

PTOSIS: MANAGEMENT PEARLS



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Blepharoptosis surgery is a common oculoplastic procedure done primarily to clear the visual axis, reduce amblyopia in young patients, and improve superior visual fields. The secondary goal is to improve cosmesis by producing symmetric lid crease and contour in the upper lids. The choice of surgical procedure varies depending on the amount of ptosis and levator function. However the choice of procedure can also vary from surgeon to surgeon. This is specially true for sling surgery where different materials and methods of passing the slings are available.

We therefore asked a panel of eminent oculoplasty surgeons from around the globe about their opinion and views on various aspects of management approach and treatment options through this questionnaire.

(AKG) Dr. Ashok K. Grover: is a prominent name in the realm of ophthalmology. He is an alumnus of Dr. Rajendra Prasad Eye Centre, New Delhi. He pursued his degree of MD from AIIMS. He started his professional life with the Maulana Azad Medical College, New Delhi as an Associate professor in the year 1984. In 1992, Dr. Grover joined Sir Ganga Ram Hospital as a senior consultant and is currently chairman of Dep't of Ophthalmology. He was awarded the prestigious Padamshri by the President of India in year 2009. He is Past President of AIOS, OPAL and APSOPRS. He is also chairman of Vision Eye Centres.

(SK) Dr. Sushil Kumar: (*Director, Professor and Head of Oculoplasty Services*) Guru Nanak Eye Centre, New Delhi.

(GS): Dr. Gangadhar Sundar: after obtaining his degrees from Madras Medical College, India and advanced subspecialty training from the Henry Ford Hospital, Detroit, specializes in the diseases and surgery of the Eyelids, Lacrimal system, Orbit & Oculofacial diseases and Ophthalmic Oncology. A strong believer of multidisciplinary, multimodality approaches to complex ocular and orbitofacial disorders, he was instrumental in starting various multidisciplinary services including the NUH Orbitofacial trauma service (with Craniomaxillofacial Surgeons), NUH Retinoblastoma service (with pediatric oncologists, neuro-interventional radiologists and pathologists), NUH Thyroid Eye Disease service (with Endocrinologists & immunologists) and the NUH Lacrimal service (with Rhinologists). He has trained Fellows from Singapore, Malaysia, Myanmar, Philippines, India, Thailand & the United Kingdom.

(AM) Dr. Anuj Mehta: is an alumnus of the Maulana Azad Medical College and Guru Nanak Eye Centre, from where he completed his graduation and postgraduation both. He had the privilege of being awarded the prestigious WHO fellowship for Oculoplasty from the L.V.Prasad Eye Institute, Hyderabad. He is presently working at the V.M.M.C & Safdarjung Hospital, New Delhi as Professor and Consultant and is the incharge of the Oculoplasty and Ocular Oncology clinic.

Q1: Of all the cases of ptosis encountered at your centre, how many of these are congenital or acquired? What is the proportion of severe, moderate or mild ptosis?

AKG: The spectrum of ptosis cases operated has undergone a great change over the last 2 decades. From about 90% of cases being congenital earlier to about 70% congenital and 30% acquired now. About 60% of all congenital cases are moderate, 30% severe and 10% mild. About 80% of acquired cases are severe.

SK: Most of the cases of blepharoptosis presenting in our centre are of congenital variety and they constitute 90-95% of all ptosis cases. Acquired variety of ptosis remain comparatively less. Severity wise division of congenital ptosis cases shows mild ptosis (<2mm) accounting for roughly 10-15%; moderate ptosis (>2 mm <4 mm) constitute the maximum number (approx. 65%) and the severe ptosis (>4 mm) accounting for (15-25%).

GS: Acquired 85% Congenital 15%, Severe 15%, Moderate 65%, Mild 20%.

AM: We see about 50-60 patients of ptosis in a year. Approximately 80% of these patients have congenital ptosis, 70-75% of patients attending our clinic have severe ptosis, 20% have mild ptosis and 5-10% have moderate ptosis.

Q2: What are the key essential points in a ptosis examination? How do you assess severity of congenital ptosis especially in kids less than 3 years of age where cooperation and comprehension can pose a major problem?

AKG: I would like to stress the two key inputs in decision making – amount of ptosis and levator action by Berke's method. Of course ocular motility, Bell's phenomenon are other essential ingredients. In children, younger than 3 years the important assessment is whether the pupil is covered or not and whether the head posture necessary to use the eye is unacceptably high. Simple observation in the clinic usually suffices.

