( ) R1 ( ) R2 (X) R3 ( ) PG0 ( ) PG1 ( ) Estagiário ( ) Tecnólogo ( )
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Service (sector) Retina and Vitreous Nº CEP

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

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Purpose: To evaluate with light 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 light microscopy.

Results: Subretinal injection of BSS and Glucose 5% showed minimal changes on light microscoy. ICG as well as TB caused a severe damage on the photoreceptor inner and outer segments and outer nuclear layer. Retinal pigment epithelium (RPE) cannot be well evaluated by light microscopy. 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 photoreceptor inner/ outer segments and outer nuclear layer. Maybe light microscopy was not able to see damage on RPE. However, this findings may explain the retinal changes seen after macular hole surgery using ICG and TB staining of internal limiting membrane in humans.