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SURGICAL CORRECTION OF BLEPHAROPTOSIS IN THE ELDERLY PATIENTS

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The demographic trends of the planet are such that with an increase in life expectancy, the older population will almost double from 2005 to 2050. Ensuring a decent quality of life for older people is one of the main tasks of a developed social society. Against the background of the natural aging process of the body, changes in the form of involutional (senile) blepharoptosis and concomitant age-related changes in the periorbital region deserve attention. This study aimed to determine the optimal tactics of upper eyelid ptosis surgery from the perspective of a comprehensive assessment of concomitant age-related changes such as overhanging folds of the upper eyelid, fat packs of the lower eyelids, as well as lowering of the eyebrows to achieve a cosmetically acceptable result for the patient. The choice of blepharoptosis correction tactics should be considered from the standpoint of a one-time elimination of age-related changes, the correction of which can ensure both functional and cosmetic satisfaction of the patient.

Key words: blepharoptosis, patients over 50 years old, age-related cataract.

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ХІРУРГІЧНА КОРЕКЦІЯ БЛЕФАРОПТОЗУ У ПАЦІЄНТІВ ПОХИЛОГО ВІКУ

Демографічні тенденції планети такі, що зі збільшенням тривалості життя чисельність літнього населення з 2005 по 2050 рік майже подвоїться. Забезпечення гідної якості життя людей – одне з головних завдань розвиненого соціального суспільства. На тлі природного процесу старіння організму заслуговують на увагу зміни у вигляді інволюційного (старечого) блефароптозу та супутніх вікових змін у періорбітальній ділянці. Метою даного дослідження було визначення оптимальної тактики хірургічного лікування птозу верхньої повіки з точки зору комплексної оцінки супутніх вікових змін, таких як складки верхньої повіки, що нависають, жирові відкладення на нижніх повіках, а також опущення брів, для досягнення косметично прийнятного результату для пацієнта. Вибір тактики корекції блефароптозу слід розглядати з погляду одномоментного усунення вікових змін, корекція яких може забезпечити як функціональне, і косметичне задоволення пацієнта.

Ключові слова: блефароптоз, пацієнти віком від 50 років, вікова катаракта.

Against the background of demographic trends on the planet, with an expected increase in the elderly population almost twofold, changes in the visual organ and the auxiliary apparatusdeserve attention [8].

Eyelid surgeries occupy the 1st position in the list of the most frequent plastic surgeries on the face, confirming the high frequency and demand for appendagesurgeries [12].

Blepharoptosis (BP) leads to functional disorders, decreased central vision, forced lifting of the chin up, the need to tilt the head back due to blurred visual axis, wrinkling the forehead, accompanied by headaches, discomfort. The purpose of BP surgery is to raise the drooping eyelid, eliminate discomfort, complaints of the patient, improve the quality of life, and is a logical criterion for evaluating the outcome of treatment [10].

Surgical correction of BP is a widely discussed problem by both ophthalmologists and plastic surgeons, where the functional and cosmetic satisfaction of the patient undoubtedly remains the evaluation

criterion. There are two main trends in the literature on BP correction. Within the framework of the first trend, purely surgical methods of BP correction are discussed, which include various surgical approaches (internal and external techniques), their advantages, disadvantages, complications, and numerous modifications of known techniques [11]. The second trend in research on the problem includes issues of surgical correction of BP in combination with aesthetic blepharoplasty in dermatochalasis (DC) [6].

The ophthalmologist's arguments in favor of expanding the scope of surgery for the correction of senile BP with simultaneous correction of concomitant changes in the periorbital region include: a high incidence of DC (16 %), as the most common in people over 45 years of age, including in combination with BP and with a predicted increase in frequency worldwide. Simultaneous elimination of BP and DC of the upper eyelid can significantly improve vision, eliminate functional disorders, and improve the quality of life [6].

