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DEMOGRAPHIC AND CLINICAL CHARACTERISTICS AND EFFECTIVENESS OF TREATMENT OF PATIENTS WITH COMBINED OCULAR PATHOLOGIES BY VITRECTOMY DUE TO RETINAL DETACHMENT

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Abstract. Demographic and clinical characteristics and effectiveness of treatment of patients with combined ocular pathologies by vitrectomy due to retinal detachment. Ismailov G.M. Purpose – to evaluate the demographic and clinical characteristics and treatment efficiency of patients by vitrectomy due to retinal detachment against the background of combined eye pathologies. The observation was conducted in the Clinic of Educational Surgery of the Azerbaijan State Medical Institute named after A. Aliyev. The case histories of 500 patients diagnosed with retinal detachment against the background of combined eye pathologies were studied by random sampling, 197 of whom underwent vitrectomy. Data on the demographic and clinical characteristics of these patients were collected. Before the operation, visual acuity and intraocular pressure were assessed. Information on registered complications after the operation, the results of optical coherence tomography on day 10 after treatment, as well as visual acuity indicators were provided for in the observation program and obtained in a standard manner for all patients. The obtained results were processed statistically using the "data analysis" package of the Excel program. The collected data were grouped by variants of features, the specific weight of each group and subgroup in the aggregate was calculated. The obtained data showed that in 197 (34.9±2.2%) patients with retinal detachment against the background of combined pathologies who underwent vitrectomy, the gender difference was not significant. The overwhelming majority of patients were admitted for treatment with a great delay. Basically, combined pathologies of the cornea (16.2%), lens (45.2%) and vitreous body (5.3%) prevailed. Combined eye pathologies in patients with retinal detachment during vitrectomy are often complicated by choroidal rupture (4.1%), increased intraocular pressure (7.6%), diplopia (3.6%), hemophthalmos (2.5%) and cataract (22.8%). The main etiologic factors of retinal detachment against the background of combined eye pathologies are myopia (50.3%), eye injuries (30.9%).

Реферат. Демографічна і клінічна характеристика та ефективність лікування хворих з поєднаними очними патологіями методом вітректомії у зв'язку з відшаруванням сітківки. Ісмаїлов Г.М. Мета – оцінити демографічну та клінічну характеристику та ефективність лікування хворих методом вітректомії у зв'язку з відшаруванням сітківки на тлі поєднаних патологій очей. Спостереження проводилося у Клініці навчальної хірургії Азербайджанського державного медичного інституту ім. А. Алієва. Методом випадкової вибірки вивчено історії хвороби 500 пацієнтів з діагнозом відшарування сітківки на тлі поєднаних патологій очей, з них 197 хворим виконано вітректомію. Були зібрані дані про демографічні та клінічні характеристики цих пацієнтів. До операції в пацієнтів оцінювали гостроту зору та внутрішньоочний тиск. Інформація про зареєстровані ускладнення після операції, результати оптичної когерентної томографії на 10-ту добу після лікування, а також показники гостроти зору були передбачені в програмі спостереження та отримані в стандартному порядку для всіх пацієнтів. Отримані результати опрацьовувалися статистично з використанням пакета «аналіз даних» програми Excel. Зібрані дані були згруповані за варіантами ознак, розрахована питома вага кожної групи та підгрупи в сукупності. Отримані дані показали, що в 197 (34,9±2,2%) пацієнтів з відшаруванням сітківки на тлі поєднаних патологій, що зазнали вітректомії, гендерна відмінність була не суттєвою. Переважна більшість пацієнтів надходила на лікування з великим запізненням. В основному переважали поєднані патології рогівки (16,2%), кришталика (45,2%) та склоподібного тіла (5,3%). Поєднані патології очей у хворих з відшаруванням сітківки під

час вітректомії нерідко ускладнюються розривом хоріоїдеї (4,1%), підвищенням внутрішньоочного тиску (7,6%), диплопією (3,6%), гемофтальмом (2,5%) та катарактою (22,8%). Основними етіологічними факторами відшарування сітківки на тлі поєднаних патологій очей є міопія (50,3%), травми очей (30,9%).

