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THE INFLUENCE OF THE LOCOMOTOR STUMP'S FORM ON THE OCULAR PROSTHETICS RESULT WITH DIFFERENT METHODS OF EYE REMOVAL

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✧ ***Aim.*** To determine the optimal shape of the locomotor stump and the configuration of the corresponding ocular prosthesis, ensuring their maximum motility in patients with anophthalmia with different methods of eye removal. ***Materials and methods.*** The study group consisted of 132 patients aged 18–80 years after enucleation or evisceration. Examination methods included medical history; examination of eyelids, measurement of length and width of the palpebral fissure, as well as of the depth of conjunctival fornices on both sides; assessment of the volume, shape, surface topography, position and excursions of the locomotor stump, of the protrusion of the ocular prosthesis compared to the contralateral eye; photo registration of the studied parameters. ***Results.*** During the study, there were 3 types of locomotor stump identified: moderate with retraction in the upper third; voluminous flattened; voluminous hemispherical. The locomotor stump after enucleation was voluminous flattened or moderate with retraction in the upper third. The best motility of the locomotor stump was noted nasally and downward. The motility of the ocular prosthesis was 47.4% compared to the contralateral eye. The locomotor stump after evisceration with keratectomy was voluminous hemispherical or voluminous flattened. Its motility in all four directions was about the same. The motility of the ocular prosthesis in comparison to the contralateral eye was 55.9%. The locomotor stump after evisceration without keratectomy was voluminous hemispherical, uniform, smooth. The motility of the locomotor stump was maximal in comparison to other groups and relatively equal in all four directions. The motility of the ocular prosthesis in comparison to the contralateral eye was 68.2%. ***Conclusion.*** The optimal shape of the locomotor stump, providing the greatest motility of the ocular prosthesis is voluminous hemispherical. The same protrusion of the eyeball and that of the cosmetic prosthesis relatively to the frontal plane after enucleation is achieved by increasing the thickness of the prosthesis itself, which reduces its motility. Evisceration with implantation of the orbital prosthesis involves the use of a thin-walled ocular prosthesis, the back surface of which ideally repeats the locomotor stump surface and does not prevent its maximum motility. When removing a squinting eyeball with preserved corneal diameter, a smaller implant should be used to prevent excessive opening of the palpebral fissure, or to prefer evisceration with keratectomy.

✧ ***Keywords:*** enucleation; evisceration; anophthalmia; implant; ocular prosthesis.

ВЛИЯНИЕ ФОРМЫ ОПОРНО-ДВИГАТЕЛЬНОЙ КУЛЬТИ НА РЕЗУЛЬТАТ ГЛАЗНОГО ПРОТЕЗИРОВАНИЯ ПРИ РАЗНЫХ МЕТОДАХ УДАЛЕНИЯ ГЛАЗА

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✧ ***Цель.*** Определить оптимальную форму опорно-двигательной культи (ОДК) и конфигурацию соответствующего ей глазного протеза, обеспечивающие их максимальную подвижность у пациентов с анофтальмом, при разных способах удаления глаза. ***Материалы и методы.*** Исследуемую группу составили 132 пациента в возрасте 18–80 лет после энуклеации или эвисцерации. Методы обследования включали сбор анамнеза; осмотр век, измерение длины и ширины глазной щели, а также глубины сводов конъюнктивы с обеих сторон; оценку объёма, формы, рельефа поверхности, положения и экскурсий ОДК, выстояния глазного протеза по сравнению с парным глазом; фоторегистрацию изучаемых параметров. ***Результаты.*** В ходе исследования у пациентов были выявлены 3 вида ОДК: умеренно выраженная с западением в верхней трети, объёмная уплощённая, объёмная полусферичная. ОДК после энуклеации была объёмной уплощённой или умеренно выраженной с западением в верхней трети. Наилучшая подвижность ОДК отмечалась к носу и книзу. Моторика глазного протеза составила 47,4 % от подвижности парного глаза. ОДК после эвисцерации с кератэктомией была объёмной полусферичной или объёмной уплощённой. Мобильность её во всех четырёх направлениях была примерно одинаковой. Подвижность глазного протеза в сравнении с парным глазом составила 55,9 %. ОДК после эвисцерации без кератэктомии была объёмной полусферичной, равномерной, гладкой. Мобильность ОДК была максимальной по сравнению с другими группами и относительно равной во всех четырёх направлениях. Подвижность глазного протеза в сравнении с парным глазом составила 68,2 %. ***Выводы.*** Оптимальной формой ОДК, обеспечивающей наибольшую подвижность глазного протеза, является объёмная полусферичная. Одинаковое выстояние глазного яблока и косметического протеза относительно фронтальной плоскости после энуклеации достигается увеличением толщины самого протеза, что снижает его мобильность. Эвисцерация с имплантацией орбитального вкладыша предполагает использование тонкостенного глазного протеза, задняя поверхность которого повторяет рельеф ОДК и не препятствует её максимальной подвижности. При удалении косящего глазного яблока с сохранённым диаметром роговицы следует устанавливать имплантат меньшего размера для исключения чрезмерного раскрытия глазной щели или отдавать предпочтение эвисцерации с кератэктомией.