Senile BP is known to have an aponeurotic character, and age-related topographic and anatomical changes in the eyelids include a progressive decrease in elasticity and firmness of the skin, a weakening of the connection with the underlying tissues, in particular, changes in the periorbital region with the development of DC, ptosis of the eyebrow, lower eyelids. The changes include the mechanisms of compensation of the eyelids and eyebrows, the volume and contour of the fatty lining of the eyebrows, the volume of orbital fat, bone symmetry, etc. [7]. It is important that not only BP, but also DC, ptosis of the eyebrows, various changes in the lower eyelids, lead to a limitation of the peripheral visual field, a decrease in the quality of vision, giving the patient additional functional and cosmetic problems [6].

Meanwhile, despite the huge number of publications, the issues of tactics, volume, surgical access with a one-time correction of BP and concomitant changes in the periorbital region remain within the framework of discussions and discussions. At the same time, publications on BP surgery and one-time correction of involutional changes in the soft tissues of the periorbital region are not sufficiently reflected in the ophthalmological literature.

Given the increase in the frequency of treatment of older patients, the problem of BP correction remains relevant for ophthalmologists, and from the standpoint of choosing surgical tactics, optimal approaches to BP correction and changes in the periorbital region to achieve a functional, cosmetically acceptable result for the patient, it is significant.

The purpose of the study was to determine the optimal surgical tactics from the perspective of a comprehensive assessment of blepharoptosis of the upper eyelid and concomitant changes in periorbital pathology (steatoblepharon of the lower eyelids, lowering of the eyebrows) in older people, to achieve a cosmetically acceptable result for the patient.

Materials and methods. The clinical material consisted of the results of examination and surgical treatment of 31 patients aged 56 to 86 years (mean age 68±8 years) with complaints of drooping of the upper eyelid. There were 5 (16 %) men and 26 (84 %) women. All cases of upper eyelid BP were acquired.

Ophthalmological examination included: visometry, biomicroscopy, refractometry, tonometry, corneal sensitivity examination, and dry eye syndrome.

The studies included an assessment of the functional state of the upper eyelid lifting muscle and the severity of ptosis. The evaluation criteria were: measurement of the levator function of the upper eyelid (LF); the distance from the ciliary edge of the upper eyelid to the central corneal reflex (MRD1) and the distance from the palpebral fold to the central corneal reflex (CRD); the vertical distance from the lateral edge of the eyebrow to the horizontal straight line drawn between the two eyeballs [3] (Fig. 1).

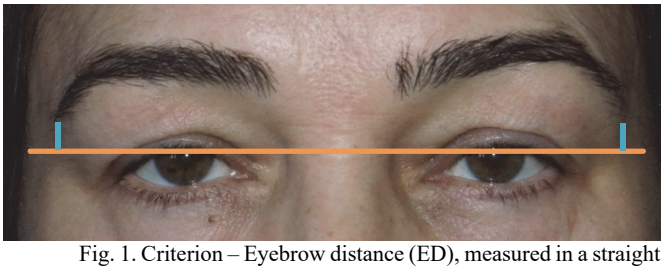


Fig. 1. Criterion – Eyebrow distance (ED), measured in a straight line from the lateral tip of the eyebrow to a horizontal straight line (blue solid line) drawn through the pupils (orange interrupted line).

Among the studies, the “Bell's phenomenon” and the presence of lagophthalmos to prevent postoperative complications were evaluated. Myasthenia gravis tests were determined: a fatigue test and a cold test. The changes in the periorbital zone were detailed, such as: lowering of the eyebrows, DC of the upper eyelids, visualization of fat packets of both upper and lower eyelids (steatoblepharone), skin changes.

Surgical correction of BP, blepharoplasty of the upper and lower eyelids, and eyebrow raising were performed.

Blepharoptosis correction was performed by the traditional method of aponeurosis resection and conjunctivo-mullerectomy [2, 3].

In the first variant, intraoperative correction was assessed in a sitting position under local anesthesia to determine the symmetry and adequate vertical position of the eyelid. In the second variant, a nomogram of 4 mm of resection was used for each millimeter of ptosis.

Blepharoplasty of the upper eyelid in DC was performed before correction of BP. Blepharoplasty of the lower eyelid after local infiltration anesthesia included removal of excess fat bags, excess skin, and cantopexy to improve the tone of the lower eyelid.

Eyebrow elevation correction was performed under local anesthesia of the pretrichial temporal region after blepharoplasty [13].