Retinal detachment, as a pathology that forms a serious medical and social problem, is observed in most cases along with other eye diseases. The coexistence of this pathology with diseases of the cornea, lens and vitreous body often requires high-tech medical care, and there is a need for treatment in ophthalmological centers and clinics with a powerful material and technical, and human resources [1]. The literature devotes special attention to the analysis of treatment results taking into account the demographic and clinical characteristics of patients diagnosed with retinal detachment. Taking into account the clinical features, 28% of children diagnosed with rhegmatogenous retinal detachment of traumatic origin underwent scleral buckling, 72% underwent vitrectomy, while anatomical compatibility of the retina was achieved in 75% of cases [2]. At the Addis Ababa University Hospital, most patients diagnosed with retinal detachment were in the age range of 20-59 years, and the number of men was more than 2 times higher than the number of women [3]. The risk factors for the disease are mainly myopia (47.0%) and injuries (31.5%). Both demographic characteristics (26% children, 62% of working age patients), hospitalization (mainly 3 or more weeks after the onset of symptoms), and clinical characteristics (severe forms of proliferative vitreoretinopathy, distribution and localization of the detachment zone) in the Hyderabad College of Medical Sciences Hospital) had different characteristics [4]. The effectiveness of vitrectomy for rhegmatogenous retinal detachment was analyzed in a large-scale study at the Islamabad University Hospital [5]. Anatomical similarity of the retina after surgery was observed in 89.5% of patients. Failure of the operation is mainly due to proliferative vitreoretinopathy. The influence of old age of patients, damage to the macula and artifacts on the negative outcome of treatment was proven at the Korea University Hospital [6, 7]. Experts from the Baltimore Hopkins Medical Center show that vitrectomy is more effective [8, 9]. The influence of clinical characteristics of patients on the prognosis of treatment was shown in a study carried out by Tunisian scientists [10]. More reliable are the results of observations on the effectiveness of vitrectomy conducted in Germany and Poland [11]. From an economic point of view, vitrectomy is 3 times more expensive than laser coagulation [10]. Based on a review of the world literature on the main treatment options (vitrectomy, laser coagulation, scleral sealing, episcleral compres-

sion, etc.) used for retinal detachment, Chinese scientists prove that they are not superior to each other [10]. There is a risk of complications with all treatment options [11]. Therefore, it is recommended to evaluate the applicability of each method depending on the clinical situation.

Purpose – to evaluate the demographic and clinical characteristics and effectiveness of treatment by vitrectomy due to retinal detachment against the background of combined eye pathologies.

MATERIALS AND METHODS OF RESEARCH

The observation was conducted in the Clinic of Educational Surgery of the Azerbaijan State Medical Institute named after A. Aliyev. The case histories of 500 patients diagnosed with retinal detachment against the background of combined eye pathologies were studied by random sampling, of which 197 patients underwent vitrectomy. Data on demographic (age, gender) and clinical characteristics of these patients (comorbid diseases associated with retinal detachment, spread of the detachment zone, localization, macular damage, severity of proliferative vitreoretinopathy, etc.) were collected. Before the operation, visual acuity and intraocular pressure were assessed. Information on registered complications after surgery, the results of optical coherence tomography on day 10 after treatment, as well as visual acuity indicators were provided for in the observation program and obtained in a standard manner for all patients.

The research was conducted in accordance with the principles of bioethics set out in the WMA Declaration of Helsinki – “Ethical principles for medical research involving human subjects” and “Universal Declaration on Bioethics and Human Rights” (UNESCO).

The subgroups were divided as follows: 2 – by patient gender, 7 – by age (10-19, 20-29, 30-39, 40-49, 50-59, 60-69, 70 and more), 3 – by disease duration (up to one week, 1-4 weeks, 4 weeks and more), 4 – by detachment area (1, 2, 3 and 4 quadrants), 3 – by detachment height (smooth, high, convex), 3 – by the degree of proliferative vitreoretinopathy (A, B, C), and 3 – by comorbidity (diseases of the cornea, lens, vitreous body). The difference in eye diseases between subgroups and groups was estimated using the xi-square method. The critical limit of statistical significance of the difference was taken as 0.05. The obtained results were processed statistically using the "data analysis" package of the Excel program. The collected data were grouped by variants of features,

the specific weight of each group and subgroup in the aggregate was calculated.

