

# PTOSIS -TYPES AND OPERATIONS FOR CORRECTION

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## ABSTRACT

**Objective:** To analyze the management of different types of ptosis of upper eyelid.

**Design:** Descriptive Study.

**Place and Duration of Study:** Eye department CMH Kharian, From January 2006 to December 2007

**Patients and Methods:** Thirty six patients having ptosis of upper eyelid, managed in eye department, were analyzed to find out frequency of different types of ptosis. Fifteen patients (27 eyes) were managed surgically and the rest were managed medically. Results and complications of different procedures required for the surgical correction were also analyzed.

**Results:** Twenty (55.6%) were congenital and 16 (44.4%) were acquired. Eight (22.2%) patients had neurogenic ptosis, 5(13.9%) had mechanical ptosis, 17 (47.2%) cases had myogenic, 6 (16.7 %) had aponeurotic ptosis. Twenty seven eye of fifteen patients were managed surgically. The procedures performed, included levator resection, which was done in 18 (66.7%) eyes, frontalis suspension done in 8 (29.6%) eyes, conjunctivomuller resection in one (3.7 %) eye which had unilateral Horner's syndrome. Post operative complications occurred in 4 (14.8%) eyes requiring reoperation. These included development of exposure keratopathy due to dryness of eyes in both eyes of one patient, overcorrection in one eye of a patient and undercorrection with hypotropia in one eye of another patient. All achieved good results.

**Conclusion:** Different types of ptosis should be identified. Levator resection and frontalis suspension can effectively correct the ptosis in most of the cases. Complications of the surgery are infrequent.

**Keywords:** Conjunctivomuller resection, Frontalis suspension, Levator resection, Ptosis.

## INTRODUCTION

Ptosis is classified as congenital or acquired. Within these two groups, ptosis is subclassified by etiology (e.g. aponeurotic, neurogenic, myogenic, and mechanical). In the upper lid, levator palpebrae superioris muscle (levator) and the sympathetically innervated muscle of Müller are the two retractors which keep the lid elevated to its normal position. Weakness of either can give rise to ptosis. Conditions may make an upper eyelid appear low (pseudoptosis), including a hypertropia on the contralateral side, microphthalmos, blepharochalasis, phthisis bulbi, dermatochalasis, or a superior sulcus defect secondary to trauma or cicatrix. In addition, widening of the palpebral fissures on the contralateral side can give the appearance of pseudoptosis and may be due to eyelid retraction from Grave's disease, axial proptosis, congenital eyelid retraction, or high myopia.

Simple congenital ptosis is the most frequent type of ptosis in children. A detailed history and thorough examination are necessary to correctly identify the type and plan appropriate treatment. It is important to assess effects of ptosis on visual acuity and abnormal head posture e.g. torticollis<sup>1</sup>. Ptosis may result in amblyopia in an infant which requires early treatment and it may also be a cause of visual loss in the adult by obstruction of the superior visual field<sup>2</sup>. Ideally patients with ptosis should be investigated clinically by an ophthalmologist and neurologist, for blood tests, X-rays, and CT/MRI scans of the brain, orbit and thorax. Generally, treatment of ptosis comprises a watch-and-wait policy, prosthesis, medication, or surgery<sup>3</sup>.

### Purpose of the study

To analyze the different types of ptosis of upper eyelid managed and the results / complications of surgical procedures carried out for the correction of ptosis.

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## PATIENTS AND METHOD

This descriptive study was carried out at eye department of CMH Kharian during 2006-2007. Thirty six patients having ptosis of upper eye lid were included in this study. 15 patients (27 eyes) were operated and the rest of the cases were managed medically. The surgical procedures were also analyzed for the results and complications. Pre-operatively complete ophthalmic history of the patient was taken with attention to the age of onset, degree and time of day, when worst, associated symptoms such as generalized fatigue and diplopia. Eye examination included checking visual acuity, pupils, Bell's phenomenon, Marcus-Gunn jaw winking phenomenon and corneal sensations. Eyelid measurements included marginal reflex distance, palpebral fissure height, upper lid crease and levator function (LF). Photographs of the operated patients were taken, before and after the operation.

Inclusion criteria for surgical treatment were ptosis of upper lid and patient willing to undergo operation. Patients with myasthenia gravis, papillary hypertrophy of superior tarsus were managed medically. Levator resection was done in any ptosis if levator function was equal to or more than 4mm. Levator resection was done, keeping in view the amount of ptosis and levator function.

Ptosis	Levator Function (mm)	Resection (mm)
<b>Mild (2mm)</b>	Good $\geq$ 12	10-15
	Fair 5-11	16-21
<b>Moderate (3mm)</b>	Good $\geq$ 12	16-21
	Fair =5-11	22-27
	Poor =4	max. 30
<b>Severe (4mm)</b>	Good $\geq$ 12	25-30
	Poor <4	Frontalis

### Suspension

Aimed position of the lid at the end of operation when the patient was looking in the straight ahead primary position varied with the levator function.