SK: Detailed workup of a ptosis case is must for the best outcome of any ptosis procedure that is chosen. Amount of ptosis, levator muscle action and the Bell's phenomenon status must be assessed along-with other parameters which include visual acuity/ amblyopia, ocular motility imbalance/strabismus especially the vertical squint, tear film status, jaw-winking phenomenon, any diurnal variation in the amount of ptosis etc. For this detailed history, neurologic workup and some pharmacologic tests if required needs to be done.

If the patient is a child where cooperation cannot be sought a careful observation of the child is made for any chin elevation, head tilt, movement of the upperlid on sucking and also the lid covering of the pupil region. For this an ambient environment for the child is must. Surgeon should be patient enough for

the observations. If possible a note should be made of behaviour of the child on occlusion of one eye and also behaviour of the everted upperlid in up and down gaze by showing a toy.

GS: Unilateral or bilateral?

MRD1, Levator function (mild, moderate or severe dysfunction), Simple vs Atypical/Complex congenital ptosis, normal Bell's vs reverse Bell's phenomenon, Visual disability vs Cosmesis, Parents/patient expectations –realistic and unrealistic, acceptance of possible undercorrection/ overcorrection/revision 15-20%.

Children: Chin elevation/AHP, Eyelid crease (absent vs moderate), mental make up/ of child/parents.

AM: The key points in examination of a ptosis patient are chin elevation, frontalis action. whether pupillary area is covered/uncovered, any associated amblyopia/ refractive errors, extraocular movements and any abnormal innervation. In children of less than 3 years of age, the primary aim of examination is to assess any risk of amblyopia and severity of ptosis. We look for any chin elevation, level of brow to assess frontalis use, whether pupillary area is covered or uncovered, presence or absence of lid crease, any associated extraocular movement abnormality or Marcus Gunn phenomenon.

Q3: What are your preferred choices as the primary modalities of management in cases of mild, moderate and severe ptosis?

AKG: I prefer Fasanella Servat Surgery for mild cases. Levator resection for the moderate cases and Frontalis Sling for the severe cases, with bilateral Fascia Lata Sling Surgery being the gold standard.

SK: Choice of procedure for the correction of ptosis is guided by the levator muscle action, grade of the ptosis and status of Bell's Phenomanon. For severe bilateral ptosis cases suspension procedure/sling surgery is preferred. Fasial Lata is the preferred suspension material. If this can not be harvested silicone rods or ePTFE (Gore Tax) may be tried. For moderate ptosis cases with fair to good levator function, LPS resection is considered. For mild ptosis with good or excellent levator function, Fasanella-Servat operation is one option, otherwise a small resection of LPS (12mm) may be the other choice.

GS: Adult: Mild – Conj mullerectomy with/without blepharoplasty/crease formation
Moderate: Levator advancement
Severe: levator resection
Congenital: Mild – Observation, Levator advancement/resection
Moderate – Levator resection, Supramaximal levator resection
Severe – Supramaximal levator resection/Frontalis suspension

AM: In severe cases with poor LPS action, we do frontalis sling with silicon rod. In children less than 3years of

age, frontalis sling with 4-0 Ethibond suture.
In moderate cases, LPS resection.
In mild cases with positive phenylephrine test, Fasanella Servat surgery and in patients with negative phenylephrine test, LPS resection/advancement.

Q4: What would you consider as the appropriate age to operate a child with mild, moderate or severe congenital ptosis?

AKG: The preferred age for surgery is 3 years onwards, except in cases where induction of amblyopia is a consideration. In those cases surgery may be done at the age of a few months, as soon as the general anaesthesia is considered safe. Mild cases often present a little late for surgery. Severe cases where autologous Fascia Lata is the material of choice, we would wait till 4 years of age for adequate development of the fascia.

SK: A child with severe ptosis presenting with chin elevation and pupil covered with the upperlid should be taken up for temporary sling surgery as early as possible. It is for the prevention of amblyopia. Here surgeon must examine the sleeping child to evaluate the Bell's Phenomenon or ask the parents for the rolling up of the eyes during sleep. Children with mild to moderate ptosis should undergo refraction test and they may be followed up on 6 monthly basis for any change in the severity of ptosis as well as levator muscle function. Moderate ptosis cases may be operated around the age of 5 years when the child is cooperative for the assessment.

