BARE SCLERA CLOSURE: A SURGICAL APPROACH IN CONGENITAL ESOTROPIA

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Background. The purpose of the authors is to evaluate the efficacy of the bare sclera closure (conjunctival and episcleral tissue recession in association with bimedial recession) in a large cohort with congenital esotropia.
Methods. The charts of 140 patients with congenital esotropia, operated on with this tech-nique, were analysed; each patient was assigned to a single group on the basis of their pre-op angle, respectively between 35 and 40 pd (36 cases); between 40 and 50 pd (66 cases); more than 50 pd (38 cases).
Results. The results were statistically analysed; the p value was statistically significant in the group of patients with a pre-op deviation between 35 and 40 pd with a follow up of 12 months.
Conclusions. This technique is a safe and effective procedure and can improve the surgical result through a uniform approach (2 muscles operated on) versus a selective approach (3 or more muscles operated on).

INTRODUCTION

The main aim in congenital esotropia surgery, and on the whole strabismus surgery, is to ob-tain the best ocular alignment through the least traumatic surgical approach. This assertion is particularly truthful in regard to congenital esotropia where the large angle needs a large amount of surgery.
Some Authors perform surgery on two muscles initially, regardless of the preoperative devia-tion (uniform approach); other surgeons approach is to operate on three or four muscles, tai-loring the amount of surgery to the pre operative deviation (selective approach). Another problem concerns the measurement of recession[1] from the muscle insertion or from the limbus; the medial rectus muscle insertion site is close to the limbus in childhood, then it recedes until it is 5.5mm from the limbus in adulthood.
According to Barsoum- Hosmy1 we can divide the growth of the globe into three phases (figure 1): a postnatal phase of rapid growth between birth and 18 months of age during which the axial length of the globe increases by 4mm; a phase of moderate growth between 2 and 5 years of age during which the length increases by 1,1 and 1,2mm; and a phase of slow growth between 5 and 13 years of age, during which the length increases by 1,3 to 1,4mm. Some Au-thors have shown that larger 2 muscle recession of 6- 7, and even 8mm can be performed in patients with larger angle congenital esotropia with results similar to that obtained with simul-taneously performed surgery on 3 or 4 muscles. The disadvantage of augmented bimedial re-cession can be an increased incidence of late consecutive exodeviations and a severe limitation of adduction. We report our experience in congenital esotropia with a bimedial recession aug-mented with a bare sclera closure (BSC) (recession of the conjunctiva and the episclera).

SUBJECTS AND METHODS

We reviewed medical records of 140 consecutive patients with congenital esotropia who un-derwent bimedial rectus recession plus BSC. The patients'age were between 24 months and 4 years. Patients were excluded from this study for one or more of the following reasons: onset of the deviation after 6 months; preop deviation less than 35 pd; A and V patterns, accom-modative factors (hyperopia greater than 2 diopters); follow up less than 1 year: significant neurological deficit. Each patient was assigned to their group on the basis of their pre-op angle, respectively between 35 and 40 pd (36 cases); between 40 and 50 pd (66 cases); more than 50 pd (38 cases).
We used alternate prism and cover test with the child fixating on an accommodative target at distance and at near. Because of the young age of our patients the Krimsky test was used in most cases. Cycloplegic refraction was performed using tropicamide 1% or atropine 0.5%. All patients in the first group (35 – 40 pd) underwent 5.5mm bimedial recession in addition to BSC; all patients in the second group (40 – 50 pd) underwent 5.5mm to 6.5mm bimedial in addition to BSC; all patients in the third group (50pd) underwent 6.5mm to 7mm bimedial re-cession in addition to BSC. Measurements were taken from the limbus after disinsertion of the muscle. The conjunctiva and the episclera

