Paretic Strabismic Diplopia

Essay

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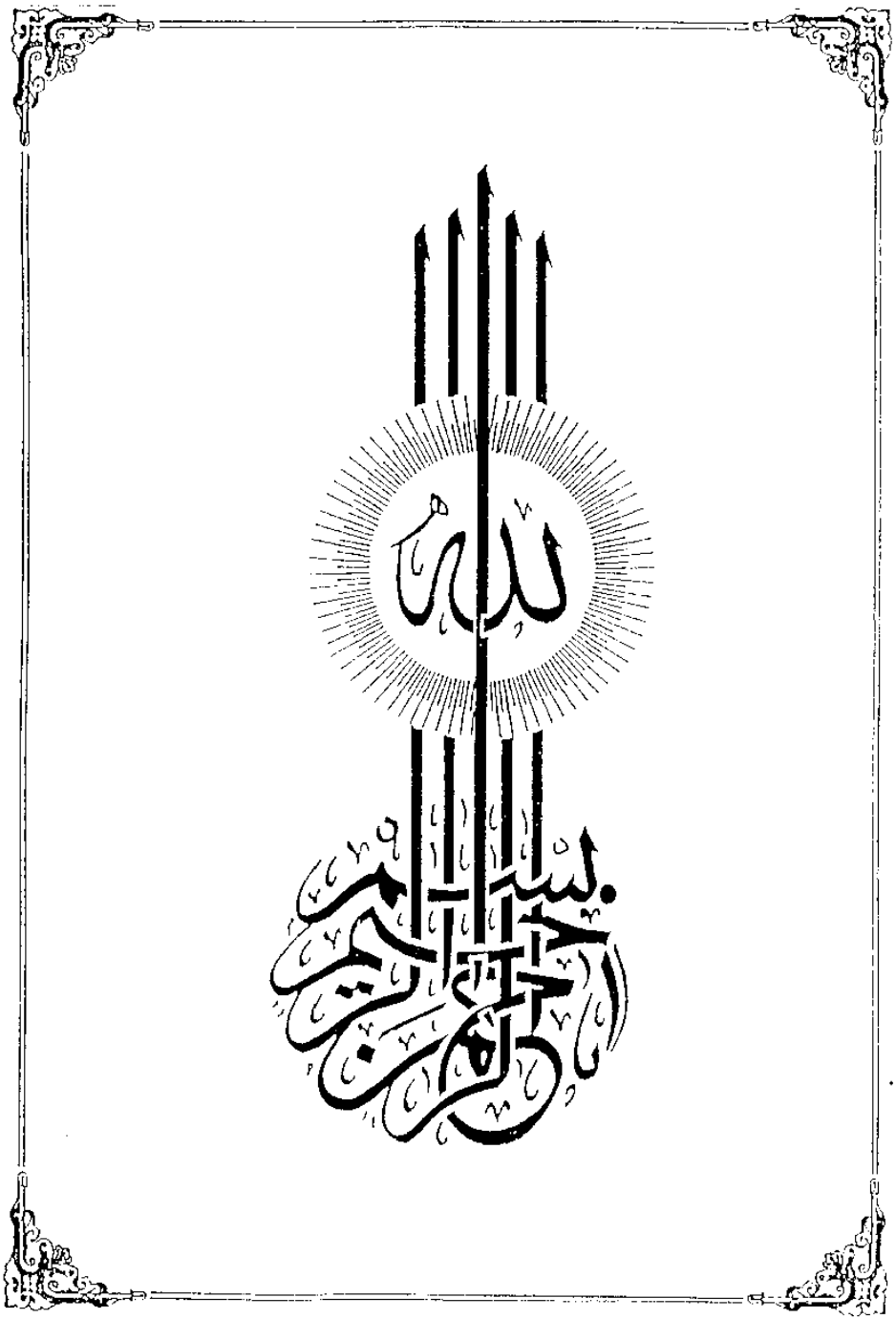

ACKNOWLEDGMENT

I WOULD LIKE TO EXPRESS MY DEEP GRATITUDE TO PROF. DR. GOLZAMIN EL - HAWWARY PROFESSOR OF OPHTHALMOLOGY, AIN SHAMS UNIVERSITY, FOR HER VALUABLE GUIDANCE, CONSTRUCTIVE ADVICE AND KIND SUPERVISION, DURING THE COURSE OF THIS ESSAY .

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Abstract

Strabismic diplopia is a pathological binocular diplopia due to causes that preclude fusion. It can occur with third, fourth and / or sixth cranial nerve palsy with the subsequent extra - ocular muscles paralysis . The management is usually surgical, but non - surgical treatment may be of value .

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ANATOMY OF THE EXTRA - OCULAR MUSCLES

I-Anatomy of the extra-ocular muscles.

The extrinsic muscles of the eye are six in number . They are the superior, inferior, medial , and lateral recti , and the superior and inferior obliques .

