

Effect Of Ptosis Surgery On The Astigmatic Refractive Error In Pediatric Patients In Ahmedabad, India – A Prospective Study.

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Abstracts: Background & Objective: To determine the effect of ptosis surgery on the astigmatic refractive error in pediatric patients. Methodology During the period of June 2005 to October 2007, a prospective study of 30 patients was carried out among patients attending department of ophthalmology, vadilal sarabhai hospital Ahmedabad. All eyes were refracted with 2% homatropine under full cycloplegia and were screened on keratometer for objective measurement of corneal curvature. All findings were recorded as per performa and analyzed at completion of the trial. Descriptive statistics were calculated. Level of significance was set at $p \leq 0.05$. Results: Developmental ptosis was seen in one eye in 26 patients. Only 4 patients (13.4%) had bilateral involvement. Fifteen patients had severe degree of ptosis (50%). When unilateral it was seen more often affecting left eye. A high incidence of amblyopia was associated with astigmatism in congenital ptosis. Conclusion: Patients with congenital ptosis should have cycloplegic refraction as soon as possible, and long-term postoperative refraction checkup is also recommended. [Pujara P NJIRM 2015; 6(3):6-9]

Key Words: amblyopia, eye, pediatric, ptosis.

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Introduction: Ptosis is the medical term for drooping of the upper eyelids. This lowering of the upper eyelid margin may cause a reduction in the field of vision when the eyelid either partially or completely obstructs the pupil. There are many causes of ptosis including age related weakening of the muscle, congenital weakness, trauma, or sometimes neurologic disease. As we age, the tendon that attaches the levator muscle, the major muscle that lifts the eyelid can stretch and cause the eyelid to fall. Ptosis can be corrected surgically and usually involves tightening the levator muscle to elevate the eyelid. In severe ptosis, when the levator muscle is extremely weak, a “sling” operation may be performed, enabling the forehead muscles to elevate the eyelids. Other types of repair may include surgery on the muscle on the inside of the lid in cases of small amounts of ptosis. It is debated whether severe blepharoptosis per se interfere with development of normal visual function! Harrad et al (1988)¹ reported that severe ptosis rarely interfered with development of normal visual activity. However, experimental and clinical observations of Wiesel and Hubel on kittens showed that suturing lids together led to form vision deprivation. Bonaccorsi et al² have shown that irreversible loss of visual acuity could follow in eyes with deprived visual stimulus in early life. Kasae³ argued that if it was

not so there was no justification in correcting ptosis in a young child. Association of refractive errors too has diverse opinions. Jody A⁴ have documented developmental axial myopia in prolong eyelid closure whereas works of Brendan T. et al⁵ have shown inconsistent relationship of ptosis with any type of refractive error. There has been report of association of astigmatism in ptotic eye.⁶ Besides anomalies of refraction and anisometropia another area of controversy is the nature of amblyopia in patients with development of ptosis; since many eyes have associated strabismus too.^{7,8,9} It is natural that obvious cosmetic disfigurement could easily mask presence of visual deficit related to refractive status or strabismus and likewise other factors. Unless looked for, these anomalies could lead to irreversible visual loss in a child. So present study was undertaken to determine the effect of ptosis surgery on the astigmatic refractive error in pediatric patients attending vadilal sarabhai hospital Ahmedabad.

Material and Methods: During the period of June 2005 to October 2007, a prospective study of 30 patients was carried out among patients attending department of ophthalmology, vadilal sarabhai hospital Ahmedabad. Before the beginning of the study, ethical approval was obtained from the ethical committee of VS medical college,

Ahmedabad, India. Informed consent was obtained from all participants. Each patient was studied in detail with assessment of laterality, degree and levator function in ptotic lid and visual function deficit. All eyes were refracted with 2% homatropine under full cycloplegia and were screened on keratometer for objective measurement of corneal curvature. All findings were recorded as per Performa and analyzed at completion of the trial.

Statistical analysis: The data was coded and entered into Microsoft Excel spreadsheet. Analysis was done using SPSS (Statistical package for social science) version 15 (SPSS Inc. Chicago, IL, USA) Windows software program. The variables were assessed for normality using the Kolmogorov-Smirnov test. Descriptive statistics were calculated. Level of significance was set at $p \leq 0.05$.

Results: Developmental ptosis was seen in one eye in 86.6% of patient. Only 4 patients (13.4%) had bilateral involvement. (Table 1) describes Laterality Of Congenital Ptosis.

It was observed that most patients, 15 had severe degree of ptosis (50%), 10 patients (33.3%) had moderate degree of ptosis and 5(17%) had mild degree of ptosis. (Table 2).

LPS action was found to be poor in 13 patients (43.3%), 8 patients (26.6%) had fair LPS action while 9 patients (30%) had good LPS action. (Table 3).