Examination of the patient and planning of surgical treatment in a number of observations included the expediency of consulting a neurologist, including cases of BP due to myasthenia gravis. The study did not include patients with paralytic, traumatic ptosis, externally progressive ophthalmoplegia, myasthenia Gravis, and Horner's syndrome, as well as patients who had previously undergone eyelid surgery.

After the examination, the patients were made aware of the changes affecting the cosmetic outcome of the treatment to varying degrees.

Photographing the patient before and after surgery was a necessary step to assess the changes taking place, to obtain the patient's consent to expand the scope of the intervention, in controversial cases – the main argument in assessing the effect of treatment, the different interpretation of the result by the patient and the doctor. Informed consent was obtained from all patients. The patient examinations and the study itself were conducted in accordance with the principles set out in the Guidelines for the requirements (provisions) of the Helsinki Declaration (and its amendments).

Results of the study and their discussion. Preoperative examination showed that senile BP was unilateral in only 4 (12.1 %) cases, and bilateral in 27 (87.9 %) cases.

Thus, a thorough examination (in addition to BP) of the periorbital region, as an extremely necessary stage of examination for an ophthalmologist, revealed changes in both the upper and lower eyelids and lowering of the eyebrows that could potentially affect the outcome of treatment. When examining the upper eyelids, attention was focused on DC (with or without an excessive medial sac). Changes in the lower eyelids included: fat bags, excess skin, and weakness of the eyelid turgor as a result of weakening of the ligamentous apparatus, orbicular muscle, and loss of skin elasticity. Lowering of the eyebrows included ptosis of the lateral end, which significantly worsened the DC of the upper eyelid.

From the standpoint of determining the scope of the intervention, the choice of surgical access(s), and the sequence of surgical steps in order to achieve a cosmetically acceptable result for the patient, there were 5 possible changes.

In the first variant of the changes, the main focus was on the existing BP (10 observations – 32 %); in the second, BP and DC (12–39 %); in the third, BP, DC and lowering of eyebrows (3–10 %); in the fourth variant, BP, DC, age-related changes in the lower eyelids and lowering of eyebrows (4–13 %); in the fifth variant, BP, DC, age-related changes in the lower eyelids (2–6 %).

When planning surgical tactics and the volume of treatment, in the first group of patients it was enough to correct BP, in the second group to add blepharoplasty of the upper eyelids, in the third group to perform blepharoplasty of the upper eyelids, correction of BP and eyebrow raising, in the fourth group to perform correction of BP, blepharoplasty of both upper and lower eyelids, eyebrow raising, In group 5, BP correction and blepharoplasty of both upper and lower eyelids were performed.

Table 1

Surgical approach to the blepharoptosis group and the group with concomitant periorbital changes

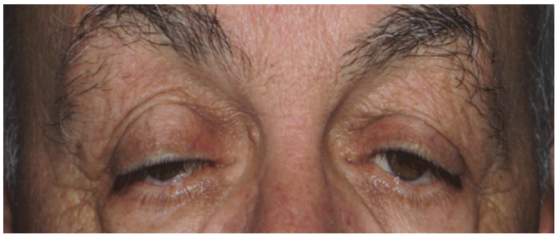
Ageing Changes		Type of surgery	Bilateral/Unilateral blepharoptosis (BP)	Number of Patients
1	BP	Conjunctivo-mullerectomy	7/3	10(32 %)
2	BP, DC	Lervator resection, upper blepharoplasty	11/1	12(39 %)
3	BP, DC, and brow ptosis	Levator resection upper blepharoplasty, lateral brow elevation	3/0	3(10 %)
4	BP, DC, lower eyelid changes, brow ptosis	Levator resection, upper blepharoplasty, lower blepharoplasty, lateral brow elevation	4/0	4(13 %)
5	BP, DC, lower eyelid changes	Levator resection, upper blepharoplasty, lower blepharoplasty	2/0	2(6 %)

In the first group of patients, the operation was aimed solely at eliminating BP, and its correction was carried out by conjunctivo-mullerectomy. In the following 4 groups, BP correction was performed by surgical access to the levator aponeurosis for resection through a skin incision for blepharoplasty. The advantage that the incision of the skin during blepharoplasty provided not only access to the levator, but

also made it possible to reduce surgical trauma, shorten the operation time, without making an additional incision on the back of the eyelid, was definitely the most optimal.

