NAME: AKINBILE GRACE OLUWASEUN

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COURSE: ANA 210 (GROSS ANATOMY)

ANSWERS

1. Vasculature is the arrangement of blood vessels in the body or within an organ.

IMPORTANCE OF VASCULATURE TO THE IMMUNE SYSTEM AND OUTBREAK OF PANDEMIC, COVID-19 ON THE HUMAN BODY

The immune system is the network of cells throughout the human body (skin, blood, etc.) that work together

to prevent or limit infection from potentially harmful pathogens (like bacteria and viruses) and to prevent damage from non-infectious agents (lie sunburn and cancer).

The human body is lined with epithelial cells which are difficult to penetrate through. They make antimicrobial compounds that are quite hostile. If a pathogen breaks these defences, it has to deal with the white blood cells or immune cells. If the immune system is weak, the pathogens would be able to attack the white blood cells and get through their defence making the person susceptible to the disease/illness.

The blood is a vitally important fluid for the body and is carried in blood vessels. When blood vessels expand, the blood flows more slowly causing heat to be lost, but when blood vessels constrict, blood flows quickly and little heat as possible is lost. If a blood vessel is damaged, blood is lost causing white blood cells for protection to be lost in the process.

White blood cells play an important role in the immune system. Here, the different blood cells have different functions; some fight intruders such as bacteria, fungi and viruses; others produce antibodies which specially target foreign objects or germs like viruses e.g. coronavirus.

2. SUBSARTORIAL CANAL: The subsartorial canal (Hunter’s canal, Adductor canal) is a narrow aponeurotic 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 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. 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 medial side.

3. EXTRAOCULAR MUSCLES: The extra ocular muscles are located within the orbit, but are extrinsic and separate from the eyeball itself. There are 7 of them;

i) Levator Palpebrae Superioris(LPS): The 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. The LPS 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. INNERVATION- the LPS is innervated by the oculomotor nerve (CN III) while the superior tarsal late is innervated by the sympathetic nervous system.

>RECTI MUSCLES- There are 4 recti muscles which characteristically originate from the common tendinous ring. From their origin, these muscles pass anteriorly to attach to the sclera of the eyeball.

ii) Superior Rectus: This muscle originates from the superior part of the common tendinous ring and attaches to the superior and anterior aspect of the sclera. Its main action is elevation but it also contributes to the adduction and medial rotation of the eyeball. It is innervated by the oculomotor nerve.

iii) Inferior Rectus: Originates from the inferior part of the common tendinous ring and attaches to the inferior and anterior aspect of the sclera. Its main action is depression but it contributes to adduction and lateral rotation of the eyeball. It is innervated by the oculomotor nerve.

iv) Medial Rectus: Originates from the medial part of the common tendinous ring and attaches to the anteromedial aspect of the sclera. It adducts the eyeball. It is innervated by the oculomotor nerve.

v) Lateral Rectus: Originates from the lateral aspect of the common tendinous ring and attaches to the anterolateral aspect of the sclera. It abducts the eyeball. It is innervated by the abducens nerve (CN VI).

>OBLIQUE MUSCLES- There are 2 oblique muscles. From their origin, they take an angular approach to the eyeball and attach to the posterior aspect of the sclera.

vi) Superior Oblique: 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. It depresses, abducts and medially rotates the eyeball. It is innervated by the trochlear nerve (CN IV).

vii) Inferior Oblique: Originates from the anterior aspect of the orbital floor and attaches to the sclera of the eye, posteriorly to the lateral rectus. It elevates, abducts, and laterally rotates the eyeball. It is innervated by the oculomotor nerve.

INTRAOCULAR MUSCLES: The intraocular muscles include the ciliary muscle, the sphincter pupillae and the dilator pupillae.

1. Ciliary Muscle: This is a smooth muscle ring that controls accommodation by altering the shape of the lens, as well as controlling the flow of aqeous humor into the Schlemm’s canal. The ciliary muscle is attached to zonular fibres which suspend the lens. It is innervated by parasympathetic fibres by way of the ciliary nerves.
2. Sphincter Pupillae: It is composed of smooth muscle. The sphincter pupillae encircles the pupil and is responsible for the constriction of its diameter. It is innervated by parasympathetic fibres by ay of the short ciliary nerves.
3. Dilator Pupillae: Also composed of smooth muscle, the dilator pupillae is arranged radially around the pupil and increases the pupilliary diameter. It is innervated by postganglionic sympathetic nerves arising from the superior cervical ganglion as the sympathetic root of the ciliary ganglion.