

# The results of intrastromal amnioplastik in the treatment of patients with induced endothelial - epithelial dystrophy of the cornea

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## **Abstract**

**Objective:** To evaluate long-term results of implantation of intrastromal amniotic membrane in patients with induced endothelial - epithelial corneal dystrophy.

**Materials and methods.** The clinical study included 50 patients (50 eyes) with a diagnosis of secondary endothelial - epithelial corneal dystrophy, an advanced stage. All patients underwent surgery ball intrastromal implantation in the cornea - the amniotic membrane.

**Results and conclusions.** The results of these studies confirmed the effectiveness of the operation intrastromal implantation of amniotic membrane in the treatment of patients with secondary endothelial - epithelial corneal dystrophy. These data suggest a persistent clinical outcome of the intervention.

**Keywords:** cornea, amniotic membrane, intrastromal implantation.

Endothelial - epithelial dystrophy (EED) is a severe, progressive disease of the cornea associated with decompensation of endothelial cell layer [1,5].

The increased incidence of secondary corneal EED many researchers associated with the intensification of eye surgery, increasing number of eye injuries and viral lesions of the cornea [1,3].

Despite improvements in microsurgical techniques, the development of new types of intraocular lenses and the instrumentariya, the widespread use of protectors of the corneal endothelium, the number of patients with secondary postoperative corneal EED in recent years has not significantly decreased. According to statistics, the development of this type of dystrophy occurs in 0,2-2,4% of the cases after cataract extraction in various ways [5].

The urgency of the medical and social rehabilitation of EED determined by the severity of the initial state of the cornea and often irreversible nature of the changes.

Among the surgical treatment of EED in principle can be divided into two groups: the transplantation and not transplantatsion.

To transplant methods of treating patients with EED are various techniques amnioplastik. Some authors suggest the amnion covering the surface of the corneal epithelium and to protect his speedy recovery. Other implanted amniotic membrane (AM) under the conjunctiva to suppress the excessive inflammatory response and stimulation of reparative processes in the treatment of EED [2,4,7].

In 2010, on the basis of clinical - morphological studies, we have proposed and put into practice a technique intrastromal implantation of amniotic membrane (IIAM) has appeared promising in the treatment of patients with advanced-stage secondary EED cornea. During the operation in the deep layers of the cornea flap is implanted amniotic membrane, limiting the penetration of moisture into the anterior chamber of the corneal tissue [8,9,10,11].

**Objective:** to evaluate long-term results of using intrastromal implantation of amniotic membrane in patients with induced endothelial - epithelial dystrophy of the cornea in an advanced stage.

**Materials and methods:** The clinical study was performed in 50 patients (50 eyes) with a diagnosis of secondary endothelial - epithelial corneal dystrophy, an advanced stage. All patients had developed EED after cataract extraction with intraocular lens implantation of various models.

The severity of degeneration, we evaluated the classification VV Volkov and M. Dronova 1978 [3]. Patient age  $67,4 \pm 3,5$  years. Of these 22 men (22 eyes) and 28 women (28 eyes).

Patients received a standard eye examination: visometry, biomicroscopy, pachymetry, tonometry. The severity of subjective sensations assessed on a five point scale (pain in the eye, a sense of rubber, of a foreign body, burning, dryness, severity, photophobia, lacrimation) calculated ratio of discomfort [4].

Studies performed before surgery and after surgery. Follow-up was 24 months. All patients completed the ball intrastromal implantation surgery in the cornea - the amniotic membrane.

AM was used, obtained from seronegative for hepatitis B and C, syphilis, TORCH - infections and women - donors during scheduled cesarean section.

A favorable outcome of the operation is the lack of recurrence of corneal syndrome in the postoperative period.

**Results and discussion:** At the time of admission, all patients had severe pain and corneal syndrome, edema of all layers of the cornea, bullous changes and extensive erosion of the epithelium. The initial visual acuity was  $0,01 \pm 0,005$ . Thickness corneal pachymetry data was within  $768,6 \pm 30,87$  mm. Indicators of intraocular pressure -  $20,34 \pm 0,2$  mm Hg. Art.. Most of the patients who are repeatedly hospitalized for getting local keratoplastic, dehydration treatment, physiotherapy. Many patients, given the nature of the pain is unbearable and unstable remission, insisted on enucleation of the affected eye.

In the course of the operation and in the postoperative period-specific complications were encountered.

We obtained in the course of the study data showed a slight, statistically significant increase in visual acuity in the operated patients. When you receive a visual acuity of the patients for an average of  $0,01 \pm 0,005$ , 12 months after IIAM  $0,03 \pm 0,01$  ( $p < 0,05$ ). Indicators on the expiration of 24 months coincided with previous and averaged  $0,03 \pm 0,01$ .

After surgery, all 50 patients (50 eyes) was the completion of epithelialization, treatment of corneal syndrome. On the 9th day in 85% of patients (42 eyes) after IIAM, and epithelialization was completed in 75% (37 eyes) were stopped corneal syndrome. After 12 months of follow-up, 18% of patients (9 eyes) periodically had relapses (1-2 times a month) corneal syndrome of varying severity, which required the use of local anti-inflammatory and keratoplasty (dexamethasone 0.1%, balarpan). The remaining 82% of patients (41 eyes) experienced persistent therapeutic effect of a lack of corneal syndrome. After 24 months of observation, recurrent epithelial erosion was observed in 20% of patients (10 eyes).

During the observation period continued to increase the transparency of the cornea. On the seventh day after the operation resulted in a minor reduction of stromal edema, manifested by a reduction of stromal opacities. In this case, the structure of AM and anterior chamber (iris, pupil) are poorly visualized due to hydration of the corneal tissue.

