

# Effectiveness of lash rotating sutures for the correction of Congenital Epiblepharon

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## ABSTRACT

**Introduction:** Epiblepharon is a congenital or acquired eyelid anomaly that commonly affect Asian children. It occurs more in the lower eyelid. The aim of this study was to establish the effectiveness of lash rotating sutures applied to the subcutaneous tissue of the upper skin flap and anchored to the lower tarsus with minimal excision of orbicularis under the lower flap. **Materials and Methods:** This was a prospective study over a period of three years. The same surgical procedure was adopted in all our cases and the outcome was evaluated. **Results:** There were 19 patients (a total of 38 eyes), 15 of which (79%) were females with mean age of  $8.8 \pm 2.8$  years (range 5-15). All patients had only lower eyelid involvement; 14 (28 eyes) with full length involvement and five (10 eyes) with medial and middle third lower lid epiblepharon. Eleven (58%) had very long cilia and eight (42%) had long cilia. All patients had their cilia oriented vertically and thick touching cornea. Epicanthus was noted in 14 (74%) of our epiblepharon cases. All (100%) had absence lid crease and complete lid closure. None had lid laxity or lid retraction. Bell's phenomenon was good in all patients. All were symptomatic and some of them had corneal involvement, such as punctuate epitheliopathy and/or scarring. After the procedure, all patients had complete recovery from lash corneal contact and symptom relief on follow up, ranging between one to three years. **Conclusion:** The study revealed that subcutaneous lash rotating sutures were sufficient for excellent correction of epiblepharon with complete relief of symptoms.

**Keywords:** Epiblepharon, congenital, eyelash, management

## INTRODUCTION

Epiblepharon is a congenital abnormality of the eyelid in which a horizontal fold of the skin and the underlying orbicularis muscle pushes the eye lashes against the eyeball in the presence of a normal eyelid position.<sup>1, 2</sup>

It can involve both the upper and lower eyelids; but is more common in the lower eyelid.

<sup>3</sup> The condition is frequently associated with an absence of the eyelid crease. <sup>3</sup> Typically, epiblepharon is noticeable along the medial half of the lower eyelid. This may not be very obvious in the primary position, but becomes conspicuous in down gaze. <sup>2</sup> In some, it may involve the whole length of the eyelid. It is a major developmental eyelid abnormality

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among Asian children.<sup>1</sup> The condition is usually not associated with other lid anomalies.<sup>4</sup> Many cases of epiblepharon correct spontaneously with facial development as the child grows older.<sup>1,5</sup> The lashes begin to rotate into the normal position beginning in the temporal to nasal direction. If epiblepharon persists beyond the age of 24 to 36 months in a child, it is unlikely to resolve spontaneously.

This condition may rarely be acquired.<sup>3,4</sup> Factors that lead to acquired epiblepharon are not clear. Epiblepharon in adults may be seen in association with thyroid orbitopathy, congenital fibrosis of extraocular muscles and previous orbital and lid surgery or trauma.<sup>3,4</sup> It may be misdiagnosed or even diagnosed late.<sup>5</sup>

Epiblepharon may be mild or severe and symptomatic or asymptomatic. Symptoms are irritation, foreign body sensation, watering and redness caused by rubbing of the inturned eyelashes or visual disturbances due to induced astigmatism or corneal scarring. Obesity among children has been attributed as a predisposing factor. The correction of this condition is via surgical correction. Several surgical approaches were adopted, the commonest being lash rotating sutures, lid split and thermal coagulation of lower lid retractors. Among these three, the simplest to perform is the lash rotating sutures approach. This study was designed to evaluate the effectiveness of this procedure, experience of a tertiary referral centre in Brunei Darussalam.

## **MATERIALS AND METHODS**

This was a prospective study of patients with

epiblepharon, who attended the Eye Centre of RIPAS Hospital between January 2009 and December 2012. Inclusion criteria for this study were patients above five years of age, absence of peri-orbital involucional changes with no past history of lid or orbital surgery and absence of any other lid pathology. Altogether, there were a total of 19 patients (a total of 38 eyes) included in this study.