Levator Function (mm) Lid Level at the end of operation

- Poor (3-4) Sup. limbus
- Fair (5-11) Cover cornea 2mm
- Good(12) Cover cornea 4mm

Children required general anesthesia. All the adults (except one apprehensive lady) were done under local anesthesia with 2% adrenaline xylocaine solution. Levator was approached through skin in all the cases of levator resection. If levator function was less than 4 mm, frontalis suspension was done and in mild ptosis with good levator function, conjunctivo muller resection was performed by everting the upper lid. Follow up ranged from one month to eighteen months.

## RESULTS

Out of 36 patients, 20 (55.6%) were congenital and 16 (44.4%) were acquired. Eight (22.2%) patients had neurogenic ptosis (5 had oculomotor nerve palsy, 2 had Marcus-Gunn jaw winking phenomenon, 1 had Horner's syndrome), 5 (13.9%) had mechanical ptosis (2 had giant papillary conjunctivitis, 2 had tumors and 1 had large chalazion), 17 (47.2%) cases had myogenic, 6 (16.7%) had aponeurotic ptosis (Table-1)

Twenty seven eyes of 15 patients were managed surgically. Nine were males and six were females. Age ranged from two years to seventy five years (mean  $22.6 \pm 21.84$ ). The procedures performed included, levator resection (Fig. 1) which was done in 18 (66.7%) eyes of 9 patients, frontalis suspension (Fig 2) done in 8 (29.6%) eyes of 5 patients, conjunctivomuller resection (Fig 3) in one (3.7%) eye who had unilateral Horner's syndrome (Table-2). Frontalis suspension was done with fascia lata in 2 eyes of 2 cases and with prolene suture in 6 eyes of 3 patients. Post operative complications occurred in 4 (14.8%) eyes. These included, development of signs of exposure keratopathy in both eyes of an old lady who had severe ptosis and full correction had been done. She required reoperation in which mild recession of levator was done to achieve final slight undercorrection. Overcorrection in 1 eye of a patient required partial cutting of levator subconjunctivally by everting the lid. Undercorrection with hypotropia, in one eye of

another patient, required inferior rectus recession (Table-3). All achieved good results in the end except one who had undercorrection (did not report back).

## DISCUSSION

Different types of ptosis require different treatment. Accurate diagnosis is thus of paramount importance. It is essential to recognize myasthenia gravis and in 90% of these patients an improvement of ptosis occurs with the ice test<sup>4,5</sup>. Mechanical due to giant papillary conjunctivitis improved with steroids. Neurological were advised follow up as they improved with time. Persistent ptosis not only was found cosmetically disturbing but also caused abnormal head posture including chin elevation, wrinkles on the forehead and updrawn eyebrows (due to overaction of frontalis). Head posture became normal after correction of ptosis.

Frontalis suspension is required in poor levator function whether due to isolated levator dystrophy or oculopharyngeal muscular dystrophy<sup>6</sup>. Excision of the levator muscle followed by brow suspension ptosis correction can reliably produce satisfactory cosmetic results with good symmetry of lid movement and position. It is used selectively in the normal upper lid in congenital ptosis with poor levator function and in both upper lids in synkinetic ptosis<sup>7</sup>. Fascia lata has been found to be the best autologous sling material<sup>8</sup>. In the present series, frontalis suspension was done with fascia lata in adults. As taking fascia lata was difficult before the age of 5-6 years, when there was danger of amblyopia, prolene suture was used. Mersilene mesh<sup>9,10</sup> with long-term functional results and low rate of complications is a suitable alternative to autogenous fascia lata as a suspensory material in ptosis surgery<sup>11,12</sup> and it has been used even in infants less than one year of age. Frontalis sling using a silicone rod<sup>13</sup> showed better cosmetic results and lower recurrence rate compared to preserved fascia lata up to 3 years after surgery<sup>14</sup>. For passing fascia lata, Wright needle having an eye was used while 1- O or 2- O Prolene suture has a long and strong needle which is sufficient for

making a passage. In all the cases eyebrow and eye lid incisions were made. A new technique claims Nylon suture passed in a circlage fashion via puncture wounds without making eyebrow incisions<sup>15</sup>. Frontalis suspension with the transposed levator palpebrae superioris has been done in severe jaw-winking with fair results<sup>16</sup>. In patients with deep superior sulci, postoperative visibility of the cables after frontalis suspension is sometimes cosmetically disturbing. In such patients, dermis-fat grafting has been found to improve the appearance<sup>17</sup>. Palmaris longus tendon has also been used for frontalis suspension<sup>18</sup>.

A modified technique has been described for patients with severe ptosis, who have insufficient levator function and for cases that have recurred after operations with other methods. In this, two orbicularis oculi muscle flaps are created, one superiorly based and one inferiorly based. The inferiorly based flap corresponds to the strip of pretarsal orbicularis oculi that is considered "excess" and is discarded in other methods. As much of the pretarsal part of the orbicularis oculi muscle as possible is preserved which enables immediate tight eyelid closure postoperatively and achieve dynamic, powerful eyelid-opening action. There is less risk of corneal damage in the early postoperative period and predictable eyelid-opening action<sup>19</sup>.

