

STUDY OF TITRATION OF SURGICAL OUTCOME IN ESOTROPIA WITH MODERATE TO HIGH DEGREES OF HYPERMETROPIA

Heba Nabil Sabry, Karim Mahmoud Nabil Mohamed Kamel, Hazem Wahid Kandil, Mohamed Fakeeh Hassen Metwally Ghattas

Department of Ophthalmology, Faculty of Medicine, Alexandria University

Introduction

Esotropia is the most common type of strabismus. It is classified as primary and secondry esotropia. Esotropia can arise for a variety of reasons, including hypermetropia. Accommodative esotropia (AE) is the most common type of childhood esotropia. It is classically divided into 3 categoriesfully refractive (AE), non-refractive and Partially (AE).Timely and full correction of the hyperopic refractive error protects normal binocular vision. Manage any associated amblyopia. Surgical correction is recommended if esotropia exceeds 15 prism diopters. The preferred surgery is recession of medial rectus muscle. Regular surgery of (PAE) is based on the maximal non-accommodative component of the esodeviation as measured through the full cycloplegic correction. The surgical amount for recession of bilateral medial rectus muscle for PAE with excessive convergence is usually difficult to determine, and under correction or residual esotropia is common in these patients. Therefore, strategies like augmentation surgery has been proposed and performed to identify surgical targets for patients with esotropia associated with high hypermetropia. An increase in the surgical amount may also be required in very high hyperopic individuals.

Aim of the work

Study surgical outcome in esotropia with moderate to high degrees of hypermetropia equal or more than 4 diopters. We also aim to assess the use of surgical tables as surgical guideline or should be altered by each surgeon in light of their unique outcomes.

Patients and Methods

The study included 30 subjects recruited from the Ophthalmology Department at Alexandria Main University Hospital and Private Centers. The Patient aged from 3 years, with manifest esotropia, with moderate to high hypermetropia equal or more than 4 diopters. The patients in the study was subjected to Full history about age of presentation / referral, sex, past medical history, past ocular history, family history, age of esotropia onset, Average time between the onset of esotropia to spectacle correction, Average duration between onset of constant esotropia to strabismus surgery.

The patients also was subjected to complete clinical examination including visual acuity, ocular motility tests, measurement of angle of deviation, refraction and cycloplegic refraction for those under 8 years old and assessment of sensory changes and detection of suppression and anomalous retinal correspondence (ARC) by: Worth’S 4 dot test. The child is seen at 3 months interval and refraction is done every 6th month. If remaining angle persists after 2nd prescription for glasses, list for surgery. Surgery will be done on the remaining angle only and will be calculated from the standard surgical table, the amount of bilateral medical rectus recession was determined from it, based on the pre- operative measurement of the near deviation with spectacle correction.

Results

Table 1: Distribution of studied cases according to sensory fusion and stereopsis with time span between the onset of esotropia to spectacle wear (n=30)

	Worth 4-dot testing		% sensory fusion
	BSV / stereopsis	non	
spectacle wear within 6 months of esotropia onset (n = 8)	7	1	87.5%
spectacle wear 6 months or longer after the onset of esotropia (n = 22)	12	10	54.5%
Total (n = 30)	19	11	63.3%

Seven of the eight patients (87.5%) who had hyperopic optical correction within six months after the onset of their esotropia showed signs of sensory fusion. 54.5% (12 out of 22 patients) of patients who underwent optical correction 6 months or more after the beginning of esotropia showed signs of sensory fusion (P = 0.02) denotes statistical significance.

Augmented surgery procedure has statistically significant better postoperative result. It has high rate of alignment success (within 10 PD of or thotropia) of 68.2%, with an under-correction rate of 9.1% (residual esotropia) and over - correction rate of 22.7% (consecutive exotropia). The regular surgery procedure has rate of alignment success (within 10 PD of orthotropia) of 50.0% with an under-correction rate of 50.0% (residual esotropia) and over-correction rate of 0.0% (consecutive exotropia).

Table 2: Comparison between augmented and regular muscle recession surgery

	Type of surgery				Test of sig.	p
	Augmented (n = 22)		Regular (n = 8)			
	No.	%	No.	%		
Angle CC						
Min. – Max.	15.0 – 35.0		25.0 – 35.0		U = 53.0	0.107
Mean ± SD.	25.05 ± 6.04		29.38 ± 3.20			
Median	25.0		30.0			
Residual angle (6 months)						
Min. – Max.	-25.0 – 18.0		0.0 – 8.0		U = 42.0*	0.031*
Mean ± SD.	-2.50 ± 9.0		3.50 ± 3.85			
Median	0.0		2.50			
Mm of ms movement						
Min. – Max.	4.50 – 6.0		4.0 – 5.50		t =2.207*	0.036*
Mean ± SD.	5.18 ± 0.52		4.69 ± 0.59			
Median	5.0		4.50			
Results						
Residual esotropia	2	9.1	4	50.0	c ² =5.867*	MCp=0.032*
Consecutive exotropia	5	22.7	0	0.0		
orthotropia	15	68.2	4	50.0		

χ²: Chi square test MC: Monte Carlo t: Student t-test
U: Mann Whitney test p: p value for comparing between
Augmented and regular *: Statistically significant at p ≤ 0.05

Conclusion

Shorter the time between the onset of esotropia and the use of hyperopic glasses, the better the functional results and rate of sensory fusion development. Surgery for esotropia associated with high hypermetropia has better outcome with high rate of surgical success and low rate of under-correction or overcorrection with augmented bilateral medial rectus recession.