With informed consent, all patients underwent visual acuity assessment, slit lamp bio-microscopy, complete ophthalmologic evaluation. This comprised of comprising assessment of lid crease, lid laxity, lid retraction, lid closure pattern as to complete or incomplete (any defect in apposition between the lids with exposure of sclera or cornea or both in varying degrees during voluntary or involuntary lid closure), presence or absence of epicanthus, epiblepharon of upper or lower lid; involving medial or middle third or full length of the lid, measurement of length as to average (5-7 mm), long (8-10 mm) and very long (>10 mm), thickness and direction of eyelashes, whether lashes are touching cornea or conjunctiva, Bell's phenomenon, other lash abnormalities such as dystichiasis or trichiasis, any other lid abnormalities, tonometry, detailed funduscopy and clinical photography.

**Operative technique:** The surgery is aimed at (a) establishing a strong bond between the lower lid retractors and the anterior lamella of the lower eyelid; and (b) by creating a barrier, prevent rolling-up of the skin and pretarsalorbicularis oculi over the stable inferior tarsus.

All surgeries were carried under gen-



**Figures 1: a) A case of epiblepharon with corneal involvement, and b) appearance on the first post-operative day.**

neral anaesthesia. On table before surgery, patients were reassessed for the extent and severity of the condition. A subciliary horizontal incision was made with tapering ends, 2 mm below the most anterior row of lashes to prevent damage to the lash roots. The length of the incision depended on the extent of the epiblepharon (entire length, medial two-thirds or medial one-third of the lid). The full length incision was from below the lower punctum to the lateral canthus. The incision was deepened without injuring the tarsus. The tarsal plate was exposed in its full length by dissection between the tarsal plate and inferior skin-muscle flap. Haemostasis was secured by thermal cautery. The subcutaneous tissue of the superior edge of the incision was sutured to the anterior surface of the inferior border

of the tarsus, making sure that the lashes were rotated outwards. A total of 6 to 8 sutures (8/0 nylon) applied. A 2 mm band of pre-tarsal orbicularis muscle was excised from the 'lower' skin-muscle flap. The skin of the lower flap was draped over the superior flap and the redundant skin was excised. The incision was closed with interrupted 7/0 vicryl sutures. At the end of the surgery, fusidic acid cream was applied to the wound. Ice cold compresses were given for a period of 12 hours following surgery.

Patients were discharged the following day and were reviewed at the end of one, two, four weeks and followed-up every three months.

The outcome of surgical correction was evaluated in relation to (i) cilia – a) their direction and b) their contact with cornea, (2) surgical complications such as: a) crease formation, b) scar formation, c) lower lid retraction, d) eversion of lid margin; (3) recurrence, and (4) symptomatic improvement.

## RESULTS

Nineteen patients were included in our study (a total of 38 eyes), 15 of which (79%) were females. The age ranged between five years and 15 years with a mean (SD) age of 8.8 (2.8) years. Out of the 19 patients, 12 were Malay and seven were Chinese (Table 1). Majority of the patients included in the study were Malay females.

All patients had only lower eyelid involvement. Fourteen (74%) patients (28 eyes) had full length involvement and five (26%) patients (10 eyes) had medial and middle third lower lid epiblepharon (Table 2).

**Table 1: Distribution of patients.**

Age (years)	Malay		Chinese	
	Male	Female	Male	Female
5	-	1	1	-
6	1	1	-	-
7	1	2	-	1
8	-	1	1	1
10	-	1	-	1
11	-	1	-	1
12	-	2	-	1
15	-	1	-	-
TOTAL	2	10	2	5

**Table 2: Extent of lower eyelid involvement.**

<b><i>Eyelid Involvement</i></b>	<b><i>Male</i></b>	<b><i>Female</i></b>
Medial third	-	-
Medial and Middle third	1	4
Full length	3	11
Total patients (eyes)	4 (8)	15 (30)

Eleven (58%) patients had very long cilia and eight (42%) had long cilia. All had their cilia oriented vertically and thick touching cornea. Epicanthus was noted in 14 (74%) patients. All (100%) had absence lid crease and complete lid closure. None had lid laxity or lid retraction. Bell's phenomenon was good in all patients. All were symptomatic (Table 3) and several had corneal involvement, such as punctuate epitheliopathy and/or scarring.

