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EFFICACY AND SAFETY OF DIODE-LASER TRANSSCLERAL CYCLOPHOTOCOAGULATION IN THE TREATMENT OF REFRACTORY GLAUCOMA

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Abstract:

This article presents the main methods of refractory glaucoma (RG) treatment. Surgical methods used for DH can be conventionally divided into two groups. The first one is fistulizing interventions, including traditional surgery, surgery with cytostatic preparations, and surgery with implants. The second group - cyclodestructive interventions suppressing secretory function of the ciliary body. Types of antiglaucoma drains are described, and the latest modifications of the valve drainage system are presented.

Keywords: Terminal Glaucoma; Contact Transscleral Diode-Laser Cyclophotocoagulation, Ciliary Body Atrophy

INTRODUCTION.

The terminal stage of glaucoma is one of the most severe glaucoma and has a considerable share in blindness and amblyopia, despite numerous attempts to preserve residual visual functions and the eye as an organ. Methods of surgical treatment, effective in the initial stages of glaucoma, have not justified themselves in the terminal stage, which may explain the increased interest in alternative therapies. A new stage in the treatment of terminal glaucoma was the emergence of cyclodestructive technologies, whose main goal was to achieve an analgesic effect with a decrease in intraocular pressure and preservation of the eyeball as an organ. Contact transscleral diode laser cyclophotocoagulation for severe glaucoma has become one of the most effective and popular technologies. Various destructive effects on the ciliary body, which achieve analgesic and hypotensive effects without opening the fibrous cap of the eyeball, have always attracted the attention of ophthalmologists. Currently, transscleral cyclophotocoagulation is performed using IAG-laser, diode and xenon semiconductor lasers. Selective destruction of the ciliary epithelium and reduction of vascular perfusion in the ciliary vessels leading to ciliary atrophy, as well as increased outflow due to transscleral filtration or uveascleral outflow are considered the mechanisms leading to the decrease of intraocular pressure during such exposure

OBJECTIVE: to study the clinical effectiveness of diode-laser transscleral cyclophotocoagulation for relief of high intraocular pressure and pain syndrome in patients with terminal painful glaucoma.

MATERIALS AND METHODS

The results of 103 operations (103 eyes) of diode-laser transscleral cyclophotocoagulation with the use of a diode ophthalmocoagulator of domestic production "ALOD-Alcom" with a wave length of 810 nm, with a standard working tip of 2, 5 mm, which was applied perpendicularly to the scleral cover in 1.5-2.5 mm from the surgical limbus, thus applying pressure on the sclera, thus reducing radiation dispersion and causing ischemia of the ciliary body. There were 61 male and 42 female patients operated on. The mean age was 71.2 years. Age distribution was as follows: 16 patients were 30 to 60 years old and 87 patients were 61 and older. All patients were examined: visometry, tonometry, ultrasound biometry, electrophysiological examination, biomicroscopy, gonioscopy, ophthalmoscopy, ultrasound B-scanning, computer perimetry of paired eyes. Visual functions in patients with terminal glaucoma were practically lost: light

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perception with irregular light projection or there was no light perception.

RESULTS AND DISCUSSION

Efficiency and safety of the cyclodestructive method was estimated according to treatment results of 103 patients with refractory glaucoma in advanced and terminal stages: open angle glaucoma in 45 eyes, mixed glaucoma - 25, neovascular - 20 (against the background of postthrombotic retinopathy, diabetic proliferation), posttraumatic - 3, phacogenic - 10. There were 103 patients with follow-up up up to 1 month and 29 patients with follow-up period up to 1 year. The overwhelming majority of patients had pain syndrome of various severity (99,9 %). Intraocular pressure (Maklakov tonometry) on hypotensive drops (2 to 3 preparations) was 27.7-40.7. The main mass of patients (65 people, i.e., 63 %) had an initial intraocular pressure on the maximal hypotensive regimen above 32 mm Hg. Preoperatively, intraocular pressure averaged 33.2 mmHg on hypotensive drops. Biomicroscopy revealed various changes in the anterior segment of the eye in patients with terminal glaucoma: congestive eyeball injection (48 %), corneal epithelial-endothelial dystrophy (68 %), vascularized corneal leukoma (10 %), iris rubeosis (89 %), anterior and posterior synechias (15 %), complicated cataract (86 %) and artifact (8 %). Gonioscopy of eyes with terminal painful glaucoma revealed flat synechiae, partial or complete obliteration of anterior chamber angle with newly formed vessels.In the first days after diode-laser transscleral cyclophotocoagulation some patients had signs of reactive iridocyclitis (endothelium fogging, opalescence of moisture, iris vessel dilation, pericorneal injection), hyphema in 5 cases. These symptoms were controlled by prescription of non-steroidal anti-inflammatory drugs, hemostatics and locally corticosteroids in combination with antibiotics. The level of intraocular pressure in the eyes with terminal glaucoma after transscleral cyclophotocoagulation was noted on the first day, in 1 month, in 3-6 months and more. Already on the first day after transscleral cyclophotocoagulation all patients, without exception, noted a significant relief of their condition due to relief of pain syndrome, a significant decrease in intraocular pressure. In the majority of patients, this was expressed by complete disappearance of heaviness, pain, aches, feeling of the eye tumescence. On the first day of the postoperative period, the level of intraocular pressure significantly decreased in all eyes compared to the baseline values (by 14.4 mm Hg on average), but the degree of decrease varied widely, being from 8.1 to 27.7 mm Hg. and 1 month after transscleral cyclophotocoagulation on eyes with terminal glaucoma the intraocular pressure level on moderate hypotensive regime decreased to subnormal figures in most patients (47 %), to normal - 40 %. 2% of patients had pressures over 30 mm Hg, but they did not complain of pain. Of the patients who came to our clinic 6 months after transscleral cyclophotocoagulation, none complained of pain in the eye with terminal glaucoma, and the intraocular pressure was normal in the majority (on average, 13.7 mm Hg. Over a follow-up period of more than 6 months, 86% managed to achieve full IOP compensation (without additional hypotensive treatment in 12%, on hypotensive treatment in 75%), in 10% of the eyes IOP decreased to subcompensation values only. In the late operative period, subatrophy of the eyeball was diagnosed in two patients between 4 months and a year, which developed in eyes with secondary posttraumatic and neovascular more than once operated glaucoma.

CONCLUSION

Transscleral diode laser cyclophotocoagulation in terminal refractory glaucoma is an effective method for compensating intraocular pressure and relieving pain syndrome. In some patients there is a risk of subatrophy of the eyeball after cyclodestructive treatment.

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