Levator resection through skin was the most commonly performed procedure in this series. Skin route has many advantages. Larger resections of levator are possible and revision of eye lid crease is possible. Blepharoplasty and ptosis repair can be performed as a combined procedure in the adult<sup>20</sup>. After levator resection results were found to be better for levator function > 8 mm as compared to 6-7 mm by some<sup>2</sup> while others found no difference<sup>21</sup>. A few found levator aponeurosis tuck procedure good in patients with congenital ptosis having good and fair levator function<sup>22</sup>. Others have found a small-incision, minimal dissection technique to be useful<sup>23,24</sup>. Ptosis due to disinsertion or thinning of the levator aponeurosis require surgical repair and a minimally invasive approach directed specifically at the levator

aponeurotic defect has been found useful<sup>25</sup>. In anophthalmic and microphthalmic patients with unilateral, moderate to severe upper eyelid ptosis, it is advisable to modify the prosthesis to vertically align the pupils before surgery<sup>26</sup>. A modified technique for levator resection as well as a newly designed and modified Berke ptosis clamp for levator resection surgery has been claimed to give good results<sup>27</sup>. The super maximum levator resection combined with superior tarsectomy has been found to correct severely ptotic eyelids with Berke levator function ranging from 3 to 4.5mm<sup>28</sup>.

The Müller muscle-conjunctiva resection (Fasanella-Servat operation) is effective for mild to moderate ptosis with good/normal levator function and for contour abnormality correction in patients with little or no ptosis. This procedure has the advantage of high reliability, is minimally invasive and leads to dry eye symptoms, only in exceptional cases<sup>29</sup>. Fibrin sealant (Tisseel) has been used<sup>30</sup> instead of suture for wound closure in ptosis repair with comparable eyelid position, fewer postoperative complications and fewer subsequent surgical procedures. Horizontal full-thickness eyelid resection has been claimed to give excellent result for patients with residual ptosis<sup>31</sup>.

Undercorrections and Overcorrections do happen and one should remain ready to tackle such cases. In a seventy five year old lady, exposure keratopathy resulted from dryness of eyes and full correction of ptosis. For dryness of eyes initially artificial tears and ointments were tried and the patient was encouraged to massage the lids to a slightly lower position. When condition did not improve, recession of levator was done to achieve final slight under correction. Undercorrection with hypotropia resulted in one eye of a patient having severe ptosis with 4 mm of levator function, probably due to pull on superior rectus while doing maximum levator resection. There might be abnormal attachments between levator and superior rectus in this case. Hypotropia was corrected by inferior rectus recession. For mild overcorrection (lid 1-2 mm above the normal

position) massage has been recommended. However in patients with filtering blebs, ocular hypotony may result from digital eyelid massage<sup>32</sup>. In one patient with overcorrection, initially massage of the upper eyelid was advised. When it did not work, the lid was everted and partial cutting of levator through conjunctiva was done. It can be done in out patient setting A few recommend recession of levator which is a lengthy procedure requiring reoperation in operation theater. In moderate (lid retraction 3 mm)/severe (lid retraction 4 mm) cases, different materials are required to fill the gap in the levator. These include sclera, buccal mucosa<sup>33</sup> etc. After Fasanella-Servat procedure, postoperative suture removal can achieve good adjustment. This process is easy, quick with minimal to no patient discomfort and allows for improvements in eyelid height and contour<sup>34</sup>. If the inverse Bell's phenomenon develops postoperatively, copious use of lubricant and close follow-up of corneal complication is required until it resolves<sup>35</sup>.

## CONCLUSION

Different types of ptosis should be identified. Levator resection and frontalis suspension can effectively correct the ptosis in most of the cases. Complications of the surgery are infrequent.

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**Table -1: Types of ptosis**

Types of ptosis (eye OPD)	No. of cases
Myogenic	17 (47.2%)
Aponeurotic	6 (16.7 %)
Mechanical	5 (13.9%)
Neurogenic	8 (22.2%)
Total	36

**Table - 2: Operations for repair of ptosis**

Operations performed	No. of eyes	No. of patients
Levator resection	18 (66.7%)	9
Frontalis suspension	8 (29.6 %)	5
Conjunctivomuller resection	1 (3.7 %)	1
Total	27	15

**Table - 3: Complications of ptosis operations**

Complications of operations	No. of eyes	No. of cases	Management
Development of dry eyes	2	1	Undercorrected
Overcorrection	1	1	Levator partially cut
Undercorrection, inferior hypotopia	1	1	Inf rectus recession
Total	4	3	



Fig 1: Levator resection



Fig 2. Frontalis suspension



Fig 3. Conjunctivo muller resection