Chulalongkorn Medical Journal

Volume 48
Issue 10 *October 2004*

Article 3

10-1-2004

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Chula Med J Vol. 48 No. 10 October 2004

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Tirakunwichcha S. Frontalis flap advancement in congenital blepharoptosis. Chula Med J 2004 Oct; 48(10): 661 - 6

Objective : *To evaluate the efficacy of frontalis flap advancement in congenital blepharoptosis.*

Setting : *Department of Ophthalmology, Faculty of Medicine, Chulalongkorn University*

Design : *Descriptive study*

Methods : *Retrospective study of nine consecutive patients with congenital blepharoptosis that underwent frontalis flap advancement surgery at King Chulalongkorn Memorial Hospital were reviewed during January-December 2003.*

Results : *Seven of nine cases (77.8%) had good results with symmetrical eyelid heights. The follow up period was 1.5-12 months (median = 7 months). All cases had difficulties in closing the eyes in the early postoperative period but no serious complications were found.*

Conclusion : *Frontalis flap advancement is effective in repairing congenital blepharoptosis. The operation is safe and can be performed with single incision.*

Keywords : *Frontalis muscle, Advancement, Blepharoptosis.*

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Received for publication. August 7, 2004.

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ศุภพงศ์ ถิรคุณวิชชะ. การผ่าตัดแก้ไขภาวะหนังตาตกแต่กำเนิดโดยใช้กล้ามเนื้อฟรอนทาลิส. จุฬาลงกรณ์เวชสาร 2547 ต.ค; 48(10): 661 - 6

วัตถุประสงค์ : *เพื่อประเมินประสิทธิภาพของการใช้กล้ามเนื้อฟรอนทาลิสในการแก้ไขภาวะหนังตาตกแต่กำเนิด*

สถานที่ทำการศึกษา : *ภาควิชาจักษุวิทยา คณะแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย*

รูปแบบการวิจัย : *การศึกษาเชิงพรรณนา*

วิธีการศึกษา : *ทำการศึกษาย้อนหลังในผู้ป่วยที่มีภาวะหนังตาตกตั้งแต่เกิดจำนวน 9 ราย และได้รับการผ่าตัดโดยใช้กล้ามเนื้อฟรอนทาลิสมาเชื่อมต่อกับทาซัสที่ แผนกจักษุ รพ.จุฬาลงกรณ์ ระหว่างเดือนมกราคม – ธันวาคม พ.ศ. 2546*

ผลการศึกษา : *ผู้ป่วยจำนวน 7 รายใน 9 ราย (77.8 %) ได้ผลการรักษาดี เปลือกตา 2 ข้างสูงใกล้เคียงกัน ระยะเวลาติดตามการรักษาอยู่ระหว่าง 1.5-12 เดือน (ค่ามัธยฐาน = 7 เดือน) ผู้ป่วยทุกรายมีภาวะการหลับตาและกระพริบตาลำบากหลังการผ่าตัดในระยะแรก แต่ไม่พบภาวะแทรกซ้อนที่รุนแรง*

วิจารณ์และสรุป : *การผ่าตัดโดยใช้กล้ามเนื้อฟรอนทาลิสในการรักษาภาวะหนังตาตกแต่กำเนิดเป็นอีกวิธีการรักษาที่ได้ผลดี การผ่าตัดมีความปลอดภัยและสามารถทำการผ่าตัดผ่านแผลตำแหน่งเดียว*

คำสำคัญ : *หนังตาตก, กล้ามเนื้อฟรอนทาลิส, แอ๊ดว้านซ์เม้นท์*

Blepharoptosis is the drooping of eyelid. It may be classified by the onset or the etiologies. It can develop later in life (acquired) or at birth (congenital).[1,2] The causes may be myogenic, neurogenic, aponeurotic, traumatic or mechanical. In severe cases, the eyelid margin can obscure the visual axis resulting in visual impairment, abnormal head positioning or amblyopia particularly in children. Treatment of the blepharoptosis depends on the etiologies, severity and the levator function. Mild degrees of ptosis (1-2 mm.), it can be corrected with Muller's muscle conjunctival resection or Fasanella Servat procedure. For moderate degree of ptosis (2-4 mm.), levator resection or Whitnall's sling are proposed. In severe degrees of ptosis (>4 mm.), frontalis muscle is the muscle of choice in elevating the eyelid.[3] There are many procedures that can be performed to correct severe blepharoptosis. Frontalis sling with autogenous *fascia lata* or banked *fascia lata* has been well accepted.[4-6] Dennis SC Lam *et al* described the method using autogenous palmaris longus tendon in stead of *fascia lata*.[7] However, many synthetic materials have been used such as nylon suture material[8], silicone rod[9], Supramid sling[10] and Gore-Tex,[11] etc. These synthetic materials can give temporary or long-term correction but may have a high cost. Bong Soo Baik proposed the procedure in repairing severe ptosis by using *orbicularis oculi* muscle and orbital septum.[12] Nevertheless, linking the frontalis muscle directly to the tarsus as a flap seems to imitate the actual mechanism to lift the eyelid with poor levation function.[13,14] The purpose of this study is to evaluate the efficacy of the frontalis flap advancement in patients with congenital blepharoptosis.

Material and Method

Records of all patients that underwent frontalis flap advancement at King Chulalongkorn University Hospital during January-December 2003 were reviewed. A total of nine cases (13 eyes): five were males and four were females; their age range was between 2-16 years old. Seven cases were diagnosed as congenital blepharoptosis, and two were blepharophimosis syndrome. Four cases were bilateral and five were unilateral cases.

