Video Article

Laser-Induced Chronic Ocular Hypertension Model on SD Rats

Kin Chiu[1], Raymond Chang[1], Kwok-Fai So[1]

[1]Laboratory of Neurodegenerative Diseases, Department of Anatomy, LKS Faculty of Medicine, The University of Hong Kong - HKU

Correspondence to: Raymond Chang at rccchang@hku.hk, Kwok-Fai So at hrmaskf@hkucc.hku.hk

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Abstract

Glaucoma is one of the major causes of blindness in the world. Elevated intraocular pressure is a major risk factor. Laser photocoagulation induced ocular hypertension is one of the well established animal models. This video demonstrates how to induce ocular hypertension by Argon laser photocoagulation in rat.

Video Link

The video component of this article can be found at http://www.jove.com/video/549/

Protocol

Check and prepare the equipments

1. Anaesthetize the rat by intra-peritoneal injection of ketamine (80mg/kg) and xylazine (8mg/kg) (volume ratio at 2:1).
2. Apply one drop of 0.5% alcaine to the rat eyes as topical anesthetics before laser photocoagulation.
3. Position the rat and expose the target veins with a curved forceps. Use the footstep to start laser photocoagulation. Apply bout 60 laser spots around the limbal vein (except the nasal area) and 15-20 laser spots on each episcleral aqueous humor drainage vein.

Laser photocoagulation

1. Anaesthetize the rat by intra-peritoneal injection of ketamine (80mg/kg) and xylazine (8mg/kg) (volume ratio at 2:1).
2. Apply one drop of 0.5% alcaine to the rat eyes as topical anesthetics before laser photocoagulation.
3. Position the rat and expose the target veins with a curved forceps. Use the footstep to start laser photocoagulation. Apply bout 60 laser spots around the limbal vein (except the nasal area) and 15-20 laser spots on each episcleral aqueous humor drainage vein.
4. After each laser treatment, apply ophthalmic Tobrex ointment on the rat eye to prevent infection.
5. Switch off the laser system by turning the key anti-clockwise to point "0".
6. Switch off slit lamp by turning the switch to point "0".

Discussion

After two laser treatments with 7 days apart, we can elevate the IOP of laser photocoagulated eye by 50% compare with control eye. The elevated IOP can sustain for at least for 3 month after first laser treatment. This rat model of elevated intraocular pressure provide valuable opportunities to study the mechanisms of pressure-induced retinal ganglion cell loss and optic nerve damage that mimic the pathological change in human glaucoma.

Disclosures

The authors have nothing to disclose.

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