RESULTS AND DISCUSSION

A total of 39.4±2.2% of patients diagnosed with retinal detachment underwent vitrectomy against the background of general eye diseases. The results obtained on the demographic and clinical characteristics of these patients are presented in the Table. Despite the fact that most patients were men, the specific weights of gender groups (53.3±3.5 and 46.7±3.5%, respectively; $p>0.05$) did not differ statistically significantly from each other. In the age range of 10-49 years, which attracts attention, the specific weight of patients dynamically increases

every 10 years (3.5±1.3; 6.6±1.7; 17.3±2.7; 28.9±3.2; $p<0.01$), and at later ages it decreases. (17.8±2.7; 12.1±2.3 and 13.7±2.4%). Two thirds of patients (60.9±3.4%) were hospitalized for 4 weeks or more after the initial manifestation of retinal detachment symptoms, the number of visits to the clinic within one week is significantly less (8.2±1.9%). Total detachment (4 retinal quadrants) was registered in 49.6±3.5%, subtotal detachment (3 retinal quadrants) – in 34.0±3.4% of individuals. Cases of local detachment (1 retinal quadrant) were not observed. The area of the rupture was predominantly smooth (43.1±3.5%), 2 times less often (20.3±2.8%) the area of the rupture was convex. In the majority of patients (97.5±1.1%), the detachment did not affect the macula.

Demographic and clinical characteristics of patients with retinal detachment who underwent vitrectomy, treatment effectiveness

Clinical signs	Variants of signs	%±m	Clinical signs	Variants of signs	%±m	
Gender	Male	53.3±3.5		Intertemporal	12.2±2.3	
	Female	46.7±3.5		Internasal	8.1±1.9	
Age, years	10-29	3.5±1.3	Comorbidity	Corneal diseases	16.2±2.6	
	20-29	6.6±1.7		Cataract	45.2±3.5	
	30-39	17.3±2.7		Vitreous diseases	55.3±3.5	
	40-49	28.9±3.2		Risk factors	Injury	30.9±3.3
	50-59	17.8±2.7			Myopia	50.3±3.5
	60-69	12.1±2.3		Cataral surgery	16.2±2.6	
Disease duration	70 and over	13.7±2.4	Visual acuity with maximal correction	Others	1.0±0.7	
	<1 week	8.2±1.9		0.3 and more	2.0±1.0	
	1-4 weeks	30.9±3.2		0.1 – 0.3	11.7±2.3	
Rupture site	>4 weeks	60.9±3.4	Intraocular pressure	0.05 – 0.1	72.1±3.2	
	Local (1 quadrant)	-		<0.05	14.2±2.5	
	General (2 quadrant)	16.2±2.6		<12	17.2±2.7	
	Subtotal (3 quadrant)	34.0±3.4		12 – 24	70.6±3.2	
Rupture height	Total (4 quadrant)	49.8±3.5	Result – retina Anatomical compliance	24 – 36	10.7±2.2	
	Smooth	43.1±3.5		36 and more	1.5±0.8	
	High	36.5±3.4		Complete compliance	9.6±2.1	
Macula coating	Tuberous	20.3±2.9	Complications	Partial compliance	80.7±2.8	
	Coating	2.5±1.1		No compliance	12.7±2.4	
Degree of proliferative vitreoretinopathy	Absence of coating	97.5±1.1	Increased intraocular pressure	Choroidal rupture	4.1±1.4	
	A	39.6±3.5		Diplopia	7.6±1.8	
	B	39.1±3.5		Cataract	3.6±1.3	
Rupture site	C	21.3±2.9	Hemophthalmos		22.8±3.0	
	Supratemporal	56.8±3.5		Others	2.5±1.1	
	Supranasal	22.8±3.0			6.1±1.7	

Mild proliferative vitreoretinopathy (A) was observed in $39.6 \pm 3.5\%$, moderate (B) – in $39.1 \pm 3.5\%$ of patients, severe (C) – only in $21.3 \pm 2.9\%$ of patients. In most cases, the rupture site was located in the supratemporal region ($56.8 \pm 3.5\%$), less often in the internasal region ($5.1 \pm 1.9\%$). The rupture site located in the supranasal and intertemporal regions was found in 22.8 ± 3.0 and $12.2 \pm 2.3\%$ of patients, respectively.