✧ ***Ключевые слова:*** энуклеация; эвисцерация; анофтальм; имплантат; глазной протез.

BACKGROUND

While deciding on the eyeball removal, the need for subsequent prosthetics of the anophthalmic socket is pertinent to be considered. The therapeutic and cosmetic importance of the prosthesis is obvious and needs no argument [1].

One of the important criteria for ocular prosthetics is the mobility of the prosthesis. It is due to the shape, volume, and mobility of the stump; the depth, reserve, and mobility of the conjunctival fornices; as well as the matching of the prosthesis with the size and configuration of the socket [2, 3].

Moreover, to receive better results from ocular prosthetics, not only a differentiated approach to the choice of the method of eyeball removal with the obligatory approach of individual formation of the locomotor stump (LMS) is required, but also taking into account the anatomical and functional aspects of different types of the orbit [4, 5].

With the introduction of modern technologies in ophthalmoplastic surgery, evisceration has presented a number of advantages over enucleation, as it provides a better cosmetic result of prosthetics [6]. Taking into account the variety of methods for the eyeball removal, including the modern developed atraumatic techniques for the formation of the primary locomotor stump, and considering the individual parameters of the orbit [7], in a number of cases, we came across different shapes and sizes of the LMS that prevented productive ocular prosthetics in patients with anophthalmia.

As such, it became necessary to determine the LMS optimal shape to create conditions for effective ocular prosthetics. However, at the same time, the authors of this study did not intend to compare their cosmetic and functional results with different methods of eye removal.

The present study aimed to determine the optimal shape of the LMS and the configuration of the corresponding ocular prosthesis, providing their maximum mobility, in patients with anophthalmia using different methods of eyeball removal.

MATERIALS AND METHODS

This study included 132 patients aged 18–80 years, who were monitored in the laboratory of complex ocular prosthetics of the St. Petersburg Diagnostic Center No. 7 for a period of six months–four years from the moment of the removal of their eyeball.

Study inclusion criteria

1. The following surgical methods were included: enucleation; evisceration with resection of the cornea, posterior pole, and neurotomy; and evisceration without keratectomy with resection of the posterior pole of the eye and neurotomy.
2. The presence of an orbital implant made of porous polytetrafluoroethylene (PTFE) or donor tissues (Alloplant series).
3. An observation term of at least six months after the removal of the eyeball.
4. The presence of an individual eye prosthesis.
5. Age >18 years.

Study exclusion criteria

1. Cicatricial changes in the anophthalmic socket and eyelids.
2. Postoperative complications such as suture line disruption or implant exposure.
3. Reduction of the anophthalmic socket in case of untimely prosthetics.
4. Delayed implantation of the orbital liner.

Further, depending on the method of surgery, the patients were divided into three groups:

Group I included patients after enucleation (61 patients, 47%);

Group II consisted of patients after evisceration with keratectomy, resection of the posterior pole of the eye and neurotomy (35 patients, 26%); and

Group III consisted of patients after evisceration without keratectomy with resection of the posterior pole of the eye and neurotomy (36 patients, 27%).

To reduce the risk of postoperative complications, especially in enucleation, it is important to choose the optimal implant material [8]. Accordingly, in this study, an orbital liner made of porous PTFE, characterized by biocompatibility, ease of sterilization, possibility of manual processing, low risk of infection, migration, and extrusion, and affordable cost was used in 121 patients (91.7%) [9–11], while Alloplant (allograft of subcutaneous fatty foot tissue) was used only in 11 (8.3%), due to the obvious advantages of synthetic liners.

The indications for the eyeball removal were melanoma of the choroid in group I (100%); trauma (51.4%), inflammatory diseases (34.3%), and glaucoma (14.3%) in group II; and trauma (88.9%) and inflammatory diseases (11.1%) in group III.

