

THE EXPERIENCE IN THE USE OF HIGH-FREQUENCY ELECTRIC WELDING OF BIOLOGICAL TISSUES DURING ENUCLEATION FOR UVEAL MELANOMA.

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Introduction: according to the literature, enucleation of the eyeball in the treatment of intraocular tumors is carried out in 12.3 - 59.0% cases. Eyeball removal operations account for about 9.4% of all ophthalmic surgeries. During the treatment of these patients, the intra-operative and postoperative complications can take place. Existing methods for enucleation of the eyeball do not adequately prevent the development of these complications. The original electric instruments for enucleation of the eyeball were developed in the Filatov Institute of eye diseases and tissue therapy on the basis of the ophthalmooncology department in collaboration with the Institute of electric welding, as well as the method of high-frequency electric welding of biological tissues using the device EK-300M1 (Ukrainian patent No. 46981), which allows to achieve dissection, hemostasis and soft tissue connections.

Purpose: to evaluate the effectiveness of the high-frequency electric welding of biological tissues using for enucleation of the eyeball due to uveal melanoma.

Material and methods: the experimental and clinical studies were conducted in the development of enucleation techniques using the electric welding. In the study group of rabbits (20 rabbits) enucleation was carried out using the electric welding, in the control group of animals (8 rabbits) - according to the standard method. Animals were removed from the experiment immediately after surgery, after 7 days and a month later for histological examination and for electron microscopy, immediately after surgery, after 5 days and after 9 days. Postoperative edema of the orbit tissue, the condition of the sutures, and the amount of serous hemorrhagic secretion from the conjunctival cavity were evaluated. The clinical studies were also conducted in 79 patients with uveal melanoma, of which 59 patients aged 63.0 ± 10.5 years with uveal melanoma who underwent enucleation using the electric welding. The control group consisted of 20 patients with uveal melanoma aged 61.5 ± 8.6 years, who underwent enucleation according to the usual method.

Results: the experiment found that the electric welding in the mode of tissue connection leads to the closure of the conjunctival wound surface occurs as a result of fibrin prolapse, followed by epithelialization of the surface and fibrotization of subepithelial tissues. A conglomerate is formed from destroyed tissue elements, denatured proteins, collagen fibrils, and also a thin fibrillar “felt-like” material that “sticks” to the wound surface of the damaged tissue.

It was established in the experiment that when using the electric welding in the mode of tissue dissection, cutting occurs with simultaneous coagulation of blood vessels, and a narrow strip of dry necrosis is formed at the site of exposure. The using of the electric welding in the cutting mode made it possible to minimize bleeding at the intersection of extrabulbar muscles and the optic nerve, which excluded the tamponade of the orbit and reduced the time of surgery by an average of 6.6 minutes (18.4 + 3.1 in the study and 25.0 + 2,0 minutes in the control group, $P < 0.00001$).

Conclusion: the using of the electric welding of biological tissues in conjunction of the conjunctival tissue allows achieving a strong connection of its edges, which excludes the procedure for applying and removing sutures.

Key words: the high-frequency electric welding of biological tissues, enucleation, uveal melanoma.