All the patients were followed up for a period ranging between one and three years. All patients had complete recovery from lash corneal contact and symptom relief. All satisfied the preset criteria for good recovery except in one eyelid (2.6%) in a male patient. He had recurrence of the condition in the medial third of his left lower eyelid due to slippage of the anchorage sutures. This was later corrected surgically under local anaesthesia.

## **DISCUSSION**

The exact pathology in epiblepharon is still not established. <sup>4</sup> Many aetiological factors may be involved. It is thought that some structural defect exists in these eyelids. There is absence of adhesion between the lower lid retractors and the anterior lamella of the lower lid; which prevents the skin and orbicularis muscle to move towards the lid margin. Re-

**Table 3: Symptoms and Signs associated with epiblepharon reported by patients.**

<b><i>Symptoms</i></b>	<b><i>Number of patients</i></b>
Irritation	16
Foreign body sensation	13
Redness	17
Watery eyes	16
Photophobia	7
Pain	11
Blurring of vision	9
<b><i>Signs</i></b>	<b><i>Number of patients</i></b>
Recurrent Conjunctivitis	13
Epithelial Keratitis	4
Nebulous corneal scar	3
Astigmatism	3

dundancy of the lower lid skin is also considered to play a role in the pathogenesis of epiblepharon. <sup>6</sup>

Few important observations that were noted in our patients were (a) absence of lower lid crease; (b) abnormally longer thick lower eye lashes which were vertically oriented rather than curved downward with sharply pointed edges; (c) all had lower lid involvement; (d) none had other lid anomalies; and (e) none were obese. <sup>7</sup> Epiblepharon is observed both in boys and girls. In our study, a female preponderance was observed. <sup>7</sup>

Our study showed that this simple approach is effective for the correction of epiblepharon. All but one of our patient had improvement and met our predefined criteria of good recovery. One patient has recurrence due to anchorage suture slippage. Therefore, it is important that anchorage sutures are placed correctly. Although the simplest of the

approaches to correction of epiblepharon, there are associated risks. In the procedure, the subciliary incision was not made very close to the anterior lash line avoid possible damage to the lash roots.<sup>1, 8</sup> Great care should be taken in assessing and excising skin and muscle from the lower flap as larger excision can cause anterior lamellar shortening leading to ectropion or lower lid retraction, and if the excision is smaller than that is necessary, under correction or recurrence may ensue.<sup>9</sup>

Formation of dog-ears, a known complication was prevented in our cases by tapering the ends of the skin incision. A higher number of closely placed anchorage sutures made complete eversion of the eyelashes possible. When using silk sutures caution should be taken to prevent slippage of the suture as it occurred in one of our cases and epiblepharon recurred. Pre-tarsal orbicularis oculi muscle fibres under the superior flap were not excised in our cases, as it may adversely affect the stability of the lower lid. Closely placed subcuticular lash rotating sutures applied to the lower tarsus alone was effective in correcting epiblepharon in our cases. Thermal coagulation of lower lid retractors and lid split may also be useful in selected cases of epiblepharon.<sup>8, 10</sup>

In conclusion, epiblepharon, a congenital lid anomaly may be symptomatic or asymptomatic. All symptomatic cases need surgical correction of the condition to alleviate symptoms and to prevent complications. Our study showed that a simple subcutaneous lash rotating sutures were effective.

Great care needs to be taken in pre-operative assessment as well as excising skin and muscle excised from the lower flap; as smaller or larger excision can lead to complications. Pre-tarsal orbicularis under the upper segment of the skin flap was not excised to prevent any possible anomalies of reflex blinking.

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