With the rule astigmatism was present in 19 patients (63.3%), against the rule astigmatism was present in 6 patients (20%) while oblique astigmatism was present in 2 patients (6%). (Table 4)

Among all 50% patients were normal, forty percent patients had Amblyopia and only 10% patients had strabismus. (Table 5)

To determine the effect of ptosis surgery on the astigmatic refractive error in pediatric patients, we assessed 30 eyes postoperatively. (Table 6) Twenty-six eyes of unilateral cases were used as controls. Out of 30 patients of the study group 27 patients (90%) were showing astigmatism and 3 patients

(10%) were normal. Among astigmatic patients in the study group myopic astigmatism was seen in 14 patients (51.8%) and hypermetropic astigmatism was seen in 13 patients (48.2%). Average change in astigmatism in myopic patients was 0.5 D and in hypermetropic patients 0.35 D. There was an overall increase in average astigmatic refractive error by 0.43 diopters; while the control group increased 0.17 D. Results were similar for both frontalis slings and levator resections. Careful monitoring with postoperative refractions is required in patients with congenital ptosis.

Table 1 : Laterality Of Congenital Ptosis Among Patients

LATERALITY	NUMBER (%)
UNILATERAL	26 (86.6)
BILATERAL	04 (13.4%)
TOTAL	30

Table 2 : Severity Of Ptosis Among Patients

Severity	Number (%)
Mild	5 (17)
Moderate	10 (33.3)
Severe	15 (50)

Table 3 : Lps Action Among Patients

Lps Aciton	Number (%)
Poor(<4mm)	13 (43.3)
Fair (4-7mm)	8 (26.6)
Good(>8mm)	9 (30)

Table 4 : Astigmatism In Patients With Ptosis

Type	Number (%)
With The Rule Astigmatism	19 (63.3)
Against The Rule Astigmatism	6 (20)
Oblique Astigmatism	2 (6)

Table 5 : Visual Function In Congenital Ptosis

Visual Funcion	Number (%)
Normal	15 (50)
Amblyopia	12 (40)
Strabismus	3 (10)

Table 6 : Change In Astigmatism After Ptosis Surgery

	No. Of Patients	Average Preop (D)	Average Post Op(D)	Difference (D)
Emmetropia	3	0	0	0
Astigmatism	27	1.28	1.71	0.43
-Myopic	14	1.00	1.50	0.5
-Hypermetropic	13	1.57	1.92	0.35

Discussion: In this prospective clinical trial on change in astigmatism after ptosis surgery, 30 patients with developmental ptosis were evaluated primarily to see the effect of ptosis surgery on the astigmatic refractive error.

Laterality of developmental ptosis when looked for it was observed that 26 cases (86.6%) had unilateral ptosis with predominant affection of left eye (15 cases) and 4 cases (13.4%) had bilateral congenital ptosis. The eyes on the contra lateral side in unilateral cases served as the control group. Severity of ptosis with degree of ptosis when evaluated, it was observed that most patients, 15 had severe degree of ptosis (50%), 10 patients (33.3%) had moderate degree of ptosis and 5(17%) had mild degree of ptosis. 13 patients (43.3%) showed poor IPS action, 8 patients (26.6%) had fair LPS action while 9 patients (30%) had good IPS action. High astigmatism is frequently associated with congenital ptosis. Ptosis surgery itself may also induce astigmatic refractive change that will cause amblyopia in young children. The purpose of this study was to assess postoperative astigmatic change. Out of 30 patients of study group 3 (10%) had emmetropia, 14 (46.6%) had myopic astigmatism and 13 (43.3%) had hypermetropic astigmatism. Average change in astigmatism in myopic patients was 0.5 D and in hypermetropic patients 0.35 D. There was an overall increase in average astigmatic refractive error by 0.43 diopters; while the control group increased 0.17 D. Results were similar for both frontalis slings and levator resections.

Study conducted by Friling at al (2004) noted that there is an inverse relation of horizontal and

vertical keratometric values with both postconceptional age and birth weight. Highest readings were noted in the babies with the lowest birth weight and youngest postconceptional age. The decrease in corneal dioptric power to normal values is linear and is apparently part of the normal ocular maturation.¹⁰ Study by Stark N and Walther C¹¹ on refractive errors, amblyopia and strabismus in congenital ptosis revealed 70% had a refractive error, 43% had an astigmatism of more than 1.0, 55% had anisometropia, 27.5% had concomitant squint and 50% amblyopia.

A high incidence of amblyopia was associated with astigmatism in congenital ptosis. Postoperative astigmatic study also revealed some change in astigmatic power.^{12, 13, 14, 15} Patients with congenital ptosis should have cycloplegic refraction as soon as possible, and long-term postoperative refraction checkup is also recommended.

Conclusion: In this prospective clinical evaluation of 30 patients having congenital ptosis, it was found that Congenital ptosis was unilateral in 86.6% and bilateral in 13.4% patients. When unilateral it was seen more often affecting left eye. A high incidence of amblyopia was associated with astigmatism in congenital ptosis. Postoperative astigmatic study also revealed change in astigmatic power. Patients with congenital ptosis should have cycloplegic refraction as soon as possible, and long-term postoperative refraction checkup is also recommended.

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