Short communication

Technique for removing donor sclera by eyeball extrusion


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ABSTRACT

Purpose: To describe a surgery technique for removing donor sclera tissue after corneo-scleral button excision.

Results: The extrusion technique is easy to perform. It allows the complete scleral extraction and its total clean up to be performed, as well as making easier to isolate the retina and uveal tissue. This technique could have an important role in the anatomical and morphological study of ocular structures.

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Técnica de extracción de esclera donante mediante extrusión del globo ocular

RESUMEN

Objetivo: Describir una técnica quirúrgica de extracción escleral en ojo de donante tras la escisión del botón corneoescleral.

Conclusiones: La técnica de extrusión es una técnica fácil de realizar, que permite la extracción escleral completa facilitando además su limpieza total y el aislamiento de la retina y del tejido uveal. Esta técnica podría tener un papel importante en el estudio anatómico y morfológico de las estructuras oculares.

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Introduction

Since organ donation is authorized and regulated in our country, currently with the development of eye banks, ocular tissue has been put to multiple uses and several techniques have been developed for its extraction. As one of the said techniques, extrusion (from the Latin extrudere, to give form to a mass causing it to exit through an opening) is described below as a technique for obtaining sclera.

Surgical technique

The technique begins after obtaining the corneal-scleral button in sterile conditions following the technical guidelines for ocular tissue of the European Eye Bank Association (EEBA, www.europeaneyebanks.org).1 Using a spatula, we traverse 360° of the corneoscleral incision to release the uveoscleral junctions (Fig. 1). Subsequently, with the curved dissection scissors we first cut the sclera from the edge of the cornea up to the equator of the ocular globe, releasing at the same time the junctions with the uvea. Thereafter, a second cut is made at 180° of the first one with the same procedure (Fig. 2). Then we proceed to extrude the content of the ocular globe (pressing the entire circumference of the donor sclera) and it will come out in a single piece (choroidal globe), cutting the nerve ancillary vessel connections to the sclera (Fig. 3), as well as the optic nerve with a cutting instrument. When carrying out this technique, we will be able to observe important references in the anatomy of the eye: uveoscleral junctions which, at the anterior level are more relaxed than in the equator and the posterior pole. This explains why choroidal detachments are more frequent at this level. The ciliary body, the pars plana and pars plicata, ora serrata; the long ciliary nerves; the lamina fusca, which is the innermost layer of the sclera and is made up by lax conjunctive tissue and melanocytes. Its inward side has channels for nerves and ciliary vessels. At the equatorial level, the vorticose veins tangentially traverse the sclera in the posterior direction and exit through orifices that are located at 14–18 mm behind the limbus. The exit points of the sclera for these veins are more posterior in the temporal quadrants than in the nasal ones and drain the blood from the choroids towards the ophthalmic vein in the orbit. In the posterior segment we find the short nerves and ciliary vessels as well as the optic nerve.

Discussion

Anatomy is an essential subject in medicine and is particularly relevant in surgery specialties.2 In ophthalmology, this
knowledge is acquired mainly from written sources because studying eyes in vivo is very difficult. Many articles have demonstrated the benefits of an adequate knowledge of anatomy for post-graduate training of physicians for surgical specialties.3

With the technique described above, donations are utilized to supplement anatomy training of ophthalmology resident physicians. It is also useful to train in the use of ocular tissue and microsurgery instruments.

The extraction in the donor enables the identification of adjacent structures, including the insertion of the extraocular muscles, small vessels, the optic nerve insertion and Tenon’s fascia. The intrinsic study of the globe reveals the sclera, the lamina fusca, the suprachoroids, the ciliary nerves and vessels (Fig. 4). With the extrusion maneuver, we separate the uvea from the sclera, revealing the pathways and interconnections of vessels and nerves between both structures. Very rarely an ophthalmologist is able to study uveal anatomy and identify its structures: iris, the ciliary body with the pars plicata and pars plana, as well as the choroids.

The study can be completed isolating the lens and the retina from the uveal tissue with an adequate technique. The extrusion technique is easy to perform and it enables a complete extraction of the sclera as well as facilitating its cleaning for subsequent use (Fig. 5). It could be important for studying the choroids, the retina, the vitreous body and the posterior chamber of the eye as it allows the anatomic preservation of all these structures (Fig. 6).

Conflict of interest

The authors declare no conflict of interest.

REFERENCES