

The treatment outcomes of crescent-shaped conjunctiva resection combined with conjunctiva sclera fixation for severe conjunctivochalasis

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Abstract. – **OBJECTIVE:** To observe the treatment outcomes of a crescent-shaped conjunctiva resection combined with conjunctiva sclera fixation for severe conjunctivochalasis.

PATIENTS AND METHODS: Eleven (22 eyes) patients with severe conjunctivochalasis were enrolled in this study. They consented to undergo crescent-shaped conjunctiva resection and conjunctiva sclera fixation, to evaluate their symptoms and inspect the lacrimal fluid system. This included the breakup time of the tear film, height and integrity of the lacrimal river, bulbus oculi fluorescein staining pre-operation and 6 m-post-operation.

RESULTS: Within the 22 eyes, the symptoms disappeared or improved in 20 eyes (90.9%). Compared with before the surgery, the tear inspections improved after the surgery. The difference was statistically significant.

CONCLUSIONS: Crescent-shaped conjunctiva resection combined with conjunctiva sclera fixation is safe and effective for severe conjunctivochalasis.

Key Words

Conjunctivochalasis, Crescent-shaped conjunctiva resection, Conjunctiva sclera fixation, Curative effect.

Introduction

Conjunctivochalasis¹⁻² is a disease characterized by the presence of excess folds of the conjunctiva located between the globe of the eye and the eyelid. It is caused by excessive conjunctival and excess tension of the inferior palpebral margin and irritates the eye and disrupts the tear film and its outflow, leading to dry eye and excessive tearing. It is not uncommon in clinical practice, but is often overlooked. Severe conjunctivochalasis is characterized by serious discomfort and bad appearance, and seriously affects the patients' quality of life. This study was conducted on 11 patients with severe conjunctivochalasis who had accepted operative treatment in our hospital.

Patients and Methods

Patients

Eleven patients with severe conjunctivochalasis at stage III-IV, willing to accept surgical treatment in our hospital from January 2012 to December 2014, were enrolled in this study. There were 8 males and 3 females, aged from 59-75 years old. The inclusion criteria was as follows: (1) patients with symptoms, including tearing, dryness and foreign body sensation; (2) patients with redundant conjunctival folds on the bulbar conjunctiva and straddle of the lower eyelid, the inner and outer canthus under slit lamp examination, and obstructed tear fluid; (3) patients with abnormal and incomplete tear meniscus; (4) patients with normal cornea, lacrimal gland and dacryon, fluent irrigation of the lacrimal passage, and without nasal lesions or anomalies that would lead to the obstruction of the opening of the canalis nasolacrimalis or entropion or ectropion and trichiasis; (5) patients without other eye disease or systemic diseases that would affect the lacrimal fluid system, without a history of eye surgery, or any administration of drugs that would affect tear fluid within three months.

Surgical Procedure

To conduct a crescent-shaped conjunctiva resection on the bitemporal, underface, and nasal side according to the position, extent, and range of the conjunctivochalasis. During the surgery, we used oxybuprocaine hydrochloride eye drops (Benoxil eye drops) as surface anesthesia. A micro toothless tweezer was used to lift the loose conjunctiva and observe the range of motion of the affected eyes to confirm the width and mark of the excision (normally 3-6 mm at widest). Then, we injected a small amount of Xylocaine on the lower conjunctiva and conducted a crescent-shaped conjunctiva resection on the bulbar

conjunctiva, which was 5-6 mm next to corneal limbus. Then, the patient was asked to look upward. We proceeded to suture the two parts of the incision through the superficial sclera 7-8 mm behind the corneal limbus to fix the bulbar conjunctiva on the superficial sclera wall. The surgical suture was conducted under a microscope to control the depth and angle of the needling, so as to avoid the piercing of the eyeball. After the surgery, Tobramycin and Dexamethasone ophthalmic ointment was applied to the eyes. One week later, stitches were removed or they were left to fall on their own.

Postoperative Follow-up

At 6 months postoperative follow-up, we observed the patients' symptoms and changes to the lacrimal fluid system, including the breakup time of tear film (BUT $\geq 10s$ was standard), height and integrity of the lacrimal river, bulbus oculi fluorescein staining (according to Bijsterveld scoring method, total scores of the three sections were 0-9 point, and total scores >3 points are considered as abnormal).

Statistical Analysis

The SPSS13.0 software (SPSS Inc., Chicago, IL, USA) was used to analyze the data, and χ^2 test was applied to compare the rate. $p < 0.05$ was considered statistically significant.

Results

The surgeries on the 11 patients (22 eyes) were successful and without any complications (including perforating injury of the eyeball, infraectus damages, or conjunctiva tearing). In the following 6-month follow-up, no complications, including infection, poor wound healing, symblepharon, or disturbance of the eye movement had occurred.

Table I. Changes of lacrimal fluid systems before and after operation.

	BUT $\geq 10s$	Tear meniscus	Abnormal fluorescein staining
Pre-operation No. (%)	2 (1%)	11(100%)	10 (91%)
Post-operation No. (%)	8 (72.7)	6 (54.5%)	7 (63.6%)
<i>p</i>	<0.05	<0.05	<0.05

The Changes in Subjective Symptoms

The disappearance of the subjective symptoms was considered as complete healing, reduced symptoms as an improvement, and no change of symptoms as invalid. Among the 11 patients, 6 patients had complete healing (54.5%), 4 patients had improvements (36.4%), 1 case was invalid (9.1%), and the total effective rate was 90.9%.

