

Clinical Efficacy of Transconjunctival Lower Eyelid Blepharoplasty for Treating Lower Eye Bags

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Abstract: *Objective:* To analyze the clinical effect of transconjunctival lower eyelid blepharoplasty for the treatment of lower eye bags. *Methods:* Retrospective analysis was done on 50 cases of patients with lower eye bags admitted to the hospital from August 2022 to August 2023. The control group received transcutaneous lower eyelid blepharoplasty, while the observation group received transconjunctival lower eyelid blepharoplasty. The efficacy, surgical indexes, and the difference in complications of the two groups were compared. *Results:* The efficacy of the observation group was higher than that of the control group ($P < 0.05$); the surgical time and postoperative skin recovery time of the observation group were shorter than that of the control group ($P < 0.05$); the rate of postoperative complications after blepharoplasty in the observation group was lower than that in the control group ($P < 0.05$). *Conclusion:* Transconjunctival lower eyelid blepharoplasty for the treatment of lower eye bags is safe and effective, which is favorable to the recovery of patients' skin appearance.

Keywords: Lower eye bags; Transconjunctival lower eyelid blepharoplasty; Clinical efficacy

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1. Introduction

Aging is a natural phenomenon that is related to metabolism and organ function decline. As a person ages, their facial skin gradually relaxes and wrinkles around the eyes gradually increase. The effects of orbital skin elasticity and periocular muscle relaxation will cause bags under the eyes to gradually appear in the middle-aged and elderly populations, which are manifested as lower eyelid sagging and fat accumulation ^[1]. Modern people are more concerned about facial aesthetics, so oculoplastic surgery has emerged as an industry. During plastic surgery treatment, cosmetic surgeons combine the patient's eye bag type to select the incision access program and orbital fat treatment program, which can assist the patient in restoring facial aesthetics ^[2]. At present, the commonly used clinical approach includes transconjunctival lower eyelid blepharoplasty, transcutaneous lower

eyelid blepharoplasty, and other forms. Selective resection of orbital lipids during the operation can prevent the risks of postoperative scarring and lower eyelid ectropion. This paper analyzes the effect of transconjunctival lower eyelid blepharoplasty on 50 patients with lower eyelid bags.

2. General information and methods

2.1. General information

The data of 50 cases of patients with lower eye bags admitted to the hospital from August 2022 to August 2023 were analyzed retrospectively. The control group consisted of 25 cases with 3 men and 22 women, aged 36–46 years old and has an average age of 39.57 ± 1.49 . The observation group consisted of 25 cases with 4 men and 21 women, aged 36–47 years old and has an average age of 39.61 ± 1.52 . The inclusion criteria included first-time oculoplastic surgery for the patients; signed informed consent for plastic surgery; approval by the ethics committee; and indications for oculoplastic surgery. The exclusion criteria were contraindications to plastic surgery; history of lower eyelid surgery; ocular diseases; and severe vision loss. The data of patients with lower eye bags in the observation group were comparable with the control group, $P > 0.05$.

2.2. Treatment methods

Transcutaneous lower eyelid blepharoplasty was adopted in the control group. The medical staff instructed the patients to lie down in a flat position, then disinfected the face, laid a towel, and prepared local anesthesia with a concentration of 2% lidocaine (Kunming Jidai Pharmaceutical Co., Ltd.). The medical staff observed the onset of anesthesia and made a curved incision at the lower edge of the lower eyelid eyelashes with a length of 1–2 mm. The incision was extended at the vertical outer canthus to the area 3–8 mm outside the inner canthus, bluntly separating the orbicularis oculi muscle and the skin of the eye based on the line of the incision to expose the fat and orbital septal fascia thoroughly. Afterward, the medical staff excised the fat globules in the internal, intermediate, and external areas, and then ligatured the hemostasis after completion. The patient was guided to turn the eyelid upwards to reset the orbital septal fascia, and at the same time, the orbicularis oris muscle was lifted and fixed in the area of the outer canthus periosteum. Then, the orbital septal fascia was tightened by using absorbent threads, the skin of the incision area was sutured in place and the incision was closed. After plastic surgery, the incision was prepared by applying Dupix ophthalmic ointment (S.A. Alcon Couvreur N.V.) overlay, and the patients were instructed to avoid water until the stitches were removed. The medication was changed one day after the surgery and the stitches were removed five days postoperatively.

