

FRONTALIS SLING SURGERY USING SILICON ROD: RESULTS IN CONGENITAL UNILATERAL PTOSIS AMONG NORTH INDIAN POPULATION

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Abstract

Purpose: To evaluate the results after frontalis sling surgery in congenital unilateral ptosis.

Methods: This was a prospective study which included 27 eyes of patients with congenital unilateral ptosis and fair to poor levator action (≤ 8 mm). A complete examination was performed including palpebral fissure height and width, lid-crease distance, margin reflex distance 1 (MRD 1) and margin reflex distance 2 (MRD 2), levator function. Fox pentagon technique was employed using silicon rod. Follow up was done at 2 weeks and at 3 months and based on the criteria recommended by Tarbet et al, the ptosis correction was categorized into: 'excellent' if MRD1 measured more than 2mm or the difference in MRD1 between two eyelids was equal to or less than 1 mm, 'good' if MRD1 ranged from 1 to 2mm or if asymmetry was 1.5 to 2mm, and 'poor' if MRD1 measured less than 1 mm or if asymmetry was greater than 2mm in primary position of gaze.

Results: A total of 27 eyelids of 27 patients underwent frontalis sling surgery with silicon rod. The correction was excellent in 20 patients (74%) on both first and second follow-up visits, shown in fig1. It was good in 5 patients (19%) and poor in 2 patients (7%) based on the above mentioned criteria. Lagophthalmos was present in all patients postoperatively which improved with time.

Conclusion: This study shows that surgical repair using silicone sling is a safe and effective method of correcting congenital ptosis with poor to fair levator function.

Keywords: frontalis sling, silicon rod, congenital ptosis

Introduction

Eyelid ptosis refers to drooping of upper eyelid to a position lower than its normal in primary gaze. A weak or absent lid crease, lid lag in down gaze and a poor levator function are characteristic of patients with congenital ptosis¹. Congenital ptosis usually occurs due to myogenic dysgenesis of levator palpebrae superioris muscle where the muscle and its aponeurosis are replaced by fat and fibrous tissue. This reduces the ability of the muscle to contract and relax. Management of congenital ptosis in young patients is extremely important as if not corrected in time; it can lead to amblyopia, astigmatism and ocular torticollis². Treatment is primarily surgical depending upon the degree of ptosis, function of levator muscle and the status of the cornea. Ptosis with poor levator function is treated with frontalis sling surgery using fascia lata or silicone rod^{3,4}. Though fascia lata has long been used successfully, a synthetic substitute is also required because of the difficulties in obtaining autogenous fascia lata in

children, associated postoperative leg scarring¹ and longer anesthesia exposure. Also, few cases have been reported to develop cicatricial contracture of upper lid following ptosis repair with fascia lata sling⁵. The property of elasticity of silicon rod allows good approximation with minimal effort leading to complete eyelid closure, and also easy postoperative adjustability⁶.

A few studies have been done with regard to silicone rod reporting a 7 to 44% recurrence⁷⁻¹⁰. This study was done to evaluate the results after frontalis sling surgery in congenital unilateral ptosis.

Material and Method:

This was a prospective study which included 27 eyes of patients with congenital unilateral ptosis and fair to poor levator action (≤ 8 mm).

Exclusion criteria included: absent bell's phenomenon, presence of marcus jaw winking phenomenon, blepharophimosis syndrome, systemic

disorder with secondary ptosis, history of intra- or extraocular and eyelid surgery, trauma to eyelids, and eyelid tumors and scars. A complete examination was performed including best corrected visual acuity and refraction, biomicroscopic examination of the cornea, assessment of extraocular motility, pupillary examination, corneal sensation and fundus examination. Ptosis examination included palpebral fissure height and width in all directions of gaze, lid-crease distance, margin reflex distance 1 (MRD 1) and margin reflex distance 2 (MRD 2), levator function, jaw winking and bell's phenomenon.

Surgery was performed under general anesthesia for all children and local anesthesia with sedation in all adults. Fox pentagon technique was employed using silicon rod. 2 % lignocaine with 1:2,00,000 adrenaline injected at the surgical site. 5 stab incisions were given: 2 in upper lid 2 to 3 mm above the eyelash line corresponding to the edge of the limbus, 2 above the superior edge of brow corresponding to medial and lateral canthus and last about 14mm above the brow midway between two brow incisions. Starting from the central forehead incision, the sling was passed in the submuscular plane creating a pentagon. The two ends of silicone rod were passed through a silicone sleeve and was tucked deep into frontalis muscle. The sling was tightened to keep the lid position at the same level as the other eye. The brow and forehead incisions were closed using 6-0 silk. Frost suture was applied at the end of the procedure. Follow up was done at 2 weeks and at 3 months and based on the criteria recommended by Tarbet et al¹¹, the ptosis correction was categorized into: 'excellent' if MRD1 measured more than 2mm or the difference in MRD1 between two eyelids was equal to or less than 1 mm, 'good' if MRD1 ranged from 1 to 2mm or if asymmetry was 1.5 to 2mm, and 'poor' if MRD1 measured less than 1 mm or if asymmetry was greater than 2mm in primary position of gaze. Skin sutures were removed after 10 days of surgery (at first follow-up visit).

