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STAGES OF ETIOLOGY, PATHOGENESIS, DIAGNOSIS, TREATMENT OF REFRACTER GLUCOMAS

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Abstract:

The organs of the body connect a person with the external environment, while the internal organs themselves show the effect of the face by the fall. More than 90% of the information that enters the human body is entered by construction analyzers. Therefore, maintaining and adapting the functions of the building and the health of the building members to the society is a very important issue. In recent years, the incidence of disability due to autumn diseases has been increasing (AUTHOR).

Keywords: ETIOLOGY, PATHOGENESIS, DIAGNOSIS, STAGE OF TREATMENT OF REFRACTER GLUCOMAS, Treatment of glaucoma.

According to the World Health Organization, the incidence of glaucoma has been increasing in the last 10 years, and today the number of glaucoma patients in the world as of 2020 has increased from 64 million to 76 million. Analysis and forecasts show that by 2040 this figure will reach 111 million, with the incidence of glaucoma in Africa and Asia being much higher than in other regions (AUTHOR). Years of research by ophthalmologists show that the risk of developing glaucoma in the population of the African region is very high, due to genetic factors, environmental influences and environmental factors (AUTHOR).

At the initiative of the Helmholtz Automated Research Institute of Autumn Diseases in Moscow, on the basis of the program of the World Health Organization - "Right to Build Vision 2020", developed programs to prevent glaucoma-induced blindness. Epidemiological analysis shows that the incidence of glaucoma varies in different regions of Russia. The incidence of glaucoma and the consequences of glaucoma is increasing every year (AUTHOR). In the Russian Federation, it is the cause of 14-29% of blindness. If this figure was 14% in 1997, by 2013 it will increase significantly to 29%. To date, in many regions of Russia, primary glaucoma accounts for 23-57% of all types of disability caused by autumn diseases (AUTHOR). Secondary glaucoma accounts for 24%. Secondary neovascular glaucoma is characterized by rapid and complete loss of visual function (AVTOR), characterized by specific clinical symptoms. According to many authors, patients with refractory glaucoma account for 24-39% of fall apple enucleation surgeries (AVTOR). The main reasons for the development of neovascular glaucoma in 30-40% of cases are thrombosis of the central vena cava, diabetic proleferative retinopathy (AUTHOR). In refractory glaucoma, ophthalmohypotensive drugs used in normal primary glaucoma are ineffective. Anti-glaucomatous fistula surgery is very ineffective in refractory glaucoma, but there are many complications in surgical procedures. In the postoperative period of antiglucomatous surgery in 50-55% of patients hemorrhagic complications, scarring of the drainage areas, closure, loss of the anterior chamber, blurred vision, postoperative infections, irritability, irridocyclitis, hemophthalmos, tightening of the peritoneum and the most severe form are observed in the fall. After surgery, the autumn hydrodynamics are progressively disrupted. It is difficult to predict a decrease in intracranial pressure, which is accompanied by a sharp deterioration of autumn functions, complete loss of visual acuity and, in some cases, autumn enucleation. In refractory glaucoma, the effectiveness of fistula surgery is much lower and it gives a positive result in 40 - 45% of cases. Increases the efficiency of combined operations up to 70% (AVTAR). Unfortunately, these surgeries are mainly aimed at lowering the internal pressure in the fall and relieving pain in the fall. Construction functions are completely

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lost in most cases (AVTAR). To date, the pathogenesis of secondary neovascular refractory glaucoma has not been thoroughly studied. In the pathogenesis of neovascular glaucoma, ischemia and hypoxia, an increase in endothelial factor of the vascular bed (VGF). Under hypoxia, neovascular tissue appears in the peritoneal tissue, new veins appear in the drainage area of the fall, which in turn prevents the flow of fluid in the fall and leads to an increase in intracranial pressure (ASTOR). During its development, neovascular secondary glaucoma goes through 4 stages:

In the posterior part of the prerubiotic stage, new blood vessels appear in the posterior membrane, and new blood vessels appear in the area of the optic disc. During this period, autumn functions remain unchanged.

Preglaucoma stage rubiosis of the cornea is observed, autumn internal pressure readings are normal. Biomicroscopy reveals irregularity of capillaries in the area of the cornea around the cornea. The new veins begin at the intrastroma of the cornea and then spread to the surface of the cornea, while the neovascular veins grow from the anterior chamber area of the cornea.

The open-angle stage of glaucoma develops rubiosis of the cornea. Rubiosis also develops in the anterior chamber, the intracranial pressure increases, in many cases there are signs of inflammation, the autumn fluid becomes cloudy. The permeability of the walls of new vessels increases, gives hemorrhagic complications, microhemorrhage and hyphema are observed. The most distinctive feature of this stage is the appearance of a fibrovascular membrane on the surface of the colored membrane. At this stage, the increase in intracranial pressure is due to the obstruction of the trabecular tissue with new blood vessels, which depresses the outflow of intracranial fluid.