Transconjunctival lower eyelid blepharoplasty was performed in the observation group. The patients were instructed to lie down in a flat position for plastic surgery, face was disinfected, towels were spread, and 1 ml of lidocaine (Kunming Jidai Pharmaceutical Co., Ltd.) at a concentration of 2% was prepared for local anesthesia of the conjunctiva of the fornix of the lower eyelid. The medical staff observed the onset of anesthesia, turned down the patient's lower eyelid until after full exposure of the lower eyelid plate, then made a transverse incision in the middle of the conjunctiva and eyelid fissure at the edge of the facial plate with a length of 1 mm. As the eyelid slit pulling hook traction line was pulling open the edge of the incision, ophthalmic scissors were used to gradually open the subconjunctival layer, bluntly separating and processing the subconjunctival orbicularis oculi muscle. After the full exposure of the orbital septum, the orbital septum was cut open, then gently pressing the eyeballs, separating the local puffed orbital fat mass. Excess fat was removed from the

perichondrium with an electric cutter and the lower eyelid was gently lifted. Then the remaining fat was reset to the orbit, the incision was evaluated, the bleeding was stopped, and the incision was closed. After the plastic surgery, the patient applied eye ointment (S.A. Alcon Couvreur N.V.) to the incision in a covering type and was instructed to avoid water before removing the stitches. The medication is changed one day after the surgery and the stitches are removed five days after the surgery.

2.3. Observation indexes

The observation indexes included efficacy, surgical indicators, and adverse reactions. The efficacy indexes were as follows: significantly effective: the lower eyelid bloating and the ptosis disappeared, no discomfort, and the ratio of the lower eyelid bag groove height to the width of the eyelid fissure was reduced by more than 90%; effective: the lower eyelid bloating and ptosis improved, the eye was mildly uncomfortable when moving the eye, the lower eyelid bag ratio was reduced by 30–90%; ineffective: the lower eyelid bloating and ptosis was severe, the eye was seriously uncomfortable, and the lower eyelid bag ratio was reduced by less than 30%.

Surgical indicators included the time of surgery and postoperative skin recovery time of patients. Adverse reactions included patients' eye redness, swelling, incision infection, lower eyelid ectropion, pigmentation, and foreign body sensation.

2.4. Statistical methods

Data were processed using SPSS21.0 software, the χ^2 test was performed on the % count index, and the *t*-test was performed on the mean \pm standard deviation (SD) measurement index. $P < 0.05$ indicated statistical differences.

3. Results

3.1. Comparison of plastic surgery efficacy

The efficacy of plastic surgery in the observation group was higher than that in the control group, with $P < 0.05$, as shown in **Table 1**.

Table 1. Plastic surgery efficacy [*n* (%)]

| Groups | Significantly effective | Effective | Ineffective | Overall effective rate |
|------------------------------------|-------------------------|-----------|-------------|------------------------|
| Observation group (<i>n</i> = 25) | 17 (68.00) | 7 (28.00) | 1 (4.00) | 24 (96.00) |
| Control group (<i>n</i> = 25) | 11 (44.00) | 8 (32.00) | 6 (24.00) | 19 (76.00) |
| χ^2 | - | - | - | 4.153 |
| <i>P</i> | - | - | - | 0.042 |

3.2. Comparison of plastic surgery surgical indexes

The operation time and postoperative skin recovery time of the observation group were shorter than that of the control group ($P < 0.05$), as shown in **Table 2**.

