

Outcome of Frontalis Brow Suspension Surgery in Congenital Ptosis –Experience in a Tertiary Eye Care Center in Bangladesh

Farzana Afzal^{1*}, Nazmul Haque Robi¹, Sadia Sultana¹, Riffat Rashid¹, Nasrin Habib² and Mamunur Rashid³

¹Department of Oculoplasty, Ispahani Islamia Eye Institute and Hospital, Bangladesh

²Department of Physiology, QUEST International University, Malaysia

³Department of Medicine, QUEST International University, Malaysia

*Corresponding author: Farzana Afzal, Department of Oculoplasty, Ispahani Islamia Eye Institute and Hospital, Dhaka, Bangladesh, Email: farzana.afzal@islamia.org.bd

Perspective

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Abstract

Objective: to assess functional and cosmetic outcome of frontalis brow suspension surgery with silicon tube in correction of moderate to severe congenital ptosis with poor levator function.

Method: it is a prospective interventional study conducted in Ispahani Islamia Eye Institute and Hospital with in period of January 2018 to December 2018 with minimum follow up period of 6 months. Total 44 eyes of 39 patients were included in this study. Detailed history were taken from the entire patient, and then properly evaluated and surgery was done. Pre and postoperative details were properly documented in each case.

Results: among 39 patients, 61.5% patients were within 0 to 15 years age group. Rest 38.46% patient were more than 15 years. Among all patients, 53.84% patients were male and 46.15% patients were female with male female ratio 1.16:1. 34 (87.17%) patients had unilateral ptosis while 5 (12.82%) patients had bilateral ptosis. 22(50%) cases came to the hospital with ptosis only and 22 (50%) cases had associated symptoms like refractive error, amblyopia, mono ocular elevation deficiency, hypotropia etc. In all cases frontalis brow suspension were done by silicon tube. Functional outcome were measured by comparing pre and post-operative margin reflex distance 1 (MRD 1). Mean pre-operative MRD1 -2.04 ± 0.56 mm has improved post operatively to +1.90 ± 0.05 mm. Cosmetic success were defined when 3 criteria were met: 1.satisfactory lid contour, 2. satisfactory lid symmetry (≤ 2 mm asymmetry in MRD1) and 3.satisfactory lid crease formation. Functional and cosmetic success rate was 93.18 % cases. Only 3 cases had under correction requiring knot revision. Other mild complication was lid edema, mild lagophthalmos, and mild lash ptosis. Post-operative wound infection occurred in 1 case which was successfully treated with systemic antibiotic.

Conclusion: in simple congenital ptosis with poor levator function, frontalis brow suspension with silicon tube has good efficacy and excellent safety profile. This procedure requires less surgical time, provides good cosmesis, less complication and early recovery.

Keywords: Congenial Ptosis; Silicon Tube; Frontalis Brow Suspension

Introduction

Abnormal drooping of upper eyelid is called ptosis. Normally the upper eyelid margin rests about 1–2 mm below the upper limbus. Ptosis may be congenital or acquired. It can be unilateral or bilateral. On the basis of severity ptosis may be mild (up to 2 mm), moderate (3 mm), severe (4 mm or more) [1,2]. Congenital ptosis presents at birth and may be due to poorly developed levator palpebrae superioris (LPS) and fibro-fatty infiltration of the levator muscle. It may be associated with superior rectus weakness, chin elevation, refractive error and amblyopia [3,4].

Congenital ptosis has got negative effect on the physiological development of normal vision resulting in deprivation amblyopia [5]. Restoration of cosmetic symmetry, establishment of visual and psychological satisfaction is the aim of ptosis surgery. Early surgery may establish vision, prevent amblyopia, correct head posture and chin elevation and improve cosmesis. Ptosis repair is a challenging oculoplastic surgical procedure that requires correct diagnosis, thorough planning, understanding the lid anatomy, experience and good surgical technique. Levator function is probably the most important eyelid measurement in term of surgical planning as the effectiveness of certain procedures rests solely on the integrity of levator muscle function.