All cases had abnormal head posturing with chin up and head tilt back position. The marginal reflex distances (MRD) were between 0-1 mm. Four cases had amblyopia due to pupil-covering upper eyelid margins. All cases underwent frontalis flap advancement under general anesthesia.

One millimeter of 1% lidocaine with 1:100,000 adrenaline was injected subcutaneously before the incision was made in double-fold fashion about 4-5 mm. above the upper eyelid margin in bilateral cases and at the same height with the opposite eye in unilateral cases. The *orbicularis oculi* muscles and orbital septum were identified, then the dissection was performed between the myocutaneous layer and orbital septum toward the superior orbital rim until arriving at the level of the upper border of the eyebrow. The supraorbital neurovascular bundle was avoidable by marking the location of the supraorbital notch before the incision was done. The frontalis muscle was identified and a 1-1.5 cm. in width; a rectangular flap was created and held with arterial clamp. A pulley of the orbital septum was made by making incisions on the septum near the superior orbital rim and above the upper border of the tarsal plate forming a tunnel. The frontalis flap was pulled down beneath the pulley

sliding over the preaponeurotic fat pad. The cut end of the frontalis flap was sutured to the upper part of the tarsus just medial to the pupil with 5/0 vicryl in one to three stitch fashion. The level of the upper eyelid margin was adjusted to cover the upper cornea 0-1 mm. below the superior limbus. Bleeding points were checked, and excess skin was trimmed. The skin was closed with 6/0 black silk suture by fixing the lower skin through frontalis fiber and upper lid skin. Frosted suture was made to close the eyelids to prevent corneal exposure in the early postoperative period.

Results

Seven of nine cases (77.8 %) had good results with symmetrical height between both sides (Figure1,2) The MRDs were not different than 1-2 mm. between both eyes. There were two cases that remained blepharotosis. One with bilateral blepharoptosis revealed asymmetry with more than two millimeters in difference and another case gained improvement of negative MRD to zero MRD but blepharoptosis was still apparent. The follow-up period was 1.5-12 months (median = 7 months). All eyes had lagophthalmos in the early postoperative period but spontaneously disappeared within a few months. No abnormal head position was discovered. No serious complication was found.

Discussion

In severe blepharoptosis, the procedure such as Muller's muscle conjunctival resection and levator resection can not be sufficient to elevate the upper eyelid.[3] Frontalis muscle is the muscle of choice to lift up the upper lid margin beyond the pupil.[14]

In this study, two cases had previously undergone frontalis suspension with two different materials. One had autogenous *fascia lata* harvested from his father to repair bilateral blepharoptosis and recurrence was seen after 2 years of postoperative period. Another was unilateral case and had frontalis suspension with prolene suture material with recurrence in five year-loss follow-up period. The use of nylon suture material has no permanent effect on the correction of blephartoptosis but it has some

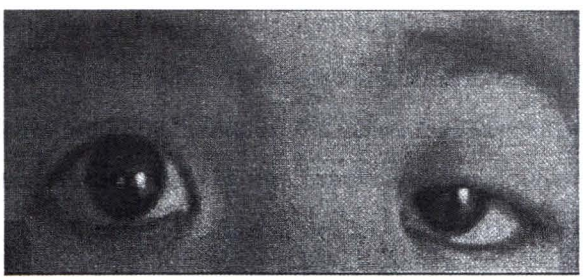

Figure 1. Congenital Blepharoptosis. Congenital blepharoptosis of left upper eyelid with narrow interpalpebral fissure and MRD = 1 mm. in pre-operative period.

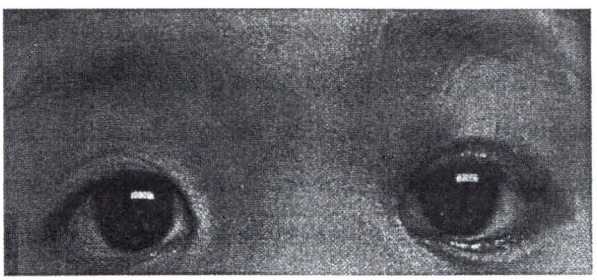

Figure 2. Frontalis flap advancement.Postoperative period of Frontalis flap advancement of left upper eyelid. Notice the widening of interpalpebral fissure with nearly equal MRD compare to the right eye.

benefit in temporary use, particularly in congenital blepharoptosis with amblyopia. On the contrary, *fascia lata* can have a permanent effect but increases the morbidity and takes a longer time to operate. These two cases had second operations with frontalis flap advancement with symmetrical results within 9-12 months of follow- up. Seven of nine cases (77.8%) showed good results with symmetrical heights. The other two cases that remained blepharoptosis: one which revealed asymmetry may be due to too much relaxing incision while making the rectangular flap or loosen sutures. Another case still had bilateral blepharoptosis but improvement of negative MRD to zero MRD satisfied the patient.

All cases received lubrications in the early postoperative periods to prevent corneal exposure due to poor blinking during day time and lagophthalmos during night time. No serious complications were found in the study such as corneal abrasion or corneal ulcer.

Conclusions

Frontalis flap advancement is another effective method in repairing severe blepharoptosis especially in congenital group. The surgery is safe and can be performed on single incision without other wound morbidities. Lagophthalmos in all cases can be spontaneously improved.

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