INTRODUCTION. Aqueous shunts or glaucoma drainage implants, are drainage devices designed to lower intraocular pressure by draining aqueous humor from the interior of the eye to the subconjunctival cavity. In general, drainages have been used in eyes with poor surgical prognosis [1-3]. Currently, biodegradable drainage designs are the most relevant for use in glaucoma surgery, as they do not cause complications associated with the use of other drainages [4-6].

PURPOSE. To develop a new design of the biodegradable drainage for forming a more stable way of aqueous humor outflow and prolongation of the hypotensive effect of glaucoma surgery.

PATIENTS AND METHODS. The operation was performed in 30 patients (30 eyes) with refractory glaucoma aged 50-70 years. We used the polyglycolide thread as a new material for drainage glaucoma surgery (Russia, 8-0, thread length 45 cm, diameter - 0.2 mm). This synthetic biodegradable material is composed of filaments of glycolic acid (Fig. 1). The period of complete biodegradation of this material is 60-90 days. The drainage is prepared from three strands, nodular weaving in the operating room. As a result, drainage acquires a cylindrical structure with length 4 mm and diameter 1.5-2.0 mm (Fig. 2). The drainage is elastic and can easily change the form.

Surgical technique. Processing the surgical field. After this, we cut out a superficial scleral flap based on the limb, which thickness amount 1/3 of sclera. Then we prepare a deep scleral flap (Fig. 3). The next step of surgery is the performing of trabeculectomy and iridectomy. We prepared the drainage before the surgery in the operating room. Further drainage laid on the base of a deep scleral flap (Fig. 4). Then the edges of the deep scleral flap twisting outwards and fixed by seams 8/0, forming a tunnel (Fig. 5). We covered the formed tunnel with a superficial scleral flap and fixed it by two seams (Fig. 6). The connective capsule is formed in the tunnel around the drainage in postoperative period. This capsule serves as a framework for the tunnel for aqueous humor outflow [7].

RESULTS. The duration of observation period was 12 months. In the pre- and postoperative period, all patients underwent standard research methods: visometry, perimetry, tonometry, biomicroscopy, ophthalmoscopy, gonioscopy and confocal scanning laser ophthalmoscopy (CSLO) using HRT.

<table>
<thead>
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<th>Month</th>
<th>1</th>
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<th>12</th>
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<tbody>
<tr>
<td>Ave. IOP, mmHg (M±σ)</td>
<td>13.86±0.58</td>
<td>13.94±0.61</td>
<td>14.00±0.62</td>
<td>13.92±0.61</td>
<td>13.87±0.58</td>
<td>13.83±0.52</td>
<td>14.95±0.76</td>
<td>14.71±0.81</td>
<td>14.53±0.58</td>
<td>14.43±0.64</td>
<td>14.35±0.78</td>
<td>14.00±0.78</td>
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IOP was 13-15 mm Hg in 100% of cases (30 eyes) during 1-6 months of observation period after the surgery. An increase of IOP to 26-27 mm Hg was observed in two cases, which had returned to normal range after instillation of hypotensive medicines. All patients had unchanged visual acuity and visual field examination before and after the surgery.

The quality of the operation in postoperative period was assessed by method of ultrasound biomicroscopy (UBM). UBM is a unique method of dynamic and visual observation of the changes in the drainage system of the eye after glaucoma surgery. The functionally active cavity without elements of excessive proliferation was determined in the surgery area. The study was conducted in 3, 6, 9 and 12 months after surgery. The preservation of ways of aqueous humor outflow was marked in all periods.

CONCLUSIONS. We proposed a new method of surgical treatment of refractory glaucoma using the new drainage. Design of a new drainage allows to preserve a sustained hypotensive effect in long-term period after surgery and can be recommended for use in glaucoma surgery.

REFERENCES