Frontalis suspension surgery is now well-accepted as the procedure of choice for patients with severe congenital ptosis and poor levator function [6,7]. Different types of material are being used for sling including as fascia lata; and non autogenous materials (artificial material) e.g., silicone band, mersilene mesh, polypropylene, nylon monofilament, polyester and poly tetra fluoro ethylene (PTFE). All these materials have proved effective in correction of ptosis with frontalis brow suspension technique [5]. Various feature of the materials to influence the outcome, such as surface roughness, tensile strength and tissue acceptance. Ideal sling material should be inert for body, strong, inexpensive, easily available, and time tested. Many

authors have shown merits and demerits of their materials of study. Autologous fascia lata is the most biocompatible, but requires thigh dissection and consumes more time and effort during surgery. Also fascia lata is poorly developed in young children. The synthetic materials like prolene, silk and supramid seem to show more granulomatous reaction, wound infection and extrusion [8]. Silicon material is inexpensive, easily available, and well-tolerable by body, life- long good surgical effect may be achieved. It is smooth and elastic and it may improve eyelid elasticity and may allow easy post-operative adjustment or removal if necessary as in under or overcorrection. Now a day Self loaded silicon tube is available which is less traumatic and work friendly.

Purpose of the study is to evaluate the effectiveness and outcome of frontalis brow suspension procedure in management of moderate to severe congenital ptosis by using silicon tube as sling material.

Materials and Methods

This is a prospective interventional study which was conducted at department of oculoplasty, Ispahani Islamia Eye Institute and Hospital, Dhaka with in the period of January 2018 to December 2018 with last follow up to June 2019. Total 44 eyes of 39 patients were included in this study. Patients with severe congenital ptosis having poor levator function (4 mm or less) were included in this study. Patients with variable ptosis, fair to excellent levator function, diplopia, and presence of Marcus Gunn Jaw winking ptosis were excluded from the study.

A proforma was used to record history and examination. A detailed history and examination was performed. History included the age of onset of ptosis, its duration, reviewing old photographs (if the history is ambiguous), diplopia symptoms, variability of ptosis during the day and excessive fatigue. A complete examination including cyclorefraction, best corrected visual acuity, slit lamp examination, extraocular movements, pupillary reactions and corneal sensation

was performed. Ptosis examination included: lid fissure height, eyelid crease height, upper lid margin to reflex distance (MRD), scleral show, levator function, lagophthalmos, jaw winking and Bell's phenomenon), inspection for abnormal head posture (e.g. chin elevation). Informed written informed consent was obtained from each patient or parents. All the study patients were undergone ptosis correction by a group of competent oculoplastic surgeon. Frontalis sling was performed by Fox pentagon technique.

Surgical Procedure

Under general or local anaesthesia, 2 horizontal stab incisions are made, in the upper lid about 3 mm above the lash line at the level of nasal and temporal limbus. Two stab incisions are made just above the brow at the level of lateral and medial canthus. Another stab incision is made in the forehead about 2 cm above the brow midway between the brow incisions. A pocket in the sub orbicularis plain is made for passage of the sling material by blunt dissection with scissors. Prefixed needle with silicon tube attached to it is used as sling. The needle is passed from lateral eyelid incision in sub muscular plane horizontally to medial eyelid incision and then to nasal eyebrow incision. Another needle is passed from lateral eyelid incision to temporal eyebrow incision. Care was taken to maintain the muscular plane all throughout the procedure. Finally both needles were brought back to forehead incision and exteriorized. A small sleeve is then passed through the two silicon tubes to tighten and lift the lids up to the requisite level. The silicon tubes are cut slightly beyond the sleeve, then the sleeve and tube are buried in the sub muscular pocket. The forehead and brow incisions are then closed with one or two interrupted 6-0 vicryl sutures. A frost suture is placed to prevent exposure (Figures 1-7).

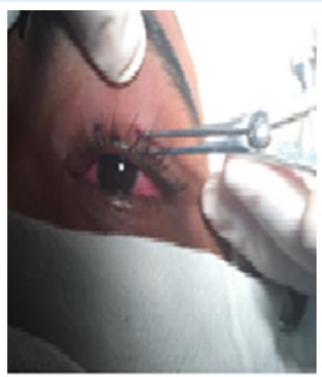


Figure 1: Measuring the incision point.



Figure 2: Marking the incision point.

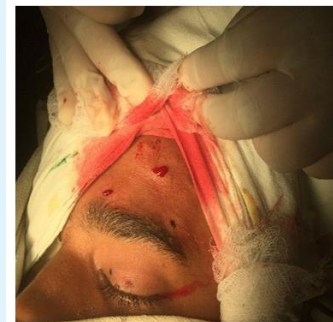


Figure 3: Stab incisions.