Mild ptosis cases may be followed up to the age of adolescence.

GS: Mild – as late as possible, pre primary school 5-6 yrs.

Moderate – 'age of awareness' by the child, generally girls earlier than the boys.

Severe: whenever indicated.

AM: A child with severe ptosis and at risk of developing amblyopia as early as possible and in moderate or mild ptosis, around school going age (4-5years).

Q5: What is the procedure of choice in mild congenital ptosis with good LPS action? Why?

AKG: For cases of mild congenital ptosis with levator action exceeding 10 mm and a good lid crease, my first choice is the modified Fasanella Servat surgery (Betharia, Grover & Kalra, BJO 1982). The reason I choose this procedure is its high predictability, excellent contour and absence of any dry eye symptoms or lid instability in over 300 cases performed.

SK: I practice both Fasanella-servat operation and also small LPS resection. If you want to avoid the double upper eyelid creasing after FS open. LPS resection is the right option.

GS: Adult mild ptosis: Conj mullerectomy with bleph/

crease formation.

Simpler, faster, predictable, less morbidity, good outcomes, patient acceptance, etc.

AM: In mild ptosis with good LPS action, positive phenylephrine test and tarsal height of more than 8mm: Fasanella Servat surgery.

If tarsal height is less than 8mm: Mullerectomy

In case of negative phenylephrine test, LPS advancement.

Q6: Which approach do you prefer for LPS resection? Conjunctival or skin? Why?

AKG: Skin approach has been my preference. The reasons are easy orientation, applicability to all cases including traumatic ptosis, resurgery patients and cases requiring Whitnall's sling. The lid fold creation is excellent and the tarsal show can be matched quite well.

SK: I prefer skin approach for most of the cases of LPS resection as you can match the skin crease with the fellow eye and the amount of resection you wish to do can be gauged.

Conjunctival approach is used for the revision cases only.

GS: Transcutaneous lid crease approach.

Familiarity, training, exposure, ability to perform a bleph/crease formation at the same time.

AM: Skin approach easier, with full view of relevant anatomy and good dynamic crease.

Q7: In which group of patients would you like to do frontalis sling surgery?

AKG: I would do a Frontalis Sling surgery in severe congenital simple ptosis with levator action of 4 mm or less, jaw winking ptosis (after levator excision) and blepharophimosis syndrome. I also choose it in acquired neurogenic and myogenic ptosis.

SK: Frontalis sling surgery is done for bilateral severe ptosis cases with poor LPS action and good Bell's Phenomenon. It is also done for Marcus Gunn ptosis cases where Jaw Winking is severe and the scleral show is prominent.

GS: Pediatric/Congenital: Severe ptosis, with absent <2mm Levator Function, surgery <2yr (Silicone rod), Surgery > 3 yrs Autologus Fascia Lata (AFL), Adult: Myopathic ptosis.

AM: In patients with severe ptosis and poor LPS and those who are adept to using their frontalis muscle.

Q8: Do you assess the frontalis action prior to surgery? In cases of severe ptosis with poor LPS where frontalis action is also poor or the patient is not adept to using frontalis muscle, which procedure do you prefer?

AKG: I have not really found Frontalis action to be a useful predictor in decision making and do not use it regularly.

SK: Any severe ptosis case will show forehead Winking

(implying that frontalis is being used) and indistinct upper eyelid crease. Person not using frontalis shall have chin-elevation to keep the pupillary area clear of any obstruction. So in any situation sling surgery is desirable.

GS: May combine levator resection with frontalis suspension or periosteal fixation of Frontalis suspension material.

AM: Yes we assess frontalis action prior to sling surgery. In cases where patient is not adept to using frontalis, the ideal surgery would be Whitnall Sling but we have very limited experience with this procedure.

Q9: In cases of unilateral severe ptosis with poor LPS, do you perform unilateral or bilateral sling?

AKG: My first choice in unilateral severe ptosis is contralateral levator disabling (excision) with bilateral Fascia Lata Sling Surgery to provide the best possible symmetry. In the cases that elect unilateral surgery, silicone sling is the procedure chosen.

SK: Theoretically one may consider unilateral sling surgery, but I prefers combined procedure of LPS resection alongwith tarsectomy if unilateral surgery is consented. Otherwise to avoid any cosmetic blemish due to the condition or unilateral procedure performed (especially the sling surgery), choose bilateral suspension procedure.

