
- We monitor the doses by doing a serial ERG, where the Iron in the eye can diminish the b wave.
- In retinitis pigmentosa, there is a decrease in both a and b waves and resulting in a Flat wave.

**Q7.10: Which imaging modality is best for diagnosing posterior staphyloma?****Answer:**

- USG B-scan.

Q7.11: In which condition is posterior staphyloma most commonly observed?**Answer:**

- Pathological myopia.

Q7.12: What is posterior staphyloma?**Answer:**

- It is an ectatic condition of the eyeball with herniation of uveal tissue.

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