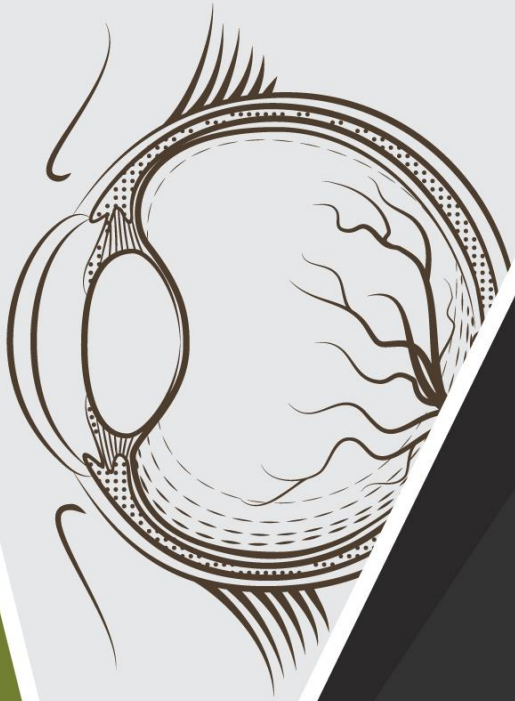

BIODEGRADABLE GLAUTEX DRAINAGE IN REFRACTORY GLAUCOMA SURGERY

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TURAKULOVA DILFUZA MUKHITDINOVNA
NAZIROVA ZULFIYA RUSTAMOVNA

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LIST OF ABBREVIATIONS

AGO - anti-glaucoma surgery

IOP - intraocular pressure

intraocular fluid - intraocular fluid

CG - congenital glaucoma

optic disc - optic disc

KLO - coefficient of ease of outflow

MOF - minute volume of fluid

RG - refractory glaucoma

TA - trabecular apparatus

APC - anterior chamber angle

CNS - central nervous system

UBM - ultrasonic biomicroscopy

VEP - visually evoked potentials

SOUTH - juvenile glaucoma

OCT - optical coherence tomography

PZO - anterior and size of the eyeball

PVG - primary congenital glaucoma

CTR - central corneal thickness

NRP - neuroretinal girdle

CHO - ciliochoroidal detachment

INTRODUCTION

Decrees of the President of the Republic of Uzbekistan No. PP-4947 of February 7, 2017 “On the Strategy of actions for the further development of the Republic of Uzbekistan”, No. PP-5590 of December 7, 2018 “On comprehensive measures to radically improve the healthcare system of the Republic of Uzbekistan”, No. 3071 of 20 June 2017 "On measures for the further development of specialized medical care for the population of the Republic of Uzbekistan for 2017-2021", as well as other legal documents adopted in this area will help solve the research problems of this dissertation work.

Optimization of the methods of pathogenesis of surgical treatment of children with refractory glaucoma is carried out by leading medical research centers and medical universities of the world, including the University of Texas Health Science Center, Eye Care Center, University of Colombo (Columbia), Rehabilitation Institute of Neuromuscular Disease , Yonsei University College of Medicine (Korea), Pediatric Health Research Center, Tabriz University of Medical Sciences (Iran), Capital Institute of Pediatrics (China), Children's Hospital of Wisconsin (USA), Helmholtz Moscow Research Institute of Eye Diseases, VPO Russian State Medical University of Roszdrav (Russia) and Tashkent Pediatric Medical Institute (Uzbekistan).

In the world's leading foreign medical centers, scientific research has been conducted on optimizing the diagnosis and treatment of eye pathology in children, the following results have been obtained: clinical and immunological features, risk factors for the development of the disease and their course have been determined (Children's Nutrition Research Center, Department of Pediatrics, Baylor College of Medicine, USA); determination of characteristic features of molecular genetic changes in a number of populations (Rehabilitation Institute of Neuromuscular Disease, Yonsei University College of Medicine, Korea); combined methods of surgery for refractory glaucoma were developed (Moscow Research Institute of Eye Diseases named after Helmholtz, Russia); the role of intrauterine infection in the development of the disease has been proven (Hacattepe University, Typkiya; University of British Columbia, Canada; The

National Institute of Perinatology Isidro Espinosa de los Reyes, Mexico); a new system for the diagnosis and treatment of congenital glaucoma has been improved (Ohio State University, College of Medicine, University of North Carolina, USA).

Today, work is being carried out all over the world to improve the surgical treatment of refractory glaucoma in the pathogenetic aspect based on the following priority areas, such as: to develop new methods of surgery for refractory glaucoma; identify the features of the course of refractory glaucoma; determination of biochemical and immunological markers in the diagnosis of the disease; determination of genetic and teratogenic factors in PVH; to develop a new optimized method of PVG surgery; study of phenotypic variants of alleles of the main and candidate genes and molecular genetic factors in various PVG populations; development of a protocol for the management of children with this pathology.

In the pathogenesis of primary CH, the basis is genetic and teratogenic factors (exposure to radiation, viral diseases of the mother during gestation, alcohol and tobacco use during gestation, etc.). The main mechanism of SH is not resorption of the mesodermal tissue in the angle of the anterior chamber of the eye (goniodysgenesis) or developmental anomalies. SH is more severe and progresses faster and more frequently. VG is characterized by an autosomal dominant type of inheritance with a degree of penetrance of 60-80%, boys get sick more often (Egorov E.A. va boshkalar, 2016; Zavgorodnyaya N.G., Sarzhevskaya L.E., Ivakhnenko E.M., Tsybulskaya T. E., Kostrovskaya K.O., 2017).

And also, in children with PVG, there is a decrease in the activity of oxidation and phosphorization, a decrease in ATP synthesis, a number of mitochondrial DNA diseases were found as a result of lipid peroxidation, and this in turn leads to the destruction and classification of tissues of the anterior chamber angle and the manifestation of glaucomatous changes. The results of surgical intervention are quite dependent on the early diagnosis of PVH. Treatment not started in a timely manner leads to the progression of the disease, and this, in turn, contributes to irreversible disorders of the eyeball (Khabibullina N.M., Galeeva G.Z., Rascheskov A.Yu. authorlar, 2016; Bahler C.K., Hann C.R., Fjield T. et al, 2015;).

Currently, the main methods for visualizing the structures of the fundus are ophthalmoscopy, biomicroscopy and photographic recording of the tissues of the eye fundus using a fundus camera, fluorescein angiography of the fundus with fluorescein and indocyanine green, optical coherence tomography (L. A. Katargina, E. V. Mazanova, Tarasenkov A. O., Ryabtsev D. I., 2017).

Currently, surgical methods with low trauma and without excessive scarring in the postoperative zone are being developed (Starostina A.V., 2017). More sparing pathogenetically oriented operations reduce the frequency of intraoperative complications. However, so far implantation of drains is the most effective method of treating glaucoma. Thus, it is considered relevant to study the diagnostic potential of immunological, molecular genetic studies in the surgical treatment of PVH. This, in turn, makes it possible to improve the algorithm for the management and treatment of children with PVH.

The purpose of the research is to optimize surgical methods for the treatment of children with refractory glaucoma based on pathogenesis.

Research objectives:

based on a prospective and retrospective analysis of case histories, to study the incidence and clinical and ophthalmological features of the course of refractory glaucoma in children;

to study indicators of corneal diameter in primary and re-operated children with glaucoma in order to develop the most reliable method for measuring the diameter of the cornea;

to conduct a retrospective analysis of the timing of the development of complications that led to repeated surgical intervention in children with refractory glaucoma;

to study the polymorphism of the cytokine gene TNFα (308G/A) and IL-10 (C-819T, G-1082A) and evaluate their role in the prognosis of the development of refractory glaucoma;

to conduct a comparative analysis of the results of surgical treatment of children with refractory glaucoma operated on in the traditional way and with the use of GLAUTEKS drainage;

to study the role of cytokine status in the immune system in children with refractory glaucoma;

develop and implement an algorithm for early diagnosis and treatment of children with primary congenital glaucoma.

Research methods. In this study, general clinical, ophthalmological (visometry, ophthalmoscopy, biomicroscopy, gonioscopy, tonometry and tonography, ultrasound of the eyeball, keratometry), immunological, immunogenetic and statistical research methods were used.

The scientific significance of the results of the study serves as the basis for further in-depth research in the future in order to optimize the surgical treatment of WG based on pathogenesis in our republic; changes in the parameters of cytokines (TNFα, IL-10) of the immune system during the development of the disease and their complications in children with PVH, pathogenesis of glaucoma development, identification of the relationship between repeated surgical interventions and TNFα (308G/A) gene polymorphism and IL-10 (C-819T) , G-1082A) makes it possible to study new aspects of the pathogenesis of this pathology.

The practical significance of the work lies in the fact that a device for remote measurement of the diameter of the cornea in the form of "glasses" has been developed, the use of biodegradable GLAUTEKS drainage in WG has been proposed, the role of the pro-inflammatory genetic marker TNFα (308G/A) has been proven in order to select a surgical method and to predict the treatment of PVH. , developed and implemented an algorithm for managing patients with WG to select treatment tactics and reduce complications.

clinical and genetic correlation allowed to improve the tactics of managing patients with refractory glaucoma and to reduce repeated surgical interventions in children. Based on the results of our proposed special clinical, ophthalmological and statistical methods of research, the scheme of surgical treatment was optimized using

biodegradable GLAUTEKS drainage in order to reduce the number of reoperations.

Chapter I. ANALYSIS OF THE RESULTS OF COMPARISON OF INDICATORS OF THE CORNEAL DIAMETER WITH DIFFERENT MEASUREMENT METHODS IN REFRACTORY GLAUCOMA AND IN PRIMARY CONGENITAL GLAUCOMA

All patients were measured the diameter of the cornea using three methods and obtained the following results.

In order to study the reliability of the data obtained by us, a comparative analysis of these methods was carried out by the method of their statistical processing, based on the determination of the Student's coefficient, associated with checking the equality of the average values in two samples. The measurement was carried out on 21 patients (42 eyes) with WG, who were included in the main group of our study, with a diagnosis of PVH.

Table 4.1 shows the arithmetic mean of the reliability of the results when comparing three methods for measuring the diameter of the cornea.

Table 4.1

Results of Comparison of Methods for Measuring the Corneal Diameter in PVG

Measurement method / Indicators (mm)	Compasses (n=21)	Ruler (n=21)	Glasses (n=21)
	12,48±0,97	12,74±1,0	12,38±0,98
Student's criterion (t)		t= 4,3 p≤0,05 (critical value: 2,02)	t=1,4 p>0,05 (critical value: 2,02)

The indicators obtained by measuring the diameter of the cornea using a surgical caliper were taken as the basis by us as the most objective method of remote measurement of the diameter of the cornea. The mean value was 12.48±0.97 mm. These indicators were compared with the indicators obtained by measuring with a ruler and the special glasses we proposed. All indicators were subjected to statistical processing to identify a significant difference in indicators.

The table shows that when comparing the indicators obtained using a compass and a ruler (12.48±0.97 and 12.74±1.0, respectively), the difference in the average values did not differ statistically (t= 4.3 p≤0.05 "critical value: 2.02"). When comparing the indicators obtained using a compass and glasses (12.48±0.97 and 12.38±0.98, respectively), the difference in the average values was not significant (t=1.4 p>0.05 "critical value: 2 .02").

This confirms that no difference was found in the indicators obtained when measuring with compasses and glasses, which says the method of measuring the diameter of the cornea with glasses is quite accurate, convenient and can be used in pediatric practice for all eye pathologies accompanied by a change in the diameter of the cornea.

A comparative evaluation of the methods used for remote measurement of the cornea diameter made it possible to establish the positive and negative aspects of each of them.

The use of a conventional school ruler for remote measurement of the cornea diameter showed that the method can be performed on an outpatient basis and does not require premedication, which is an important criterion in the study. Easily performed in older children.

But in comparison with other methods, measuring the diameter of the cornea with a regular school ruler has negative sides. The most important criterion of the negative side is the reliability of the result during statistical processing, the lack of the possibility of dynamic observation at a distance and the difficulty of conducting it in young children.

Table 4.2

Description of the positive and negative aspects of using a regular school ruler to measure the diameter of the cornea

Positive sides	Negative sides
Conducted on an outpatient basis	It is impossible to carry out dynamic observation at a distance
Does not require anesthesia	Difficulty fixing children under 3 years old
Not difficult to carry out in adult children	Low confidence
	Requires a long time
	It is carried out by two medical workers (one medical worker measures, the other fixes his gaze).
	Dynamic observation is not possible

A description of the pros and cons of using a surgical caliper to measure corneal diameter is provided in Table 4.3.

