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PIBIC Last Name - Penha First Name - Fernando Middle - Marcondes

Service (sector) Retina and Vitreous Nº CEP

Electron Microscopy Findings After Indocyanine Green, Trypan Blue and Glucose 5% Injections Into the Subretinal Space of Rabbits

Fernando M. Penha, André Príncipe, Maurício Maia, Octaviano Magalhães Jr., André Maia, Luciano Pinto Moreira, Edna Freymüller, Michel Eid Farah

Purpose: To evaluate with electron microscopy the effects of indocyanine green (ICG) 0.05%, trypan blue (TB) 0.15% and glucose (SG) 5% injection into the subretinal space of rabbit eyes.

Methods: Four pigmented rabbits underwent two-port vitrectomy in the right eye followed by injection of ICG (0,05% and 279 mOsm), TB (0.15% and 312 mOsm) and SG (5%) into the subretinal space, just inferior to the optic disc. Balanced Salt Solution (BSS) was also injected subretinally as a control subretinal solution. The blebs of the four substances were separated by two reference burns made with red diode laser that facilitated histological sections after subretinal blebs reabsorption. The animals were examined at 12 hours, 24 hours, 7 days and 14 days after surgery. The eyes were studied by optical coherence tomography, fluorescein angiography and electron microscopy.

Results: Subretinal injection of BSS and Glucose 5% caused minimal edema on the photoreceptor outer segments. However, subretinal injection of ICG as well as TB caused a severe damage on the photoreceptor inner and outer segments, outer nuclear layer and retinal pigment epithelium. Damage was observed 24h after surgery and especially 14 days after subretinal injection.

Conclusions: Subretinal delivery of ICG (0,5 mg/ml) and TB (1,5 mg/ml) in rabbits induces damage of the retinal pigment epithelium, photoreceptor inner/ outer segments and outer nuclear layer. This damage may explain the retinal pigment epithelium changes seen after macular hole surgery using ICG and TB staining of internal limiting membrane in humans.