

## Case Report of Blepharospasm After Double Eyelid Surgery

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Li J, Zhang W, Huang Q, Chen Y are contributed equally to this work.

**1. Abstract:** Blepharospasm is characterized by excessive involuntary activity of orbicularis oculi muscle and an increased blink rate and apraxia of eyelid opening. Except for secondary blepharospasm, etiology is not clear in benign essential blepharospasm. We present a case that a patient suffered from blepharospasm after double eyelid surgery. There were no similar reports that analyzed the connection between blepharospasm and double eyelid surgery before. Subcutaneous injection of kreotoxin type A is considered as the first try of treatment.

Blepharospasm (BSP) is a kind of movement disorder, which is characterized by excessive involuntary activity of orbicularis oculi muscle. It is also characterized by an increased blink rate and apraxia of eyelid opening. The symptoms of BSP may occur intermittently or continuously and BSP can be showed as one of symptoms in patients with other systematic diseases [1]. Generally, BSP includes Benign Essential Blepharospasm (BEB) and Secondary Blepharospasm (SB). BSB is more common than SB in clinical work. The main symptoms of BSB include frequent and involuntary blinking, frowning of eyebrows, clonic or tonic involuntary closure of both eyelids. Patients who suffer from severe persistent BSP may influence their self-care ability due to the functional blindness. At present, the etiology and pathogenesis of BSP are still unclear. Study of neuroimaging and neuroelectrophysiology suggest that the abnormal function of pathway of brain stem, striatum, thalamus, cortex and pathway of cerebellar thalamic cortex are the main mechanisms of dystonia [2]. It has also been reported that the disease is related to environmental factors and genetic sus-

ceptibility, which causes decreased cortical inhibition [3]. SB is often related to eye disorders, such as keratitis, dry eye and blepharitis [4].

In our paper, we provide a case report that a patient suffered from BSP after double eyelid surgery and the mechanism of how it happens is worth being discussing. We have obtained the written informed consent from patient for publication. All procedures performed in studies involving human participant were in accordance with the Helsinki declaration.

## 2. Case presentation

A 31-year-old female complained that she was strenuous to open her eyes intermittently after double eyelid surgery three years ago. The patient underwent double eyelid surgery in a plastic surgery hospital. As the swelling of eyelids subsided, she felt it was difficult to open her eyes and her upper eyelids were frequent blinking with a pull-feeling one week after the operation. The uncomfortable felling could relieve itself or relieve after pressing the inner side of eyebrow arch. She could open eyes freely without any discomfort in remission. The condition recurred irregularly. She went to an ophthalmology department two years ago. The result of dry eye examination showed no abnormality. Local treatment of levofloxacin eye drops and artificial tears had no effect. Later, she went to neurology department to do examination of muscle electrogram, cranial MR and tension test. Although all results were negative, she was diagnosed with anxiety disorder. However, the effect of anti-anxiety treatment was not effective.

Then she came to our department (Ophthalmology department, Peking University Shenzhen Hospital) to try further treatment. She denied the history of nervous system diseases and history of family genetic diseases. Besides, her family members had no such similar symptoms. In physical examination, her visual acuity of both eyes was 1.0 and intraocular pressure was 13mmHg in right eye and 11.5mmHg in left eye. When she was in remission, the upper eyelids of both eyes covered about 2mm below the upper corneal limbus and she could open eyes freely. Her eyelids could close completely. And the examination of eyeballs did not have any problems. When it attacked, the upper eyelid of both eyes covered about 4mm below the upper corneal limbus. She felt it was difficult to open eyes. The upper eyelids were blinking frequently but they could close completely. Furthermore, the examination of both lacrimal ducts was normal. Schirmer test of right eye was 13mm and left eye was 15mm. Tear film break-up time in right eye was 10 seconds and left eye was 12 seconds. The result of muscle electrogram, cranial and orbital MR and Tension test was negative. The patient was diagnosis with 'blepharospasm after double eyelid surgery' based on the examination result. Procaine hydrochloride eye drops (Alcon registration, Registered number H20160133) were applied to both eyes when it attacked, but it did not make sense. We tried to use kreotoxin type A (Lanzhou biological products, 100 units / piece) to observe whether it was effective. The medicine was diluted with 10ml body saline and it was injected into the upper eyelid 3mm away from the eyelid margin. The total amount of injection was no more than 30 units. Surprisingly, the patient felt relieve after injection half an hour and the uncomfortable feeling did not recur in stage of 1-year follow-up.

### 3. Discussion and Conclusions

The patient, presented with frequent involuntary blinking, difficulty in opening eyes and palpebral retraction, could relieve after pressing the inner side of eyebrow arch. She was diagnosed with blepharospasm undoubtedly. No specific reasons that caused the symptoms were found out, so we believed it was BEB. It is reported that almost 71% BEB patients suffering from sensory trick, which is significant to support the diagnosis of BEB. In other hand, eye diseases such as blepharitis, keratitis and dry eye were excluded after thorough ophthalmic examination. The local antibiotic and dry eye treatment did not make sense and procaine hydrochloride eye drops had no effect when blepharospasm attacked [4]. Thus, the diagnosis of SB was not being supported. There was no related discomfort such as blepharospasm before double eyelid surgery in our patient. It was after double eyelid surgery that she suffered from blepharospasm intermittently. However, the association between blepharospasm and double eyelid surgery has not been reported yet. Therefore, the correlation between blepharospasm and double eyelid surgery is not clear.

In our case, the possible reasons that caused blepharospasm may be as follows: 1. There is no correlation between blepharospasm

and double eyelid surgery. The occurrence of blepharospasm appeared coincidentally at that moment after double eyelid surgery. 2. The excessive removal of orbicularis oculi muscle during surgery led to the tear function instability, which caused the related symptoms of dry eye. The persistent corneal stimulation caused by dry eye could enhance the trigeminal nerve afferent impulse. And the excitability of trigeminal blink reflex is equivalent to blink reflex caused by paired electrical stimulation. Finally, symptoms of blepharospasm would appear [5]. 3. It is reported that blepharospasm is related with mental pressure, irregular lifestyle, anxiety and depression, etc. [6]. In our case, the patient suffered from blepharospasm after double eyelid surgery. We suspected that she might be trouble with severe mental pressure or irregular life habits caused by surgical stress. It is also reported that the incidence rate of anxiety in patients with blepharospasm is high [7]. The patient has been diagnosed with anxiety disorder in neurology department. She denied the history of anxiety before double eyelid surgery. However, whether anxiety is the cause or result of blepharospasm or complications of surgery, we cannot come to a conclusion. 4. Double eyelid surgery may be the cause or inducement of blepharospasm, but it is not clear yet. Further clinical observation and researches are needed.

Essential blepharospasm may become a disabling condition for patients. Systemic drug therapy is not effective and it is often frustrating patients and physicians. Treatment efficacy with kreotoxin type A has been demonstrated and it should be indicated as the first choice in treatment. Surgery should be limited to the rare patients who are not effective with kreotoxin treatment [4].

The etiology of blepharospasm is complex, and its pathogenesis is not completely clear. Case of blepharospasm after double eyelid surgery has not been reported yet and the correlation between them needs further observation and research in clinic. Blepharospasm seriously affects patients' life. Subcutaneous injection of kreotoxin type A is considered as the first try of treatment.

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