The volume and nature of one-time surgical correction of BP and age-related changes in the periorbital region in all study groups are shown in Table 1.

There were no complications during the surgical treatment. A smooth postoperative course was observed. The results of BP correction in the first group of patients are shown in Fig. 2.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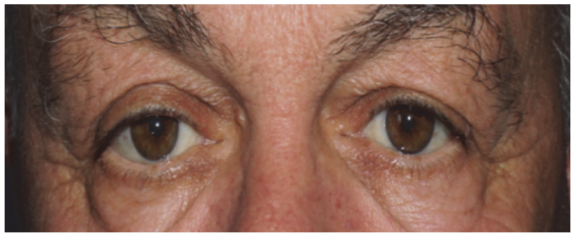
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Fig. 2. Patient with bilateral senile blepharoptosis from the 1st group. A – before the surgery, B – after the surgery.

The need for additional correction after surgery occurred in 8 (26 %) cases during one of the operated bilateral observations. Of these, in 5 (16 %) cases there was insufficient correction of BP (aponeurosis resection), in 2 (6 %) cases there was excess skin of the upper eyelid in the second group and in one case (3 %) hypocorrection of the fat pack of the lower eyelid in the 5th group, which were eliminated. As you know, BP surgery does not always have predictable results, and the success rate varies from 70 % to 95 %.

After surgical treatment, all patients were under dynamic observation. Postoperative studies in the period from 6 months to a year showed an improvement in all parameters.

Table 2

Eyelid and periorbital measurements before and after the surgery

Groups	MRD1 before/after	CRD before/after	BD before/after
Group 1	0.98 (±0.97) 2.51 (±0.70) p-value <0.05	7.05 (±1.94) 5.53 (±1.63) p-value <0.05	-
Groups 2, 3, 4, 5	1.12 (±0.42) 2.89(±0.37) p-value <0.05	5.16 (±1.59) 7.30 (±0.71) p-value <0.05	5.90 (±1.94) 6.84 (±1.97) p-value=0.21

MRD1 – margin reflex distance, CRD – crease corneal reflex distance, BD – brow distance.

The results of the study confirmed that the conjunctivo-mullerectomy method for isolated correction of BP is preferable due to the greater predictability of the results relative to the resection of the levator with anterior access [11].

As a result, as shown by dynamic examinations of patients after surgery, the condition of the upper eyelids was positively assessed by all patients who were satisfied with the result of the correction. Functional and cosmetic satisfaction was achieved in all cases early after surgery and confirmed by observations long after surgery.

Thus, an ophthalmologist's examination of patients with senile BP revealed concomitant changes in the periorbital region in the form of DC (67.7 %), changes in the lower eyelids (19.4 %), and lowering of the eyebrows (22.8 %). The tactics of the chosen surgery, its scope, and the most appropriate surgical approaches to correcting age-related BP determined the degree and severity of changes in the periorbital region.

An important point when choosing a treatment is a clear understanding of the outcome that the patient expects. The result expected by the patient does not always coincide with the necessary amount of intervention planned by the surgeon.

Thus, of the 31 patients who were included in the study due to complaints of drooping eyelids, only 10 (32 %) had isolated BP correction that could provide the patient with the desired result. At the same time, in 21 (78 %) patients, i.e., twice as often, the tactics could be considered optimal from the standpoint of a one-time elimination of concomitant changes in the periorbital region.

For a surgeon, when correcting BP, the choice of surgery technique, its volume, and also, possibly, such a difficult decision that it may not be necessary to operate are crucial. When deciding whether an ophthalmologist can limit himself to correcting BP against the background of age-related changes in the periorbital zone, one should agree with the opinion that the position of the edge of the eyelid is only one aspect of the result, but not always cosmetically acceptable for the patient.