The flat-angled stage flattens the color membrane, shrinks the fibrovascular membranes, closes the anterior chamber angle with radially oriented snexia, changes the shape of the cornea, deforms, causes pigmented epithelium to shrink, the corneal endothelium grows into the color membrane. At this stage, the pain in the fall increases, the intracranial pressure rises sharply, and patients are advised to undergo emergency surgery (AUTHOR). To date, the pathogenesis of the development of secondary neovascular glaucoma is called angiogenesis - type ischemia, hypoxia, the appearance of a vasoconstrictive factor. Maykolson I.S. This factor, discovered by 1948, is called the "X" factor (AUTHOR). Researchers have studied the biochemical properties of this factor. It is produced by the tourniquet and it stimulates the development of new mining vessels. At the same time, ischemia also develops in the early autumn and creates the basis for the formation of new blood vessels (neovascular). Recent studies have shown that there are several different types of angiogenic factors (AUTHOR). Angiogenesis is a multi-stage process in which new pathological blood vessels appear under the influence of angiogenic factors in healthy tissues, and angiogenic factors then bind to receptors located in the vascular endothelium. This, in turn, leads to the activation of the expression gene of endothelial cells by pro angiogenic molecules. Endothelial cells invade the surrounding cells and form a wall of newly formed vessels. The new veins are then stabilized by parietal cells (AUTOR).

To date, the following types of vasoproleperative substances have been identified: fibroblast growth factor (FGF rus) (FUF), transforming growth factor (TFGA rus) (TUF), growth factor modifier (TGF rus) (UFU), pigment epithelial factor (PEDF). rus) (PEKF), tumor necrosis factor (TNF - a rus) (UNF), interleukins and vascular endothelial growth factor (VEGF rus). Fibroblast growth factor stimulates mitosis and chemotaxis-free processes in endotclial cells, its presence in autumn tissues leads to proliferation of retinal pigment epithelial, vascular endothelium and fibroblasts (AVTOR).

The balance between the production of autumn fluid and its outflow from autumn allows it to maintain the internal pressure of autumn. The fall in internal pressure is accompanied by cyclodestruction of the ciliated body. After this treatment, the intraocular pressure decreases, the intraocular fluid decreases, the structures of the intraocular space collapse, the cornea becomes opaque, the vitreous body undergoes dystrophy, the intracranial pressure decreases, the autumn volume decreases. More recently, the ciliated body has been exposed to a transimellar pathway using a laser beam in a micro-pulse mode, along with a reduction in intraocular fluid, making it easier for the intraocular fluid to exit through the uveoscleral pathway. For the past 10 years, ophthalmology has been using a type of fox with a length of 810 µm to reduce intracranial pressure. Using this laser device, cyclophotocoagulation is performed on the flat part of the ciliated body. The duration of the laser beam is 1.56 µm wavelength. With this method, the internal pressure of the fall is easily lowered and at the same

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time does not have a negative effect. After treatment, the rate and quality of complications decreases. At present, this method can be used in the early stages of glaucoma. In painful terminal glaucoma, this method is not the first digital treatment.

In the treatment of glaucoma, first of all, the fall pressure is lowered and its parameters are kept constant, otherwise the rise in fall intraocular pressure exacerbates glaucomatous neuroopticopathy and leads to a complete loss of visual function. The production of the internal fluid of the fall and the balance of its outflow from the fall ensure the stability of the fall pressure. Autumn intrusion is provided by reducing the production of intracranial fluid or facilitating the outflow of intracranial fluid from the abdomen. Until recently, the production of intracellular fluid was reduced by transscleral laser technology, i.e., diode laser pathways. In this case, the ciliated body was burned by means of photocoagulation, and the amount of internal fluid in the fall was reduced. At the same time, in recent years, a new technology has been developed to ensure that the fluid escapes through the uveskleral path by affecting the flat area of the ciliary body in the micro-pulse mode using tracheal rays. Since the beginning of the twentieth century, several methods have been used to influence the structure of the ciliated body. Especially in logistic forms of terminal glaucoma surgical removal of the ciliary body - cycloectomy, used in practice (AUTHOR). For this purpose, cyclodiothermocoagulation (AVTOR) was performed with the help of special electrodes of the ciliated body. These methods were not widely used in practice due to the fact that many cases later complications and the possibility of predicting the internal pressure of the fall was very low. By 1950, Bietti had practiced cryodestruction, the effect of cold on the ciliary body, to destroy the ciliated body (AUTHOR). With the help of the cortex, the cilia of the ciliated body are destroyed, which in turn reduces the intracranial pressure and reduces the production of intracranial pressure (AUTOR). However, many complications have been observed with the use of this method, including uveitis, subatrophy of the eyeball, ophthalmohypotonia, hemisphere rupture, instability of the fall intracranial pressure, loss of pain in the fall, and recurrence, which led to the development of new methods.

