



Analysis of the Effectiveness and Complications of Quadrilateral Method for Eyebag Removal in Elderly Patients Undergoing Eyelid Plastic Surgery

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<https://ijmf.damray.com>

OPEN ACCESS

DOI: 10.26855/ijmf.2023.12.004

Received: October 28, 2023

Accepted: November 25, 2023

Published: December 22, 2023

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Abstract

Objective: To analyze the effectiveness of quadrilateral method for eyebags removal and its impact on complications in elderly patients undergoing eyelid plastic surgery. **Methods:** A total of 72 elderly patients undergoing eyelid plastic surgery in the Department of Plastic Surgery of our hospital from August 2021 to August 2022 were selected. They were divided into a control group and an observation group (n=36) using a random allocation method. The control group underwent a traditional lower eyelid skin incision, while the observation group underwent the quadrilateral method for eyebags removal. The therapeutic effect and incidence of complications were compared between the two groups. **Results:** The total effective rate in the observation group was higher than that in the control group (94.44% vs. 72.22%, $P<0.05$). The incidence of complications such as periorbital hematoma, incision infection, ectropion, and ocular vessel injury was lower in the observation group than in the control group (8.33% vs. 25.00%, $P<0.05$). **Conclusion:** Quadrilateral method for eyebags removal has a good effect on elderly patients undergoing eyelid plastic surgery, improving the sagging of eyelid skin and having fewer postoperative complications. It is safe and worthy of clinical promotion.

Keywords

Quadrilateral method for eyebags removal, eyelid plastic surgery in the elderly, eyebags removal, complications

With the aging process and the continuous effect of gravity, the skin of the lower eyelid becomes loose in people over the age of forty. The orbital septum droops and the tension of the orbicularis oculi muscle decreases. This leads to the formation of bag-like protrusions above the lower margin of the orbit and deepening of the cheek-lid groove, which not only affects facial aesthetics but also causes abnormalities in eyelid position, leading to entropion, ectropion, cataracts, and exposure keratitis, affecting patients' daily lives [1]. For the treatment of eyebags in elderly individuals, the quadrilateral method for eyebags removal is a safe and aesthetically effective surgical approach that minimizes postoperative bruising and improves patient satisfaction [2]. Therefore, to analyze its application value,

this study explores the effectiveness of the quadrilateral method for eyebag removal and its impact on complications in elderly patients undergoing eyelid plastic surgery. The following report is presented.

1. Materials and Methods

1.1 Clinical Data

A total of 72 elderly patients undergoing oculoplastic surgery in the Department of Plastic Surgery at our hospital were selected for this study from August 2021 to August 2022. They were divided into a control group and an observation group using a randomization method ($n=36$). The control group consisted of 6 males and 30 females, with an age range of 60-77 years and an average age of (66.34 ± 2.36) years. The observation group consisted of 5 males and 31 females, with an age range of 60-76 years and an average age of (66.45 ± 2.39) years. There were no significant differences in baseline characteristics such as age and gender between the two groups ($P>0.05$). Inclusion criteria were as follows: patients/family members who were aware of and agreed to participate in this study, age ≥ 60 years, and no cognitive impairment. Exclusion criteria were as follows: patients with allergic reactions to the study medications, coagulation disorders, significant dysfunction of liver, kidney, or lung, presence of malignant tumors, and missing medical records.

1.2 Surgical Methods

In the control group, the traditional subciliary approach was used. The specific procedure was as follows: Local anesthesia was administered to the surgical area, and the patient was placed in a supine position. The surgical incision was made upward, separating the skin and orbicularis oculi muscle, followed by opening the orbital septum and removing excess fat and skin in the lower eyelid area. After hemostasis, nylon sutures were used for closure, and erythromycin ointment was applied to the incision site. Intermittent ice packs were applied for 48 hours. Suture removal was performed on the 7th day after surgery, and proper eye hygiene was ensured.

In the observation group, the four-step technique for lower eyelid blepharoplasty was used. The specific procedure was as follows: (1) Step one: Local anesthesia with 2% lidocaine was administered to the surgical area, and the patient was placed in a supine position. A 1-2 mm incision was made below the lower margin of the face, with the outer edge of the incision extending approximately 5 mm outward from the outer canthus and the inner edge extending near the canthus. (2) Step two: The patient's skin and orbicularis oculi muscle were sequentially incised, followed by separating the orbital septum fascia to fully expose the orbital fat. The orbital septum was spread out at the position of the lacrimal groove, and excess fat was removed. The orbital septum was tightened and sutured using silk thread. (3) Step three: The lateral canthal tendon was identified and suspended on the periosteum of the lateral orbital wall using silk thread to tighten the lax orbicularis oculi muscle. (4) Step four: For patients with severe skin laxity, the patient was required to look upward and open their mouth forcefully, stretching the skin of the lower eyelid. Excess skin was removed when there was no tension at the incision site. After hemostasis, nylon sutures were used for closure. Erythromycin ointment was applied to the incision site, and intermittent ice packs were applied for 48 hours. Suture removal was performed on the 7th day after surgery, and proper eye hygiene was ensured.