Figure 4: Needle passing through incision point.

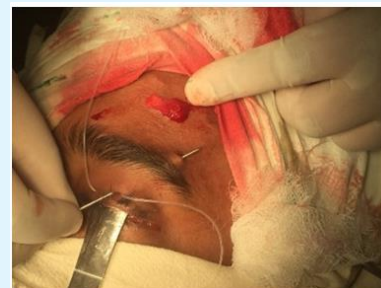


Figure 5: Needle passing through brow incision.



Figure 6: Sleeves passing through the silicon tube.



Figure 7: Frostbite Suture.

Oral broad spectrum antibiotic were prescribed for all patients for 1 week. Topical antibiotics and lubricants were routinely used for the first week and then as required. Patients were followed up on 1st POD, 7th POD, and then after 1 month, 3 months and 6 months of surgery. Pre-operative and post-operative data has been recorded and then analyzed. Functional outcome were measured as good when MRD was more than 1mm and poor when it was less than 1 mm. Cosmetic outcome were assessed according to eyelid symmetry, lid contour and lid crease formation. It was graded as excellent, good or poor based on follow up on 6th month.

Excellent result means natural lid contour with less than 1 mm lid height difference with symmetric lid crease. Good result means mild but acceptable peaking of lid with lid height difference 1 to 2 mm and mild but acceptable obliteration of lid crease. Poor result means marked eye lid tenting, with more than 2 mm asymmetry and complete obliteration of lid crease which requires corrections.

Results

Age and Sex Distribution

We included total 44 eyes of 39 patients in our study (Table 1).

Age	Male	Female
0-5 years	5	7
>5 -15 years	9	3
>15 years	7	8
Total	21	18

Table 1: Age and Sex Distribution.

21 patients were male and 18 patients were female. There is no significant difference in age distribution.

Laterality of Ptosis (Table 2)

Laterality	Number of Patient	Percentage (%)
Unilateral	34	87.19
Bilateral	5	12.8

Table 2: Laterality.

Among 39 patients, 34 (87.19%) patients came with unilateral ptosis; rest 5 (12.8%) patient had bilateral ptosis.

Associated Symptoms (Table 3)

Associated Symptoms	Number of Patients	Percentage (%)
Only ptosis	24	54.54
Refractive error	8	18.18
Amblyopia	3	6.81
Mono ocular elevation deficiency	3	6.81
Hypotropia	3	6.81
Others	3	6.81

Table 3: Associated Symptoms.

Among 44 eyes, 24 (54.54%) eyes had ptosis only with no associated symptom. Refractive error was present 8 (18.18%) eye and amblyopia found in 3 cases. Mono ocular elevation deficiency was found in 3 cases. 3 patients with hypotropia had undergone squint surgery first. After that ptosis correction were done. Among other symptoms, nystagmus, micro cornea and corneal opacity were found.

Functional Outcome

We measured the functional outcome of the surgery by comparing pre and post-operative margin reflex distance (MRD) (Table 4).

Mean pre-operative MRD (mm)	Mean post-operative MRD (mm)
-2.04 ± 0.56	+1.90 ± 0.05

Table 4: Mean Pre-Operative and Post-Operative MRD.

By assessing the mean pre-operative and post-operative outcome, it is observed that functional outcome has been improved successfully.

Cosmetic Outcome (Table 5)

Cosmetic Outcome	Excellent	Good	Poor
Lid contour	10 (22.72%)	34 (77.27%)	0
Symmetry	10 (22.72%)	31 (70.40%)	3 (6.81%)
Lid crease	10 (22.72%)	34 (77.27%)	0

Table 5: Cosmetic Outcome.

Cosmetic outcome were assessed according to eyelid symmetry, lid contour and lid crease formation. It was graded as excellent, good or poor based on follow up on 6th month. 10 (22.72%) eyes had excellent post-operative

outcome, 31(70.40%) patients had good cosmetic outcome and 3 (6.81%) patients had poor outcome and required knot revision later on.

Complication (Table 6)

Complication	Number of Cases	Percentage
Swelling	9	20.45%
Undercorrection	9	20.45%
Overcorrecton	2	4.54%
Lash ptosis	1	2.27%
Lagophthalmos	10	22.72%
Wound infection	1	2.27%

Table 6: Post-Operative Complication.