The most reliable and convenient method for measuring the diameter of the cornea is measurement with a surgical caliper. The method does not take much time to conduct the study, the reliability is high, it is carried out at any age. But, unfortunately, there is the biggest negative side of this method of measuring the cornea - this is that it is performed under anesthesia.

A description of the positive and negative aspects of using our invented device for measuring the diameter of the cornea is given in Table 4.4.

Table 4.3

Description of the pros and cons of using a surgical caliper to measure the diameter of the cornea

Positive aspects of using a surgical compass	Negative aspects of the use of a surgical compass
Doesn't take long time	Impossible to conduct remote dynamic monitoring
Does not require eye fixation	Performed under anesthesia
High accuracy of the result	Carried out in stationary conditions
Not difficult to carry out	Remote measurement of the cornea diameter is not possible
Conducted at any age	

An analysis of the application of the proposed device for measuring the diameter of the cornea showed that it is convenient to use, available not only for use by ophthalmologists of central hospitals, but also by ophthalmologists who work in remote areas of our region. Since the data can be archived and you can remotely consult with the doctor who previously operated on the patient.

The most significant positive side is the absence of the need for anesthesia and the high reliability of the result.

The negative side for holding you need any device for photographing and a computer. But this is a solvable problem, since you can use any phone and the most common computer that is available in every home and every SVP doctor.

Table 4.4

Description of the positive and negative aspects of using our invented device for measuring the diameter of the cornea

Positive aspects of the device for	Negative sides of the device for

measuring the diameter of the cornea	measuring the diameter of the cornea
Conducted on an outpatient basis	Requires any gadget for photography and any computer.
Does not require anesthesia	
Can be used for children of any age	
High accuracy of the result	
Conducted in a short time	
Carried out by one medical worker	
All data is archived and it is possible to conduct dynamic monitoring at a distance	
Data can be obtained remotely	

In addition, the device can be used for a wide range of corneal diameters - from 8 to 15 mm, and can be used not only in children with PVH, but also in the diagnosis of micro and macrocornea.

Measuring the diameter of the cornea with the help of special "glasses" contributes to the early diagnosis of pathological deviations of the cornea in diameter, which is very important in the dynamic monitoring of children with RG. The sensitivity and specificity of this method was 90.5% and 85.7%, respectively.

When measuring the diameter of the cornea in a comparative aspect between children with PVG (n=50) and RG (n=65).

The study of the diameter of the cornea in the examined patients showed that in patients with RG the average size of the cornea was 14.5±0.5 mm. While in the group of primary operated patients, the diameter of the cornea varied within 13.0 ± 0.4 mm (Fig. 4.1).

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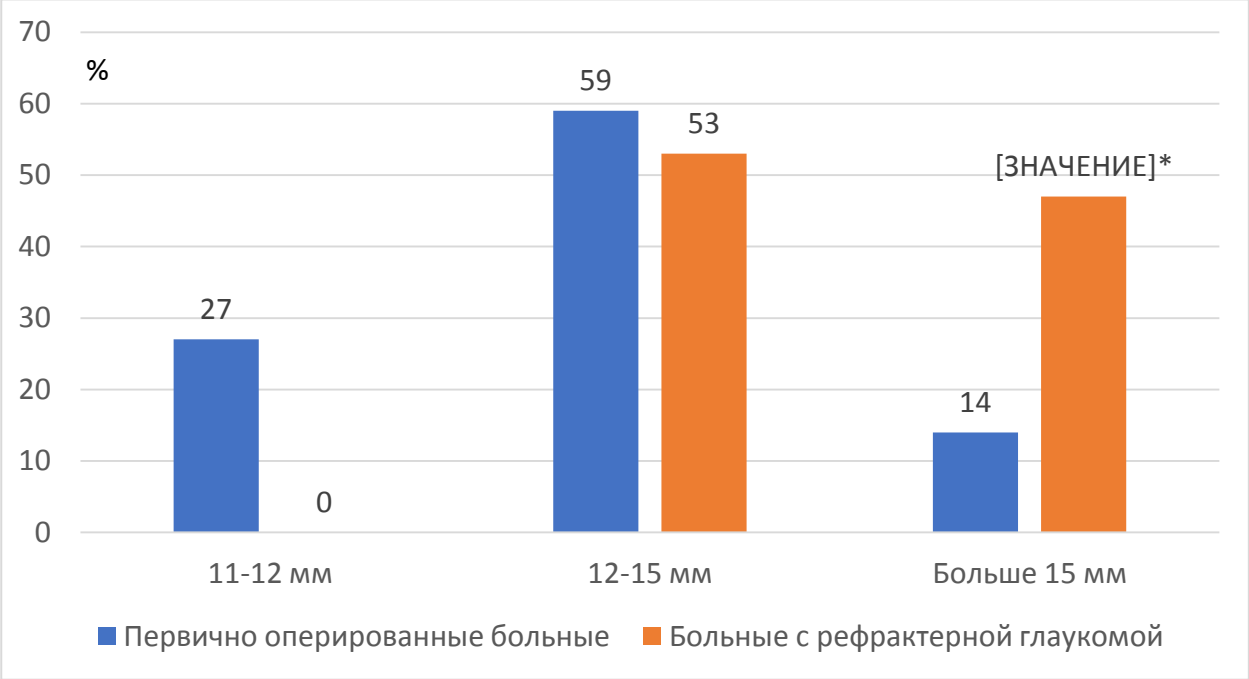

* Reliability of data between groups (p<0,05)

Fig. 4.1. Indicators of corneal diameter in the studied groups

Corneal diameter over 15.0 mm was registered in 47% of sick children with WG and in 14% of children with PVH, which is significant (P<0.05).

Thus, the special “glasses” proposed by us for measuring the diameter of the cornea provide reliably accurate indicators, are safe and convenient for use in pediatric ophthalmology. And also, they make it possible to dynamically monitor the progression of the process and archive the data obtained.

Conclusions on Chapter I

Thus, our invention for a method for measuring the diameter of the cornea in the form of glasses solves the problem of obtaining a result quickly, clearly, conveniently and safely. The resulting technical result consists in accurate measurement of the diameter of the cornea with the maximum approach of the measuring instrument to the eye in adults and children with different face shapes.

The method is easy to use, safe and comfortable for the patient during measurements, has a stable measurement accuracy, with any qualification of a

specialist, which contributes to the early diagnosis of pathological changes in the diameter of the corneas.

The special “glasses” proposed by us for measuring the diameter of the cornea give reliably accurate indicators, are safe and convenient for use in pediatric ophthalmology. And also, they make it possible to dynamically monitor the progression of the process and archive the data obtained.

Chapter II. PATHOGENETIC ASPECTS OF SURGICAL TREATMENT OF CHILDREN WITH REFRACTORY GLAUCOMA ON THE BASIS OF IMMUNE GENETIC ANALYSIS

§2.1. Frequency distribution of alleles and genotypes of the TNFα -308G/A gene in children with refractory glaucoma and primary congenital glaucoma

In recent years, in ophthalmopathology, much attention has been paid to the study of the role of cytokine polymorphisms in predicting healing and early scarring after surgery. The primary postoperative immune response is mediated by the production of pro-inflammatory cytokines, in particular tumor necrosis factor alpha (TNF-α) [112].

The TNF gene encoding TNF-α is located on the short arm of chromosome 6 (6p21.1 6p21.3) within the MHC class III gene cluster. One of the most studied polymorphic variants in this gene is rs1800629 (G-308A), which is located in the gene promoter and is associated with the level of gene expression and TNF-α production – the A-308 allelic variant is associated with a high concentration [329].

In connection with the above, it seems relevant to study the genetic polymorphisms of cytokine genes in children with primary congenital glaucoma in order to expand the understanding of the pathogenetic mechanisms of the formation of the immune response in glaucomatous processes and the postoperative outcome of the disease in carriers of polymorphic mutations.

When studying the frequency distribution of alleles and genotypes of TNFα -308G/A (Table 5.1) in groups of patients with refractory glaucoma (main group, n=65) and primary operated patients (comparison group, n=50), as well as in controls (n =95) a statistically significant increase in the frequency of the A allele was found in the examined children in the main group and in the comparison group compared with the control group (OR = 2.221; 95% CI: 1.198 > 2.221 > 4.116; $\chi 2 = 6.661$ ($p = 0.009855$)).

Table 5.1

Distribution of frequencies of alleles and genotypes of the *TNFα* -308G/A gene in the main group and in the comparison group

Genotype	Main group, n=115		Control, n=95		χ2	OR (95% CI)
	n	%	n	%		
G	191	83,04	174	91,58	6.661 (p=0.009855)	0.243 >0.45> 0.835
A	39	16,96	16	8,42		1.198 >2.221> 4.116
GG	76	66,09	79	83,16	7.843 (p=0.005103)	0.204 >0.395> 0.765
GA	39	33,91	16	16,84	7.843 (p=0.005103)	1.307 >2.534> 4.91
AA	0	0,00	0	0,00		

Note. χ^2 – Pearson confidence score; RR - relative risk;

The G allele of polymorphism was detected significantly less frequently than in the control group (OR = 0.45; 95% CI: 0.243 >0.45 > 0.835; 6.661 (p=0.009855)).

Further, a comparative analysis of TNFα -308G/A genotypes for the GG genotype revealed significant differences between patients in both groups and the control group (OR = 0.395; 95% CI: 0.204 > 0.395 > 0.765; χ2 = 7.843 (p = 0.005103)). Analysis of the heterozygous GA genotype revealed differences between the frequency of occurrence in children in both groups and the control group (33.91% and 16.84%, respectively; OR = 2.534; 95% CI: 1.307 > 2.534 > 4.91; χ2 = 7.843 (p =0.005103)). Thus, TNF-308(G/A) polymorphism influences disease susceptibility.

Further, (Table 5.2) an analysis of the frequencies of alleles and genotypes of the TNFα -308G / A gene was carried out in primary operated patients (children with PVH).

When studying the frequency distribution of alleles and genotypes of TNFα -308G/A in the comparison group and in the control group, a statistically significant

increase in the frequency of the A allele in primary operated patients compared with the control group was found (20.00% vs. 8.42%; OR = 2.719; 95 % CI: 1.338 > 2.719 > 5.523; 8.079 (p=0.004478)). The G allele of polymorphism was detected significantly less frequently than in the control group (OR = 0.368; 95% CI: 0.181 >0.368 > 0.747; $\chi 2$=8.079 (p=0.004478)).

A comparative analysis of the TNFα -308G/A genotypes for the GG genotype revealed significant differences between patients in the comparative group and the control group (OR = 0.304; 95% CI: 0.139 > 0.304 > 0.663; $\chi 2$ = 9.413 (p = 0.002154)). Analysis of the heterozygous GA genotype revealed differences between the frequency of occurrence in the comparison group and the control group (40.00% and 16.84%, respectively; OR = 3.292; 95% CI: 1.508 > 3.292 > 7.183; $\chi 2$ = 9.413 (p = 0.002154)). Genotypic analysis of the homozygous AA genotype did not register.

Table 5.2

Distribution of frequencies of alleles and genotypes of the TNFα -308G/A gene in the comparison group (primarily operated patients)

Genotype	Comparison group, n=50		Control, n=95		$\chi 2$	OR (95% CI)
	n	%	n	%		
G	80	80,00	174	91,58	8.079	0.181 >0.368> 0.747
A	20	20,00	16	8,42	(p=0.004478)	1.338 >2.719> 5.523
GG	30	60,00	79	83,16	9.413 (p=0.002154)	0.139 >0.304> 0.663
GA	20	40,00	16	16,84	9.413 (p=0.002154)	1.508 >3.292> 7.183
AA	0	0,00	0	0,00		

Note. $\chi 2$ – Pearson confidence score; RR - relative risk;

A comparative analysis of the TNFα -308G/A genotypes for the GG genotype revealed significant differences between patients in the comparative group and the control group (OR = 0.304; 95% CI: 0.139 > 0.304 > 0.663; $\chi 2$ = 9.413 (p = 0.002154)). Analysis of the heterozygous GA genotype revealed differences between the frequency of occurrence in the comparison group and the control group (40.00% and 16.84%, respectively; OR = 3.292; 95% CI: 1.508 > 3.292 > 7.183; $\chi 2$ = 9.413 (p = 0.002154)). Genotypic analysis of the homozygous AA genotype was not registered.

Analysis of allele and genotype frequencies of the TNFα -308G/A gene in patients with refractory glaucoma (Table 5.3).

