

EVALUATION OF OUTCOME OF VARIOUS SURGICAL PROCEDURES FOR UPPER EYELID PTOSIS

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ABSTRACT: INTRODUCTION: There are various procedures available for ptosis correction. Successful outcome not only depends on correct technique but also choosing appropriate procedure for each patient. Selection of procedure is based on available levator function and also other factors like etiology, severity, Bell's phenomenon etc. If such varied procedures are performed in a group of patients based on standard criteria and results are evaluated systematically we can determine what works best for a given patient. **AIM:** Evaluation of outcome of various surgical procedures for upper eyelid ptosis. **METHODOLOGY:** 25 eyelids of 20 patients who presented to a tertiary centre in south India with complaint of drooping of upper lid were considered. All subjects underwent complete ocular examination corrected visual acuity and detailed ptosis evaluation with particular emphasis on measurement of levator muscle function, MRD1 (margin reflex distance-1), palpebral fissure width in different gazes and margin crease distance. The effect of various factors like MRD1, MCD, levator function were assessed, the amount of correction required and appropriate surgical procedure was chosen. Surgical procedure of Levator resection, frontalis sling operation, anterior levator aponeurosis advancement, or other ptosis correction procedures under appropriate anaesthesia were performed. Post-operative evaluation in terms of visual acuity, MRD, Interpalpebral fissure height, lid symmetry, lagophthalmos and complications (if any) was done. **RESULTS:** Levator muscle resection was done in 28% of eyelids, frontal sling surgery in 60% of eyelids, Levator muscle plication in 8% eyelids and levator muscle disinsertion with frontal sling surgery in 4% eyes. Undercorrection was seen in about 44% of eyelids in varying degrees. 56% of the eyes had optimal correction. Symmetric correction was achieved in 76% of eyelids. **CONCLUSION:** The influence of various preoperative factors on the outcome of surgery was assessed. Undercorrection was the most common complication noted. Resurgery in view of undercorrection was required in one of the eyelids.

KEYWORDS: Ptosis; blepharoptosis; surgery; frontalis sling.

INTRODUCTION: Blepharoptosis is abnormal drooping of upper lid. It can be congenital or acquired. Congenital ptosis can cause amblyopia if it obstructs the visual axis. Excluding medical conditions like myasthenia, third nerve palsy, muscular dystrophy etc. a significant number of patients require correction.

There are various procedures available for correction of ptosis like levator resection; frontalis sling suspension surgery, Fasanella Servat procedure and Mullerectomy. Successful outcome not only depends on correct technique but also choosing appropriate procedure for each patient based on clinical evaluation. Levator resection and frontalis sling suspension surgery are

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the two most common procedures performed for ptosis correction. Generally levator resection is used for patients with fair to good levator function (>4mm) while frontalis sling suspension procedure is used for patients with poor levator function (<4mm).

Therefore, selection of procedure is based on available levator function and also other factors like etiology, severity, Bell's phenomenon and associated abnormalities like lid malformations, presence or absence of jaw winking phenomenon, squint or ocular motility disorders. Successful outcome includes not only cosmetic result that is lid symmetry, contour of the lid margin; but also functional result which is sufficient exposure of the pupillary axis.

AIM: To study the outcome of blepharoptosis surgery.

METHODOLOGY: The study was done as prospective interventional case series done at a tertiary centre in south India from August 2012 to September 2014. All patients with ptosis attending oculoplasty clinic and outpatient department were evaluated. Patients requiring ptosis surgery were assessed and managed as per prevailing surgical practice. Institutional Ethical Committee Clearance was obtained for the same.

The diagnosis was based on history and detailed ophthalmic and ptosis evaluation which included visual acuity, refraction, slit lamp examination of anterior segment, dilated fundus examination with indirect ophthalmoscope, slit lamp biomicroscope and ptosis specific examination which includes measurement of MRD1 (margin reflex distance-1), MRD2 (margin reflex distance-2), palpebral fissure width (PFW) in primary position, upgaze and downgaze, margin crease distance(MCD), levator muscle function (LMF), fatigue test/ice pack test, extraocular movements, jaw winking phenomenon, Bell's phenomenon, lagophthalmos, Schirmer's test and corneal sensation

The type of surgery was planned based on following factors:

- Congenital/acquired.
- Unilateral/bilateral.
- Degree of ptosis.
- Amount of levator muscle function.
- Presence or absence of synkinesis.
- Presence or absence of Bell's phenomenon.
- Presence or absence of lagophthalmos.

After detailed evaluation patients were posted for surgery.