Table 2. Plastic surgery surgical indexes (mean \pm SD, points)

| Groups | Surgical time | Postoperative skin recovery time |
|--------------------------------|-----------------|----------------------------------|
| Observation group ($n = 25$) | 1.98 \pm 0.48 | 27.84 \pm 1.25 |
| Control group ($n = 25$) | 2.79 \pm 0.57 | 36.11 \pm 1.48 |
| <i>t</i> | 5.435 | 21.345 |
| <i>p</i> | 0.000 | 0.000 |

3.3. Comparison of complication indicators

The complication rate after plastic surgery in the observation group was lower than that in the control group ($P < 0.05$), as shown in **Table 3**.

Table 3. Plastic surgery complications [n (%)]

| Groups | Redness and swelling of the eyes | Infection of the incision | Lower lid ectropion | Pigmentation | Foreign body sensation | Total incidence |
|--------------------------------|----------------------------------|---------------------------|---------------------|--------------|------------------------|-----------------|
| Observation group ($n = 25$) | 0 (0.00) | 0 (0.00) | 1 (4.00) | 0 (0.00) | 0 (0.00) | 1 (4.00) |
| Control group ($n = 25$) | 1 (4.00) | 1 (4.00) | 2 (8.00) | 1 (4.00) | 1 (4.00) | 6 (24.00) |
| χ^2 | - | - | - | - | - | 4.153 |
| <i>P</i> | - | - | - | - | - | 0.042 |

4. Discussion

Eye bags have symmetrical distribution characteristics, including the orbicularis oculi muscle laxity, fat volume and lower eyelid support structure imbalance, poor orbital septum support, and so on, which can lead to bulging and bloating of lower eyelid tissue after orbital fat displacement^[3]. Middle-aged and elderly people have bags under their eyes due to aging and orbital septal fascia degeneration, while young people have bags under their eyes due to heredity conditions, sleep deprivation, and so on^[4]. Eye bags have a great impact on human facial aesthetics, and patients are prone to a combination of keratitis, entropion, and other diseases. Mild eye bags generally can be relieved through the use of eye creams and regular rest, while moderate and severe bags require cosmetic surgery for orbital septum fat removal to restore the smoothness of the eyes^[5]. There are many types of clinical plastic surgery, of which the most reasonable procedure should be chosen based on the characteristics of patients. At present, the common lower eye bag plastic surgery is mainly divided into two types: transconjunctival and transcutaneous approaches, which can restore facial aesthetics, but the effects of the surgical treatment types still need further in-depth research^[6].

The transcutaneous approach has a high application rate, which can effectively remove the lower eye bags by making an incision through the lower eyelash margin, removing the bulging orbital septum, and disconnecting the excess skin, simultaneously treating the fat, orbital septum, orbicularis oculi muscle, and skin. Analyzing the treatment principle of the transcutaneous approach, the lower eyelid soft tissue tension is low, the skin, orbicularis oculi muscle, and orbital septum tissue are severely loose, and a large amount of fat accumulates behind the orbital septum. After the transcutaneous approach incision, the fat also automatically overflows. The removal of the excess fat globules can reduce the symptoms of sagging and

laxity, so it is suitable for the treatment of patients with combined orbital fat prolapse of the lower eyelid bags^[7]. The indications for the transcutaneous approach are broad, but there are some limitations. Transcutaneous approach surgery requires physicians' high experience and operating skills, and high precision in the selection of approach incisions, otherwise it can lead to large incisions and other adverse events. The transcutaneous approach has more bleeding and is prone to scarring, which may lead to medical disputes. This approach also has a long recovery cycle and a high risk of postoperative infection. In addition, the long postoperative recovery time may cause patients to develop negative emotions and reduce their quality of life.

