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1) Describe the importance of vasculature in relation to immune system and outbreak of pandemic Covid -19 on the human body

Answer

Vasculature is the function of blood vessels to transport nutrients to organs/tissues and transport wastes away from tissue/blood . A primary purpose and significance role of vasculature is its participation in oxygenating the body .

The importance of immune system is that it helps fight foreign substances called antigens . When the body senses these antigens , the immune system works to recognize the antigen and get rid of it.

Circulating T cells contact blood vessels either when they extravasate across the walls of microvessels into inflamed tissues or when they enter into the walls of larger vessels in inflammatory diseases such as atherosclerosis. The blood vessel wall is largely composed of three cell types: endothelial cells lining the entire vascular tree, pericytes supporting the endothelium of microvessels and smooth muscle cells forming the bulk of large vessel walls. Each of these cell types interacts with and alters the behavior of infiltrating T cells in different ways, making these cells active participants in the processes of immune-mediated inflammation.

The coronavirus pandemic has turned the world's attention to the immune system, the body's defence force against disease-causing bacteria, viruses and other organisms that we touch, ingest and inhale every day.

* Until a vaccine is available, our immune systems will need to adapt unaided to COVID-19.
* The immune system is the body ' s multi-level defence network against potentially harmful bacteria, viruses and other organisms.
* A healthy lifestyle helps one's immune system to be in the best shape possible to tackle pathogens, but it's better to stop them entering the body in the first place.

Think of the immune system as the body's personal army working from the cellular to macro level. Each cell, molecule, tissue and organ in this army plays a vital role in warding off invading pathogens, and also helps guard against internal threats like cancer.

The system has two types of response: innate and adaptive.

The body's natural barriers against disease-causing intruders – for example, our skin, the mucous and hairs in our nose, and the acid in our stomachs – are part of our innate immune systems.

Adaptive immunity develops over a lifetime of contact with pathogens and vaccines, preparations which help our immune systems to distinguish friend from foe.

Vaccination safely teaches our adaptive immune systems to repel a wide range of diseases, and thus protect ourselves and others.

There is currently no vaccine for coronavirus, and we may not see one for 18 months or longer. So, for now, our immune systems must adapt unaided to this potentially deadly threat.How to help your immune system

A healthy lifestyle – not smoking, drinking little or no alcohol, sleeping well, eating a balanced diet, taking regular moderate exercise and reducing stress – helps our immune systems to be in the

best shape possible to tackle pathogens.

2) Subsartorial canal is an important area in the lower limb , discuss

ANSWER

The adductor canal (Hunter's canal, subsartorial canal) is a narrow conical tunnel located in 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 serves as a passageway from structures moving between the anterior thigh and posterior leg.

Borders

The adductor canal is bordered by muscular structures:

* Anteromedial: Sartorius.
* Lateral: Vastus medialis.
* Posterior: Adductor longus and adductor magnus.

The adductor canal runs from the apex of the femoral triangle to the adductor hiatus – a gap between the adductor and hamstring attachments of the adductor magnus muscle.

Contents

The adductor canal serves as a passageway for structures moving between the anterior thigh and posterior leg.

It transmits the femoral artery, femoral vein (posterior to the artery), nerve to the vastus medialis and the saphenous nerve – the largest cutaneous branch of the femoral nerve.

As the femoral artery and vein exit the canal, they are called the popliteal artery and vein respectively.

Clinical Relevance - Adductor Canal Block

In the adductor canal block, local anaesthetic is administered in the adductor canal to block the saphenous nerve in isolation, or together with the nerve to the vastus medialis.

The block can be used to provide sensory anaesthesia for procedures involving the distal thigh and femur, knee and lower leg on the medial side. The sartorius and femoral artery are used as anatomical landmarks to locate the saphenous nerve.

Adductor Canal Compression Syndrome

Adductor canal compression syndrome describes entrapment of the neurovascular bundle within the adductor canal. A rare condition, it is usually caused by hypertrophy of adjacent muscles such as vastus medialis.

It is most common in young males, who may present with claudication symptoms due to femoral artery occlusion (more common) or neurological symptoms due to entrapment of the saphenous nerve.

3) Describe the Extraocular and Intraocular Muscles with their nerve supply

ANSWER

EXTRAOCULAR MUSCLES

The extraocular muscles are located within the orbit, but are extrinsic and separate from the eyeball itself. They act to control the movements of the eyeball and the superior eyelid.

There are seven extraocular muscles – the levator palpebrae superioris, superior rectus, inferior rectus, medial rectus, lateral rectus, inferior oblique and superior oblique. Functionally, they can be divided into two groups:

* Responsible for eye movement – Recti and oblique muscles.
* Responsible for superior eyelid movement – Levator palpebrae superioris.

Levator Palpebrae Superioris

The levator palpebrae superioris (LPS) is the only muscle involved in raising the superior eyelid. A small portion of this muscle contains a collection of smooth muscle fibres – known as the superior tarsal muscle. In contrast to the LPS, the superior tarsal muscle is innervated by the sympathetic nervous system.