Each group members underwent a history taking; examination of the eyelids, measuring the length and width of the palpebral aperture on both sides with a ruler; assessment of the volume, shape, and relief of the surface, LMS position (central or displaced) and its excursions; measurement of the depth of the fornices; and assessment of the eye prosthesis protrusion compared to the fellow eye.

The mobility of a cosmetic prosthesis is always inferior to the motility of the eyeball, the range of motion of which reaches 180° in all four directions [12]. According to V. Happé, while the volumes of adduction and abduction are equal and amount to 45°, the volume of supraduction is 40° and that of infraduction is 50° [13]. The LMS mobility was determined in four directions (adduction, abduction, supraduction, and infraduction). The measurements were performed using a protractor scale and a “needle pointer” formed from a hemostatic sponge (Fig. 1). The ocular prosthesis mobility was determined using a protractor scale and a “needle pointer” fixed at the center of the prosthesis (Fig. 2). The examination was completed by a photographic registration of the measured parameters and the statistical analysis of the data obtained.

Fig. 1. Measurement of the mobility of the locomotor stump using a protractor scale and the arrow-pointer formed of the hemostatic sponge

Рис. 1. Измерение подвижности опорно-двигательной культи с помощью шкалы транспортира и сформированной из гемостатической губки «стрелки-указки»

Fig. 2. Measurement of the mobility of an ocular prosthesis using a protractor scale and a needle pointer

Рис. 2. Измерение подвижности глазного протеза с помощью шкалы транспортира и «иголки-указки»

RESULTS

While in groups I and II, the primary prosthetics were performed on days 3–5 after the surgery, in group III, the prosthesis was made one month after the intervention to prevent the occurrence of corneal erosion and create optimal conditions for further prosthetics [14].

In group I (61 patients), the LMS was volumetric flattened in 38 patients (62.3%), and it was moderately expressed with a retraction in the upper third, not always with sufficiently deep fornices and a smooth surface in 23 patients (37.7%). Exophthalmometry revealed equal position of the eyeball and the prosthesis relative to the frontal plane in 27 patients (44.3%). Besides, 34 patients (55.7%) had anophthalmic enophthalmos. The difference between the exophthalmometry parameters of the LMS with a double-walled ocular prosthesis and the fellow eye averaged 2.4 ± 0.21 mm, which worsened the cosmetic parameters. The average total LMS mobility in this group was 97.9 ± 2.3°, reaching 130° in some patients. The average total mobility of the eye prosthesis was 85.3 ± 2.6°, while the maximum was 104°. The best LMS mobility during enucleation was noted toward the nose and downward. The mobility of the eye prosthesis compared with the fellow eye was 47.4%.

The parameters of ocular prosthetics, depending on the methods of operation

Показатели глазного протезирования в зависимости от методики операции

Evaluation criteria	Enucleation	Evisceration	
		with keratectomy	without keratectomy
Average total mobility of the stump, degrees	97.9 ± 2.3	127.4 ± 2.4	145.2 ± 1.6
Supraduction, degrees	22.5 ± 2.67	31.0 ± 3.03	34.9 ± 1.45
Infraduction, degrees	26.7 ± 2.25	32.7 ± 2.51	37.4 ± 1.38
Adduction, degrees	25.4 ± 1.96	34.0 ± 2.27	37.7 ± 2.26
Abduction, degrees	23.3 ± 2.16	29.7 ± 1.61	35.2 ± 1.67
Average total mobility of the prosthesis, degrees	85.3 ± 2.6	100.6 ± 2.1	122.8 ± 1.9
Supraduction, degrees	18.2 ± 2.05	23.3 ± 1.91	30.3 ± 2.26
Infraduction, degrees	24.3 ± 1.84	25.0 ± 1.96	31.9 ± 1.31
Adduction, degrees	22.2 ± 1.75	28.1 ± 2.83	32.8 ± 3.42
Abduction, degrees	20.6 ± 2.45	24.2 ± 1.30	27.8 ± 1.83
Prosthesis mobility (% of fellow eye mobility)	47.4	55.9	68.2
Difference in the protrusion of the prosthesis and the fellow eye, mm (exophthalmometry)	2.4 ± 0.21	1.8 ± 0.64	1.6 ± 0.49