Table 5.3

Frequency distribution of alleles and genotypes of the TNFα-308G/A gene in patients with refractory glaucoma (main group)

Genotype	Main group, n=65		Comparison group, n=50		$\chi 2$	OR (95% CI)
	n	%	n	%		
G	111	85,38	80	80,00	3.04	0.265 >0.537> 1.089
A	19	14,62	20	20,00	(p=0.081219)	0.919 >1.861> 3.773
GG	46	70,77	30	60,00	3.466 (p=0.062643)	0.23 >0.49> 1.046
GA	19	29,23	20	40,00	3.466 (p=0.062643)	0.956 >2.039> 4.352
AA	0	0,00	0	0,00		

Note. $\chi 2$ – Pearson confidence score; RR - relative risk;

When studying the distribution of frequencies of alleles and genotypes of TNFα -308G/A in the comparison group and in the main group, a tendency was found to increase the frequency of the A allele in patients with PVH compared with children with RG (14.62% vs. 20.00%; OR = 1.861; 95% CI: 0.919 > 1.861 > 3.773;

3.04 (p=0.081219)). The G allele of polymorphism was detected significantly less frequently than in the control group (OR = 0.537; 95% CI: 0.265 >0.537 > 1.089; $\chi 2$=3.04 (p=0.081219)).

A comparative analysis of the TNFα -308G/A genotypes for the GG genotype revealed significant differences between the subjects of the comparative group and the main group (OR = 0.49; 95% CI: 0.23 > 0.49 > 1.046; $\chi 2$ = 3.466 (p = 0.062643)).

Analysis of the heterozygous GA genotype revealed differences between the frequency of occurrence in the comparison group and the main group (40.00% and 29.23%, respectively; OR = 2.039; 95% CI: 0.956 >2.039 > 4.352; $\chi 2$=9.413 (p=0.062643)). Genotypic analysis of the homozygous AA genotype was not registered.

When studying the distribution of frequencies of alleles and genotypes of TNFα -308G / A of the main group and in the control, no significant differences were found.

§2.2. Distribution of allele and genotype frequencies of IL-10 gene C-819T, G-1082A in children with refractory glaucoma and primary congenital glaucoma

Interleukin 10 (IL-10), also known as human cytokine synthesis inhibitory factor, is Interleukin 10, an anti-inflammatory cytokine. In humans, interleukin 10 is encoded by the IL10 gene. IL-10 signals through a receptor complex composed of two IL-10 receptor-1 proteins and two IL-10 receptor-2 proteins. Therefore, a functional receptor consists of four IL-10 receptor molecules. IL-10 binding induces STAT3 signaling through phosphorylation of the cytoplasmic tails of IL-10 receptor 1 + IL-10 receptor 2 by JAK1 and Tyk2, respectively. In humans, IL-10 is encoded by the IL10 gene, which is located on chromosome 1 and consists of 5 exons and is mainly produced by monocytes and, to a lesser extent, by lymphocytes, namely T-helpers type II (T H 2), mast cells, CD4 + CD25 + Foxp3 + regulatory T cells, as well as in a certain subgroup of activated T cells and B cells.

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The obtained data on the distribution of frequencies of alleles and genotypes of the IL-10 gene are presented in the table

Further (Table 5.4), when studying the distribution of alleles and genotypes of IL-10 C-819T (rs1800871) in patients of the main and comparative groups, as well as in the control group, no significant differences were found in the frequency of occurrence.

Table 5.4

Distribution of allele and genotype frequencies of the IL-10 C-819T gene in the main and comparative groups

Genotype	Main group, n=115		Control group, n=95		χ2	OR (95% CI)
	n	%	n	%		
C	170	73,91	143	75,26	0.1	0.599 >0.931> 1.449
T	60	26,09	47	24,74	(p=0.751956)	0.69 >1.074> 1.67
CC	56	48,70	49	51,58	0.173 (p=0.677461)	0.517 >0.891> 1.535
CT	58	50,43	45	47,37	0.196 (p=0.658186)	0.656 >1.131> 1.948
TT	1	0,87	1	1,05	0.018 (p=1)	0.051 >0.825> 13.361

Note. χ2 – Pearson confidence score; RR - relative risk;

When studying the distribution of frequencies of alleles and genotypes of IL - 10 C-819T in the control group and in the main group, a slight decrease in the frequency of the C allele in patients with PVH compared with children in the control group was found (73.91% vs. 75.26%; OR = 0.931 ; 95% CI: 0.599 > 0.931 > 1.449; 0.1 (p=0.751956)). At the same time, the T allele of the studied polymorphism was more common than in the control group (OR = 1.074; 95% CI: 0.69 >1.074 > 1.67; χ2=0.1 (p=0.751956)), however, without significant differences.

A comparative analysis of IL-10 C-819T genotypes by CC genotype revealed a slight decrease between the examined main group and control (OR = 0.1.131; 95% CI: 0.656 > 1.131 > 1.948; $\chi 2$ = 0.196 (p = 658186)).

When analyzing the heterozygous genotype of CT, differences were found between the frequency of occurrence in the main group and in the control group (47.37% and 50.43%, respectively; OR = 1.131; 95% CI: 0.656 > 1.131 > 1.948; $\chi 2$ = 9.413 (p = 0.062643)).

In the genotypic analysis of the homozygous TT genotype, 0.87% was registered in children of the main group, and 1.305% in the control group, however, the obtained data were not statistically significant (OR = 0.825; 95% CI: 0.051 > 0.825 > 13.361; $\chi 2$ = 0.018 (p=1).

In the study (Table 5.5) of the distribution of alleles and genotypes of IL-10 C-819T (rs1800871) in the main group and in the control group, no significant differences in the frequency of occurrence were found, as well as in both groups.

In the comparison group (Table 5.6), as well as in the previous groups, there were no significant differences in the frequency of occurrence.

As in the study of the distribution of alleles and genotypes of IL -10 C-819T (rs1800871), when analyzing the indicators of IL -10 G-1082A (rs1800896) in both groups and in the control (Table 5.7), no significant differences were found.

Table 5.5

Distribution of allele and genotype frequencies of the IL-10 C-819T gene in the main group

Genotype	Main group, n=65		Control group, n=95		$\chi 2$	OR (95% CI)
	n	%	n	%		
C	96	73,85	143	75,26	0.003 (p=1)	0.587 >0.986> 1.656
T	32	24,62	47	24,74		0.604 >1.014> 1.703

CC	32	49,23	49	51,58	0.085 (p=0.770456)	0.484 >0.91> 1.711
CT	32	49,23	45	47,37	0.054 (p=0.816883)	0.573 >1.077> 2.026
TT	1	1,54	1	1,05	0.074 (p=0.785887)	0.09 >1.469> 23.912

Note. χ2 – Pearson confidence score; RR - relative risk.

Table 5.6

Distribution of allele and genotype frequencies of the IL-10 C-819T gene in the comparison group

Genotype	Comparison group, n=50		Control group, n=95		χ2	OR (95% CI)
	n	%	n	%		
C	74	74,00	143	75,26	0.055 (p=0.813757)	0.537 >0.935> 1.63
T	26	26,00	47	24,74		0.614 >1.069> 1.863
CC	24	48,00	49	51,58	0.168 (p=0.682031)	0.437 >0.867> 1.72
CT	26	52,00	45	47,37	0.281 (p=0.59591)	0.606 >1.204> 2.389
TT	0	0	1	1,05	0.097 (p=0.75545)	0.063 >0.702> 7.823

Note. χ2 – Pearson confidence score; RR - relative risk

Table 5.7

Distribution of frequencies of alleles and genotypes of the IL-10 G-1082A gene in the main and in the comparison group

Genotype	Main group, n=50		Comparison group, n=65		χ2	OR (95% CI)
	n	%	n	%		
C	96	73,85	74	74,00	0.031 (p=0.860589)	0.687 >1.038> 1.568
T	32	24,62	26	26,00		0.638 >0.964> 1.456

CC	32	49,23	24	48,00	0.045 (p=0.832698)	0.606 >1.062> 1.863
CT	32	49,23	26	52,00	0.034 (p=0.854717)	0.543 >0.949> 1.659
TT	1	1,54	0	0	0.018 (p=1)	0.051 >0.825> 13.361

Note. χ2 – Pearson confidence score; RR - relative risk

Table 5.8

Distribution of frequencies of alleles and genotypes of the IL-10 G-1082A gene in the main group

Genotype	Main group, n=65		Control group, n=95		χ2	OR (95% CI)
	n	%	n	%		
G	87	66,92	129	67,89	0.033 (p=0.855378)	0.595 >0.957> 1.539
A	43	33,08	62	32,63		0.65 >1.045> 1.682
GG	22	33,85	35	36,84	0.151 (p=0.697536)	0.453 >0.877> 1.7
GA	43	66,15	59	62,11	0.274 (p=0.600835)	0.616 >1.193> 2.308
AA	0	0,00	1	1,05	0.001 (p=1)	0.099 >0.96> 9.332

Note. χ2 – Pearson confidence score; RR - relative risk

When analyzing the indicators of IL -10 G-1082A (rs1800896) in patients in the main group and in the control (Table 5.8), there were also no significant differences found, as in the comparison group. (tab. 5.9).

Table 5.9

Distribution of allele and genotype frequencies of the IL-10 G-1082A gene in the comparison group

Genotype	Comparison group, n=50	Main group, n=65	Main group, n=65	OR (95% CI)

	n	n	n	%		
G	71	71,00	87	66,92	0.295	0.682 >1.158> 1.964
A	29	29,00	43	33,08	(p=0.586925)	0.509 >0.864> 1.465
GG	22	44,00	22	33,85	0.704 (p=0.401604)	0.671 >1.347> 2.704
GA	27	54,00	43	66,15	0.892 (p=0.345002)	0.358 >0.716> 1.433
AA	1	2,00	0	0,00	0.216 (p=0.641998)	0.117 >1.918> 31.334

Note. $\chi 2$ – Pearson confidence score; RR - relative risk;

When studying the distribution of frequencies of alleles and genotypes of IL - 10 G-1082A in the control group and in the main group, a slight decrease in the frequency of the G allele in patients with PVH compared with children in the control group was found (67.89% vs. 66.92%; OR = 0.957 ; 95% CI: 0.595 > 0.957 > 1.539; 0.033 (p=0.855378)).

At the same time, the A allele of the studied polymorphism occurred with an identical frequency compared with the control group (OR = 1.045; 95% CI: 0.65 > 1.045 > 1.682; $\chi 2$ = 0.151 (p = 0.697536)), without significant differences.

In a comparative analysis of the IL-10 G-1082A genotypes, the GG genotype also had an identical frequency between the main and control groups (OR = 0.877; 95% CI: 0.453 > 0.877 > 1.7; $\chi 2$ = 0.196 (p = 658186)). When analyzing the heterozygous GA genotype, no differences were found between the frequency of occurrence in the main group and in the control group (66.15% and 62.11%, respectively; OR = 1.193; 95% CI: 0.616 > 1.193 > 2.308; $\chi 2$ = 0.274 (p =0.600835)).

In the genotypic analysis of the homozygous AA genotype, only 1.05% was registered in the control, and this genotype was absent in the main group.

Thus, as can be seen from the results presented, the pro-inflammatory marker *TNFα -308G/A* plays the most important role in the development of the disease and in the prognosis of treatment.

Chapter Conclusions

It was found that in children with PVH before surgery, the concentration of TNF-α in the blood serum is 6 times higher than in the control group.

It was established that in the group of children with slow scarring, surgical treatment did not reduce the expression of the studied mediator, and the analysis of TNF-α in dynamics revealed a slight decrease in the synthesis of this cytokine, which is associated with genetic determination.

Definitely, the obtained data of TNF-α gene typing testify in favor of the -308(G/A) TNF polymorphism, in particular heterozygous carriage, makes a significant contribution to the predisposition of early scarring, as it promotes the fusion of new outflow tracts and leads back to the accumulation intraocular fluid.

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Chapter III. COMPARATIVE ANALYSIS OF THE RESULTS OF SURGICAL TREATMENT OF CHILDREN WITH REFRACTORY GLAUCOMA USING GLAUTEKS DRAINAGE AND ASSESSMENT OF THE CYTOKINE STATUS IN THIS PATHOLOGY

For the first time in Uzbekistan in 2020, on March 31, we received a registration certificate No. TV / X 03512/03/20 for the use of Glautex drainage models TDA and TMA in AGO in pediatric practice.

Children with WG were divided into 2 groups: the main group consisted of 21 children (21 eyes) who underwent AGO using Glautex drainage. The comparison group consisted of 44 children (44 eyes) who underwent AGO with autoscleral drainage.