The most important clinical sign in patients diagnosed with retinal detachment is the presence of comorbid eye diseases: 55.3 ± 3.5 vitreous diseases, 45.2 ± 3.5 and 16.2 ± 2.6 were registered per 100 patients. Among the possible causes of rupture, myopia ranks first ($50.3 \pm 3.5\%$), – eye injuries rank second, and cataract surgery ranks third (30.9 ± 3.3 and $16.2 \pm 2.6\%$).

Before vitrectomy, the visual acuity of patients was sharply impaired, the proportion of patients with visual acuity in the range of 0.05-0.1 with maximum correction was $72.1 \pm 3.1\%$, visual acuity was preserved in $14.2 \pm 2.5\%$ of patients, visual acuity less than 0.5 was in 14.2 ± 2.5 patients. Intraocular pressure in most patients was at a normal level: <12 mm Hg was recorded in $17.2 \pm 2.7\%$, 12-24 mm Hg – in $70.6 \pm 3.2\%$ of patients. Levels of indicators 24-36, 36 and more mm Hg were observed in 10.7 ± 2.2 and $1.5 \pm 0.8\%$ of patients, respectively.

The number of complications per 100 patients after vitrectomy was: 4.1 ± 1.4 – rupture, 7.6 ± 1.8 – increased intraocular pressure, 3.6 ± 1.3 – diplopia, 22.8 ± 3.0 cataracts, 2.5 ± 1.1 – hemophthalmos, 6.1 ± 1.7 – other types of complications. On day 10 after the operation, $9.6 \pm 2.1\%$ of patients had complete anatomical compliance of the retina, and $80.7 \pm 2.8\%$ of patients had partial compliance. A reliable positive result was recorded in $87.3 \pm 2.4\%$ of patients. Thus, despite the serious condition of patients admitted to the University Clinic with retinal detachment against the background of common eye diseases (severe proliferative vitreoretinopathy, in most cases subtotal and total detachment, etc.), vitrectomy allowed us to obtain a positive result.

In the literature, information on the clinical and demographic characteristics of patients treated in university hospitals and ophthalmological centers with a diagnosis of retinal detachment varies from one another [2, 3, 4]. Although our results have their own characteristics (Table), there are also results that are consistent with the information provided in a number of sources. Thus, both in the literature and in our observation, among patients diagnosed with retinal detachment, there is a high proportion of men and individuals in the age range of 30-59 years (i.e., people of working age). In our review and in the literature, immediate hospitalization of patients due to

signs of retinal detachment was not ensured. 5.6% of patients undergoing inpatient treatment at the Addis Ababa University Hospital with a diagnosis of retinal detachment were hospitalized in the first week after the onset of symptoms [3]. In our observation, this figure is significantly higher ($8.2 \pm 1.9\%$). Mild and moderate proliferative vitreoretinopathy (grades A and B) was recorded in 70% of patients at the Hyderabad Eye Hospital in India [4], while in our observation, it was $78.7 \pm 2.9\%$ of patients.

Data from a large-scale study [9] on the results of vitrectomy surgery and demographic and clinical characteristics of patients show that 47.5% of patients were women ($46.7 \pm 3.5\%$ in our observation). The cause of the rupture was myopia in 32.1% of patients in China [10], while in our country this figure was significantly higher ($50.3 \pm 2.5\%$). Macular detachment was observed in 8.1% of patients in China and in $2.5 \pm 1.1\%$ of patients in our country.

In China [10], anatomical compliance of the retina after vitrectomy was achieved in 87.37% of patients, and in our observation – in $87.3 \pm 2.4\%$ of patients. The homogeneity of the results is proven by the achievement of the Clinic of the Medical University.