In group II (35 patients), the LMS was optimal, that is, it was volumetric hemispherical or volumetric flattened, and 33 patients (94.3%) had a smooth surface and sufficient fornices. However, in two patients (5.7%), the LMS had an uneven relief (Fig. 3). Exophthalmometry showed equal position of the eyeball and the prosthesis relative to the frontal plane in 14 patients (40%). Anophthalmic enophthalmos was registered in 21 patients (60%). The difference between the exophthalmometry indices of the LMS with a thin-walled ocular prosthesis and the fellow eye was insignificant (on average 1.8 ± 0.64 mm), which did not affect the cosmetic results. The total mobility of the LMS was almost equal in all patients of this group (127.4 ± 2.4°), the maximum being 145°. The LMS mobility in all four directions was approximately 30–34°. The average total mobility of the eye prosthesis was 100.6 ± 2.1°, and the maximum one reached 119°. In addition, the eye prosthesis mobility compared with the fellow eye was 55.9%.

In group III (36 patients), the LMS in 31 patients (86.1%) was volumetric hemispherical, uniform, smooth, centrally located with a commensurate implant (Fig. 4), with the correct eyelid contour. However, an excessively convex shape of the LMS was noted in five of the operated patients (13.9%), and in two of them, the center of the cornea was displaced toward the temple or nose due to a pronounced initial horizontal strabismus. Exophthalmometry revealed identical position of the eyeball and the prosthesis relative to the frontal plane in 19 patients (52.8%), of which, 5 (13.9%) had an anophthalmic exophthalmos and 12 (33.3%) an anophthalmic enophthalmos. Moreover, the difference between the exophthalmometry parameters of the LMS with a thin-walled plastic ocular prosthesis and the fellow eye was insignificant; its average value was 1.6 ± 0.49 mm, which did not affect the cosmetic results.

The average total mobility of the LMS was 145.2 ± 1.6°, and reached 160° in some patients. The LMS mobility in each of the four directions was approximately 35–37°. The average total mobility of the eye prosthesis was 122.8 ± 1.9°, and the maximum was 134°. In six patients, despite the reduced area of the preserved cornea, the total mobility of the LMS reached 150°. The mobility of the eye prosthesis compared to the fellow eye was 68.2%.

Table 1 presents the indices of ocular prosthetics, depending on the operation technique, among the patients of the three groups.

Fig. 3. Locomotor stump with uneven surface after evisceration with keratectomy

Рис. 3. Опорно-двигательная культя с неровным рельефом после эвисцерации с кератэктомией

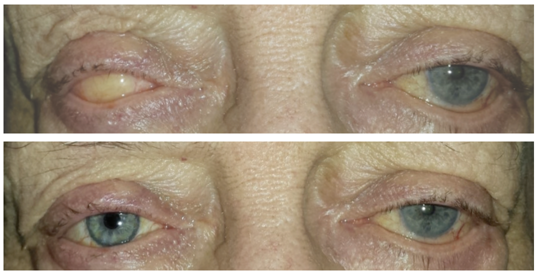


Fig. 4. Post-evisceration state without keratectomy: upper figure — centrally located locomotor stump with a commensurate implant; lower figure — the result of prosthetics

Рис. 4. Состояние после эвисцерации без кератэктомии: верхний рисунок — опорно-двигательная культя, центрально расположенная с соразмерным имплантатом; нижний рисунок — результат протезирования

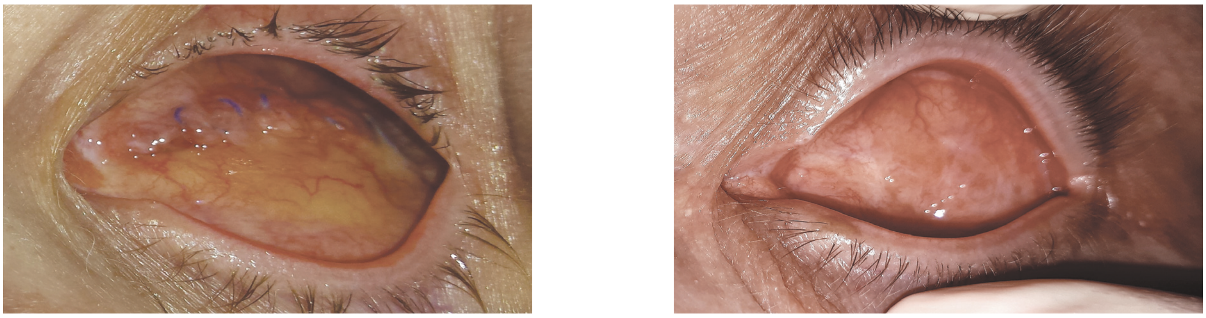
DISCUSSION

During the present study, three types of LMS were identified among the patients (Fig. 5, 6):

- moderately expressed with a retraction in the upper third;
- volumetric flattened; and
- volumetric hemispherical.