****A) Anatomy of the Four recti :-**

They are attached posteriorly to a short tendinous ring i.e. annulus tendinous comminis of Zinn , which encloses the optic foramen and a part of the medial end of the superior orbital fissure .

Its attachement to the anterior margin of the fissure is marked by the spina recti lateralis . The inner surface of the annulus is thickened in its upper and lower parts by strong bands or common tendons .

The lower tendon of Zinn :

It is attached to the inferior root of lesser wing of the sphenoid between the optic foramen and the superior orbital fissure .

It gives origin to part of the medial rectus, part of the lateral rectus and the whole of the superior rectus . (Wolff, 1976) .

The upper tendon of lockwood :

It arises from the body of sphenoid and gives origin to part of the medial and lateral recti and the whole of the superior rectus . (Wolff, 1976) .

Origin of the Four recti :

* The superior rectus muscle arises from the upper part of the annulus of Zinn and from the sheath of the optic nerve .

* The medial rectus muscle shares the superior rectus in that it takes origin also from the sheath of the optic nerve as well as from both parts of the common tendon to the medial side of, and below the optic foramen .

* The inferior rectus muscle is attached below the optic foramen and to the middle slip of the lower common tendon .

* The lateral rectus muscle originates from the upper and lower common tendons from that part which crosses the superior orbital fissure . This origin is characteristically V or U shaped with the opening of the letter towards the optic foramen . It is attached also to the spina recti lateralis .

Insertion of the four recti :

* The recti muscles extend anteriorly close to the wall of the orbit and get inserted into the sclera by tendons of different lengths and widths at variable distances from the cornea .
* The superior rectus muscle tendon is 5.8 mm in length and inserted

7.7 mm from the cornea .

* The medial rectus muscle is inserted by a tendon of 3.7 mm in length to the sclera at 5.5 mm from the cornea .
* The inferior rectus muscle tendon is 5.5 mm in length and inserted 6.5 mm from the cornea , it is also attached to the lower lid by means of the fascial expansions of its sheathes .
* The lateral rectus muscle tendon is 8.8 mm in length and inserted 6.9 mm from the cornea .
* The length of the four recti muscles varies from 40 to 42 mm ; the superior rectus being the longest then the medial rectus then the lateral rectus then the inferior rectus being the shortest one .

Innervation of the four recti muscles :

The superior , medial and the inferior recti muscles are supplied by the oculomotor nerve which is the third cranial nerve .

This nerve gives a superior division which supplies the superior rectus muscle .

Also , it gives an inferior division which supplies the medial rectus muscle entering it on its lateral surface , and also supplies the inferior rectus muscle entering it on its ocular surface .

The lateral rectus muscle is the only one of the recti which is not supplied by the oculomotor nerve but supplied by the sixth cranial nerve or abducent nerve .

The nerve enters the muscle on its medial aspect , just behind its middle .

In general , the motor nerve to each muscle enters the internal surface of the muscle approximately at the junction of the posterior one third and anterior two - thirds .

Blood supply of the four recti muscles :

The ophthalmic artery gives the medial muscular and the lateral muscular branches .

The medial muscular branch supplies the medial and the inferior recti muscles .

The lateral muscular branch supplies the superior rectus muscle , and gives also the lateral rectus muscle which is supplied also by the lacrimal artery (Wolff , 1976) .

**** B- The oblique muscles :**

They are the superior and the inferior oblique muscles .

- The superior oblique muscle :

It is the longest and thinnest muscle .

Origin :

It arises immediatly above the inner margin of the optic foramen, above and internal to the origin of the superior rectus and passing forwards to the inner angle of the orbit, terminates in a rounded tendon, which play in a fibrocartilagenous ring or pully attached to the trochlea fossa , the tendon is reflected backwards, outwards and down-wards beneath the superior rectus to be inserted to the sclera behind the equator of the eyeball lying between the superior and lateral recti (Gray , 1909) .

It is innervated by the trochlear nerve that divides into three or four branches, which enter the muscle superiorly (Wolff, 1976) .

**** The inferior oblique muscle :**

It is the only extrinsic muscle to take origin from the front of the orbit . It is also remarkable in having the shortest tendon of insertion (Wolff , 1976) .

It arises from a small depression on the orbital plate of the maxilla a little behind the lower orbital margin and just lateral to the orifice of the naso-lacrimal duct .

Some of the muscle fibres may arise from the fascia covering the wall of the lacrimal sac .

It is inserted obliquely into the postero-temporal quadrant of the globe . Its posterior or nasal end is about 5 mm from the optic nerve, and thus lies practically over the macula (Roper - Hall, 1989).

It is innervated by the inferior division of the oculomotor nerve which enters the muscle on its upper surface . The ophthalmic artery gives the superior muscular branch which supply the superior oblique , and the medial muscular branch that supplies the inferior oblique . The inferior oblique is also supplied by the infra - orbital artery (Wolff, 1976) .