The results of the distribution of children in the main and control groups by stages of primary congenital glaucoma are shown in Table 6.1.

Table 6.1

Distribution of examined children in the control and main groups by stages of PVH (n=65 eyes)

Groups	PVG stages			
	Initial	Developed	Far-reaching	Terminal
Main (n=21 eye)	-	-	13 (61,9%)	8 (38,1%) **
Comparison group (n=44 eye)	-	-	31 (70,5%)	13 (29,5%) **
Total	-	-	44 (67,7%)	21 (32,3%) **

Note: * - percentage of the total number of examined; ** - reliability of data in relation to the stage of PVG (P <0.05)

Visual acuity was studied in 65 children (65 eyes) with HR, which in the affected eye ranged from 0 (zero) to 0.03-0.04. With visual acuity less than 0.005, the calculation of changes was carried out in ranks, a change in one rank was taken as a significant improvement or deterioration (Table 6.2).

Table 6.2

Rank values of visual acuity indicators according to E.M. Gareev (2002)

№	Rank	Indicators
1	1 Rank	Lack of vision
2	2 Rank	Wrong light projection
3	3 Rank	Correct light projection
4	4 Rank	Hand movement in front of the face
5	5 Rank	Face counting fingers
6	6 Rank	Finger count up to 50 cm
7	7 Rank	Finger count over 50 cm
8	8 Rank	0,01…
9	18 Rank	0,1…
10	27 Rank	1,0

Visual acuity data for both study groups before surgical treatment are shown in Table 6.3.

Table 6.3

Data from the analysis of visual acuity of the control and main groups before surgical treatment (n=44 eyes)

Visual acuity	Группы			
	Primary (n=21 eyes)		Comparisons (n=44 eyes)	
	Abs.	%	Abs.	%
0 - 0,01	13	61	14	31,8*

0,01-0,06	6	28,5	26	59,1*
0,06-0,1	2	10,5	4	9,1

Note: * - reliability of data between groups (P <0,05)

The results of the study, obtained by us in children with primary congenital glaucoma, showed that in children in the main group, visual acuity from 0 to 0.01 was observed in 13 eyes (61%), from 0.01 to 0.06 in 6 eyes (28 .5%), from 0.06 to 0.1 in 2 eyes (10.5%) eyes. In children in the comparison group, visual acuity was from 0 to 0.01 in 7 eyes (32%; P<0.05)); 0.01 to 0.06 in 14 eyes (58%; P<0.05); from 0.06-0.1 in 2 eyes (10% P<0.05).

The results of the analysis of the parameters of the anterior segment of the eye during biomicroscopy of both groups before surgical treatment are presented in Table 6.4. As can be seen from the table, biomicroscopy data in both groups were not reliable and had identical indicators.

Table 6.4

Biomicroscopic parameters of the anterior segment of the eye in the study groups (n=65 eyes)

Groups	Corneal opacities									
	Limb		Gaaba line		Opacification of the central zone		Pronounced opacification		Total opacification	
	абс	%	Абс	%	Абс	%	Абс	%	Абс	%
Comparison group (n=44 eye)	15	34,1	40	90,9	14	31,8	21	47,7	9	20,5
Main (n=21 eye)	8	38,1	19	90,5	7	33,3	10	47,6	4	19
Total	23	35,4	59	90,8	21	32,3	31	47,7	13	20,0

During biomicroscopy of the anterior segment of the eye in all children of the main group (100%), an increase in the cornea in diameter (12-14 mm; 13.2 ± 0.01 mm) was recorded, clouding was noted in 33.3% of patients. The Gaaba line was detected in 90.5% of cases; in all patients, the anterior chamber was deeper than normal. In 35% of patients, the expansion of the corneal limbus was more than 2 mm, which averaged 2.4±0.001 mm. In the comparison group, these indicators were approximately the same, because the groups were representative in all clinical and functional parameters (Fig. 6.1).

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Fig 6.1. Degrees of corneal opacity in PVG.

The data of the results of the study of PZO parameters before surgical treatment in both groups are shown in Table 6.5.

Table 6.5

PZO parameters depending on the age norm of the studied groups before surgical treatment (n=65 eyes)

Group of patients		Main (n=21 eye)	Comparison (n=44 eye)
PZO of the eyeball	До 2 мм	1,9±0,01	1,7±0,02
	от 3 до 5 мм	2,6±0,01	2,8±0,01
	Больше 5 мм	5,6±0,01	5,31±0,02
Corneal diameter	От11 до 12 мм	11,5±0,01	11,3±0,04
	От 12 до 15мм	12,3±0,21	12,7±0,03
	Более 15 мм	15,1±0,01	15,3±0,03

When examining patients of the comparison group, the determination of the PZO of the eyeball in 75.6% of children revealed an increase in indicators, up to 2.0 mm (1.9 ± 0.01 mm) - in 9.2%, more than 3-5 mm (2, 6 ± 0.01 mm) - in 25.6% and in 41% of children, the PZO increased by more than 4-5 mm (5.6 ± 0.01 mm). In 24.4%

of children, there was a pronounced clouding of the cornea, an increase in the eyeball - buphthalmos.

Also, when analyzing the diameter of the cornea in children with RG to AGO, it was revealed that the size of the cornea was in 11.5% of children, in 27.3% from 11 to 12 mm (11.5 ± 0.01 mm) - more than from 12 to 15 mm (12.3 ± 0.21 mm) - and in 43.0% of children more by 4-5 mm (15.1 ± 0.01 mm).

In the main group, there was an increase in the PZO of the eyeball in 84.6% of children; mm) - in 28.3% and in 46.7% of children, the PZO increased by more than 4-5 mm (5.31±0.01 mm). Also, when analyzing the diameter of the cornea in children with RG to AGO, it was revealed that the size of the cornea in 28.4% of children was from 11 to 12 mm (11.13 ± 0.01 mm), in 35.1% of children it was more than 12 to 15 mm (12 .7 ± 0.21 mm) and in 51.33% of children more by 4-5 mm (15.3 ± 0.01 mm).

The statistical norm of the true level of IOP (P0) is from 10 to 21 mm Hg. Art., tonometric level of IOP (Pt) - from 12 to 25 mm Hg. Art. The results of this study are reflected in Table 6.

Table 6.6

Indicators of tonometry and tonography of the main and comparison groups before surgical treatment (n=65 eyes)

Group	Tonometria by Maklakov (Рт)	True IOP (P_0)	Production within the eye fluid (F)	coefficient outflow ease cent (C)	Becker coefficient (КБ)
Comparison Group (n=44 eye)	35,83±1,3	25,13±0,03	5,0±0,03	1,25±0,03	1141,33±2,3
Main (n=21 eye)	37,01±1,53	27,0±0,03	6,0±0,03	1,42±0,03*	144±2,5*

Note: * - reliability of data between groups (P <0,05)

According to the results of tonography and tonometry in the main group, an increase in P0 was observed (25.13±0.01 mmHg) in 15 eyes (71.4%; P<0.05), the tonometric pressure was - (35.83 ±1.3 mmHg) in 6 eyes (28.6%; P<0.05)). The Becker coefficient was increased in 19 eyes (90.4%) and averaged 141.33±2.5.

According to the results of tonography and tonometry in the comparison group, the increase in P0 to 27.0±0.03 mm. rt. st was observed in 20 eyes (45.5%), the

tonometric pressure was 37.01±1.53 mm Hg. in 24 eyes (55.5%). The Becker coefficient was increased in 42 eyes (95.5%) and amounted to 144±2.5.

The data of the gonioscopy study of the main and control groups before surgical treatment are shown in Table 6.7.

When performing gonioscopy in both groups using a Goldman three-mirror goniolens, the following results were obtained:

As a result, it was found that I degree of goniodysgenesis - the angle is open - occurred in 14.3% and 18.2% of cases, respectively. Grade I goniodysgenesis APC was characterized by the presence of a strip of the ciliary body, above the trabecula, a delicate grayish veil of non-resorbed mesenchymal tissue was seen.

Table 6.7

Gonioscopy parameters of the main and comparison groups before surgical treatment (n=65 eyes)

Degrees of goniodysgenesis	Main (n=21 eye)		Comparison (n=44 eye)	
I- degree	3	14,3	8	18,2
II- degree	10	47,6	22	50,0
III- degree	4	19,0	12	27,3
failed to carry out	4	19,0	2	4,5
Total	21	100	44	100

At grade II, there was a high attachment of the iris root at the level of the posterior third of the abnormal trabecula, which was observed in 47.6% and 50.0% of cases, respectively. There was a space between the root of the iris and the anterior boundary ring of Schwalbe filled with semi-translucent grayish tissue or a continuous layer of mesodermal tissue in the form of Barkan's membrane, in 5.6% of cases in the area of the trabecula the pectinate ligaments formed a "jagged" line.

Grade III was observed in 19.0% and 27.3% of cases, respectively, and was characterized by the fact that the root of the iris was located at the level of the middle

of the trabecula, in 10% of patients there was an atypical position and obliteration of the helmet canal. In the examined 19.0% and 4.5% of children, gonioscopy was not possible due to severe edema and clouding of the cornea. A comparative analysis of the morphometric parameters of the ONH before AGO in both groups is given in Table 6.8.

Table 6.8

Comparative analysis of the morphometric parameters of the ONH before AGO in both groups

Morphometric indicator	Main (n=21 eye)	Comparison (n=44 eye)
OD size (Disc area) mm2	2,81±0,12	2,51±1,21
cup volume mm2	0,52±1,21	0,46±0,21
area of the neuroretinal rim (Rim volume) mm2	2,15±0,13	1,92±1,14
ratio of the excavation area to the ONH (cup/disc area)	0,59±0,28	0,73±0,18*
RNFL thickness (Mean RNFL thickness temporal, μm)	107±11,5	102,7±18,7

Note: * - reliability of data between groups (P <0,05)

A comparative analysis of the morphometric parameters of the ONH before AGO showed that the size of the ONH (Disc area) in the main group was 2.76±0.11, in the control group it was 2.46±1.15. The volume of excavation (Cup volume) mm2 in the main group was 0.51±1.2, in the control group - 0.45±0.18. In the main group, the ratio of the area of excavation to the ONH (cup/disc area) was 0.59±0.28, in the control group it reached 0.73±0.18 (P<0.05). RNFL thickness Mean RNFL thickness temporal, μm) in the main group reached 107±11.5.

The results of comparison of early complications in the main and comparative groups are shown in Table 6.9.

We analyzed the results of the analysis of early postoperative complications in both groups.

Table 6.9

Results of the analysis of early postoperative complications in the study groups

Early Complications	1 day after operations				10 days after operations			
	Comparison group		Main group		Comparison group		Main group	
	Абс	%	Абс	%	Абс	%	Абс	%
Hyphema	1	4,4	2	9,5*	-		-	
Choroid detachment	4	17,4	-		3	13,0	-	
Hypotension	4	17,4	-		3	13,0	-	
Increase in IOP	-		-		-		-	

Note: * - reliability of data between groups (P <0,05)

In the main group, on the first day and 10 days later, postoperative complications - hyphema were not observed in any case. Choroid detachment in the comparison group was observed in 2 children on the first day after surgery, and in 3 children on the 10th day.

In the main group of early complications, hypotension and an increase in IOP were observed on the first day. The above complications were eliminated after drug treatment until the patient was discharged.

The results of the study showed that in children in the main group, visual acuity after AGO did not decrease, in isolated cases there was an improvement by 0.01-0.02 6 months after the operation. In the comparison group, visual acuity indicators did not stabilize after AGO, in some cases they tended to decrease 6 months after AGO.

The results showed that in the main and control groups, after 1 and 6 months, all children (100%) had a stop in the growth of the cornea (12-14 mm; 13.2±0.01 mm). In 7 patients (33.3%) of patients of the main group, its enlightenment was noted

in the peripheral sections. The Gaaba line, which was detected in 91% of the eyes before AHO, also did not increase in the main group; in the comparison group, this indicator increased significantly due to an increase in the AOR. In 35% of patients in the comparison group, there was an expansion of the limbus by more than 2 mm (Fig. 6.2).