1.3 Observational indicators

(1) Comparisons on clinical efficacy between two groups of patients: significant improvement in patients with eyelid skin laxity, drooping, and swelling, as well as improvement in eye bags (markedly effective); improvement in patients with eyelid skin laxity, drooping, and swelling, as well as some improvement in eye bags (effective); no improvement in eyelid skin laxity, drooping, and swelling, as well as no improvement in eye bags (ineffective).

(2) Comparisons on postoperative complication rates between two groups of patients include eyelid hematoma, incision infection, ectropion, and ocular vascular injury.

1.4 Statistical methods

SPSS 21.0 was used for the analysis. Continuous data were expressed as the mean \pm standard deviation (s). A paired t-test was used for within-group comparisons before and after treatment, while an independent samples t-test

was used for between-group comparisons. Categorical data were expressed as n (%), and the chi-square test was used for between-group comparisons. A p-value < 0.05 was considered statistically significant.

2. Results

2.1 Comparison of treatment efficacy between two groups of patients

The overall effective rate in the observation group was higher than that in the control group (94.44% vs. 72.22%, $p < 0.05$) (see Table 1).

Table 1. Comparison of treatment efficacy between two groups of patients [n (%)]

Group	n	Significant	Effective	Ineffective	Overall Effectiveness (%)
Observation group	36	20(50.00)	14(45.24)	2(5.55)	40(94.44)
Control group	36	15(33.33)	11(40.48)	10(26.20)	26(72.22)
χ^2 Value		-	-	-	7.372
P value		-	-	-	0.006

2.2 Comparison of Complication Incidence between Two Patient Groups

The incidence of complications, including ocular hematoma, incision infection, ectropion, and ocular vascular injury, was lower in the observation group compared to the control group (8.33% vs. 25.00%, $P < 0.05$) (please refer to Table 2).

Table 2. Comparison of Complication Incidence between Two Patient Groups [n (%)]

Group	n	Orbital hematoma	Incision infection	Ectropion	Ocular vascular injury	Overall incidence
Observation group	36	1(2.78)	1(2.78)	2(5.56)	0(0.00)	4(8.33)
Control group	36	2(5.00)	2(5.56)	3(8.33)	2(5.56)	9(25.00)
χ^2 Value		-	-	-	-	0.091
P value		-	-	-	-	0.763

3. Discussion

There are differences in the pathological characteristics of eye bags between elderly individuals and young people. This is mainly due to the gradual aging of their facial tissues, which undergo degenerative changes. The orbital septum and its related supporting structures become lax, leading to a decrease in their supportive capacity, which differs from the protrusion of orbital fat in young people [3]. In elderly individuals, the orbicularis oculi muscle and the medial canthal tendon of the lower eyelid undergo degenerative changes, resulting in weakened elasticity, laxity, and atrophy. This can easily lead to eyelid retraction and even ectropion. The ocular tissues, including the conjunctiva and cornea, also undergo degenerative changes, which can cause congestion and edema [4]. If eye bags in elderly individuals are not promptly treated, the worsening condition can not only severely affect their facial appearance but also have adverse effects on their vision. The four-step eye bag surgery focuses on repairing and reinforcing the supporting structures of the lower eyelid while addressing orbital fat, ensuring a tight skin appearance after surgery [5]. The four steps of the eyebag surgery include removing fat from within the orbit, reinforcing the orbital septum, suspending the medial canthal tendon, and removing excess skin. Over time, the function of the medial canthal tendon and the orbicularis oculi muscle in elderly individuals gradually deteriorates, causing the skin around the eyes to lose its original elasticity and resulting in eyelid atrophy and laxity. During surgery, combining the reinforcement of the lax orbital septum and the orbicularis oculi muscle can effectively prevent potential complications after surgery. Additionally, suspending the medial canthal tendon significantly reduces the risk of lower eyelid ectropion postoperatively. Before initiating the four-step eye bag surgery, a comprehensive assessment must be performed to ensure the tightness of the lower eyelid skin in any postoperative situation [6].

The results of this study showed that the overall effective rate of the treatment group was higher than that of the

control group (94.44% vs. 72.22%, $P < 0.05$), indicating that the use of the four-step method for eyelid bag plastic surgery in elderly patients is more effective and safer. The results of this study also showed that the incidence of complications such as periorbital hematoma, incision infection, ectropion, and ocular vascular injury in the treatment group was lower than that in the control group (8.33% vs. 25.00%, $P < 0.05$), suggesting that the application of the four-step method for eyelid bag plastic surgery in elderly patients can not only repair sagging skin around the eyes but also reduce the incidence of complications and improve treatment outcomes.

4. Conclusion

In summary, the four-step method for eyelid bag plastic surgery has good effects in removing eye bags in elderly patients, which can improve eyelid skin laxity, and has fewer postoperative complications, thus demonstrating its safety and worthiness for clinical promotion and application.

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