In group I (after the removal of the eyeball for malignant neoplasm), edema of the eyelids and mucous membrane of the anophthalmic socket persisted longer than after enucleation due to other causes. This affected negatively the results of prosthetics.

In this group, the LMS was volumetric flattened or moderately pronounced with a retraction in the upper third. According to L.V. Shif [3], the LMS formed with the use of an implant should have a sufficiently wide base, that is, the frontal diameter of



a *b*

Fig. 5. Locomotor stump during enucleation: *a* — having moderate volume with retraction in her upper third; *b* — voluminous flattened

Рис. 5. Опорно-двигательная культя при энуклеации: *a* — умеренно выраженная с западением в верхней трети; *b* — объёмная уплощённая

a *b*

Fig. 6. Voluminous hemispherical locomotor stump after evisceration: *a* — with keratectomy; *b* — without keratectomy

Рис. 6. Опорно-двигательная культя при эвисцерации объёмная полусферичная: *a* — с кератэктомией; *b* — без кератэктомии the liner should be larger than the sagittal one [3]. Based on our experiences, this technique does not always provide the desired result. An individual approach to the selection of the size of the orbital implant is necessary. Accordingly, double-walled glass or thick-walled plastic eye prostheses were made for the patients. With a small volume of LMS and a disorder of the lower eyelid tone, to prevent its ptosis, individual glass (hollow) eye prostheses were used that weighed less than the plastic analogs of the same volume.

In case of insufficient volume of the stump in the upper third, to prevent the ocular prosthesis retraction, complex shapes were used, which improved cosmetic parameters, but worsened its mobility (Fig. 7). Identical position of the prosthesis and the eyeball relative to the frontal plane was achieved by increasing the prosthesis thickness, which also reduced its mobility.

Thus, the LMS mobility in group I was influenced by the type of surgery, the indication for enucleation, insufficient volume of the stump, the complex shape of the eye prosthesis, and its thickness and weight.

In group II, the main indication for eyeball removal was trauma. In this group, the LMS was sufficient in volume and not too convex, the fornices remained deeper, the conjunctiva was more labile, and the extraocular muscles retained their physiological location [15]. This LMS provided for the ellipsoidal shape of a thin-walled plastic or double-walled thin glass prosthesis, which simplified their manufacture. The inner surface of the prosthesis followed the relief of the stump, which contributed to its best mobility. Simple (classical) forms of eye prostheses without supports and hooks (horns) did not interfere with the stump excursion. Insufficient protrusion of the eye prosthesis was compensated by its minor thickening. Thus, the LMS mobility in group II was determined by type of surgery, indication for evisceration, sufficient volume of the hemispherical stump, simple ellipsoidal shape of the eye prosthesis, and its low thickness and low weight.

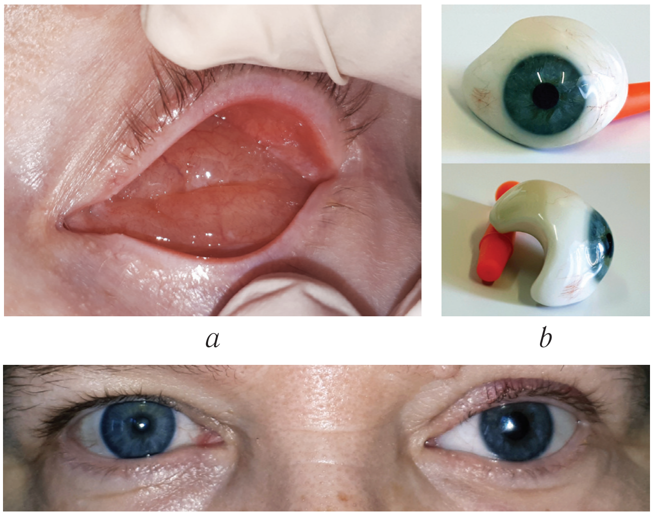
In group III, the main indication for eyeball removal was trauma. Posterior evisceration without keratectomy with resection of the posterior pole of the eyeball and insertion of a PTFE liner is a safe and effective way to create an LMS in severe eye trauma [16].