* Attachments: Originates from the lesser wing of the sphenoid bone, immediately above the optic foramen. It attaches to the superior tarsal plate of the upper eyelid (a thick plate of connective tissue).
* Actions: Elevates the upper eyelid.
* Innervation: The levator palpebrae superioris is innervated by the oculomotor nerve (CN III). The superior tarsal muscle (located within the LPS) is innervated by the sympathetic nervous system.

Muscles of Eye Movement

There are six muscles involved in the control of the eyeball itself. They can be divided into two groups; the four recti muscles, and the two oblique muscles.

Recti Muscles

There are four recti muscles; superior rectus, inferior rectus, medial rectus and lateral rectus.

These muscles characteristically originate from the common tendinous ring. This is a ring of fibrous tissue, which surrounds the optic canal at the back of the orbit.From their origin, the muscles pass anteriorly to attach to the sclera of the eyeball.

The name recti is derived from the latin for 'straight' – this represents the fact that the recti muscles have a direct path from origin to attachment. This is in contrast with the oblique eye muscles, which have an angular approach to the eyeball.

Superior Rectus

* Attachments: Originates from the superior part of the common tendinous ring, and attaches to the superior and anterior aspect of the sclera.
* Actions: Main movement is elevation. Also contributes to adduction and medial rotation of the eyeball.
* Innervation: Oculomotor nerve (CN III).

Inferior Rectus

* Attachments: Originates from the inferior part of the common tendinous ring, and attaches to the inferior and anterior aspect of the sclera.
* Actions: Main movement is depression. Also contributes to adduction and lateral rotation of the eyeball.
* Innervation: Oculomotor nerve(CN III).

Medial Rectus

* Attachments: Originates from the medial part of the common tendinous ring, and attaches to the anteromedial aspect of the sclera.
* Actions: Adducts the eyeball.
* Innervation: Oculomotor nerve (CN III).

Lateral Rectus

* Attachments: Originates from the lateral part of the common tendinous ring, and attaches to the anterolateral aspect of the sclera.
* Actions: Abducts the eyeball.
* Innervation: Abducens Nerve (CN VI).

Oblique Muscles

There are two oblique muscles – the superior and inferior obliques. Unlike the recti group of muscles, they do not originate from the common tendinous ring.

From their origin, the oblique muscles take an angular approach to the eyeball (in contrast to the straight approach of the recti muscles). They attach to the posterior surface of the sclera.

Superior Oblique

* Attachments: Originates from the body of the sphenoid bone. Its tendon passes through a trochlear, and then attaches to the sclera of the eye, posterior to the superior rectus.
* Actions: Depresses, abducts and medially rotates the eyeball.
* Innervation: Trochlear nerve CN IV).

Inferior Oblique

* Attachments: Originates from the anterior aspect of the orbital floor. Attaches to the sclera of the eye, posterior to the lateral rectus
* Actions: Elevates, abducts and laterally rotates the eyeball.
* Innervation: Oculomotor nerve(CN III).

INTRAOCULAR MUSCLES

intraocular muscles, which are responsible for pupil accommodation and reaction to light; and the protractor and retractors of the eyelids. Deficits in the muscles or the nerves innervating these muscles can result in functional impairment of the involved structures.

Structure and Function

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 humor into Schlemm's canal. The ciliary muscle is attached to the zonular fibers which suspend the lens. Upon contraction of the ciliary muscle, the tension on the lens is lessened which causes it to adopt a more spherical shape to focus on near objects. Relaxation of the ciliary muscle has the opposite effect, optimising distant focus. The sphincter pupillae 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.

There are three primary axes of ocular movements: vertical, transverse, and anteroposterior.

Rotation around the vertical axis results in either adduction (medial movement) or abduction (lateral movement) of the eye. Rotation around the transverse axis causes elevation (superior motion) or depression (inferior motion). The anteroposterior axis enables movement of the superior pole of the eye medially (intorsion) or laterally (extorsion). The rotations around the anteroposterior axis allow the eye to adjust to tilting of the head. The medial rectus muscle is responsible for medial rotation around the vertical axis, and the lateral rectus lateral rotation. The superior rectus muscle primarily elevates the eye and contributes to adduction and intorsion. The inferior rectus depresses and laterally rotates the eye and contributes to adduction and extorsion. The superior oblique abducts, depresses, and medially rotates the eye, while the inferior oblique abducts, elevates, and laterally rotates the eye.

The primary retractor of the upper eyelid is the levator palpebrae superioris, which is a skeletal muscle. The superior tarsal muscle (Müller's muscle) is comprised of smooth muscle and also contributes to the elevation of the upper eyelid. In the lower eyelid, the retractors are the capsulopalpebral fascia and the inferior tarsal muscle. The orbicularis oculi is the main protractor (closure) of the eyelids. It is a flat, ringlike band of skeletal muscle surrounding the anterior orbit composed of three parts: the orbital portion, the palpebral portion, and the lacrimal portion.