Depending on the age of the patient surgery was done either under local anaesthesia or general anaesthesia. However for adolescents local anaesthesia was preferred if the patient was cooperative since on table dynamic evaluation of lid height and lid movements would be made possible. For cases done under local anaesthesia, 0.5 % proparacaine was instilled into the conjunctival sac, local infiltration with 2% lignocaine with adrenaline given into the upper lid and forehead also if frontalis sling surgery was planned. Surgery was performed according to standard procedure. On table assessment of lid height, lid symmetry, palpebral fissure height in upgaze

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and downgaze, presence or absence of lagophthalmos was done and amount of correction achieved was noted. If the patient had lid asymmetry or lagophthalmos or under correction or overcorrection, corrections were made in the surgery to achieve desired result. Cases with monocular elevation deficit, superior rectus palsy or lagophthalmos were under corrected as there is risk of postoperative corneal exposure keratitis in these cases.

Patients were monitored intraoperatively to look for lagophthalmos/ exposure. With proper precautions surgery was performed and titrated if required ensuring bilateral lid symmetry.

RESULTS: 25 eyes of 20 patients were considered for the study and surgery was done. Age of patient ranged between 2- 75 years with a mean of 21.6 years (SD 20.49 years). Majority of the patients in our study were males – 14 patients (70%). Majority of the cases – i.e. 22 eyes (88%) had congenital ptosis and 3 (12%) had acquired ptosis. The age distribution of various types of ptosis is depicted in Image 1.

The Clinical Data of all patients is depicted in table 1. Average MRD 1 (pre-operative) was -0.6mm. The levator muscle function ranged from 1-12 mm as demonstrated in Image 2. Mean pre-operative height of palpebral fissure was 4.8mm.

7 levator muscle resection, 15 frontalis sling suspension surgery, 2 levator muscle muscle plication and 1 levator muscle disinsertion with frontalis sling surgery were performed as depicted in Image 3. The most common surgery performed was frontalis sling suspension surgery. Out of 20 patients 5 patients had bilateral congenital ptosis and underwent bilateral frontalis sling suspension surgery.

8 eyes were operated under general anaesthesia and 17 under local anaesthesia. Patients who were operated under general anaesthesia were aged under 10 years. Postoperative bilateral lid symmetry was achieved in 19 eyes (76%).

The preop and postop palpebral fissure width and MRD1 are depicted in Table 1.

The mean postoperative MRD 1 and palpebral fissure height was 2.28 mm and 7.68 mm. The average increase in palpebral fissure height was 2.9 mm.

Image 4 and Image 5 demonstrate the pre-operative and post-operative clinical photographs of few of our patients.

A final outcome of optimal correction and under correction was achieved in 14 eyes (56%) and 11 eyes (44%). There were no patients who were over corrected.

DISCUSSION: This is a prospective intervention case series of 25 eyelids of 20 patients who underwent ptosis correction surgery under local/ general anesthesia at tertiary centre in south India

There are various surgical techniques available for the correction of ptosis. The choice of surgery depends on various factors like etiology, degree of ptosis, amount of levator muscle function, laterality, presence or absence of synkinesis, Bell's phenomenon, presence or absence of lagophthalmos, presence or absence of squint. Successful outcome not only depends on correct technique but also choosing appropriate procedure for each patient.

Type of anesthesia was based on age group and anticipated co-operation of patient for surgery. In our study the average age group of patients was 21.6years. Patients with congenital

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ptosis were aged between 2-40 years. Patients with aponeurotic ptosis were aged between 60-75 years.

Correction of ptosis in adults and children is done for both functional and cosmetic purpose but early intervention in children with ptosis is essential to prevent amblyopia.

In our study the most common etiology for blepharoptosis was simple congenital ptosis (76%) followed by senile aponeurotic ptosis (12%). Diagnosis was made based on clinical evaluation.

Levator muscle function is considered the key factor in determining the choice of procedure. Previously levator muscle resection was done in patients with good levator muscle function only and frontalis sling suspension surgery was done in patients with poor levator muscle function. Study done by Goncu T et al showed good results with levator muscle resection even for severe ptosis with poor LMF muscle resection. In our study 9 eyelids (36%) underwent levator muscle resection or plication out of which 4 cases had good- fair levator muscle function. Undercorrection was seen in 50% of eyelids with poor levator muscle function for which levator muscle surgery was done.

The most common surgery performed in our study was frontalis sling surgery (60%) followed by levator muscle resection in 28% of eyelids. Good lid symmetry was achieved with both these procedures. Undercorrection was the most complication and was seen in 44% of eyelids. Over correction leading to overt lagophthalmos or exposure keratitis however was not seen in any case. Mild lagophthalmos seen in immediate postoperative period was treated by taping eyelid at night with downward traction. One patient with Marcus Gunn jaw winking phenomenon underwent levator muscle disinsertion with frontalis sling suspension surgery. Synkinesis was eliminated and good lid symmetry was achieved.

