4. Diseases of the Sclera

Q Give an account on the scleral foramina

Answer

Scleral foramina:
(A) Large foramina (2 in number)
(B) Small multiple foramina

(A) Large foramina (two in number):

1. Posterior scleral foramen.
- Lies 3 mm medial and 1 mm above the posterior pole of the eye.
- It is the site of exit of optic nerve.
- The optic nerve fibers pierce the sclera which is weakened and has a sieve-like appearance and is known as Lamina cribrosa.
- The sclera is fused at the edge of the posterior scleral foramen with the dural and arachnoid sheaths of optic nerve.
- The central opening of lamina cribrosa is large and transmit the central retinal vessels.

2. Anterior scleral foramen:
The cornea fits in the anterior scleral foramen like a watch glass.

(B) Multiple small foramina;
► ***Three groups exist:***

a) Anterior:
Located at the insertion of recti muscles or immediately infront of it. Transmit branches of the anterior ciliary arteries (7 in number: 2 from each rectus muscle except the L.R. which only has one).

b) Middle:
About 4 mm behind the equator and number 4 or 5. These are for the exit of vortex veins, which drains the uveal tract, mainly choroid.

c) Posterior:
Are small, numerous and located around the optic nerve. They transmit the long and the short posterior ciliary nerves and vessels.

Q Differentiate between episcleritis and phlyctenular conjunctivitis

D.D.:
Phlyctenular kerato conjunctivitis **(Table).**
Table : DD of nodular episcleritis and phlycten

Character:	**Nodular episcleritis**	**Phlycten**
(1) Incidence: 1) Age: 2) Sex: **(2) History:** **(3) Signs:** 1) Site.	 Old age More in females Long. Some distance from the limbus.	 Children. Equal. Short. At the limbus.

2) Colour: 3) Level: 4) Movement: 5) Tenderness: 6) Utceration: 7) Suppuration: 8) Adrenaline test: **(4) Complications:** **(5) Prognosis**:	Purple (deep vessels). Subconjunctival (deep). Fixed to sclera and conjunctiva moves over it. Very tender. Never occurs. Never occurs. No blanching (deep vessels). Rare (scleritis). May be serious (cause).	Grey. Conjunctival (superficial). Moves with conjunctiva. Not tender. Occurs. Occurs. Blanching (superficial vessels Common (corneal). Good.

Q Mention the classification, clinical picture, and complications of scleritis

Answer

Classification (Clinical Types) of Scleritis:

(1) Anterior Scleritis

a) Non-necrotozing scleritis:

i. Nodular

ii. Diffuse

b) Necrotozing scleritis (with & without pain) :

(2) Posterior scleritis

(I) Anterior Scleritis

(A) Anterior Non-necrotozing Scleritis:

• ***Clinical Picture*:**

***1. Symptoms*: Pain** is common symptom and may radiate to the frontal or maxillary regions, **marked tenderness**.

2. Signs:

a) Nodular Scleritis: A localized nodular lesion *with the following characters:*

- **Less circumscribed** than episcleritis.
- **Dark red or violet** at first, later it becomes pale purple.
- It may surround the cornea**. (Annular scleritis).**
- **Never ulcerate,** the cornea and iris may be involved.

***b) Diffuse Scleritis*:**

- **Widespread inflammation**
- **No ulceration,** but much absorption of the sclera causing marked **thinning** and **staphyloma.**

• **Treatment:**

- **Non-steroidal Anti-inflammatory drugs (NSAID)** e.g. indomethacin 100 mg daily for 4 days then 75 mg daily until resolution.

(B) Anterior Necrotozing Scleritis (with & without Pain):

(i) Anterior Necrotozing Scleritis with pain:

- ***Clinical Features*:**
    a. **Presentation (Symptoms):** with ***severe pain***.
    b. **Signs:** Localized patches of scleral necrosis exposing the uvea..
- **Treatment:**

- Systemic steroids or
- Immunosuppressive drugs e.g. cyclophosphamide.

(ii) Anterior Necrotozing Scleritis without Pain (Scleromalacia Perforans):

- ***Clinical Features*:**
    c. **Presentation (Symptoms):** usually in females with long standing generalized seropositive **rheumatoid arthritis** with an asymptomatic **(painless) dark scleral patch** due to scleral atrophy.
    d. **Signs:** Large patches of scleral necrosis exposing the uvea..
- ***Treatment:***

1. Medical treatment: usually not effective.

2. Surgical treatment:

1- Extreme thinning of the cornea and sclera:

- Corneal grafting
- Scleral grafting covered by conjunctiva.
- Fascia lata or periosteum are more resistant to the melting process.

2- Extreme corneal marginal ulceration or keratolysis: may require corneal grafting (usually lamellar patch graft).

- ***Complications of anterior scleritis***:

1- Uveitis with its complications, especialy cyclitis and anterior choroiditis.

2- Sclerosing keratitis. (triangular with rounded apex, with little or no corneal vasularization, ulceration never occur, partial clearing occur, pupillary area usually escape), the densest parts usually persists as a bluish clouds.