Inspection on Lacrimal Fluid Dynamic Changes under Slit Lamp

Slit lamp examination on the 11 patients showed that no more accumulation of the loose conjunctiva was observed. However, 3 patients still had folds when looking downward. See Figure 1 for the changes to the lacrimal fluid system before and after surgery. All pre-surgery and post-surgery data were tested by χ^2 . A $p < 0.05$ was considered statistically significant.

Discussion

Conjunctivochalasis was first described by Elschmig and Beitrag³ in 1908 and was named as "Conjunctivochalasis" in 1942 by an American eye doctor, Hughes⁴. In China, it was firstly reported by Zhang et al in 1999⁵. This disease was quite common among the elderly. The most common symptoms included dry eye, foreign body sensation, pains and epiphora. In clinical settings, it was characterized by the presence of excessive folds in the lower bulbar conjunctiva located between the globe of the eye and the inferior palpebral margin, the inner and outer canthus. It could cover the lacrimal punctum⁶, which would influence the motion of the lacrimal fluid, the distribution of the tear film, lacrimal fluid drainage, lead to abnormalities of the lacrimal fluid systems, and further result in abnormal symptoms and damages to the ocular surface. As age increased, fibrous tissues under the bulbar conjunctiva would gradually become thin, reducing the elastic fibers, so that the elasticity and tension of the conjunctiva were reduced, and the link between the bulbar conjunctiva and sclera loosened^{7,8}. At scardamyxis, the bulbar conjunctiva would loosen and accumulate between the globe of the eye, the inferior palpebral margin, and the inner and outer canthus. Moreover, lower fornix was relatively shallow, which further led to the falling of the loosened conjunctival tissues^{6,7}. As people age, they become vulnerable to this disease⁷.

As for the patients with mild and moderate conjunctivochalasis, subjective symptoms were usually very slight. They could be treated by hot compresses, physiotherapy, and supplemented with artificial tears. But for severe patients, conservative treatments are ineffective, so surgical treatment is required to relieve their symptoms. The most commonly used methods include crescent-shaped conjunctiva resection and conjunctiva sclera fixation^{8,9}. It was reported by Zhang et al¹⁰ that the efficacy rate of the two methods was 82.61% and 80%, respectively. But both methods have limitations. Crescent-shaped conjunctiva resection is simple and easy to handle¹¹. It is a method commonly used for conjunctivochalasis treatment and is quite suitable for patients with mild and moderate conjunctivochalasis. But it also requires an accurate evaluation of the resection. The width of resection shall be limited to 6 mm. If the volume of the resection is so small that the symptoms do not improve, recurrence can occur. If the volume of resection is too large, it might lead to the constriction of the lower conjunctival sac, influence the motion of the eyeballs, and even result in the abnormality of the cornea. Conjunctiva sclera fixation, through the suture to stimulate the inflammatory reaction so as to tighten the loosened conjunctiva and fix it tightly on the surface of the shallow sclera, was very simple and with a slight adverse events. It could deepen the lower fornix¹²⁻¹⁴. But since it did not involve the cutting of the loose bulbar conjunctiva, it was more favorable for the treatment of mild and moderate conjunctivochalasis rather than the severe conjunctivochalasis. Besides, since sutures shall get through the shallow sclera under indirect view, it also carried certain risks in breaking through the sclera wall and impairing the retina¹⁵⁻¹⁸.

“Crescent-shaped conjunctiva resection combined with conjunctiva sclera fixation” mentioned in this paper refers to the surgical method that combines the two surgical methods so as to make the best use of the advantages and avoid the disadvantages. On one hand, resection could cut off certain loose conjunctiva tissues, tighten and restore the loosened conjunctiva under direct view, and deepen the lower fornix¹⁹⁻²³. Since conjunctiva was separated and resected, the adhesion between the incision and the lower shallow scleral tissues was tighter than that of simple suture²⁴. The combination of both methods improve symptom relief of conjunctivochalasis and could also prevent recurrence. The joint method could avoid resection of the conjunctival tissue, negative effects on the lower fornix, and also make the su-

ture of shallow sclera under direct view, which could well avoid the risk of breaking through the sclera²⁵. Therefore, combined surgery could avoid the shortcomings of both surgeries.

In clinical settings, among the 11 patients, 6 cases completely healed, 4 cases improved, and total the effective rate had reached 90.9. This was significantly higher than that of the simple crescent-shaped conjunctiva resection or simple conjunctiva sclera fixation. Therefore, the combined surgery had a better therapeutic effect than the single operation.

Slit lamp examination on the 11 patients showed that no more accumulation of loose conjunctiva was observed, indicating that the combined surgery could well resolve the problem of the loose conjunctiva and the corresponding lacrimal fluid dynamic system. Post-surgery BUT was higher than pre-surgery, and the tear meniscus recovered, fluorescein staining improved, epiphora was relieved, and the symptoms improved (with total effective rate of subjective symptoms of 90.9%). The various symptoms of conjunctivochalasis, including eye dryness, foreign body sensation, pains, and epiphora had no specificity. They resulted from various ocular surface diseases. Also, the elderly group had various types of ocular surface diseases or unhealthy symptoms, such as xerophthalmia, chronic conjunctivitis, trachoma, which might also lead to eye discomforts. Therefore, a few patients still had abnormalities in the lacrimal fluid dynamic system, though their loose conjunctiva had improved.

Conclusions

The crescent-shaped conjunctiva resection combined with conjunctiva sclera fixation is a safe and effective treatment method for severe conjunctivochalasis. Conversely, regarding the treatment outcomes and safety, it is better to use them alone than combined.

Conflict of Interests

The Authors declare that they have no conflict of interests.

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