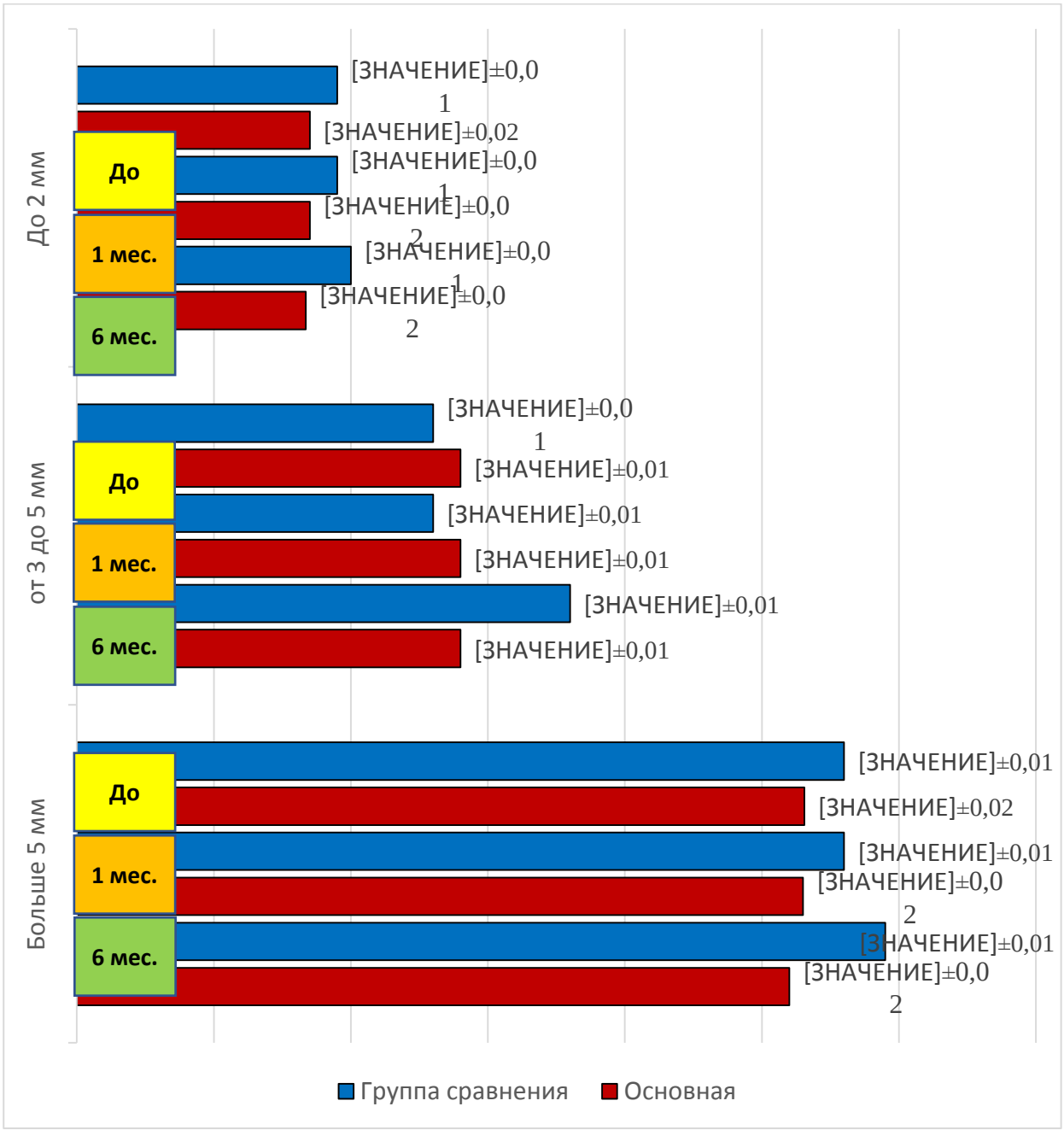

Fig. 6.2. Changes in PZO parameters depending on the age norm of the main group and the comparison group before and after AGO (n=65 eyes)

The PZO index in dynamics after 1 and 6 months in the comparison group

increased significantly after AGO and amounted to 5.9±0.01 mm. Indicators in the main group tended to a slight decrease, which amounted to 5.2±0.02 mm.

In all groups before surgery, the diameter of the cornea exceeded the age norm. In the postoperative period after 1 and 6 months, no significant increase in the diameter of the cornea was observed (Fig. 6.3).

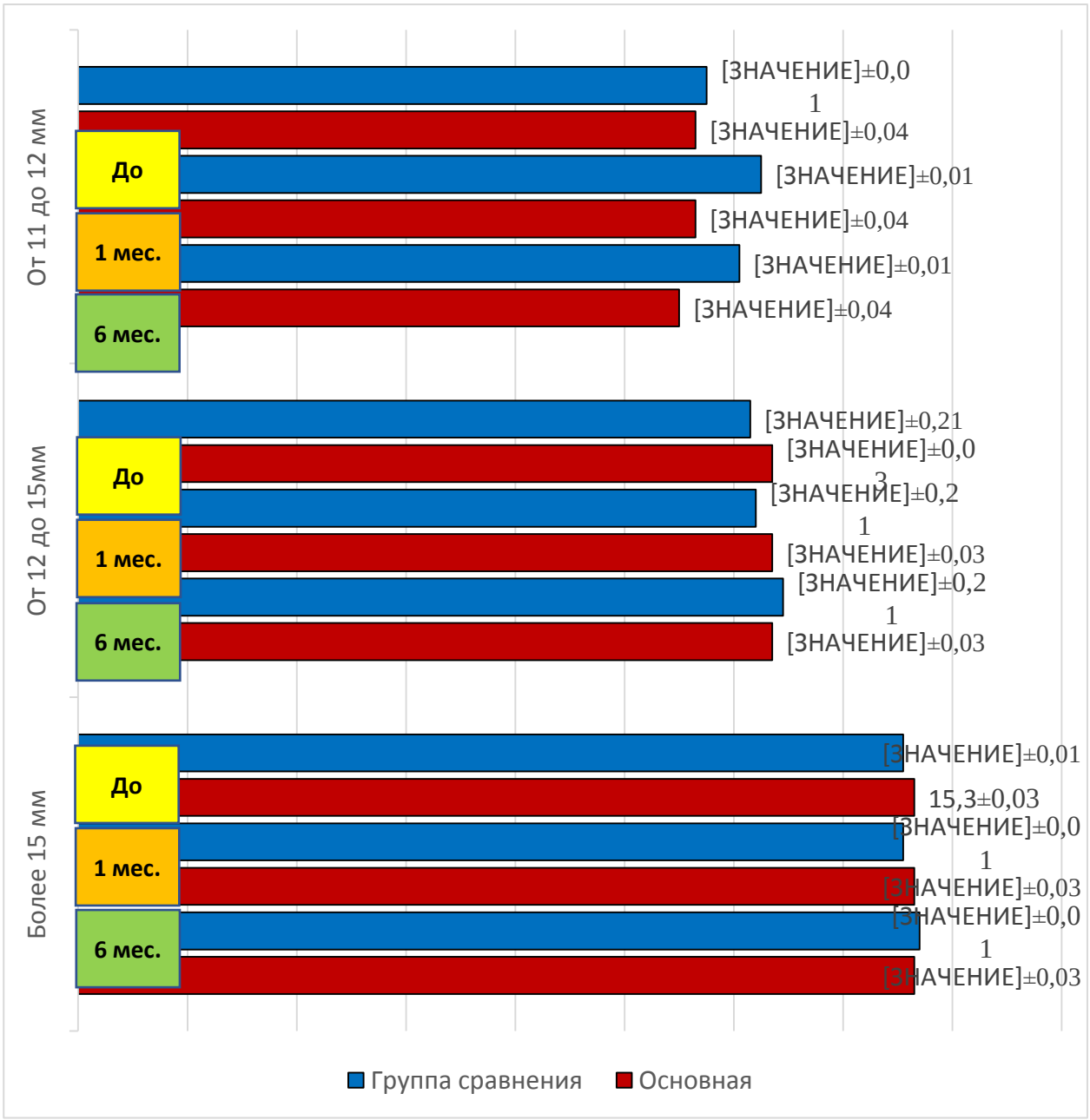

Fig. 6.3. Changes in the parameters of the cornea diameter of the main group and the comparison group before and after AGO (n=65 eyes)

According to the results of tonography and tonometry, no increase in P0 was observed in the main group 1 and 6 months after AGO (21.13±0.03). In the control

group, these indicators were correspondingly increased in 30% of the patient (18.5±0.87 mmHg; P<0.05).

The Becker coefficient in the comparison group was increased in 7 eyes (30%) and amounted to 104.0±2.5, in the other eyes of the patients of the main group this indicator decreased and amounted to 93.7±2.50; P<0.05.

Analysis of IOP dynamics in patients in the postoperative period, depending on the AGO method, showed that when using Glautex drainage, the true IOP gradually decreases to normal values, in contrast to the traditional method, in which the true IOP decreases to subnormal values (Fig. 6.4).

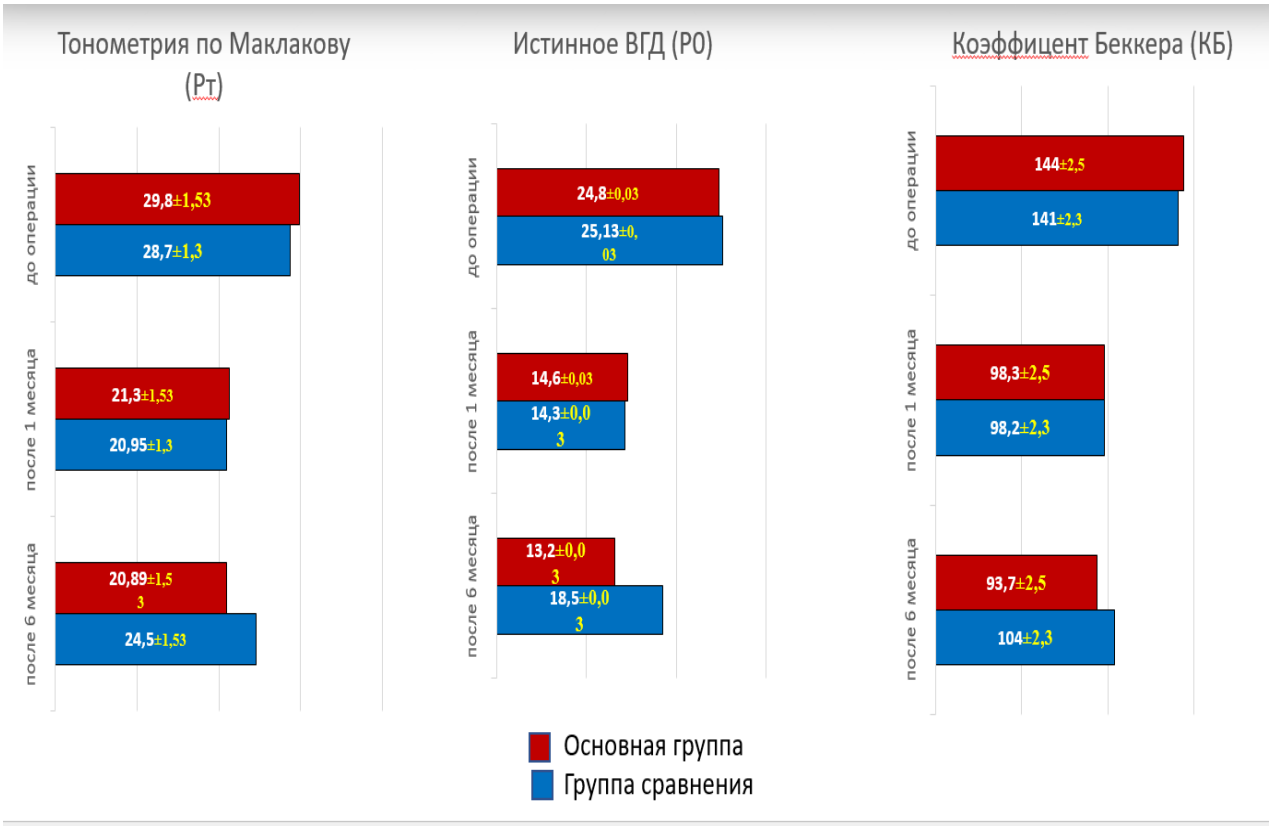

Fig. 6.4. Parameters of tonometry and tonography in the main and comparison group before and after AGO (n=65 eyes)

Comparative analysis of OD morphometric parameters 1 and 6 months after AGO showed that the above parameters remained stable, i.e. after AGO, no increase was observed in the main group.

To identify a more accurate state of healing of the organ of vision of patients, we conducted a comparative analysis of the content of TNFα and IL-10 in the blood serum in dynamics, that is, on the 3rd, 10th day and 1 month after surgery (Table 6.10).