The transconjunctival approach refers to making an incision at the conjunctiva of the lower eyelid and selectively resecting orbital septal fat based on the condition of patients with lower eyelid bags, which can reduce external tissue damage and the risk of scar exposure, so it has the advantages of shorter recovery time, less bleeding, and lower risk of postoperative incomplete closure and lower eyelid ectropion. Analyzing the principle of the transconjunctival treatment, patients with lower eye bags have loose orbital septum, sagging skin, and eye bags. The transconjunctival approach can reach the inner orbital septum and selectively resect orbital septal fat, which can improve the eye bags and reduce postoperative adverse reactions^[8]. The advantages of the transconjunctival approach are summarized as follows. Small incisions can reduce the adjacent tissue damage, and almost no scar remains after surgery. There is no incision or scar on the lower eyelid, with a low risk of lower eyelid ectropion after surgery and little impact on their daily lives. The transconjunctival approach can accurately remove fat, and the small incision is suitable for later suturing, so the surgical risk is low.

According to the data analyzed in this article, the plastic surgery efficacy of the observation group was higher than that of the control group, $P < 0.05$. This suggests that the transconjunctival approach to plastic surgery has a better efficacy. Analyzing the reasons, the transcutaneous approach incision is large after tightening the orbicularis oris muscle resection, so it cannot completely reduce the orbicularis oris muscle laxity. For the transconjunctival approach to the anterior orbital septum operation, the lower eye bag excess fat removal can initially restore facial aesthetics. In addition, when the transconjunctival approach deals with the inner side, the orbicularis oris muscle is loosened at the starting point of the orbicularis oculi, the orbital part of the orbicularis oculi, and the tear trough ligament area, which can make this gap connect to the premaxillary space; when the outer side is dealt with, the orbicularis oculi muscle is loosened in the area of the supportive ligament and is continually extended and stripped to the zygomatic bone area, and at the same time, the residual fat is reset, which can improve the problem of eye bags effectively. Another set of data showed that the operation time and postoperative skin recovery time of the observation group were shorter than that of the control group, $P < 0.05$. This suggests that the transconjunctival approach can shorten the recovery time of patients with lower eye bags. The reason for this is that the transconjunctival approach to remove the fat from the bags under the eyes is less damaging to the ocular tissues, so the postoperative recovery is faster. In addition, the transconjunctival approach has a small operating range and will not adversely affect the patient's vision, which is safer. The last set of data shows that the postoperative complication rate of the observation group is lower than that of the control group, with $P < 0.05$, suggesting that the transconjunctival approach is safer. The reason for this is that in the transcutaneous approach, the amount of orbital fat removed is too much, and the surgical trauma is large, so it is easier to cause postoperative complications; while the transconjunctival approach makes a 1 mm incision in the middle of the conjunctiva and eyelid fissure at the edge of the face plate, which is less traumatic. After the selective removal of the fat with the electrosurgical knife, the remaining fat will be reset to the orbit, which reduces the degree of local damage and makes the operation safer. In

addition, based on the analysis of the physiological anatomy of the eye, orbital fat refers to the adipose tissue in the orbital space, which has the function of protecting the optic nerve, fixing the eyeball, protecting the blood vessels, and cushioning the pressure of external force on the eyeball, and so on. After the accumulation of excessive orbital fat and the emergence of bags under the eyes, the conventional treatment via the skin approach involves the direct removal of the inflated fat and skin tissues, and the rest of the orbital fat has not been reset to its normal physiological structure. Excessive loss of orbital fat can lead to subsidence of the inferior rim, increasing the fine lines of the eyes, and then affecting the length and height of the tear trough, impairing facial aesthetics. Transconjunctival approach blepharoplasty is a small incision procedure that uses a blepharoplasty hook retractor to open the edge of the incision and the conjunctiva, detach the orbicularis oculi muscle, excise the excess fat, and reset the remaining fat to the orbit, which restores fixation of the orbital fat, dampens and protects the orbital fat, thus avoids the undesirable events of excessive orbital resetting.

5. Conclusion

In conclusion, transconjunctival lower eyelid blepharoplasty for the treatment of lower eye bags is popular due to its low postoperative complications and short postoperative skin recovery time.

Disclosure statement

The author declares no conflict of interest.

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