In 1991, using ultrasound to destroy the ciliary body, Silverman et al. Analyzed the effectiveness of clinical studies in patients with refractory glaucoma. Using high-intensity ultrasound, the ciliated body lashes undergo thermal necrosis, and the fall's internal fluid production is reduced and the fall's internal pressure is reduced. However, this method was not without its shortcomings. After treatment, anterior irridocyclitis, shrinkage of the fall apple - phthisis is observed. However, the proportion of these complications is small and averages 1.1%. Later this method was improved and round probes were used. Recently, it has been used to increase the uveskleral flow of ultrasound (AUTOR). In 2016, Italian ophthalmologists proved an increase in uveascleral flow during cyclophotodestruction with ultrasound using OST and confocal microscopy (AUTHOR)

Smith et al. Proposed a cyclophotocoagulation operation on the lashes of the ciliated body in 1969 with laser beams based on ruby laser and yttrium-aluminum garnet (IAG) (15,16). Beckman et al. Were one of the first to use cyclophotocoagulation in the terminal stage of glaucoma in 1972 using a rubella laser beam with a transcleral pathway (17). One year later, the effectiveness and safety of this method was proved in the ciliary body using short-pulse laser beams, beams with a wavelength of 1064 nnm. In the 70s and 90s of the last century, these laser beams were considered very suitable for cyclophotocoagulation (18). According to the literature, 45–86% of patients were exposed to ash using contactless laser cyclophotocoagulation to maintain the target fall intracranial pressure level, compared to 66–71% when exposed to contact pathway (19). Compared with laser cyclophotocoagulation of IAG lashes from cryodestruction of the ciliary body, the number of complications is significantly reduced (20), however, this method is prone to trauma, often causes pain in the fall during treatment, and after treatment, parrotitis, uveitis, gifema causes ophthalmohypotany, autumn apple subatroya, and symptomatic ophthalmia (21–22). Despite the good reduction of intracranial pressure in the fall, transcranial IAG significantly reduces the scope of its use in oathological practice due to the large number of complications of cyclophotocoagulation treatment. The advent of diode lasers became widespread in later ophthalmology, and this laser was first used in ophthalmology in 1984. In 1992, Xenis and Steward used diode lasers for cyclophotocoagulation by the transcleral pathway, which has a wavelength of 810 nm, significantly reducing the internal pressure of the fall (24). The popularity of this diode laser is balndrok compared to other lasers. Small size of the equipment, low cost of maintenance, ease of use (25-26). However, laser beams with a fox length of 810 nm are very well

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absorbed in the melanin pigment of the uveal tract and significantly reduce energy costs compared to the IAG laser (27-28).

The analysis showed that when patients were observed for 12 months, treated with IAG laser, and cyclophotocoagulation with a diode laser, the difference between them was not noticeable (29). But pain syndrome, fall discomfort is less common when cyclophotocoagulation with a diode laser. Recent results show that anatomical changes in the ciliary body are safer when cyclophotocoagulation using a laser diode. When the ciliary body is cyclophotocoagulated by a diode laser through the transcleral pathway, the decrease in fall function is on average 7 - 31%. 30-47% when cyclophotocoagulation with IAG laser. In case of cryodestruction, this figure is 69% (32-36). Historically, transscleral cyclophotocoagulation has been performed only in terminal and refractory glaucoma, with the aim of preventing patients from bowel movements. It should be noted that transcellular cyclophotocoagulation is much more effective than antiglaucomatous surgeries. Comparative analysis shows that diode cyclophotocoagulation and the installation of Ahmed valves in neovascular glaucoma further increase the efficiency of the operation.

Postoperative reading loss was 27% in patients with Ahmed valve implants, compared with 24% after diode cyclophotocoagulation. Autumn apple subatrocia is observed in 6% of patients with Ahmed valve implantation. Such complications are not observed in patients undergoing diode laser cyclophotocoagulation. The possibilities of laser transcleral cyclophotocoagulation are expanding and allow ophthalmic surgeons to use this method in the early stages of glaucoma (38-39). Observations show that the decrease in postoperative visual acuity is similar to that of patients who have undergone traditional trabeculaectomy (40). Rectospectral analyzes were performed in 49 autumn 2010s, with an average visual acuity index of 0.67 Sivtsev table, patients observed for 5 years, and visual acuity decreased by one or two in 63.2% of patients during the follow-up period. The main causes of decreased visual acuity were progressive, neurooptic pathology, in 9 autumns, and macular edema in 4 autumns (41).