The eyeball mobility is known to worsen with the progression of eye phthisis. Following-up our cases, in patients who underwent timely surgical interventions for preserving the volume of the eyeball, the probability of subatrophy of the soft tissues of the eye–orbital complex and the emergence of blepharoptosis decreased. In such patients, after the posterior evisceration, the volume of the orbital tissue was retained, which contributed to the best cosmetic indicators, since it prevented the retraction of the eye prosthesis.

Moreover, in group III, the LMS, in most cases, was volumetric, hemispherical, uniform, smooth, and centrally located. In patients with severe initial horizontal strabismus, the eccentric location of the preserved cornea with a diameter of >7 mm affected the shape and size of the palpebral fissure, leading to its greater opening in the displacement zone (Fig. 8). Sometimes ophthalmic surgeons offer ophthalmologists–prosthetists to make flatter prosthesis for such patients. However, studies have shown that when the convex LMS moves, the use of such prosthesis leads to its spontaneous displacement and the appearance of a gap between the ciliary edge of the upper eyelid, the lacrimal caruncle, and the edge of the prosthesis (Fig. 9). To avoid this defect, the prosthesis should maximally follow the shape of the LMS.

For the patients in group III, only individual thin-walled plastic eye prostheses were made that were lightweight, which reduced the likelihood of sagging the lower lid. The prosthesis posterior wall adhered tightly to the LMS surface, contributing to its maximum mobility. The plastic prosthesis is easy to model, which enables to make a more accurate shape according to a given template or pick-up impression. To avoid irritation of the fornices of the conjunctiva, the edges of the thin-walled plastic prosthesis were rolled up. The cornea–pupil–iris complex created an “anterior chamber” in the prosthesis, which improved its cosmetic appearance but thickened the prosthesis center to 2.5–3.5 mm, while the edge did not exceed 1.1–1.4 mm (Fig. 10). Therefore, when calculating the optimal implant diameter planned for the use in posterior evisceration, it is important to consider the thickness of the future prosthesis in the central zone. A number of authors propose cosmetic rehabilitation with a soft contact lens (SCL) for this type of surgery. In our opinion, SCL neither replenish the required volume, nor does it reconstruct the correct relief of the upper eyelid and cover the entire visible part of the injected conjunctiva, as a result of which a “red eye” effect is obtained.

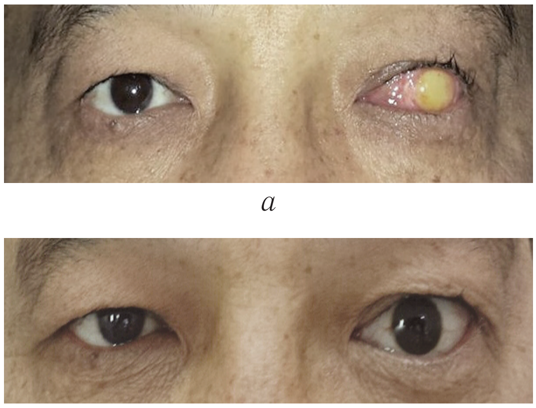
Thus, in group III, the LMS mobility was influenced by the type of surgery, the indication for evisceration, the proportionate or disproportionate



a *b* *c*

Fig. 7. Prosthetics with locomotor stump with retraction in her upper third: *a* – insufficient stump volume; *b* – ocular prosthesis of a complex form; *c* – the result of prosthetics

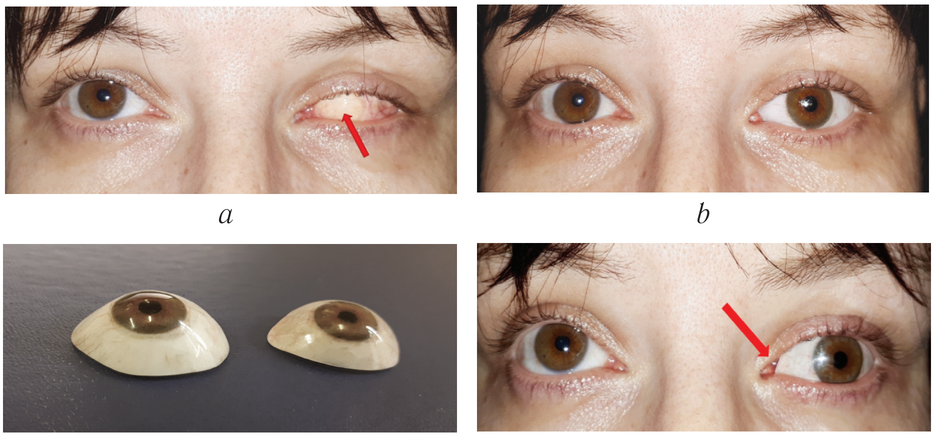
Рис. 7. Протезирование при опорно-двигательной культе с западением в верхней трети: *a* — недостаточный объём культи; *b* — глазной протез сложной формы; *c* — результат протезирования