Surgery was tailored for each case based on the clinical examination and etiology. Cases with less than grade 2 Bell's phenomenon were intentionally undercorrected to avoid postoperative lagophthalmos and exposure keratitis.

Surgery for blepharophimosis epicanthus inversus syndrome was done in two stages. In the first stage horizontal narrowing of palpebral fissure was corrected by a V-Y plasty since this procedure accentuates the amount of ptosis. In the second stage the ptosis was corrected by frontalis sling suspension surgery.

Frontalis sling suspension surgery can be done using various materials like fascia lata, prolene suture, silicone sling. Out of the fifteen eyelids which underwent frontalis sling suspension surgery, 3 were done using prolene suture. Undercorrection due to slippage of the forehead ligature was seen in one out of the three eyelids. This was corrected by taking the patient for resurgery in the first postoperative week.

Cosmesis is very essential component in the outcome of ptosis surgery. Good cosmesis with lid symmetry was achieved in 19 eyelids (76%). However lid symmetry could not be achieved in 6(14%) eyelids.

CONCLUSION: Both frontalis sling suspension surgery and levator muscle resection surgery was observed to be an effective treatment for congenital ptosis and aponeurotic ptosis. However levator muscle surgery for severe congenital ptosis with poor levator muscle function results in

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undercorrection in 50% cases. Hence, severe congenital ptosis with poor LMF should undergo frontalis-sling surgery.

Prolene and silicone sling used for frontalis sling suspension surgery, both show good results.

Patients with bilateral ptosis show excellent results with bilateral frontalis sling suspension surgery. Unilateral sling also gives good cosmetic outcome with good patient satisfaction once the patient is taught compensation with head movements.

Synkinetic ptosis or Marcus Gunn ptosis requires levator excision with tarso-frontal sling surgery.

Aponeurotic ptosis benefit well with levator muscle surgery through anterior approach.

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SL. NO.	AGE	SEX	DIAGNOSIS	PREOP MRD1 (mm)	LMF (mm)	PREOP PFW (mm)	MG	BP	SURGERY	POSTOP MRD1 (mm)	POSTOP PFW (mm)
1.	75	F	Aponeurotic	-4	5	2	-	Good	LMR	-1	5
2.	60	F	Aponeurotic	-1	9	5	-	Good	LMR	4	9
3.	16	M	Simple Cong	1	11	6	-	Good	LMR	4	9
4.	18	F	Simple Cong	-3	8	2	-	Poor	FSS	2	7
5.	40	M	Simple Cong	-2	10	4	-	Good	LMR	1	7
6.	26	M	Simple Cong	-2	2	3	-	Good	FSS	3	7
7.	14	M	Simple Cong	0	1	5	-	Good	FSS	1	7
8.	14	M	Simple Cong	1	2	6	-	Good	FSS	4	9
9.	33	M	Simple Cong	-1	12	4	-	Good	LMP	4	9
10.	2	F	BPES	-1	2	3	-	Moder	FSS	2	6
11.	2	F	BPES	1	2	5	-	Moder	FSS	2	6
12.	19	F	Simple Cong	1	11	6	-	Good	LMP	4	9
13.	3	M	Simple Cong	1	3	5	-	Good	FSS	2	7
14.	3	M	Simple Cong	3	7	7	-	Good	FSS	3	8
15.	3	F	Simple Cong	-2	3	3	-	Good	FSS	-1	4
16.	3	F	Simple Cong	-2	3	3	-	Good	FSS	3	8
17.	19	M	Simple Cong	1	6	7	-	Good	LMR	2	8
18.	18	M	Simple Cong	2	4	9	-	Good	LMR	4	10
19.	19	M	Simple Cong	-2	3	5	-	Moder	FSS	4	10
20.	6	M	Simple Cong	-1	4	4	-	Good	FSS	3	7
21.	32	M	Simple Cong	1	3	8	-	Good	FSS	3	10
22.	19	M	Simple Cong	1	3	6	-	Good	FSS	3	9
23.	19	M	Simple Cong	1	4	7	-	Good	FSS	3	9
24.	70	M	Aponeurotic	-3	10	3	-	Good	LMR	3	9
25.	7	M	Synkinetic	-5	3	2	+	Good	LMD+FSS	-1	5

TABLE 1: Clinical Data of Patients

PREOP – Pre operative, LMF – Levator Muscle Function, PFW – Palpebral Fissure Width, MG – Marcus Gunn Phenomenon, BP – Bell’s Phenomenon, POSTOP – Post operative, M – Male, F – Female, LMR – Levator Muscle Resection, SIMPLE CONG – Simple congenital, BPES – Blepharophimosis Ptosis Epicanthus Inversus Syndrome, FSS – Fronatalis Sling Surgery, LMP – Levator Muscle Plication, LMD – Levator Muscle Disinsertion.