Table 6.10

The content of pro- and anti-inflammatory cytokines in dynamics in patients with congenital glaucoma, M±m

Cytokine	Control n=32	Main group before treatment, n=21	After operation		
			After 3 days	After 10 days	After 1 month
TNF-α, pg/l	20,3±0,71	85,8±2,92*	114,3±3,38*^	107,7±3,14*^	25,6±2,21*^
IL-10 pg/l	8,9±0,42	32,3±1,48*	39,1 ±2,77*^	28,5±2,57*	11,3±0,69^

Note: * - a sign of the reliability of differences in relation to the data of the control group; ^ - a sign of reliability before and after treatment.

Comparative analysis of the systemic cytokine status after surgery in the course of follow-up revealed minor changes in the synthesis of pro-inflammatory and anti-inflammatory cytokines in the main group. Thus, the content of TNFα slightly decreased after 3 days by 6%, on day 10 by 11.5%, and after a month by 21.7% compared with preoperative indicators (3 - 116.82±3.1 pg/ml (P>0.05), 10 – 107.7±3.14 pg/ml (P<0.05), 1 month – 25.6±2.21 pg/ml (P<0.05) versus 85 .8±2.92 pg/ml) (Fig. 6.5).

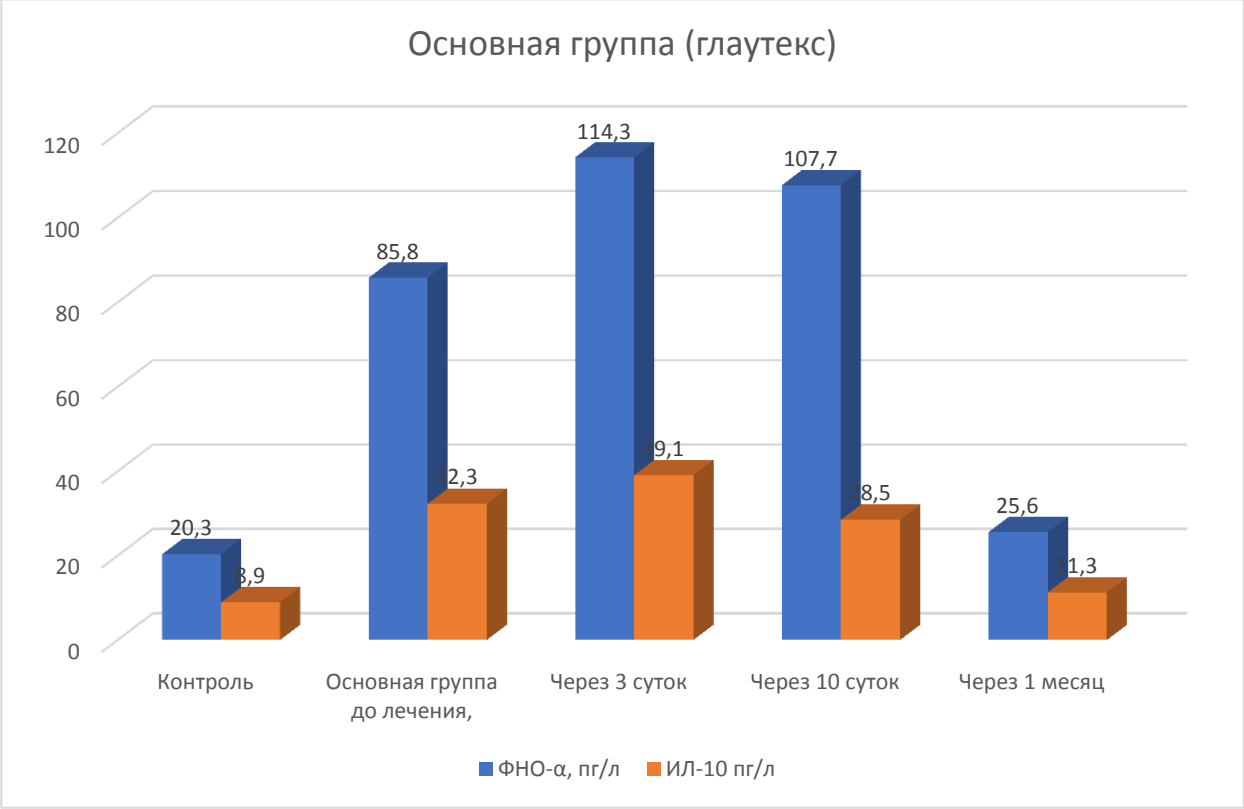

Fig.6.5. TNF-α level after surgery in the main group of children

According to the authors-researchers, any operation increases the concentration of TNF-α in all patients. Normally, the production of TNF-α increases significantly in the first few hours to several days after surgery, then decreases to the initial level, but in our case, enhanced expression before surgery, relatively enhanced synthesis and a pronounced significant increase indicate an initial pathological condition, which is likely genetically conditioned [191, 198].

The analysis of the results of IL-10, which also revealed a slight decrease in the synthesis of this cytokine, confirmed the development of the inflammatory process. It was found that after 3 days the level of IL-10 was 32.3±1.48 pg/ml, after 10 days 28.5±2.6 pg/ml, after 1 month by 11.3±0.69 pg /ml ($P<0.05$) compared with preoperative values of 32.3±1.48 pg/ml.

In our opinion, the revealed high level of synthesis is justified by the migration (localization) of macrophages to the inflammation site, which indicates low tissue regeneration when using Glautex drainage and promotes remodeling of the damaged

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trabecular network, which will lead to a decrease in resistance to the outflow of intraocular fluid and intraocular pressure.

The study of the concentration of TNF-α showed that in the blood serum of children in the comparison group, the concentration of tumor necrosis factor-alpha averaged 103.5±4.04 pg/ml versus 85.8±2.92 pg/ml (P<0.001). This indicates an increase in the synthesis of this mediator by 20.6% (Table 6.11).

Table 6.11

Comparative content of pro- and anti-inflammatory cytokines in dynamics in patients with congenital glaucoma from the comparison group, M±m

Cytokine	Control n=32	Main group before treatment, n=21	After operation		
			After 3 days	After 10 days	After 1 month
TNF-α, pg/l	20,3±0,71	85,8±2,92*	103,5±4,04*^	52,1±1,74*^	19,1±1,32
IL-10 pg/l	8,9±0,42	32,3±1,48*	36,6±2,34*	27,8±1,85*	9,8±0,42^

Note: * - a sign of the reliability of differences in relation to the data of the control group; ^ - a sign of reliability before and after treatment.

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When assessing the content of IL-10, a statistically insignificant increase in its content was revealed in patients from the comparison group. Thus, the level of IL-10 expression also increased by 21% of the initial values before surgery, which averaged 36.6±5.3 pg/ml versus 32.3±1.48 pg/ml (P>0.05) (Fig. .5.4).

The TNF-α level averaged 52.1±1.74 pg/ml, which is 38.9% less than preoperative data (P<0.001).

Analysis of the study of pro-inflammatory cytokine in the comparison group after 1 month showed that the level of TNF-α synthesis decreased by 77.8% and

averaged 19.1±2.9 pg/ml (P<0.001). Well, the content of IL-10 decreased on average by 69.7% and amounted to 9.8±0.42 pg/ml (P<0.001).

Obviously, there is a high probability of early excessive scarring associated with increased proliferation of fibroblasts and collagen production in the area of newly created outflow tracts, which leads to an imbalance in the production of mediators, an increase in local production with aggravation of the systemic one.

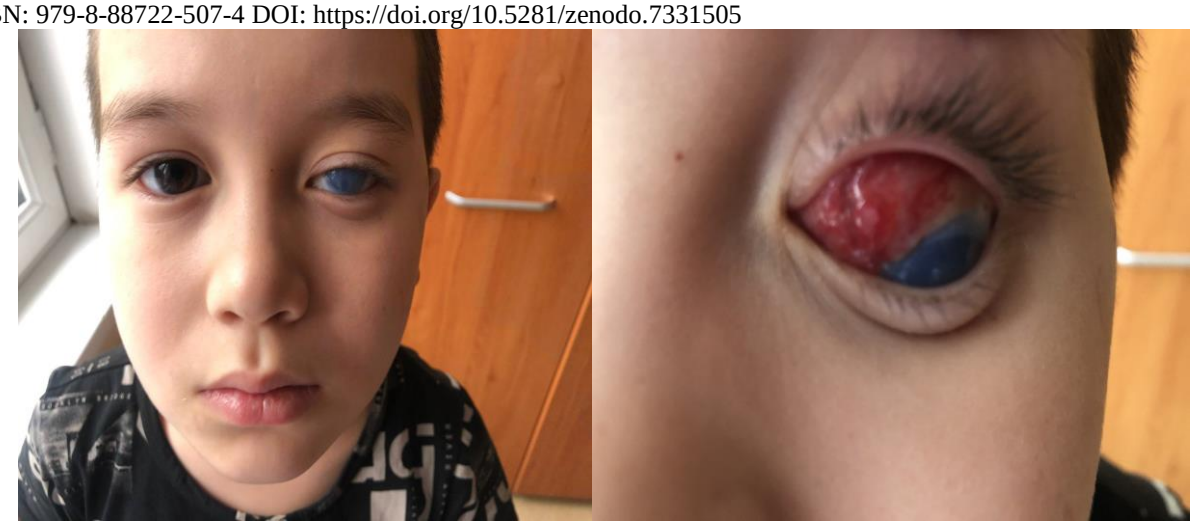
Thus, the above endogenous polypeptide mediators of intercellular interaction are actively involved in the development and maintenance of already disturbed immune homeostasis in congenital glaucoma. We tend to consider a rapid decline in cytokine concentrations as a negative factor, the implementation of which can lead to increased synthesis of extracellular matrix proteins, remodeling of damaged trabeculae, and, consequently, to an increase in resistance to the outflow of intraocular fluid and an increase in IOP.

An analysis of the surgical treatment of children with refractory glaucoma using biodegradable drainage Glautex showed that the use of drainage provides a stable hypotensive effect, but at the same time prevents excessive filtration of intraocular fluid.

The location of the drainage around the scleral flap as a “clutch” does not allow changing the position and is a prevention of the development of sclero-conjunctival, sclero-scleral adhesions and adhesions along the contact edge of the scleral flap.

The use of Glautex biodegradable drainage does not complicate the surgical intervention itself, since its placement is not at all a complicated and time-consuming manipulation.

The duration of the hypotensive effect in group 1 was 1.7 ± 0.5 years, while in group 2 its duration reached an average of 2.2 ± 0.35 years, which is 1.3 times higher and has significant values (P <0 .05).



а) б)

Fig. 6.5. Photo of the patient before (a) and after surgery: sinustrabeculectomy using biodegradable drainage "Glautex" (b).

The number of bed days spent in the hospital by children in group 1 averaged 8.1 ± 0.75 bed days, while in the second group there was an average reduction of 2.0 ± 0.5 days (P <0.05).

In the dynamics of observation for 6 months, we found that repeated surgical interventions were required in 13.6% of cases from the comparison group, while in the main group in 4.8% of cases, respectively, which is significant (P <0.05).

Thus, patients with refractory glaucoma who have previously undergone repeated antiglaucomatous surgical interventions should undergo sinustrabeculectomy using biodegradable drainage "Glautex".

The use of biodegradable Glautex drainage is considered to be one of the main ways to reduce and maintain ophthalmotonus in the surgical treatment of refractory glaucoma.

Based on the above, we have developed an algorithm for managing children with primary congenital glaucoma (Fig. 6.6).