Simultaneous surgical interventions have been previously presented in the literature and discussed from the standpoint of their advantages. Among them, emphasis was placed on reducing the time of the operation (compared to if the operations had been performed separately), the financial burden (which is related to both the cost of the operation and which can fall either on the patient or on the country's budget), as well as the number of patient visits. The latter becomes even more complicated if the patient lives at a distance from the hospital. The advantages of single-stage interventions were also discussed and presented from the standpoint of greater efficiency, especially in the field of periorbital surgery [7].

Simultaneous correction of BP and DC of the upper eyelid provides even greater elimination of functional complaints that bother the patient with improved vision, peripheral field of vision, and life [1].

In our study, additional arguments in favor of combined surgery included patients who had only BP removed without removing excess skin of the upper eyelid (group 1). When the eyelid is raised, the fold of the upper eyelid falls lower, in comparison with the preoperative indicator, due to the shortening of the distance between the ciliary margin and the eyebrow [5]. This fact was reflected in the 1st group of patients, where, when the ciliary margin was raised from 0.98 mm to 2.51 mm, the fold dropped from 7.05 mm to 5.53 mm. Lowering the fold, in turn, leads to an even greater overhang, thereby affecting the deterioration of the visual field and a less attractive cosmetic result [7].

The patient's complaints about the asymmetry of the upper eyelid after surgery caused by lowering of the eyebrow are considered as a difficult-to-predict complication. In this regard, it is worth remembering that changes in connective tissue with age lead to relaxation of the structures of the lateral part of the forehead, lowering of the lateral third of the eyebrow, creating excess skin in the lateral corner of the upper eyelid. The latter, in turn, helps to limit the lateral field of vision, further increasing the discomfort of the patient [6].

Clinically, when examining a patient before surgery, ptosis of the eyebrows is manifested by overhanging of the skin over the upper eyelids, horizontal wrinkles of the forehead (due to the constant need to raise the eyebrows), horizontal wrinkles in the bridge of the nose, headache and fatigue. Surgical correction of BP at the same time as raising the position of the edge of the eyelid, shortening it, can also reset eyebrow compensation, especially in the central part. Given the fact that the lateral end of the eyebrows, as a rule, does not have attachment to the frontal muscle, it leads to its large lowering, and in this situation, a one-time lifting of the lateral edge of the eyebrow can serve as an important argument in achieving an adequate result.

Fat pads are known to play an important role in maintaining the contour of the eyelids, providing fullness and smoothness to both the upper and lower eyelids. The upper eyelid contains two fat pads located in the medial and central sections. The lower eyelid contains three fat pads located in the medial, central and lateral sections. Changes in the form of decreased tone of the orbicular muscle, weakening of the external and internal ligaments of the eyelids, weakening of the orbital septum with age, accompanied by the appearance of fatty hernias, negatively affect the overall result [14].

Underestimation of concomitant age-related changes and insufficiently active surgery can cause persistent discomfort in the form of limited visual field from the outside, patient complaints [1]. It should be agreed that surgical decision-making generally includes consideration of individual age-related changes, optimal tactics for their elimination with the choice of less traumatic surgical approaches. During surgical correction of BP, preference is given to the technique of plastic surgery of the muscle that raises the upper eyelid (levator) or its aponeurosis, as more physiological [2, 4]. Thus, the optimal tactics of planning BP surgery in elderly people assumes (includes): the proper examination algorithm, a comprehensive assessment of all existing age-related changes in the eyelids, periorbital area, which determines the choice of the surgical technique, more often, the techniques that can provide a cosmetic, functional effect, which, first of all, the patient himself expects. Predicting a result that satisfies the patient is often not limited only to the correction of BP, but includes a one-time elimination of age-related changes affecting the outcome, especially in women.

Conclusion

It is justified to consider the choice of tactics for correcting BP in older people from the perspective of a one-time elimination of those age-related changes, the correction of which can ensure both functional and cosmetic satisfaction of the patient. The optimal tactics of BP surgery in the elderly is advisable only from the standpoint of an individual approach for each patient and a low-traumatic surgery technique, its volume, the possibilities of eliminating BP in combination with involutional periorbital changes, ensuring a cosmetically acceptable result for the patient, and an adequate quality of life.

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