3- Secondary glaucoma.

4- Fctasia of the thinned sclera (ciliary staphyloma).

5. Loss **of vision.**

6- Brawny scleritis: diffuse form with involvement of extra ocular muscles, with marked oedema and diffuse redness, chronic course. Loss of the eye, may occur.

7- The most serious complication is **kcratolysis** wherein the stroma melts away with Descematocele formation.

8- Corneal and lirnbal **guttering** with thinning and ectasia.

9- Complicated Cataract.

10. **Retinal detachment.**

11- Papilloedema.

(II) Posterior Scleritis

It is actually scleral and Tenon's capsule inflammation behind the equator.
leading to:

1- **Moderate pain and oedema of lids.**
2- **Proptosis.**
3- **Limitation of ocular movement with diplopia.**

• **<u>Complications</u> of posterior scleritis:**

1. Choroidal effusion
2. Exudative RD
3. Macular edema
4. Optic disc edema (swelling0

Q What are the types of ocular staphylomata

Answer

• **<u>Definition:</u>**

A staphyloma is a bulge of the outer coat of the eye, lined by atrophic uveal tissue.

• **<u>Clinical Types:</u>**

It may be **corneal or scleraL**

A. Corneal Staphyloma:

- It is a bulge of a corneal scar with incarcerated atrophic iris tissue.
- It is caused by perforated corneal ulcer or wound with iris prolapse
- The surface appears lobulated bluish in colour.
- On healing lead to glaucoma if a sufficient area of the angle is blocked by peripheral anterior synechiae.
- If the condition is neglected blindness follow.

- ***Types***: it may be **partial or total.**
  1) Partial corneal staphyloma : Conical bulging of a big corneal scar with iris in carceration due to large corneal perforation with iris prolapse.
  2) Total corneal Staphyloma : Hemispherical bulging of the pseudo-cornea due to sloughing of the whole cornea →sloughing of the whole cornea.

B. Scleral staphylomata:

• ***These may be:***

1. <u>Anterior scleral staphyloma</u>
- where the sclera is weakened by the ciliary B.vs. and schlemm's canal.
- ***This includes:***

a) *Intercalary staphyloma:*
- Occurs within 2-3 mm zone concentric with the limbus.
- This part is weakened by schlemm's canal.

- The staphyloma is **lined by atrophic iris root and peripheral anterior synechiae.**

- It is in front of the perforating branches of the anterior ciliary arteries.

- *Causes:* It is caused usually by prologed rise of IOP in the degenerative stage of the absolute **glaucoma**

b) *Ciliary staphyloma*:

- It is a bulge of the sclera, situated behind the limbus, **lined by atrophic ciliary body.**
- It is **behind the perforating branches of the anterior ciliary vessels.**
- Its surface is irregular, bluish in colour.
- It may surround the cornea **(Ring staphyloma).**
- It is slowly progressive and may rupture.
- ***Causes***: it is caused by weakness of the sclera following **scleritis or injury,** usually associated with some rise of the IOP, and also caused by prolonged rise of I.O.P. in the degenerative stage of **absolute glaucoma.**

2. <u>Equatorial staphyloma</u>:

- Occurs at that part of the eyeball which is weakened by the passage of the vortex veins **usually between recti muscles, lined by atrophic chorioretinal tissue. (**usually seen after excision of the globe)**.**
- ***Causes***:.Caused by **absolute glaucoma.**

3. <u>Posterior Staphyloma</u>:

- Which occurs at the posterior pole of the eye, usually on the **temporal** side of the optic disc, or may surround the optic disc **(peripapillary staphyloma).**
- **Cause**: Caused primarily by the scleral degeneration of **high degree of axial myopia.**
- **Diagnosis**: Can be diagnosed **ophthalmoscopically** (the B.vs. being at two levels). **The best diagnostic method is by ultrasonography.**

• **<u>Treatment of Ocular Staphylomata</u> :** Depends upon the cause.
(1) Treatment of the cause: If treatable.
(2) Treatment of the staphyloma:
1)Partial corneeal_staphyloma: Penetrating keratoplasty.
2)Scleral staphyloma: Scleral graft especially small equatorial staphylom;
(3) Treatment of secondary glaucoma: Filtering operation.
(**4) Treatment of a blind painful eye**: Enucleation.

Q What are the causes of blue sclera

Answer

<u>BLUE SCLERA</u>
• **<u>Definition</u>**
Abluish discolouration of thin sclera due to uveal tissue showing through it (as sclera is thin).

• **<u>Aetiology:</u>**

(1) <u>Osteogenesis imperfecta</u>: ***A hereditary syndrome characterized by:***

1) Fragile bones.
2) Deafness (due to otosclerosis).

3) Blue sclera (due to thin sclera).

(2) <u>Thin sclera:</u>

1) In children. .
2) In high myopia.
3) In scleral staphyloma.
4) In buphthalmos.