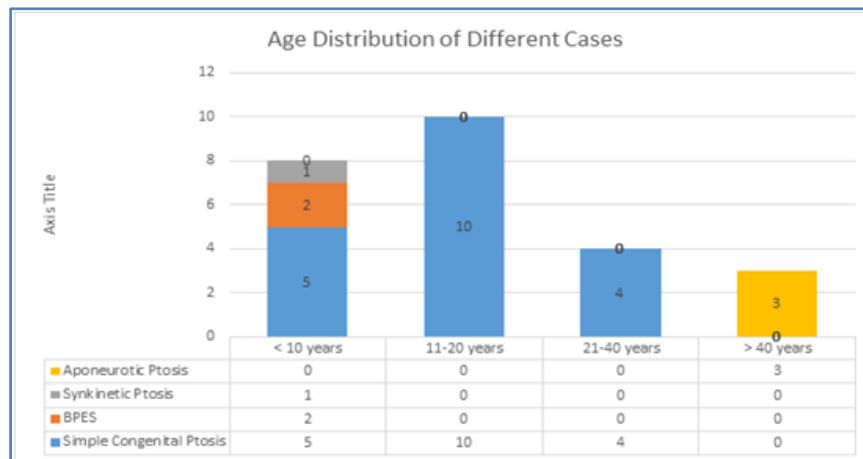


Image 1: Age distribution of different cases

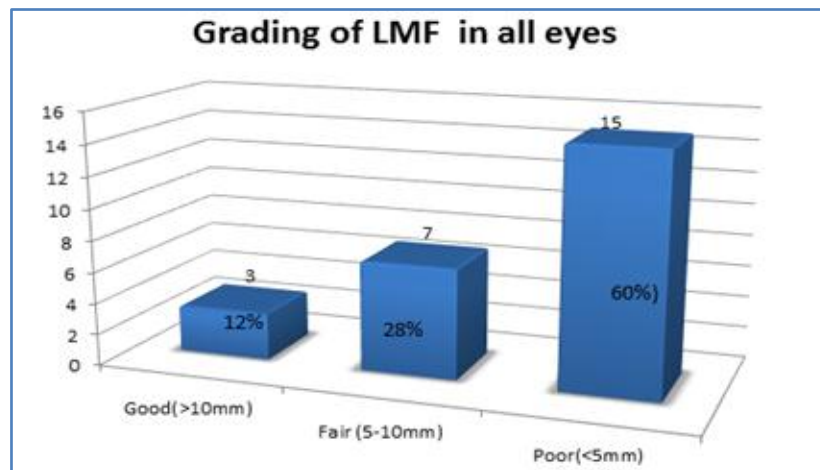


Image 2: Levator Muscle Function

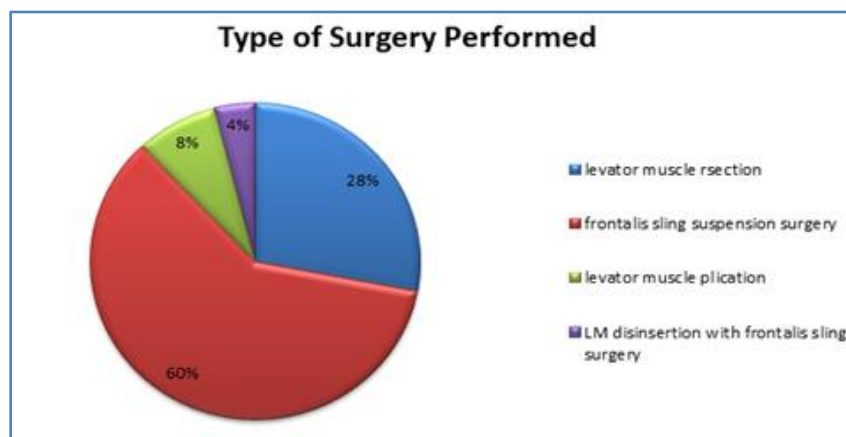


Image 3: Surgical Procedures for Correction of Ptosis

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Image 4: Clinical photographs of patient.

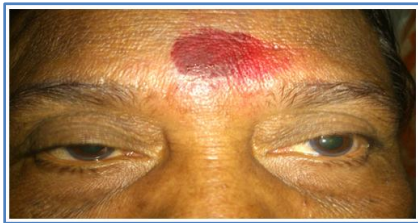


Image 4a: Pre-operative



Image 4b: Post-operative

Image 5: Clinical photographs of patient.



Image 5a: Pre-operative



Image 5b: Post-operative

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