ORIGINAL ARTICLE

Unilateral Single Horizontal Muscle Surgery with Augmented Recession for the Treatment of Moderate Horizontal Squint

Muhammad Luqman Ali Bahoo[1], Shahid Aslam[2], Muhammad Saeed[1],
M. Arshad Mahmood[2], Nazeer Ahmad Aasi[1]

ABSTRACT

Objective: To study the effects of unilateral single horizontal muscle surgery with augmented recession for the treatment of moderate horizontal squint. **Methodology:** The study was conducted at Department of Ophthalmology Azra Naheed Medical College, Superior University Lahore & University College of Medicine & Dentistry, The University of Lahore from January 2012 to June 2013. In this study 37 patients with esotropia or exotropia less than 45 prism diopteres (20-45Δ) were included. Patients with paralytic or cicatricial squint or had surgery before were excluded from the study. Non-dominant single eye was operated of each patient. The rectus muscle to be recessed was dis-inserted from its insertion and after maximum recession and leaving an additional loop of a non-absorbable suture it was re-inserted. **Results:** Out of 37 patients 34 (94 %) patients achieved correction within 08Δ. All were corrected within 12Δ **Conclusion**: Augmented recession of unilateral single horizontal muscle is an effective way to treat horizontal squint with mild to moderate angle. Only non-dominant eye requires surgery and it is more acceptable to the patient because the risk of multiple muscle surgeries is avoided.

Keywords: Esotropia, Augmented recession, Non-dominate eye.

INTRODUCTION

Traditionally moderate angle horizontal squints are corrected by recession/ resection procedures involving single non-dominant eye. Most of the time a single surgery leads to near orthophoria. For any residual squint, surgery may be done on the horizontal rectus muscle of the contra lateral eye(1).

Different surgical techniques to treat moderate angle concomitant squint have been tried that result in variable (40 to 90 %) success rates. Bimedial recessions(2), conjunctival recession along with bimedial recession procedure(3), and unilateral supramaximal horizontal rectus muscle recession are included in such results(4). Botulinum Toxin-A injection have also been used intra operatively for augmented recession particularly in paralytic squint(5),(6). Above mentioned surgical procedures have their own advantages and disadvantages. We have discussed a relatively new augmented recession technique (non absorbable suture loop is left in excess of maximum allowed recession) for surgical correction of moderate angle horizontal squint without combining it with resection of the ipsilateral opposite muscle.

METHODOLOGY

The study was conducted at Ophthalmology departments of Azra Naheed Medical College, Superior University, Lahore & University College of Medicine & Dentistry, The University of Lahore from January 2012 to June 2013. Patients having alternating horizontal concomitant squint, Horizontal deviation between 20 to45 prism dioptres (Δ) and Both esotropes and exotropes were included in the study whereas the patients with history of previous trauma, squint surgery, or paralytic squint were excluded. Patients were examined; visual acuity and extra ocular eye movements were recorded. Squint was assessed and measured by using Hirschberg, cover/uncover and Krimsky test. Cycloplegic refraction with cyclopentolate or 1% atropine was done where found necessary after evaluating refractive status of every patient. Post operatively alignment with in 08 prism dioptre of orthophoria at 6 weeks was taken as success. Augmented recession of thirty seven (37) patients with moderate angle esotropia (<45 prism dioptres) was done. Horizontal muscle of single non-dominant eye was operated of each patient. Limbal conjunctival incision was given, blunt dissection of the muscle to be operated was done after identifying it. The muscle was secured with non-absorbable suture dis-inserted and re inserted leaving an additional loop with predetermined length of the suture after maximum recession was allowed and was sutured to its new site of insertion. The loop length varied with the amount of squint (ie; 06 mm to 12 mm). The conjunctival incision was closed with 10/0 Nylon. It was made sure that the muscle and non-absorbable extra loop suture were free of adhesions etc, to prevent hampering of extra ocular movements. Follow up was done postoperatively at 7th day, one month & finally at six to eight months.

Correspondence
[1]Prof. Muhammad Saeed, Professor of Ophthalmology, Azra Naheed Medical College, The Superior College Lahore.
[1]Department of Ophthalmology, Department of Pediatrics, Azra Naheed Medical College, The Superior College Lahore.
[2]Department of Ophthalmology, University College of Medicine and Dentistry, The University of Lahore.

Fig: 1.Standard recession procedure

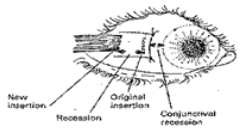
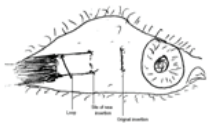


Fig:1a. Augmented recession procedure



RESULTS

Thirty seven patients were included in this study with a follow up for 6-8 months. Eso or exo squint of less than 45 Δ and ranging from 20 to 45Δ (Pre op average squint = esotropia was 34.75Δ and exotropia was 34.70Δ). Finally 34 (94%) patients had squint within 08Δ on their last follow up visit. Remaining 3 patients (06%) had residual squint of less than 12Δ. Over correction was not seen. Three eyes had transient limitation of movement on 1st post op day. None of eye had defective movement at final follow ups.