UK ophthalmologists have used diode laser cyclophotocoagulation in 12.3% of patients with low visual acuity. In other cases, it has been widely used in patients with high visual acuity. (42).

Skortsov V. Yu. and others used ciliated body thermotherapy to treat refractory glaucoma. This method has proven to be clinically safe. Mechanical injuries are greatly reduced. Traditional diode transcranial cyclophotocoagulation (P = 0.8 -3.0 watts, t = 1-6 s) causes the water in the tissue to boil suddenly and give a "popcorn" effect, resulting in severe tissue damage (43-44). This effect leads to many complications, especially hemorrhagic complications. In the method of transcleral thermotherapy (P = 0.5 watt t = 60 s), the heating of the tissues begins slowly, the water in the tissue does not boil, and many complications are prevented (45-46). One of them was the use of endoscopic cyclophotocoagulation in 1992 in combination with vitrioretinal surgery, phacoemulsification of the flat part of the ciliary body by the transcleral route. The advantage of this method is that the lashes of the ciliated bodies are directly visualized, and their direct coagulation ensures the positive effect of the operation. However, this method is not used in ophthalmology during the day, and is not without its many complications, as it passes with the onset of autumn (49). It should be noted that endoscopic cyclophotocoagulation is a promising method and allows it to be performed in conjunction with vitrioectomy. In patients with diabetes mellitus, hemophthalmos, and post-traumatic glaucoma, ash is very common (50).

In phacoemulsification operations, surgeons have traditionally performed in conjunction with endomcopic cyclophotocoagulation (51-53). Depending on where the laser beam is applied to the ciliary body, it affects the coronal part of the ciliary body. When exposed to 1 - 2 mm from the limb, the cilia of the ciliated body undergo dystrophy and the production of autumn fluid is reduced. If the limb is exposed to 3 - 4 mm of orcarok, it facilitates the excretion of the internal fluid of the fall by the uveoscleral route. The structure of the ciliated body is determined by ultrasonic biomicroscopy. The location and localization of the ciliated body of each patient has individual characteristics, the location of which is associated with the large size of the autumn apples and autumn refraction (54). To date, the most advanced part of ophthalmology is the strengthening of the uveoscleral tract outflow by affecting the flat part of the ciliary body (55). Thus, exposure to the flat part of the ciliary body significantly reduces the intraocular pressure and facilitates the uveoscleral outflow of intraocular fluid. Modern ophthalmology has demonstrated the effectiveness of transcellular

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cyclophotocoagulation in the micro-pulse mode. The wavelength of these laser beams is 810 nm. Diode laser beams are transmitted in the form of micro-pulses, repetitive. Melanin pigments located in the ciliary body undergo dystrophy in the heat of laser light and then cool down. The cooling time of the tissues is twice as long as the heating, which returns the temperature to its initial state and reduces tissue damage. That is why this laser treatment is attracting ophthalmic surgeons. To date, the production has been launched and the Cyclo G6 Laser system IRIDEX USA.

S. Lin and others studied the structure of the ciliated body before and after surgery using ultrasonic biomicopy. The changes in the ciliary body after surgery are very subtle, not rough. At the same time, however, the internal pressure of the fall drops significantly (58).

When Mengya Zhao et al. Examined histologically the ciliary body, using laser beams in a continuous mode, the cilia of the ciliated body showed very rough changes. When using laser beams in the micro-pulse mode, the lashes of the ciliary body are not damaged and the probability of injury is very low (59). When using micro-pulsed laser beams, the main reason for the fall in intracranial pressure is a significant widening of the gap between the sclera and the ciliary body, which is due to the contraction of the ciliary body, which in turn facilitates the outflow of autumn fluid through the uveoscleral pathway. When this method is used, the ciliated body contracts the muscles and reminds me of the mechanism by which pilocarpine acts (60).

When the traditional transscleral cyclophotocoagulation of patients with refractory glaucoma is examined continuously with laser light, the intraocular pressure decreases in the fall, but many complications are observed. When exposed to micro-pulsed laser beams, the fall internal pressure decreases more sharply, but the complications are much less (61). Micro-pulse cyclotsotocoagulation has proven to be a good, safe, and uncomplicated method in refractory glaucoma (62-63). Its effectiveness is further enhanced if micro-pulse cyclophotocoagulation therapy is used in combination with intereovitreal VEGF inhibitors in conjunction with deep scleroctomy of the sclera. Secondary refractory glaucoma, which can occur later in keratoplasty, is best assisted by micro-pulse cyclophotocoagulation lasers (66). However, micro-pulse cyclophotocoagulation therapy can also be used in the early stages of glaucoma. Even in cases of high construction functions, the fall can reduce the internal pressure to the target values, and very few complications are observed (67-68).

Because the micro-pulse cyclophotocoagulation method is new, it requires large-scale and long-term monitoring.

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