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***Sence organs: Eye II***

***Sclerocorneal Junction/Limbus (fig.)***

* The sclerocorneal junction is marked by a shallow depression externally and it is the place where the transparent cornea becomes continuous with the opaque sclera.
* It contains an important circular canal lined by endothelium called *canal of Schlemm* or *scleral venous sinus* concerned with drainage of aqueous humour as this canal is connected externally to the anterior ciliary veins and internally to the anterior chamber through spaces of Fontana at iridocorneal angle. In section, the canal appears as an oval cleft whose inner wall is
* formed by trabecular meshwork enclosing *spaces of Fontana*.
* Aqueous humour is dialysate of blood. It is a clear watery fl uid (similar to CSF in composition) produced by the ciliary epithelium, covering the ciliary processes into the posterior chamber. From there it passes into the anterior chamber via pupil and is continuously reabsorbed (drained) through the canal of Schlemn into the bloodstream. Aqueous humour serves as a medium for exchange of metabolites to and from the avascular lens and cornea. It is also responsible for the intraocular pressure (normal pressure is 20 mmHg).
* Normally, the canal of Schlemn contains no blood, as the communication between the canal and the ciliary veins are oblique and fl attened preventing the refl ux of blood into the sinus. However, under venous congestion blood may pass into the canal.
* Obstruction to the drainage of aqueous humour leads to sustained increase in the intraocular pressure/tension, causing **glaucoma**. If untreated, this may cause damage to retina resulting in blindness.

***Middle Vascular Pigmented Coat/Uveal Tract***

* This is a heavily pigmented vascular coat that absorbs light that has passed through the retina, creating a dark chamber for the eyeball.
* It consists of three parts, namely, choroid, ciliary body and iris.
* The arteries of this layer are derived from branches of ophthalmic artery and are responsible for nourishment of 1st–4th layer of retina.

***Choroid***

* Choroid is the posterior part of the middle coat and lies between sclera and retina.
* It is rich in small blood vessels and pigment cells, which give a purple black colour to this coat.

***Sclerocorneal Junction.***

*Presence of :*

* **Scleral venous sinus;**
* S**paces of Fontana** of iridocorneal angle;
* Corneal epithelium becoming ocular conjunctiva.
* It is made of the following layers from superfi cial to deep:
1. *Suprachoroidal layer* – loose connective tissue rich in melanocytes.
2. *Vascular layer* – loose connective tissue rich in melanocytes and medium-sized blood vessels.
3. *Choriocapillary layer* – capillary network essential for nourishment of retina.
4. *Bruch’s membrane* (glossy membrane) – refractile hyaline layer forming basement membrane of the pigment epithelium of retina.
* ***Ciliary Body***
* The ciliary body is a circumferentially thickened part of the middle coat extending from the ora serrata to the edge of lens.
* Its anterior part presents radially oriented ridges called *ciliary processes* and they give attachment to the suspensory ligament (zonule) of lens.
* The ciliary body is triangular on cross section. It is mainly formed by *ciliary muscle* (smooth muscle) oriented in longitudinal, circular and radial directions.
* Ciliary muscle is innervated by parasympathetic nerve fi bres. When it contracts it pulls the ciliary body forwards resulting in relaxation of suspensory ligament of lens causing the lens to become more convex so that the nearer object is focused on the retina. This muscle is also called *muscle of accommodation*.
* The inner surface of the ciliary body and the ciliary processes are covered by a double layer of epithelial cells, the *ciliary e pithelium* responsible for production of aqueous humour.
* Ciliary epithelium, is the forward prolongation of nonsensitive part (*ciliary part*) of retina beyond the ora serrata.
* Of the two layers of ciliary epithelium, the superfi cial layer is the pigmented cuboidal epithelium and is continuous with the pigment epithelium of retina and the deep layer is the nonpigmented columnar epithelium which is continuous with the nervous layer of retina at the ora serrata. Anteriorly, both layers are pigmented and line the posterior surface of the iris as iridial part of retina.

***Iris***

* Iris is the anterior most part of the middle coat. It forms a *pigmented circular diaphragm* placed in front of the lens with an aperture in the centre, the *pupil*. Through the pupil the anterior and posterior chambers communicate.
* The size of the aperture is controlled by two muscles present in it. They are *sphincter pupillae* and *dilator pupillae,* innervated by parasympathetic and sympathetic nerve fi bres respectively. Sphincter pupillae (smooth muscle) is circularly arranged near the pupillary margin of the iris and it causes constriction of pupil. Dilator pupillae (myoepithelial cells–derived from
* posterior pigment epithelium of iris) is radially arranged and causes dilation of pupil.
* The rough anterior surface of iris has no epithelial lining and is covered by a discontinuous layer of pigmented cells and fi broblasts. Its smooth posterior surface is covered by a double layer of pigmented cuboidal epithelium (*iridial part of retina*).
* The central core is formed by vascular pigmented connective tissue stroma. The colour of the eye depends on the amount of stromal pigment. (Blue eyes contain little pigment whereas brown eyes have more pigments.)

***Retina.***

*Presence of :*

* pigment epithelium (simple cuboidal);
* layer of rods and cones;
* outer and inner nuclear layers;
* outer and inner plexiform layers;
*  ganglionic cell layer.