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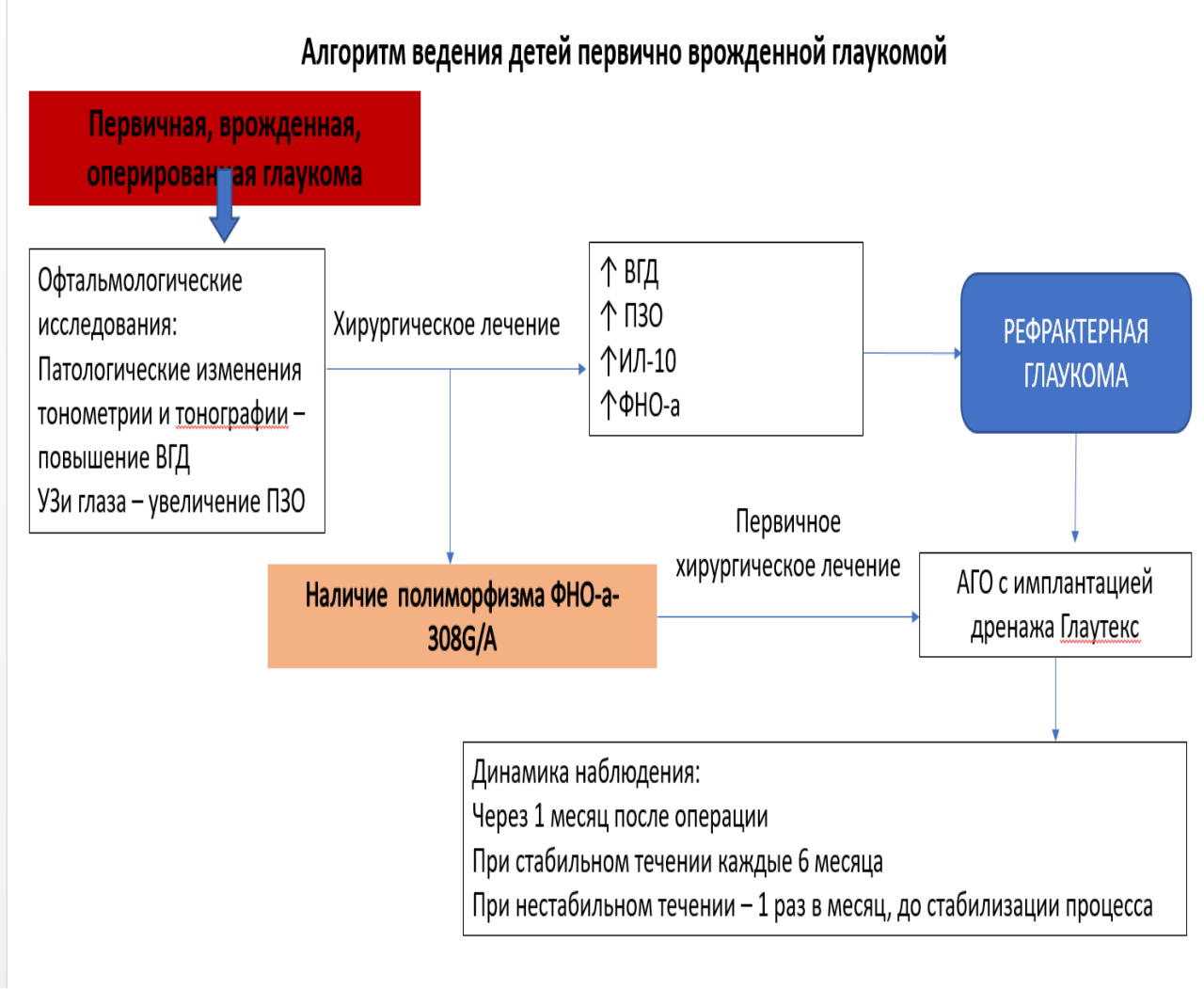

Fig. 6.5. Algorithm for managing children with primary congenital glaucoma

Evaluation of the economic efficiency of the proposed method.

The effectiveness of a differentiated approach to the management of children with refractory glaucoma using Glautex drainage is confirmed by a 1.5-fold decrease in the number of complications in the postoperative period compared to traditional methods of antiglaucomatous surgery, and also helps to reduce the number of bed-days by an average of 3 days.

$E X = K \times (X x - X y)$,

where K is the average cost of one bed-day of the patient's stay in the corresponding department of the hospital (568,000 soums);

X x is the average number of bed-days of hospital stay per treatment of one case of the disease (refractory glaucoma) by the traditional method of antiglaucoma surgery (8 days).

X y is the average number of bed-days of hospital stay per one case of the disease treated by the method of surgical treatment of refractory glaucoma using Glautex drainage (6 days).

EH = K × (Xx - Xy) = 554000 × (9 - 6) = 2216000 sum

Thus, the share of savings from reducing the length of stay of one patient in the hospital as a result of using a differentiated approach to the management of children with refractory glaucoma amounted to 2,216,000 soums.

Chapter Conclusions

Based on the foregoing, it can be concluded that patients with refractory glaucoma who have previously undergone repeated antiglaucomatous surgical interventions should undergo sinustrabeculectomy using biodegradable drainage "Glautex".

Based on the study of the level of TNF-A and IL-10, the effectiveness of the use of Glautex drainage in the surgical treatment of children with RG was proved: high levels of the studied cytokines indicate an extension of the scarring period, which in turn prevents cicatricial obliteration of the created aqueous humor outflow tracts and improves the quality of the treatment . In the group of children with traditional surgery, a decrease in the levels of TNF-A and IL-10 contributes to excessive scarring of the newly created outflow tracts, leading to an increase in ophthalmotonus and, thereby, to a decrease in the quality of AGO.

The use of biodegradable Glautex drainage is considered to be one of the main ways to reduce and maintain ophthalmotonus in the surgical treatment of refractory glaucoma.

CONCLUSION

Glaucoma is one of the most severe forms of ophthalmopathology, occupying a leading position among the causes of blindness and low vision [73, 126]. Congenital eye pathology remains to this day the main cause of blindness and low vision in children, while congenital glaucoma (CH) reaches 10%, causing 4.4% of cases of blindness and 2.2% of low vision.

VH is characterized by a wide variety of clinical symptoms, the complexity of pathogenesis and the severity of outcomes. The modern classifications of VG used are based on structural and anatomical changes in the eyes due to high intraocular pressure (IOP) and do not cover visual functions depending on the age of children and the form of pathology.

Signs of PVH disease in 60% of children can be detected already in the first 6 months of their life, in 80% - in the first year of life [188]. When examining newborns in maternity hospitals, in 90% of them the disease can be diagnosed with early signs.

A carefully collected history, correct and in-depth early diagnosis in PVH reduces the risk of early disability by 34%. When conducting a complete examination of infants and children under 3 years of age, it is usually performed in the operating room, under the influence of sedative drugs. The check includes:

Examination of the anterior segment of the eye: to assess the condition of the cornea and angle and, in accordance with this, the choice of the appropriate method of surgical intervention for each individual case of congenital glaucoma.

Fundus examination: after dilating the pupils with special eye drops, the ophthalmologist, using a special magnifying glass, examines the retina and optic nerve for damage. In glaucoma, the optic nerve loses its fibers, leaving a void (notch) that increases as the disease progresses. Measurement of the corneal diameter in children with PVH is one of the important indicators for diagnosis and further dynamic monitoring of the progression of this pathology. Especially children with PVH after surgery for PVH, who are far from medical institutions, including

Republican clinics, often cannot visit these medical centers every month for dynamic monitoring of indicators in this pathology. Parents often complain about an increase in the cornea and eyeball, but these are subjective data.

However, surgical treatment in children is significantly less effective than in adult patients and ranges from 92.3% in the early postoperative period to 46% in follow-up [24, 39, 45].

This work is devoted to the development and evaluation of the effectiveness of surgical treatment of refractory glaucoma using biodegradable Glautex drainage.

Based on the foregoing, the purpose of this study was to substantiate the pathogenetic criteria for the development of refractory glaucoma in children on the basis of molecular genetic and immunological studies and to optimize the methods of surgical treatment.

At the first stage, a retrospective and prospective analysis of 5367 patients admitted to the eye department of the TashPMI clinic.

The exclusion criteria from the study were children with secondary glaucoma, with syndromic pathology, as well as with concomitant diseases of the organ of vision.

Among 478 children with primary congenital glaucoma (PVG), according to the selection criteria, 448 children with primary congenital glaucoma (PVG) were selected. Surgical treatment was done in 390 patients, among which 265 children were initially operated and 125 children were re-operated, these children were diagnosed with refractory glaucoma.

At the 2nd stage of the study, we conducted a prospective study including the study of the immunogenetic role of TNFα-308G/A, IL-10 C-819T and G-1082A cytokine gene polymorphisms in the development of refractory glaucoma. Also at this stage, the effectiveness of the use of special "glasses" for measuring the cornea of the eye in diameter was evaluated in comparison with traditional methods, such as measurements using a regular school ruler and a surgical compass.

The 3rd stage of the study consisted in evaluating the effectiveness of surgical treatment of children with refractory glaucoma using biodegradable Glautex drainage (21 children) in a comparative aspect with traditional AGO (44 children).

The study of the multiplicity of AGO showed that patients operated on 2 or more times, that is, patients with WG, accounted for 32%. The distribution of children depending on the stage of the disease showed that the largest percentage of children with WG were children with terminal and advanced stages. And in the group of primary operated patients, there is a far-reaching and advanced stage.

All patients underwent biomicroscopy, which showed that patients with RG are admitted with severe keratopathy and degenerative changes in the cornea.

The results of the study of tonometric and tonographic parameters in the studied groups showed that patients with HR have significantly higher rates of both true and tonometric IOP compared with initially operated patients.

An analysis of the PZO parameters in the studied groups compared with the age norm showed that in patients with RG, the PZO indicators exceeded the age norm by an average of 4.6 mm, while in those initially operated on, it exceeded the average by 3.3 mm.

In 47% of sick children with WG, PZO values of more than 5.0 mm (4.5±0.02 mm) are noted, while in primary operated PVH, only 18% ($P<0.05$).

In patients with WG in 50% of cases (every fifth child), the need for repeated surgical intervention develops 12-24 months after the primary surgical intervention, the smallest percentage occurs in the first 12 months (12.8%) after the primary AGO.

Thus, in a retrospective study, it was found that refractory glaucoma occurred in 32.11% of cases after traditional operations, was characterized by a lack of stabilization of the glaucoma process, which was manifested by an increase in the diameter of the cornea, anterior eye area, tonometric and tonographic parameters and a deterioration in the clinical and functional parameters of the organ of vision.

In the course of the study, a method of special "glasses" was developed to measure the diameter of the cornea. This method was used in the dynamic

observation of children with PVH, it is a simple, fast, reliable and non-traumatic method. The resulting technical result has a sufficient degree of accuracy.

All patients were measured the diameter of the cornea using three methods and obtained the following results. In order to study the reliability of the data obtained by us, a comparative analysis of these methods was carried out. The measurement was carried out on 65 patients (130 eyes) diagnosed with WG.

The indicators obtained by measuring the diameter of the cornea with a compass were taken as the basis by us as the most objective method of remote measurement of the diameter of the cornea. The mean value was 12.48±0.97 mm. The table shows that when comparing the indicators obtained using a compass and a ruler (12.48±0.97 and 12.74±1.0, respectively), the difference in the average values did not differ statistically (t= 4.3 p≤0.05 "critical value: 2.02"). When comparing the indicators obtained using a compass and glasses (12.48±0.97 and 12.38±0.98, respectively), the difference in the average values was not significant (t=1.4 p>0.05 "critical value: 2 .02").

This confirms that no difference was found in the indicators obtained when measuring with compasses and glasses, which says the method of measuring the diameter of the cornea using special "glasses" is quite accurate, convenient and can be used in pediatric practice for all eye pathologies accompanied by a change in diameter. cornea.

Measuring the diameter of the cornea with the help of special "glasses" contributes to the early diagnosis of pathological deviations of the cornea in diameter, which is very important in the dynamic monitoring of children with RG. The sensitivity and specificity of this method was 90.5% and 85.7%, respectively.

The study of the diameter of the cornea in the examined patients showed that in patients with RG the average size of the cornea was 14.5±0.5 mm. While in the group of primary operated patients, the diameter of the cornea varied within 13.0 ± 0.4 mm. Corneal diameter over 15.0 mm was registered in 47% of sick children with WG and in 14% of children with PVH, which is significant (P<0.05).

Thus, the special “glasses” proposed by us for measuring the diameter of the cornea provide reliably accurate indicators, are safe and convenient for use in pediatric ophthalmology. And also, they make it possible to dynamically monitor the progression of the process and archive the data obtained.

The role of TNFα -308G/A, IL-10 C-819T, G-1082A cytokine gene polymorphism in the prognosis of refractory glaucoma was studied. When studying the distribution of frequencies of alleles and genotypes of TNFα -308G/A in groups of patients with HR (main group) and initially operated patients (comparison group), as well as in controls, a statistically significant increase in the frequency of the A allele (Table 2) was found in the examined children in the main group and in the comparison group compared with the control group (OR = 2.221; 95% CI: 1.198 >2.221> 4.116; $\chi 2$=6.661 (p=0.009855)). The G allele of polymorphism was detected significantly less frequently than in the control group (OR = 0.45; 95% CI: 0.243 >0.45 > 0.835; 6.661 (p=0.009855)).

Further, a comparative analysis of TNFα -308G/A genotypes for the GG genotype revealed significant differences between patients in both groups and the control group (OR = 0.395; 95% CI: 0.204 > 0.395 > 0.765; $\chi 2$ = 7.843 (p = 0.005103)). Analysis of the heterozygous GA genotype revealed differences between the frequency of occurrence in children in both groups and the control group (33.91% and 16.84%, respectively; OR = 2.534; 95% CI: 1.307 > 2.534 > 4.91; $\chi 2$ = 7.843 (p =0.005103)). Genotypic analysis of the homozygous AA genotype was not registered.