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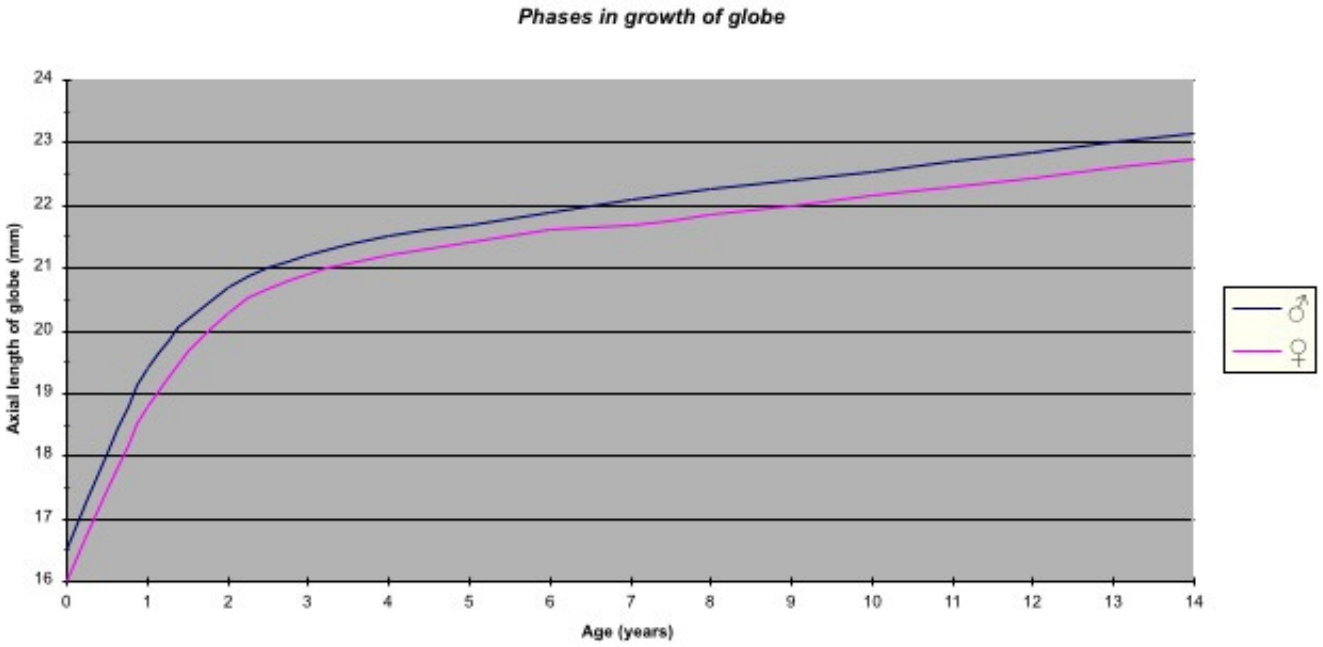
Fig.1: The growth of the globe



were recessed to the original muscle insertion (BSC). The patients were checked at 24 hours, 3, 6 and 12 months in the post-op period.

RESULTS

Our results are reported in table 1. We tested our data with a statistical analysis (Z test) (table 2): we found a p value statistically significant (p= 0.001) in the first group (follow up 12 months); in the second and in the third group the p value was not statistically significant in any of the cases. The trend is toward a late stability of the angle in the post-op period (6 – 12 months). A noteworthy finding was a conjunctival cyst growth early in the post op period in five patients ; a similar finding was not found at anytime in our adjustable strabismus sur-gery (800 cases) where a BSC is routinelly performed to adjust the sutures 24 hours after surgery.

In 4 cases the cyst required surgical excision; in 1 case the cyst vanished spontaneously.