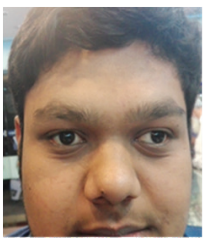


Fig:2. Moderate angle esotropia. Before surgery

Fig:3. Moderate angle exotropia. After surgery

Table 1: Clinical data analysis

Patient Group	Esotropia	Exotropia
Average Age (Years)	22.85	24.76
Male: Female ratio	11: 09	09: 08
Average Squint. Pre-operative	34.75 PD	34.70 PD
Average Squint.		
At 1st Post- operative Day	9.2 PD	9.8 PD
Average Squint.		
At 06 Post- operative month	2.3 PD	2.4 PD

PD = Prism Diopter

DISCUSSION

Stepwise approach is recommended for treating moderate horizontal squint. This involves bi medial rectus recession symmetrically or recession of medial rectus along with resection of lateral rectus, or unilateral single horizontal muscle recession of non-dominant eye[1]. Further surgery on remaining muscles of the other eye or the same eye is done as and when it is required.

Orthophoria with alignment within 10Δ is generally considered successful outcome of strabismus surgery by most of the authors[5,7,8]. Squint surgery success rate of 42 to 50 % traditionally has been reported. Ing & co worker, [9] , Van Noorden et al.[10] Another study (Hess JB and Calhoun11) have reported 72 to 80% success rate by their augmented recession techniques that consist of a graded bimedial recession (with maximum recession of 5.5mm) combined with recession of conjunctiva and tenon's capsule. In one study Harry Wilshaw et al compared bimedial standard recession combined with recession of conjunctiva and anterior Tenon's capsule (augmented recession) with standard bi medial recession[3]. They found the former technique is significantly effective than the later to achieve final correction, however this study was limited mainly to find out amount of correction achieved/ mm of recession. Resection of rectus muscle along with augmented recession of opposite muscle of the same eye have been successfully done for large angle horizontal squint with fairly good success rate without any sequele[12]. Likewise augmented bilateral lateral rectus recession in children with intermittent exotropia resulted in more successful alignment and lower recurrence without higher overcorrection compared to the original surgery[13]. One muscle surgery for concomitant strabismus had been controversial because of concerns that it may result in a significant number of under corrections and/or produce ocular incomitance. Recent evidence in unilateral lateral rectus recession for exotropia, unilateral medial rectus recession for esotropia, and unilateral rectus resections for under corrected or recurrent strabismus and convergence or divergence insufficiency suggests that unilateral rectus muscle surgery is a safe, effective and predictable procedure for small to moderate-angle horizontal deviations. The recession of a single medial rectus muscle for the treatment of various forms of esotropia has been well described. A unilateral medial rectus muscle recession of 5 mm has also been successfully used to treat small angle partially accommodative or residual esotropia.[8] In one study augmented medial rectus recession was found satisfactory results (70%) along with other two techniques for the treatment of convergence excess esotropia. In addition, high AC/A ratio has been treated with 5 and 5.5 mm single medial rectus muscle recession.[3,6] Supra maximal recessions in another study have shown rather more encouraging results.[10] Recession of medial recti in excess of maximally recommended limit of 5mm was carried out and authors claimed success rate within 90% range with no limitation of movements or any other significant complications. In one study (Cogen MS & Roberts BW)[4] supra maximal unilateral medial recession (6-7mm)has been found fairly effective (> 80%) for mild

to moderate esotropias with over corrections. Recession of only one muscle has also been used successfully (success rate= up to 85%) by Natan K, Traboulsi EI[14]. In another study Attarzadeh et al[15] found high effectivity of unilateral lateral rectus muscle recession on moderate angle intermittent exotropia (25-30 Δ). Our study of augmented recession without combining with resection of the opposite horizontal rectus muscle for moderate horizontal squint is first of its kind with fairly good outcome. In this study alignments in all the patients were stable till their last follow up. Abnormal or restricted eye movements or consecutive squint like complications were not seen in any case. The main advantages in our procedure were: surgery on single muscle of non dominant eye was done to achieve maximum corrections in moderate deviation range compared to traditional surgery, fewer over corrections, shorter operative time and exposure to anesthesia was decreased, resulting in less number of procedures required.

CONCLUSION

From this study we conclude that augmented recession of a horizontal muscle by the method described above is a safe and effective way to treat moderate angle horizontal squint. It requires surgery on single muscle of the non dominant eye. Only one rectus muscle is operated and is more acceptable to the patient rather than to have surgery on both recti, avoiding multiple muscle surgery of the eye and comparatively longer exposure to general anesthesia.

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