Most common complication is postoperative swelling (20.45%) and mild acceptable lagophthalmos (22.72%). Under correction was found in 20.45% cases and over correction in 4.54% cases. Mild acceptable lash ptosis and wound infection was found only in 2.27% cases (Figures 8-14).



Figure 8(a): Pre Operative Photograph.



Figure 8(b): Post Operative Photograph.



Figure 9(a): Pre Operative Photograph.

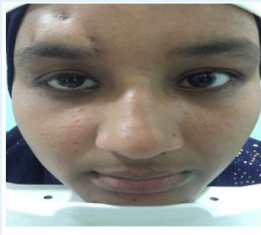


Figure 9(b): Post Operative Photograph.



Figure 10(a): Pre Operative.



Figure 10(b): Undercorrection.



Figure 10(c): After Knot Revision.

Discussion

Congenital ptosis is present at birth .it may be isolated or associated with other syndrome. In cases of poor levator function, frontalis brow suspension is the surgery of choice. Silicon tube as suspension material has many

advantages over other materials. Our study has focused on outcome of management of congenital ptosis by frontal is brow suspension surgery using silicon tube as sling material. We included 44 eyes of 39 patients in our study. 21 patients were male and 18 patients were female. There is no significant difference in age distribution. 87.19%patients had unilateral ptosis; rest 5 (12.8%) patient had bilateral ptosis. Zulfiquar ali, et al. also found more unilateral (68%) cases than bilateral (32%) cases in their study [5].

In our study, 54.54% eyes had ptosis only with no associated symptom. Refractive error was present 18.18% eye and amblyopia found in 3 cases. 3 patients with hypotropia had undergone squint surgery first. After that ptosis correction were done. Among other symptoms, nystagmus, micro cornea and corneal opacity were found. Chi ting horng, et al. showed amblyopia, refractive error and strabismus as associated symptoms in their study [8].

We measured the functional outcome of the surgery by comparing pre and post-operative margin reflex distance (mm). We found that pre-operative MRD (-2.04 ± 0.56 mm) has significantly improved post operatively (1.90 ± 0.05 mm). 79.54% patient had postoperative MRD 2mm or more. In study of zulfiqar et al, functional success was achieved in 91.45 % cases [5]. The difference of success rate between this two studies is because of planned under correction ptosis in 6 cases in our study.

Cosmetic outcome in our study were assessed according to eyelid symmetry, lid contour and lid crease formation. It was graded as excellent, good or poor based on follow up during 6th month. Sheriff Hamdeno et al has measured cosmetic outcome of ptosis surgery following same parameter [9]. In our study, 10 (22.72%) eyes had excellent post-operative outcome, 31(70.40%) patients had good cosmetic outcome and 3 (6.81%) patients had poor outcome because of lid height difference (>2 mm). this patients required knot revision later on. MA Hossain et al found 80% people achieved good outcome and 20% had poor outcome [2].

In our study, most common complication is postoperative swelling (20.45%) and mild acceptable lagophthalmos (22.72%). Swellings resolved spontaneously with in few days. We advised lubricating eye drop and eyelid taping during sleep until lagophthalmos resolved. Under correction was found in 20.45% cases and over correction in 4.54% cases. We had done planned under correction in 6 cases because of mono ocular elevation deficiency and poor bells

phenomenon. We had done knot revision in rest 3 cases. Mild acceptable lash ptosis and wound infection was found only in 2.27% cases. We treated the wound infection case successfully with systemic antibiotic. Hossain MA, et al. found complication like under correction, spontaneous suture rupture and overcorrection after ptosis surgery. They did not get any stich granuloma or infection in their study [2]. Baggio, et al. noticed overcorrection in 5% cases, under correction 10% cases, spontaneous suture extrusion in 4 cases [10]. Chi ting horng got 2 cases with post-operative exposure keratopathy [8]. We did not get any cases with spontaneous extrusion of sling or exposure keratopathy in our study.

Conclusion

Silicon tube is an ideal suspensor material for frontalis brow suspension in severe congenital ptosis with poor levator function because of its good functional and cosmetic outcome, less operative time, simple learning curve, less complication rate and ease of post-operative adjustment. Further study with large scale samples and longer duration of follow up may be required to have final inference.

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