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**1**

The vasculature is a network of blood vessels connecting the heart with all other organs and tissues in the body. The Vasculature system place an important role in immune modification. In our body, the vascular system consists of blood and lymphatic vessels, both which are lined by endothelial cells. Blood vessels are the paths that transport our immune cells to sites of inflammation. Blood vascular and lymphatic endothelial cells have important roles in trafficking of immune system.

When a virus enters the body, the immune system detects an intruder and fights back. This is one reason human beings still exist. In some cases, its (immune system) fight against the viruses damages the tissues itself. Before the war at the cellular level, the virus slips into the body on the hunt for cells it can commandeer. At the same time trying to avoid getting noticed.

The human immune system is a highly intricate network of cells designed to keep the host free from infection. Once the immune system is triggered, and the T-cell finds a body cell that has become a virus factory, it latches on and fires molecules that punch through the cell`s membrane and everything inside. A virus like Covid-19 attacks the alveolar epithelium, a part of the lungs. This virus causes illness and death by attacking cells in the alveolar epithelium. The immune system attacks this virus already in the alveolar epithelium and as a result also damages the epithelium. With the help of lymphatic vasculature, the body builds up immune response to the virus.

**2**

The Subsartorial canal (Adductor canal or Hunters canal) is an aponeurotic tunnel located in the middle third of the thigh. It is approximately 15cm long, extending from the apex of the femoral triangle to the adductor hiatus of the adductor Magnus. The canal is an important part of the lower limb as it serves as a passageway for structures moving between the anterior thigh and posterior leg.

It transmits the femoral artery, Femoral vein, nerve to the vastus medialis and the saphenous nerve. It is bounded by; The vastus medialis (lateral), The adductor longus and adductor Magnus (posterior), and The Sartorius (anteromedial). As the femoral artery and vein leaves the canal, they become the popliteal artery and popliteal vein, respectively.

In the adductor canal block, local anaesthetic is administered in the adductor canal to block the saphenous nerve in isolation. The block can be used to provide sensory anaesthesia for procedures involving the distal thigh and femur, lower leg and knee on the medial side.

**3**

**EXTRAOCULAR MUSCLES:**

The extraocular muscles are the six muscles that controls the eyelid elevation (levator palpebrae). The actions of the six muscles responsible for eye movement depend on the position of the eye at the time of muscle contraction. The six extraocular muscles are;

* Superior rectus
* Inferior rectus
* Lateral rectus
* Medial rectus
* Superior oblique, and
* Inferior oblique

Four of the extraocular muscles have their origin in the back of the orbit in a fibrous ring called Annulus of Zinn. The four rectus muscles attach directly to the front half of the eye and are named after their straight paths.

The Medial rectus is the muscle closest to the nose. The superior and inferior recti do not pull straight back on the eye, because both muscles also pull slightly medially. The extent of rolling in the recti is less than the oblique, and opposite from it.

The superior Oblique muscle originates at the back of the orbit, (a little closer to the medial rectus though medial to it), getting rounder as it courses forward to a rigid, cartilaginous pulley, called the trochlea, on the upper, nasal wall of the orbit. Due to its unique paths, the superior oblique pulls the eye downward and laterally.

The Inferior oblique muscle originates at the lower front of the nasal orbital wall, and passes under the left rear to insert on the lateral, posterior part of the globe. Thus, the inferior oblique muscle pulls the eye upward and laterally.

The movements of the extraocular muscles take place under the influence of a system of extraocular muscle pulleys, soft tissue pulleys in the orbit.

**Blood Supply**

The extraocular muscles are supplied mainly by branches of the ophthalmic artery. This is done either directly or indirectly. Each rectus muscle receives blood from two anterior ciliary arteries, except for the lateral rectus muscle, which receives blood from only one.

**Nerve Supply**

The extraocular muscles are innervated by nerves that enter the orbit through the superior orbital fissure. The Oculomotor nerve (CN III) divides into superior and inferior branches and innervates the Superior, Medial, and Inferior recti, the levator palpebrae superioris and the Inferior oblique.

The Trochlea nerve (CN IV) innervates the Superior oblique, and the Lateral rectus is innervated by the Abducens nerve (CN VI).

**INTRAOCULAR MUSCLES:**

The intraocular muscles are muscles responsible for pupil accommodation and reaction to light; and the protractor and retractors of the eyelids. The intraocular muscles include;

* The Ciliary muscle
* The Sphincter pupillae, and
* The Dilator pupillae

The ciliary muscle is a smooth muscle ring that controls accommodation by altering the shape of the lens, as well as controlling the flow of aqueous humour into Schlemm`s canal. The ciliary muscle is attached to the zonular fibres which suspends the lens. Relaxation of ciliary muscle has the opposite effect, optimising distant focus. The ciliary muscle is supplied by parasympathetic fibres by the way of the ciliary nerves.

The Sphincter and Dilator pupillae are also composed of smooth muscle. The sphincter pupillae encircles the pupil and is responsible for the constriction of its diameter, while the dilator muscle is arranged radially and increases the pupillary diameter. The sphincter relaxes at death, often releasing fluids and faeces. The sphincter can be classified into anatomical and functional sphincters. The sphincter pupillae is supplied by parasympathetic fibres by the way of the short ciliary nerves and its contraction results in constriction of the pupil.

The Dilator Pupillae consist of smooth muscle anterior to the pigmented epithelium on the posterior aspect of the iris, which constitutes the iridial part of the retina. The dilator pupillae is supplied by sympathetic fibres, and its contraction results in dilatation of the pupil. This sympathetic innervation arises as preganglionic nerve fibres leaving the spinal cord in the upper 4nthoracic ventral roots.

The ophthalmic nerve branches into the frontal, nasociliary, and lacrimal nerves. The ciliary ganglion is made up of postsynaptic parasympathetic nerve cell bodies associated with the ophthalmic nerve. The short ciliary nerve originates from the ciliary ganglion. The sphincter pupillae is parasympathetically stimulated while the dilator pupillae is sympathetically stimulated.