The data obtained suggest that the -308(G/A) TNFα polymorphism makes a significant contribution to disease susceptibility.

Further, an analysis of the frequencies of alleles and genotypes of the TNFα -308G/A gene in primary operated patients was carried out. When studying the frequency distribution of alleles and genotypes of TNFα -308G/A in the comparison group and in the control group, a statistically significant increase in the frequency of the A allele in primary operated patients compared with the control group was found (20.00% vs. 8.42%; OR = 2.719; 95 % CI: 1.338 > 2.719 > 5.523; 8.079

(p=0.004478)). The G allele of polymorphism was detected significantly less frequently than in the control group (OR = 0.368; 95% CI: 0.181 >0.368 > 0.747; $\chi 2$=8.079 (p=0.004478)).

A comparative analysis of the TNFα -308G/A genotypes for the GG genotype revealed significant differences between patients in the comparative group and the control group (OR = 0.304; 95% CI: 0.139 > 0.304 > 0.663; $\chi 2$ = 9.413 (p = 0.002154)). Analysis of the heterozygous GA genotype revealed differences between the frequency of occurrence in the comparison group and the control group (40.00% and 16.84%, respectively; OR = 3.292; 95% CI: 1.508 > 3.292 > 7.183; $\chi 2$ = 9.413 (p = 0.002154)). Genotypic analysis of the homozygous AA genotype was not registered.

Analysis of allele and genotype frequencies of the TNFα -308G/A gene in patients with refractory glaucoma. When studying the distribution of frequencies of alleles and genotypes of TNFα -308G/A in the main group and in the control group, no significant differences were found.

The obtained data on the distribution of allele and genotype frequencies of the IL-10 C-819T (rs1800871) gene in patients of the main and comparative groups, as well as in the control group, did not reveal significantly significant differences in the frequency of occurrence. In the comparison group, as well as in the previous groups, there were no significant differences in the frequency of occurrence.

As in the study of the distribution of alleles and genotypes of IL -10 C-819T (rs1800871), when analyzing the indicators of IL -10 G-1082A (rs1800896) in both groups and in the control, no significant differences were found either.

When analyzing the indicators of IL -10 G-1082A (rs1800896) in patients in the comparison group and in the control group, there were also no significant differences found, as in the comparison group.

Thus, as can be seen from the presented results, the pro-inflammatory marker TNFα -308G/A plays the most important role in the development of the disease and in the prognosis of treatment.

For the first time in Uzbekistan in 2020, on March 31, we received a registration certificate No. TV / X 03512/03/20 for the use of Glautex drainage models TDA and TMA in pediatric practice in AGO.

Children with WG were divided into 2 groups: the main group consisted of 21 children who underwent AGO using Glautex drainage. The comparison group consisted of 44 children who underwent AGO with autoscleral drainage.

We analyzed the results of the analysis of early postoperative complications in both groups. In the main group, on the first day and 10 days later, postoperative complications - hyphema were not observed in any case. Choroid detachment in the comparison group was observed in 2 children on the first day after surgery, and in 3 children on the 10th day.

In the main group of early complications, hypotension and an increase in IOP were observed on the first day. The above complications were eliminated after drug treatment until the patient was discharged.

To identify a more accurate state of healing of the organ of vision in patients, we conducted a comparative analysis of the content of TNFα and IL-10 in the blood serum in dynamics, that is, on the 3rd, 10th day and 1 month after surgery.

Comparative analysis of the systemic cytokine status after surgery in the course of follow-up revealed minor changes in the synthesis of pro-inflammatory and anti-inflammatory cytokines in the main group. Thus, the content of TNFα slightly decreased after 3 days by 6%, on day 10 by 11.5%, and after 1 month by 21.7% compared with preoperative indicators (3 - 116.82 ± 3.1 pg /ml ($P>0.05$), 10 - 109.9±5.8 pg/ml ($P>0.05$), 1 month - 97.24±1.7 pg/ml ($P<0.05$) versus 124.06±2.42 pg/ml).

The analysis of the results of Il-10, which also revealed a slight decrease in the synthesis of this cytokine, confirmed the development of the inflammatory process. It was found that after 3 days the level of IL-10 was 34.60±1.3 pg/ml, after 10 days 28.85±2.6 pg/ml, after 1 month by 24.53±4.2 pg /ml ($P <0.05$) compared with preoperative values of 8.29±1.06 pg/ml.

In our opinion, the revealed high level of synthesis is justified by the migration (localization) of macrophages to the inflammation site, which indicates low tissue regeneration when using Glautex drainage and promotes remodeling of the damaged trabecular network, which will lead to a decrease in resistance to the outflow of intraocular fluid and intraocular pressure.

The comparative content of pro- and anti-inflammatory cytokines in dynamics in the group of children with the traditional surgical technique showed that the concentration of TNFα in the blood serum of children in this group indicates a decrease in the synthesis of this mediator by 17.5%.

The expression level of IL-10 also decreased by 18% of the initial values before surgery, which averaged 32.1±5.3 pg/ml versus 39.1±1.6 pg/ml ($P<0.05$).

On day 10, the TNFα level averaged 82.53±3.7 pg/ml, which is 33.5% less than preoperative data ($P<0.05$).

One month after surgery, the level of TNFα synthesis decreased by 57.8% and averaged 52.45±2.9 pg/ml ($P<0.05$). Well, the content of IL-10 decreased by an average of 50.6% and amounted to 19.33±0.8 pg/ml ($P<0.05$). The established indicators in the dynamics of treatment in the comparison group indicate a more pronounced regeneration process, which in turn leads to the prevention of outflow due to early gluing of the wound edges together and scarring.

Thus, the obtained results of the study make it possible to establish the fact that a gradual decrease in the expression (synthesis of pro- and anti-inflammatory cytokines) of TNFα and IL-10 directly affects the state of the volume of the created filtration passage, inhibiting regeneration processes, contributing to the creation of an outflow tract, which is observed. after the application of surgical drainage Glauteks.

The results of the study showed that in children in the main group, visual acuity after AGO did not decrease, in isolated cases there was an improvement by 0.01-0.02 6 months after the operation. In the comparison group, visual acuity indicators did not stabilize after AGO, in some cases they tended to decrease 6 months after AGO.

The results showed that in the main and control groups, after 1 and 6 months, all children (100%) had a stop in the growth of the cornea (12-14 mm; 13.2±0.01 mm). In 7 patients (33.3%) of patients of the main group, its enlightenment was noted in the peripheral sections. The Gaaba line, which was detected in 91% of the eyes before AHO, also did not increase in the main group; in the control group, this indicator increased significantly due to the increase in the AOR. In 35% of patients in the control group, there was an expansion of the limbus by more than 2 mm.

The PZO index in dynamics after 1 and 6 months in the comparison group increased significantly after AGO and amounted to 5.9±0.01 mm. Indicators in the main group tended to a slight decrease, which amounted to 5.2±0.02 mm.

According to the results of tonography and tonometry, no increase in P0 was observed in the main group 1 and 6 months after AGO (21.13±0.03). In the control group, these indicators were correspondingly increased in 30% of the patient (18.5±0.87 mm Hg; $P<0.05$). The Becker coefficient in the comparison group was increased in 7 eyes (30%) and amounted to 104.0±2.5, in the other eyes of the patients of the main group this indicator decreased and amounted to 93.7±2.50; $P<0.05$.

Analysis of IOP dynamics in patients in the postoperative period, depending on the AGO method, showed that when using Glautex drainage, true IOP gradually decreases to normal values, in contrast to the traditional method, in which true IOP decreases to subnormal values. Comparative analysis of OD morphometric parameters 1 and 6 months after AGO showed that the above parameters remained stable, i.e. after AGO, no increase was observed in the main group.

Thus, the use of Glautex biodegradable drainage is considered one of the main ways to reduce and maintain ophthalmotonus in the surgical treatment of refractory glaucoma.

Based on the above, we have developed an algorithm for managing children with primary congenital glaucoma.

DEDUCTIONS

Based on the research conducted on the thesis of a doctor of medical sciences (DSc) on the theme: "Pathogenetic aspects of surgical treatment of children with refractory glaucoma", the following conclusions were made:

1. In a retrospective study, it was found that refractory glaucoma occurred in 32.11% of cases after traditional operations, was characterized by a lack of stabilization of the glaucoma process, which was manifested by an increase in the diameter of the cornea, anterior eye area, tonometric and tonographic parameters and a deterioration in the clinical and functional parameters of the organ of vision.
2. The study of the diameter of the cornea in the examined patients showed that in patients with RG the average size of the cornea was 14.5 mm, while in the group of primary operated patients the diameter of the cornea varied within 13.0 mm. The special glasses proposed by us for measuring the diameter of the cornea give reliably accurate indicators, are safe and convenient for use in pediatric ophthalmology. And also, they make it possible to dynamically monitor the progression of the process and archive the data obtained.
3. In patients with RG in 49.6% of cases (every fifth child), the need for repeated surgical intervention develops 12-24 months after the primary surgical intervention, the smallest percentage occurs in the first 12 months (12.8%) after primary AGO.
4. Molecular genetic study of TNFα -308G/A, IL-10C-819T (rs1800871) and IL-10G-1082A (rs1800896) gene polymorphism in the group of children with PVH and RG did not reveal significant differences in the distribution of allele frequencies and genotypes of the studied markers, which indicates the identity of the causal relationship between the development of PVH and RG in children. The results of medical genetic counseling showed that the most important role in the prognosis of treatment is played by the pro-inflammatory marker TNFα-308G, which is characteristic of the early stages of WG development and is detected long before known clinical manifestations.

5. AGO using Glautex drainage eliminates a sharp decrease in IOP in the early postoperative period, reduces the number of postoperative complications by 1.25 times and thereby reduces the patient's stay in the hospital by 2.2 ± 0.1 days and the number of repeated operations by 85% cases. The use of Glautex drainage in AGO in children with RG contributes to a decrease in ophthalmotonus, preservation of visual functions and stabilization of the growth of the PZO, elimination of pain, which, in turn, prevents repeated surgical intervention. Thus, it allows you to save the organ of vision in patients with terminal painful glaucoma.

6. Based on the study of the level of TNF-α and IL-10, the effectiveness of the use of Glautex drainage in the surgical treatment of children with RG was proved: high levels of the studied cytokines indicate an extension of the scarring period, which in turn prevents cicatricial obliteration of the created aqueous humor outflow tracts and improves the quality the treatment carried out. In the group of children with traditional surgery, a decrease in TNF-α and IL-10 levels contributes to excessive scarring of the newly created outflow tracts, leading to an increase in ophthalmotonus and, thereby, to a decrease in the quality of AGO.

7. In the course of the results obtained, an algorithm for the early diagnosis and treatment of children with HR was developed and implemented.

PRACTICAL RECOMMENDATIONS

1. When examining and monitoring patients with suspected congenital glaucoma, it is advisable to include methods of optical coherence tomography of the optic disc and pachymetry in the complex of diagnostic methods to detect early signs of congenital glaucoma.

2. The proposed special device in the form of a semi-frame for remote measurement of the diameter of the cornea gives more accurate readings and is safe and convenient for use in pediatric ophthalmology. Measuring the diameter of the cornea with the help of special "glasses" contributes to the early diagnosis of pathological deviations of the cornea in diameter, which is very important in the dynamic monitoring of children with CH.

3. Biodegradable drainage Glautex is advisable to use in refractory glaucoma. An analysis of the surgical treatment of children with refractory glaucoma (children who had previously undergone repeated antiglaucomatous surgical interventions) showed that the use of the sinus trabeculotomy method using the Glautex drainage provides a stable hypotensive effect and reduces the risk of postoperative complications by 1.5 times, and the number of reoperations by 2. 3 times. The use of a Glautex drainage has a number of advantages compared to a fistulizing operation using an autoscleral one, which is explained by the gradual resorption of the drainage, which in turn prevents a sharp decrease in IOP and avoids the development of complications such as hypotension and hyphema formation.

5. The proposed method of surgical treatment using biodegradable Glautex drainage increases the effectiveness of therapy and will reduce the number of reoperations and complications in primary congenital glaucoma.

6. To predict the treatment of PVH, it is advisable to study the pro-inflammatory marker TNFα -308G/A. The conducted studies of the immunological and genetic features of primary congenital glaucoma in children will help practical ophthalmologists in the diagnosis of this disease.

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