a *b*

Fig. 8. State after evisceration without keratectomy: *a* – the consequences of the installation of a disproportionate implant, excessively convex locomotor stump is displaced to the temple, the left palpebral fissure even without the prosthesis is wider than the right one; *b* – cosmetic result of prosthetics with thin-walled prosthesis

Рис. 8. Состояние после эвисцерации без кератэктомии: *a* — последствия установки несоразмерного имплантата, чрезмерно выпуклая опорно-двигательная культя смещена к виску, левая глазная щель даже без протеза шире правой; *b* — косметический результат протезирования тонкостенным протезом



a *b* *c* *d*

Fig. 9. State after evisceration without keratectomy: *a* – horizontal displacement of the cornea to the nose; *b* – the opening of the palpebral fissure on the side of the prosthesis is wider in the medial third; *c* – convex and flatter ocular prostheses; *d* – the gap between the ciliary edge of the upper eyelid, the lacrimal caruncle and the edge of the prosthesis during the manufacture of a flatter prosthesis

Рис. 9. Состояние после эвисцерации без кератэктомии: *a* — горизонтальное смещение роговицы к носу; *b* — раскрытие глазной щели на стороне протеза шире во внутренней трети; *c* — глазные протезы, выпуклый и более плоский; *d* — зазор между ресничным краем верхнего века, слёзным мясцом и краем протеза при изготовлении более плоского протеза

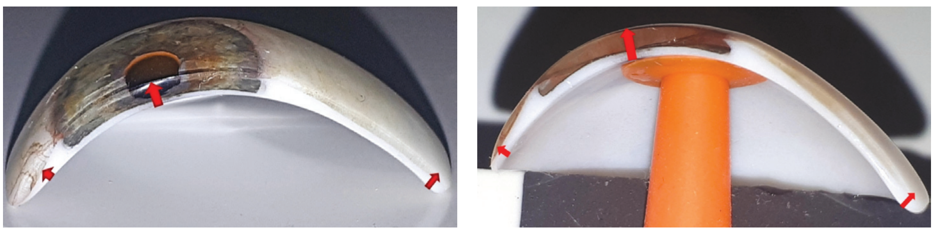


Fig. 10. The cut of the complex is cornea – pupil – iris of a thin-walled plastic eye prosthesis

Рис. 10. Срез комплекса роговица – зрачок – радужка тонкостенного пластмассового глазного протеза volume of the hemispherical stump, the simple shape of a thin-walled plastic eye prosthesis, and its low weight.

After understanding the aspects of the LMS shape in the different types of surgery, we have developed forms of eye prostheses that increase the cosmetic parameters of prosthetics and can be used as mass prostheses in the postoperative period.

CONCLUSIONS

1. The optimal shape of the LMS, which provides the greatest mobility of the eye prosthesis, is a volumetric hemispherical, centrally located, and has a smooth surface.

2. In group I (after enucleation), due to the insufficient volume of the flattened LMS, identical position of the eyeball and the cosmetic prosthesis relative to the frontal plane was achieved by increasing the thickness of the latter, which reduced its mobility.

3. Ophthalmic prosthetics after evisceration with implantation of a commensurate orbital liner provides for the use of a thin-walled plastic ellipsoid-shaped ophthalmic prosthesis, the rear surface of which follows accurately the relief of the volumetric, hemispherical LMS and does not interfere with its maximum mobility.

4. When removing an eyeball with pronounced initial strabismus and preserved corneal diameter, a smaller orbital implant should be installed to prevent the asymmetry of the palpebral apertures during cosmetic prosthetics, or evisceration with keratectomy should be chosen.

5. Although the creation of an anterior chamber in the prosthesis improves its cosmetic appearance, it increases the thickness in the center due to the cornea—pupil—iris complex, which should be taken into account when calculating the optimal implant size and planning evisceration without keratectomy.

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Authors' contributions: N.A. Baranova, V.P. Nikolaenko created the concept and design of the study; N.A. Baranova, I.A. Senina wrote the text, analyzed the data, collected and processed the materials, and performed diagnostic studies and literature review.