GS: Seldom, only if parents agreeable.

AM: Unilateral sling with silicon rod.

Q10: Which material do you prefer for sling? And why?

AKG: Fascia Lata is the material of first choice in all bilateral congenital cases. The reason for the choice is almost universal take, very low rates of recurrence, granuloma formation or infection. The appearance of the lids is very close to the natural. Silicone is the material of choice for unilateral surgery, for cases with restricted ocular motility and relatively poor Bell's phenomenon (greater elasticity, adjustability and reversibility).

SK: Fascial Leta is the standard for the sling surgery. Other option is the silicon rod which must be passed in the submuscular ePTFE may also be tried plane and its knots must be deeply buried.

GS: Temporizing/Myopathic ptosis: Silicone rod – simple, adjustable, repeatable, LA/shorter GA Permanent/non myopathic ptosis: AFL – inert, predictable, long term outcomes

AM: Silicon rod because it is stretchable, elastic, easily adjustable, avoids extra surgery for harvesting fascia lata, less time consuming.

Q11: Which technique of passing the sling do you commonly use? How do you manage the cases where the droop is predominantly lateral or medial droop?

AKG: I prefer to use the double triangle technique with 4 eyelids incisions (Modified Crawford's) for Fascia Lata and a Fox's pentagon technique for the silicone sling. One does not really need to modify the technique of passing the sling for variations in the contour of ptosis.

SK: Crawford's double triangle or Fox's pentagon method for sling surgery may be used. Double triangle techniques helps in the correction of unequal ptosis on either end of the palpebral tissue.

GS: Pentagonal sling.
Intraoperative adjustment with a deeper pass at the brow/rim at the corresponding side.

AM: We use the "Mehta's Modification of Modified Crawford technique" (Mehta A, Abrol S, Garg P. Mehta's modification of Crawford's technique for frontalis sling surgery with silicone rod. Delhi J Ophthalmol 2015;26:115-17) which gives better control of curvature, a very good crease, avoids forehead scar and can take care of predominant medial or lateral droop.

Q12: How do you manage cases of Marcus Gunn Phenomenon? Do you perform unilateral or bilateral slings for unilateral Marcus Gunn Phenomenon? Do you only disinsert the LPS or do resection also?

AKG: I prefer bilateral levator disabling (excision of a large piece of levator aponeurosis, including a thorough cutting of horns) with bilateral fascia lata sling as the first choice for cases of jaw winking.

SK: If the Jaw-winking is minimal, one may attempt the LPS resection. If the Jaw-winking is very prominent, always choose the bilateral sling surgery alongwith excision of LPS muscle on both the sides.

GS: Mild - Moderate: routine levator resection.
Severe: levator extirpation with frontalis suspension- unilateral or bilateral.

AM: We prefer LPS disinsertion with resection with frontalis sling using silicon rod. We have done only unilateral slings in such cases.

Q13: What is your preferred mode of treatment in cases of CPEO, CFOEM, MED with severe ptosis?

AKG: In cases of CPEO, CFOEM and MED associated with severe ptosis, a conservative functional silicone sling is my first choice as it has a greater elasticity and results in a better eye closure. Also silicone sling correction may be adjusted or reversed in the rare case where exposure keratopathy cannot be control by conservative therapy.

SK: If Bell's Phenomenon is not good, choose critch-glasses alongwith topical lubricants. Option of small resection of LPS may be there theoretically but postoperative corneal explosive appreciation must be weighed against correction to be achieved.

GS: When possible levator resection with lower eyelid tightening/lateral canthoplasty.
Frontalis suspension with Silicone rod along with

aggressive blepharoplasty and lid tightening and crease formation.

AM: After taking care of the extraocular movement part, we prefer to do the frontalis sling with silicon rod just uncovering the pupillary area. We have 15 patients in our follow-up with good results.

Q14: At what level do you leave the upper lid at the end of the sling surgery? Is it different for patients who are operated under LA or GA?

AKG: With Fascia Lata I would tighten it to level where I achieve maximum height without lifting it off the globe. With Silicone Sling one has to control the tightening to get a small overcorrection, while maintaining a good contour. No I do not differentiate between cases under local and general anaesthesia except compensating for rotation of the globe under general anaesthesia.

SK: Keep the upperlid margin at the limbus. Most of the time lid comes down a little because of orbicularis being used by the patient and who has habitual national of small palpebral fissure.

