

# Comparison of Surgical Efficacy of Levator Muscle Shortening and Modified Levator Aponeurosis Tucking in Treating Minimal and Moderate Congenital Blepharoptosis

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## Abstract

**Purpose:** To evaluate the surgical effect of levator muscle shortening and levator aponeurosis tucking in treating minimal and moderate congenital blepharoptosis.

**Methods:** Clinical data of 28 patients (40 eyes) diagnosed with mild and moderate congenital blepharoptosis at our institution were retrospectively analyzed. Postoperative efficacy was evaluated and statistically compared between these two techniques.

**Results:** During 14 months follow-up, 16 eyes with ptosis undergoing levator muscle shortening were treated, 3 with undercorrection of ptosis and 1 with overcorrection of ptosis. In patients receiving levator aponeurosis tucking, 16 eyes were cured and 4 with undercorrection of ptosis.

**Conclusion:** Both levator muscle shortening and levator aponeurosis tucking are safe and efficacious for correcting minimal and moderate congenital blepharoptosis. (*Eye Science* 2015; 30:29–30)

**Keywords:** blepharoptosis; levator muscle shortening; levator aponeurosis tucking

## Introduction

Congenital blepharoptosis is a common disease characterized as drooping of the upper eyelid. Besides, patients with blepharoptosis complain about poor appearance, blurred vision and elevated tearing. Surgery is the main treatment of blepharoptosis. In this study, 28 patients with minimal and moderate blepharoptosis between 2008 and 2013 undergoing levator muscle shortening and levator aponeurosis tucking in our hospital were retrospectively evaluated

to statistically compare the surgical efficacy between these two surgical procedures.

## Subjects and methods

### Study subject

Twenty eight patients (40 eyes) diagnosed with blepharoptosis between 2008 and 2013 in our hospital were enrolled in this clinical trial. Among them, 12 patients were bilaterally affected and 16 unilateral cases. All patients were randomly assigned into the levator muscle shortening and levator aponeurosis tucking groups. In the levator muscle shortening group, 20 eyes were included, 7 eyes from male subjects and 13 from female, aged 18.7 years on average. In the levator aponeurosis tucking group, 20 eyes were enrolled, 11 from males and 9 from females, aged 21.3 years on average. Preoperative examination: All patients received visual acuity test, with drooping of levator muscle > 4 mm, Bell's phenomenon (+), normal outcomes by Schirmer's test, normal eye movement. Those with systemic diseases, Marcus Gunn (Jaw-Winking) syndrome and rectus paralysis were excluded from this study.

### Methods

**Levator muscle shortening:** The skin was excised along with the line, pretarsal orbicularis oculi muscle was removed, orbital septum was open, levator muscle tendon membrane was separated from the superior tarsus, a tendon membrane flap of levator muscle with a width longer than that of inferior and lateral corneal limbus was created and the check ligament was cut off. Based on the severity of blepharoptosis, three pairs of mattress suture were created at the surgical site and the slipknots were fixed on the superior 1/3 of tarsal plate. The patients were

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examined for the height and arc of eyelid limbus in a sitting position and the ligation was conducted after proper adjustment. The levator muscle was shortened and intermittently sutured with 6-0 silk thread. Mattress suture was made at the lower eyelid if obvious lagophthalmus was noted.

**Modified levator aponeurosis tucking:** Most surgical procedures were similar to the technique of levator muscle shortening except that three pairs of 8-shaped suture were created on the tendon membrane. The patients were observed for eyelid limbal arc, symmetry of bilateral palpebral fissure and angular deformity under local anaesthesia in a sitting position. The eyeball was kept at a normal position under general anaesthesia. Intraoperatively, the upper eyelid was adjusted to the line at the root of nose marked before surgery.

**Postoperative management:** The ocular dressing was changed at 48 after surgery. Antibiotics ointment was applied on the conjunctival sac daily. The skin stitches were removed 5-7 d after surgery.

## Results

### Evaluation criteria

Normalization of upper eyelid: when the patient looked squarely, the upper eyelid was 1-2 mm below the superior corneal limbus, the difference between bilateral palpebral fissure height  $\leq$  2 mm, normal upper eyelid limbal arc and normal function of eyelid closure; undercorrection of upper eyelid: upper eyelid covered  $>$  2 mm of the cornea; overcorrection of eyelid: upper eyelid was located at  $>$  1 mm above superior corneal limbus.

The follow up endured for 6-25 months, 14.4 months on average. In the levator muscle shortening groups, the eyelids of 20 eyes were normalized, undercorrection in 3 eyes and overcorrection in 1 eye. In the levator aponeurosis tucking group, 16 eyes were healed and 4 were undercorrected. Surgical efficacy did not significantly differ between two surgical techniques.

## Discussion

Congenital blepharoptosis is a drooping of the upper eyelid resulting from partial or complete loss of levator muscle function, mainly caused by maldevelop-

ment of oculomotor nucleus or levator muscle which controls the muscle. Congenital blepharoptosis is autosomal dominant or recessive<sup>1</sup>. In this study, the residual function of levator muscle was fully utilized to perform the surgery. This technique has been widely recognized by most ophthalmologists. In 1981, levator aponeurosis tucking was first applied in the treatment of blepharoptosis by Mcconl<sup>2</sup>. Recently, this technique has been frequently reported in China<sup>3-5</sup>.

Levator aponeurosis tucking shortens the levator muscle with high efficacy and safety. In addition, the function of Müller muscle is well retained. It is convenient to operate, requires short surgical time and yields mild postoperative injury, *etc.* In this study, 8-shaped suture was made during levator aponeurosis tucking to prevent the suture loosening and drooping of upper eyelid. Satisfactory upper eyelid height and arc were obtained.

Taken together, both levator muscle shortening and levator aponeurosis tucking are safe and efficacious in correcting minimal and moderate degree of congenital blepharoptosis with no statistical significance. However, compared with levator muscle shortening, levator aponeurosis tucking is more convenient to operate and deserves widespread application in treating minimal and moderate blepharoptosis.

## References

- 1 Zhang HX, Liu Y, Li HK, et al. Levator shortening under microscope for treatment of congenital ptosis. *International Journal of Ophthalmology*, 2011, 11(2): 363-364.
- 2 Mcconl CD. *Oculoplastic Surgery*. New York Raven Press., 1981: 25.
- 3 Zhou Tp, Hu JF, Fang XL. Levator muscle of upper eyelid tucking technique in treating severe congenital blepharoptosis. *International Journal of Ophthalmology*, 2007, 7(6): 1738-1739.
- 4 Lu YB, Tang YH, Wei LJ. Clinical observation on treatment semiptosis of upper eyelid by pleating of levator palpebrae superioris. *Ophthalmology*, 2010, 19(2): 116-118.
- 5 Yu, Q. Application of levator muscle overlapping technique on the treatment of congenital blepharoptosis. *Journal of Practical Preventing Blind*, 2012, 7(3): 123-124
- 6 Sun Y. Clinical observation of levator muscle overlapping technique on the treatment of blepharoptosis. *Journal of Changzhi Medical College*, 2008, 22(4): 285-286.