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Editorial

The Tenon's Capsule: A Closer Look

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Introduction

The French physician, Jacques Rene Tenon, gave his name in 1805 to Tenon's capsule [1]: the layer of thin fascial elastic fibrous tissue located between the eye's surface and the conjunctiva and surrounds the eyeball while also separating orbital fat [2]. The elasticity of Tenon's capsule enables its free rotation of the globe and aids in unrestricted muscle relaxation and contraction [1-5]. The anterior Tenon's capsule is the stunted capsulopalpebral head of the rectus muscles, covering around two thirds of the rectus muscles and all of their tendons, then merges with sclera 5mm posterior to corneoscleral junction [2,6-8]. Therefore, Tenon's layer reinforces the action of the extraocular muscles as each muscle requires the necessary amount of tension from the tendon and Tenon's layer to aid in correct eye movement [9].

In addition, the anterior capsule supports the episcleral tissue starting at the posterior limbus for approximately 10 mm to then bind with the intramuscular septum of the extraocular muscles [4]. The anterior capsule is attached to both conjunctival and scleral bases.

The Posterior Tenon's capsule is the smaller of the two parts. It crosses to the optic nerve separating the globe of the eye from the contents of the retrobulbar space, therefore there is a posterior space between the sclera and Tenon's capsule [4]. It is located between the conjunctiva and episclera where it merges anteriorly at the limbus [10].

Tenon's layer consists of corneal epithelial stem cells located within the limbus [11] to maintain the epithelium by providing a constant supply of cells to replace those that are lost and to maintain the epithelium [12]. The endothelial cell density of Tenon's layer is around 3,500 cells/mm [13] at 5 years of age and decreases in number throughout life [14].

Anatomical variation among African-Caribbean populations

There is evidence that shows there is an anatomical difference in African Caribbean eyes because of differences in Tenon's layers. For example, people of African Caribbean descent are seen to have multiple layers of Tenon's capsule [15]. This is possibly due to morphological differences within the epidermis, which gives black skin stratum corneum more compactness, although being equal in thickness. Overall, there are twenty cell layers observed in African Caribbean eyes compared to sixteen layers in general population [16]. Clinical research has focused on the racial differences in the health of eyes. For example, the African Descent and Glaucoma Evaluation Study (ADAGES) study has shown a high prevalence of primary open-angle glaucoma in people of African ancestry [17]. It is, however, unclear if variations in prevalence of ophthalmic diseases among African Caribbean population are a consequence of the anatomical differences in Tenon's layers. Case series on glaucoma filtration surgery failure rates among African Caribbean population showed higher reaction to surgical trauma in regards to episcleral and tenon's capsule fibrosis and scar tissue formation [18]. The anatomical variation in Tenon's capsule among African Caribbeans might be a possible contributing factor to higher rates of trabeculectomy failure, glaucoma drainage valve encapsulation and suture granuloma post squint surgery. Therefore, this is an area worth addressing when operating on such patients.

Conflict of Interest

None.

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