DISCUSSION

Several Authors2 have advocated exceeding the traditional mm recession in large or even moderate angle esotropias. Others have avoided large recession because of concerns of adduc-tion deficiency, convergence weakness and consecutive exotropia with prolonged follow up. Furthermore, high rates of undercorrection in large angle congenital esotropia with traditional bimadial rectus recession have led many surgeons to prefer three to four muscle procedures as initial treatment in these cases. Ing et Al 3 reported a success rate for 5mm bimedial recession of only 30% in 40 patients with esotropia of 50 pd or greater. Scott et al.4 reported a success rate of 37.3% in 57 congenital esotropes with deviations of 50 or more undergoing bimedial rectus recession. With three or four muscles, their success rate was 64.5% in 48 esotropes with comparable preoperative deviation. Lee et al.5 recommend bilateral medial rectus reces-sion and bilateral rectus resection in congenital esotropes with deviation in excess of 50 pd. They report 61% of their patients had straight fixation after only one operation. Forster et al.6 reported a 79.4% success rate with one procedure operating on three to six muscles. However, only 32.5% of these patients had an esodeviation of 50 pd or greater. More recent studies have suggested that results comparable to three or four muscle procedure can be obtained in large angle esotropia with 6mm to 7mm bimedial rectus recession. Hess and Calhoun7 were early proponents of large bimedial rectus recession, reporting a 60% success in 10 patients with esodeviation from 60 to 100 pd undergoing 7mm bimedial rectus recession. Preito Diaz, 8 also a proponent of large recessions, reported an 80% success rate in congenital esotropia with bimedial rectus recession from 6 to 8mm with a 3 year follow up (in these cases the amount of pre-op deviation is not mentioned). Szymd et al.9 reported a 91% success rate at 6 weeks us-ing 6 to 7mm recessions in 45 congenital esotropes with deviations exceeding 50 pd. Nelson et al.10 reported an 83.5% success rate in 97 congenital esotropes with greater than 50 pd of esotropia undergoing graduated 6 to 7mm bimedial rectus recession with a mean follow up of 23.4 months.

We believe our results with 5.5mm to 6.5mm bimedial rectus recession with BSC compare favourably to three or four muscle processes for congenital esotropia. We feel this is a safe and effective surgical treatment in

Table1. Surgical results of 140 consecutive cases of congenital esotropia operated with bimedial recession and bare sclera closure

140 cases	Pre-op pd	Post-op pd 24 h	Post-op pd 3 months	Post-op pd 6 months	Post-op pd 12 months
36 cases Bim. Rec. 5.5mm B.S.C.	35 – 40	<10 (20%) 10-20 (80%)	<10 (59%) 10-20 (41%)	<10 (80%) 10-20 (20%)	Exo (2%) <10 (81%) 10–20 (17%)
66 cases Bim. Rec 5.5-6.5mm B.S.C.	40 – 50	< 10 (27%) 10–20 (68%) > 20 (5%)	<10 (33%) 10-20 (55%) > 20 (12%)	< 10 (68%) 10-20 (26%) >20 (6%)	Exo (1%) < 10 (67%) 10-20 (26%) >20 (6%)
38 cases Bim. Rec 6.5-7mm B.S.C.	>50	10–20 (36%) >20 (64%)	10-20 (49%) >20 (51%)	10-20 (59%) >20 (41%)	10-20 (59%) > 20 (41%)

Pre-op pd: Preoperative prismatic diopter
Post-op pd: Postoperative prismatic diopter
Bim. Rec.: Bimedial Recession
B.S.C.: Bare Sclera Closure

Table 2. Statistical analysis of 140 consecutive cases of congenital esotropia operated with bimedial recession with bare sclera closure

Pre-op 35-40 p.d. (MR rec 5mm. + B.S.C.)

Follow up 24 h.	m=15	p= 0.43
Follow up 12 months	m=10	p=0.001

Pre op 40-50 p.d. (MR rec 5.5 - 6.5mm + B.S.C.)

Follow up 24 h	m=15	p= 0.26
Follow up12 months	m=10	p= 0.15

Pre op >50 p.d. (MR rec 6.5 – 7mm + B.S.C.)

Follow up 24 h	m=15	p=1
	m=20	p= 0.99
	m= 25	p= 0.05
Follow up12 months	m=10	p= 1
	m=15	p=0.99
	m=20	p=066

Pre-op pd: preoperative prismatic diopter
MR rec: Medial Rectus recession
B.S.C.: Bare sclera closure
pd: prismatic diopter

congenital esotropia, particularly if the pre-op doesn't exceed 40 pd; in these cases the success rate increases between the 6th and 12th months in the post-op follow-up. This procedure does not appear to increase the rate of re-operation. Advantages of this method include a quicker, simpler and less traumatic procedure, which leaves the lateral rectus muscles unoperated on for the patients who need further sur-gery. Though this appears to be a promising procedure, we do feel that longer follow-up is needed to determine the true incidence of under and overcorrection.

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