When viewed through the month noted greater transparency of the cornea. Continued to decrease stromal edema, AM clearly visualized in its layers. More clearly detailed structure of the anterior chamber.

After 3 months, the cornea is a brilliant, mirror, covered with a full epithelium with no signs of over-hydration. The amniotic membrane is becoming more transparent.

After 6 months of follow-up of patients was significantly reduced corneal edema and partly razvoloknilsya amnion, which led to an increase in the transparency of all layers of the cornea. The degree of transparency of the cornea in one year corresponds to the six-month-old and will not change.

After two years, the AM was defined as fibrosis deep layers of the corneal stroma without clear boundaries.

According pachymetry corneal thickness after IIAM after 7 days was  $744 \pm 32,15$  m, 1 month -  $716 \pm 31,77$  m, 3 months -  $681 \pm 32,84$  m, 6 months -  $650 \pm 35,18$ . By 12 months Figures pachymetry significantly decreased to  $628 \pm 34,03$  microns in average by 18% (140 microns;  $p$

<0,05). After 24 months of observation the average values were  $600 \pm 25,12$  microns decreased from baseline by 24% (169 microns;  $p < 0,05$ ).

After the operation, we found no statistically significant changes in intraocular pressure during the entire period of observation.

In our opinion based on the results of clinical and morphological studies suggest that persistent positive clinical effect is due to the fact that the implanted in the corneal stroma amnion serves simultaneously as a semipermeable membrane in the way of anterior chamber and a powerful biological stimulant that activates the regeneration processes. As is well known, the mechanism of therapeutic action of the amnion is based on improving the epithelialization and maintaining normal epithelial morphotype, inhibiting the formation of a rough scar tissue. The advantage of the amniotic membrane antigen is its biological inertness, which greatly expands the possibilities of its use [2,6].

The surgical procedure and biological properties of AM result in potentiation of the clinical response and sustained remission in 80% of patients, which is important, since most of the patients are elderly people with weight related physical symptoms. And all subsequent additional interventions involve risk of serious complications.

**Conclusions:** The studies we found that after 24 months, the gradual increase corneal transparency by reducing its swelling and partial pulping amniotic membrane, a statistically significant increase in visual acuity at an average of 0,02 ( $p < 0,05$ ) decrease in corneal thickness and for 24% from 768 microns to 600 microns ( $p < 0,05$ ). After 24 months of observation recurrent corneal syndrome observed in 20% of patients (10 eyes) with ostalnyeh 80% of patients (40 eyes) was observed lasting clinical effect. Intrastromal implantation of amnion may be the method of choice in the treatment of patients with advanced stage of the EED or alternative methods of surgical treatment of the primary purpose of which is the relief of persistent corneal syndrome.

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## **The role of exogenous and endogenous factors in the development of breast cancer**

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Relationship of estrogen and breast cancer has been known for over 100 years, when the first George Deatson indicated that bilateral oophorectomy leads to remission of breast cancer [1,2]. It is recognized that the hormonal factor is the root cause of tumors in hormone dependent organs and tissues, the main role is given to increased levels of estradiol in the blood serum [3]. Proliferative effect of the hormone may lead to transition from normal cell division in the body to hyperplasia, neoplasia, up to [2,4].

**Objective:** To trace the changes in ovarian giperestrogenii. Determine the role of estrogen in the development of breast cancer. Identify the role of carcinogens and giperestrogenii as etiologic risk factors for breast cancer.

**Materials and methods.** The paper was used 80 female rats aged two months, weighing 150 - 180 g All the rats were divided into 4 groups of 20 animals each. The first group - the control, the second group was due to the increased concentration of estrogen in the blood by intramuscular injection of a solution of Shrovetide 17-beta-estradiol (drug "Proginova" analog of endogenous estrogen) at a dose 1milligramm per animal - 1 time per week (estradiol on Compared with synthetic analogs have longer duration of action - to 1 week, allowing to use the minimum number of injections). Usable dose estradiol 1milligramm only slightly above physiological, but is not toxic. The third group in the area of breast deposited carcinogen 7,12dimethylbenz (a) anthracene (DMBA) at a dose of 1.5 mg of water-lipid emulsion of one fold in three weeks, the total dose of carcinogen is 4.5 mg per animal. The fourth group received both estrogens and carcinogen concentrations described for group 2 and 3. Experiment lasted 4 months, after which all groups of rats were subjected to autopsy, histological examination of breast and ovarian cancer. The sections were stained with hematoxylin - eosin, according to Van - Gieson, for ploidometriceskogoFeulgen reaction analysis was performed to identify DNA. The morphometric analysis was performed using a set of Morpho Vision from a statistical evaluation of the program Statistica 6.0.

**Results and discussion.** High concentrations of estradiol in the blood serum of animals able to exert its effect on hormone-sensitive tissues and organs, in particular the mammary gland.

The mammary gland is under the influence of hormonal stimulation of the notes in its structure a high percentage of cell proliferative activity as well as in groups of animals treated with high doses of estrogen marked increase in the area of the parenchyma  $80,012 \pm 4,2$  second and  $86,22 \pm 4,8$  in the fourth compared to  $70.43 \pm 3,8$  in the control group (at  $p < 0,05$ ). These changes are explained hyperplasia in the mammary gland by increasing the area of cells  $98,4 \pm 5,74$  and  $105,63 \pm 5,81$  in groups 2 and 4, respectively, compared to  $80,4 \pm 6,65$  in the control group (at  $p < 0,05$ ). In addition to the quantitative increase in the size of cells and nuclei, is their qualitative change, increased mitotic activity in the part of the visual fields become pathological mitosis, cells with characteristic properties of early malignant transformation. In the experimental groups of