Thus, despite the peculiarities of the clinical and demographic characteristics of patients who underwent vitrectomy in the surgical clinic of the Azerbaijan State Medical Institute named after A. Aliyev with a diagnosis of retinal detachment, the results of the operation correspond to the current state of scientific and technological progress. The frequency of postoperative complications recorded in our study does not exceed the level indicated in the literature [11].

CONCLUSION

1. Comorbidity of the most important characteristics of patients diagnosed with retinal detachment who underwent vitrectomy ($55.3 \pm 3.5\%$ – vitreous body, $45.2 \pm 3.5\%$ – lens, $16.2 \pm 2.6\%$ – corneal diseases) and etiologic causes of the disease include: myopia – $50.3 \pm 3.5\%$, eye injuries – $30.9 \pm 3.3\%$ and cataract surgery – $26.2 \pm 2.6\%$.

2. Despite the high efficiency of vitrectomy (anatomical compliance of the retina $87.3 \pm 2.4\%$), its complications persist (choroidal rupture – $4.1 \pm 1.4\%$; increased intraocular pressure – $7.6 \pm 1.8\%$; diplopia – $3.6 \pm 1.3\%$; hemophthalmos – $2.5 \pm 1.1\%$; cataract – $22.8 \pm 3.6\%$).

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REFERENCES

1. Sindal MD, Gondhale HP, Srivastav K. Clinical profile: and outcomes of rhegmatogenous retinal detachment related to trauma in pediatric population. *Can J Ophthalmol.* 2021;56(4):231-6.
doi: <https://doi.org/10.1016/j.jcjo.2020.12.001>
2. Lakshmi J, Faraz J, Reddy L. Clinical profile of patients presenting with rhegmatogenous retinal detachment. *Med Pulse International Journal of Ophthalmology.* 2017;3(3):87-91.
doi: <https://doi.org/10.26611/10093311>
3. Awan MA, Hussain Z, Shaheen ZS, et al. Efficacy and safety profile of 25-Gauge Pars Plana vitrectomy in rhegmatogenous retinal detachment in Pakistan: A multicenter retrospective study. *Cureus.* 2022 Mar 24;14(3):23437.
doi: <https://doi.org/10.7759/cureus.23437>
4. Sung J, Lee M, Won Y, et al. Clinical characteristics and prognosis of total rhegmatogenous retinal detachment: a matched case-control Study. *BMC Ophthalmology.* 2020;20:286.
doi: <https://doi.org/10.1186/s12886-020-01560-4>
5. Shchukin AD. Modern extrascleral surgery in the treatment of rhegmatogenous retinal detachment: assessment of the effectiveness of application and functional results. *Ophthalmological Bulletin.* 2019;12(4):23-8.
doi: <https://doi.org/10.17816/OV18780>
6. Arevalo F, Ong S, Sulaiman M. Retinal detachment: Vitrectomy, bucle, or both? *Retina today.* 2022;April:17-78.
7. Zgolli H, Mabrouk S, Khayrallah O. Prognostic factors for visual recovery in idiopathic rhegmatogenous retinal detachment: a prospective Study of 90 patients. *La Tunisie Medicale.* 2021;99(10):972-9. PMID: 35288898. PMCID: PMC8972183.
8. Chang JS, Smiddy W. Cost-effectiveness of retinal detachment repair. *Ophthalmology.* 2014;12(4):946-51.
doi: <https://doi.org/10.1016/j.ophtha.2013.11.003>
9. Liao L, Zhy X. Advances in the treatment of rhegmatogenous retinal detachment. *Int J Ophthalmology.* 2019;12(4):660-7.
doi: <https://doi.org/10.18240/ijo.2019.04.22>
10. Lv Z, Li Y, Wu Y. Surgical complications of primary rhegmatogenous retinal detachment: a meta-analysis. *PLOS ONE.* 2015;10(3):0116493.
doi: <https://doi.org/10.1371/journal.pone.0116493>
11. Bai Y, Song Q, Liu J. Vitrectomy for complicated retinal detachment without the use of perfluorocarbon liquid: a real-word date and retrospective study. *Ophthalmol Ther.* 2022;11:857-68.
doi: <https://doi.org/10.1007/s40123-022-00479-x>

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