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COMMENTARY ON THE ARTICLE BY BARANOVA N.A. et al. "THE INFLUENCE OF THE LOCOMOTOR STUMP'S FORM ON THE OCULAR PROSTHETICS RESULT WITH DIFFERENT METHODS OF EYE REMOVAL"

This work is presented by a group of authors from St. Petersburg, who have been working successfully for many years with the issues of ocular prosthetics in patients seeking appropriate help from various cities of Russia and other countries. In recent years, there has been a significant increase in the number of ophthalmic surgeons who have begun to perform liquidation surgeries and are specialists in the different levels of surgical training and methods of performing such interventions.

I am very glad to see in our journal not only the technical articles describing surgical approaches, but also the point of view of a prosthetist with an assessment of the functional and aesthetic components of the work.

The ideal result of ocular prosthetics represents the joint work of an ophthalmic surgeon who applies contemporary principles adopted in ophthalmic plastic and reconstructive surgery, and a prosthetist who completes the rehabilitation stage of treatment, having in their arsenal both glass and various polymers for the manufacture of external prostheses. We can hardly imagine the ideal result of ocular prosthetics, if, for instance, the surgeon worked roughly with the muscles or placed an implant in the scleral cavity that has insufficient, unstable, or excessive volume. Also, we will not see a worthy cosmetic result if the prosthetics does not take into account, for instance, the profile of the anterior surface of the support stump formed and if the stump during movement "slips" under the prosthesis, or if the location itself, the diameter, and color of the pupil on the external prosthesis differ from those of the healthy eye. Many people perhaps remember actor Peter Falk who played the role of Lieutenant Columbo in the popular detective series. After eyeball removal, for many years, the actor used glass and plastic prostheses, but the result of the prosthetics was far from ideal, which was one of the reasons for Falk's characteristic squint. Undoubtedly, I support the results obtained in this article and suggest that readers dealing with the issues of blind eye surgery analyze independently their own surgical experience and evaluate the results obtained not only from the standpoint of the operating surgeon, but also of the patient.

It is not infrequent that the surgeon does not think about the consequences of their work, and the surgeon and the patient may have different ideas about the end result. If the patient during initial weeks can be under certain psychological pressure from the ophthalmic surgeon, who saw all the aspects of the patient's eye and the surrounding orbital tissues and is satisfied with the immediate result of the surgery performed, then in a few months, when the postoperative swelling disappears, the patient's estimation of the result can change. An example can be the clinical cases of trauma to the eyeball and the orbit, if only a supporting stump is formed without a reconstructive surgery on deformed bone structures, when the prosthetic eye begins to retract, and an enophthalmos of the prosthesis occurs, as well as deepening of the superior orbitopalpebral fold, etc.

Therefore, it is extremely important not only to conduct a thorough preoperative diagnostics of patients and planning the upcoming intervention with preliminary calculations of the implant, but also to discuss with the prosthetist possible options for individual characteristics during subsequent prosthetics.

Obviously, when working in a team, many issues can be avoided immediately, and as a result, the quality of the surgical intervention can be improved and the optimal conditions for the installation of early and subsequent individual eye prostheses can be created. However, in the absence of direct contact between the operating surgeon and the prosthetist, when a patient seeks prosthetic help from a prosthetic specialist, they should have the most complete information in the form of a case record about this clinical case, such as the characteristics of the operated eyeball and the eye adnexa before surgery (state of eyelids, palpebral fissure, fornices, presence of strabismus and its angle, length of the subatrophic (buphthalmic) eyeball, etc.). One of the key points of a successful and stable result of prosthetics is the availability of information about the surgery performed (understanding of the common terminology) and the diameter (volume) of the implanted material during the stump formation. For the prosthetist, it is crucial to know the time limits within which the ophthalmic surgeon plans the primary prosthetics of the cavity, as well as the frequency of prosthetic rehabilitation. They should also know as to what should be done with the strabismus of the stump formed and what caused it or if the patient had strabismus before the surgery, but the surgeon did not take any action, believing that the prosthetist would do it.

While elaborating and polishing up our professional microsurgical skills, we should not forget other criteria for evaluating our actions, taking into account the reconstructive plastic and aesthetic nature of this topic and the possibilities of modern individual eye prosthetics.

I invite our dear readers to take part in the discussion on the topic proposed.

MD, PhD, Professor D.V. Davydov