RESULTS:

Ten right upper eyelids and 17 left upper eyelids of 27 patients underwent frontalis sling surgery with silicon rod. There were 15 male and 12 female patients. The demographic data of the study sample and their ophthalmic measurements are given in table 1.

Table 1: Demographics and preoperative descriptive statistics of ophthalmic measurement

CHARACTERISTICS	Mean \pm SD
Mean age (years)	14.2 \pm 2.4
MRD-1 (mm)	1.33 \pm 0.61
MRD-2 (mm)	5.8 \pm 0.2
LPS function (mm)	5.19 \pm 0.70

Preoperative and postoperative ophthalmic findings are shown in table 2.

Table 2: Comparison of preoperative and postoperative MRD-1 and lagophthalmos values.

Parameter	Preoperative value in mm (Mean \pm SD)	Postoperative value in mm (Mean \pm SD)	
		2 weeks	3 months
MRD-1	1.33 \pm 0.61	2.67 \pm 0.61	2.67 \pm 0.61
Lagophthalmos		1.43 \pm 0.48	1.25 \pm 0.31

The correction was excellent in 20 patients (74%) on both first and second follow-up visits, shown in fig1. It was good in 5 patients (19%) and poor in 2 patients (7%) based on the above mentioned criteria.

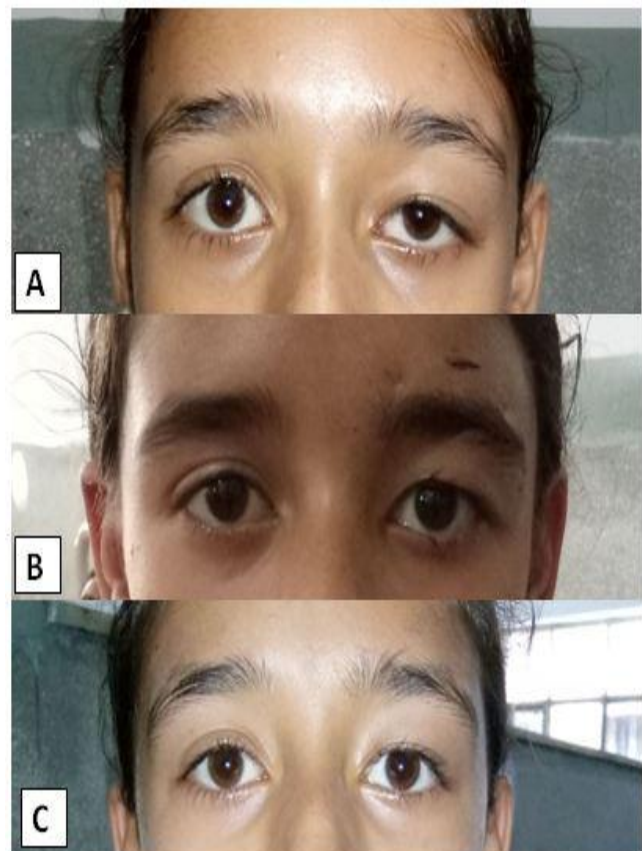


Figure 1: Photograph showing preoperative (A), postoperative 2 weeks (B) and postoperative 3 month (C) results

Lagophthalmos was present in all patients postoperatively which improved with time. Three patients had lagophthalmos more than 2 mm, among which one patient developed exposure keratopathy at 2 weeks and was medically managed.

In all the follow up visits patients were assessed for complications like exposure keratopathy, exposure of sling material, foreign body granuloma, infection etc. None but one patient developed exposure keratopathy as a complication at 2 weeks and on medical management it was successfully treated. Lid lag in downgaze was present in all patients but was never a matter of concern for the patients.

Discussion:

In our study the success rate, defined as MRD1 \geq 2mm, was 74% and remained same 3 months postoperatively indicating a stable outcome. Study by Ferreiro AG et al showed improvement in 71.8% cases¹², Lee MJ et al achieved 77% good outcome¹³.

No infection, migration and stitch granuloma formation was seen in our study which is comparable to the study conducted by Lee MJ et al¹³. It may be due to sufficient pocket formation beneath the forehead incision with meticulous repair of the skin.

No stitch granuloma or infection was observed in our study which is comparable to the studies by Hossain MA et al¹⁴. Similarly, Rai P et al¹⁵ and Manners RM et al¹⁶ observed no stitch granuloma and infection in frontalis suspension operation with prolene suture.

Our study had certain advantages. All the surgeries were performed by the same surgeon ruling out the surgeon bias. Also, there was no loss to follow-up making the results reliable. The study had a limitation of smaller sample size and shorter duration of follow-up.

Conclusion:

This study shows that surgical repair using silicone sling is a safe and effective method of correcting congenital ptosis with poor to fair levator function. Also, we recommend a larger scale sample with a longer follow-up for generalisation of the study results.

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