As regards G.A. it depends upon the level of anaesthesia, the agent being used and the technique by anaesthesia being going. But the practice is to keep at the limbus.

GS: Overcorrect – 2-3 mm.
Generally no.

AM: We have not been able to develop a normogram. In simple unilateral cases done under local anaesthesia, we ask the patient to sit and then finalise the height leaving the lid about 1-1.5mm higher than the normal eye. In cases done under general anaesthesia, the lid is left at a level 2-3mm above the level of the normal eye.

Q15: In how many percent of patient undergoing sling surgery, do you experience post-op over-correction or under-correction and how many of these require adjustment?

AKG: Under or overcorrections are fairly rare with fascia lata sling. With Silicone one does get overcorrections occasionally (? 10%), which do tend to decrease with time. Most undercorrections in silicone sling usually appear later. Some of the unilateral cases, that are undercorrected, really are habitual undercorrections due to inadequate use of Frontalis.

SK: Over and under corrections are part and parcel of the ptosis procedures. But after sling surgery under correction is most of the time, due to slippage of the material and is obvious within 1 or 2 weeks of the surgery. Regarding over creation it is really to be assessed after the lid inflammation has decreased. One may wait for 2-3 weeks and after that only decide for the intervention. And this is very-very occasionally needed.

GS: Overcorrection – Seldom
Undercorrection – 10% approx.
Adjustment – 10% approx.

AM: The incidence of over correction is very low and not more than 2-3%. However, under correction is not uncommon. Approximately 15% of patients are undercorrected and require readjustment.

Q16: In what percentage of cases have you noticed recurrence of ptosis due to slippage of breakage of sling and what steps do you take during surgery to avoid it?

AKG: The recurrence of ptosis due to slippage occurs in about 10% of cases with silicone sling. It is best avoided by ensuring adequate tissue between the eyelid incisions and the lid crease incision and avoiding excessive tightening. Breakage of sling is much rarer.

SK: Reported incidence is 7-44%.

If there is a slippage or breakage of the sling, it is obviously noticed within 2 weeks of the surgery. Slippage occurs if anchoring of final knot on the forehead to the underlying frontalis muscle and also on tarsus is not proper. Proper burying of the sling knot is must to avoid exposure and infection. Autologous fascia-lata used with proper width of the strip made shall not show this and the fibrovascular tissue adhesion of fascia-lata also helps in the prevention of slippage.

GS: Only rarely, avoiding tight sutures to secure it eg prolene, nylon, avoid skin crease incision whenever possible, avoiding unnecessary dissection along sling tracks

AM: Rarely. The sling material should not be held with toothed or sharp instruments to prevent breakage. The sleeve should be tightened by passing a prolene suture around it to avoid slippage.

Q17: In how many percentage of cases, do you come across granuloma formation following sling surgery and how do you manage them?

AKG: You virtually never get a granuloma formation with fascia lata, provided you bury your knots deep. It is quite uncommon with silicone while with ePTFE or mersilene it was commoner. A persistent granuloma usually requires removal of the sling.

SK: It may be around 7-10% in cases with synthetic material. Granuloma formation/abscess formation cases are seen if aseptic precautions not followed. Patients fascial hygiene is also an important factor. If the sling material is not buried properly, the skin infection may be the contributing factor.

If granuloma has formed one may attempt local lavage with Betadine alongwith systemic antibiotics. If frank abscess is there, it should be drained and the sling material removed. Follow up these patient and re-surgery should be considered after 3 months only.

GS: Seldom. Usually either due to an inflammatory suture material eg silk or if the silicone rod is either too superficial or the cut ends are not sufficiently buried in a deep pocket at the midforehead.

AM: During the initial phase of transition from fascia lata to silicon sling (2008-2009), the granuloma formation rate was about 10-15% but now it has come down to less than 5%. The single most important step to prevent granuloma formation is proper burial of the silicon sling and the prolene suture in the tunnel.

In a small study conducted in our dep't (Mehta A, Naik M, Abrol S, Garg P, Joshi M: Granuloma after sling surgery: an attempt to answer the? Why? and? What to do next? International Ophthalmology 2016, DOI: 10.1007/s10792-016-0342-0) in all cases of granulomas, the common finding was exposure of either sling material or prolene suture. These patients do not respond to oral antibiotics or steroids and definitive treatment is explantation of the sling. The repeat sling surgery can be done after 3 months.