

## Myectomy Technique for Horizontal Squint Surgery

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Received: September 08, 2016; Published: October 27, 2016

### Abstract

**Objective:** To explain a new surgical technique in squint surgery and to discuss and compare with old Conventional ones.

**Background:** Strabismus surgical intervention main aim is to restore the alignment of the eyes and makes it relative to each other [2]. Which corrects the binocular vision of the patients [8,10]. And of course brings back the confidence for them [6,7].

And it's done by at least three ways, weakening (recession), tightening (resection) and repositioning the extraocular muscles depending on the need of each case [1-5].

Tightening is done to the muscle by resection. It's done by cutting a part of the muscle to make it shorter, and then reattaching it to the same place. This leads to strengthening the muscle [5,9].

Weakening the muscle is accomplished by a recession action on it, and it's done by repositioning the muscle [4].

More than one extraocular eye muscle might be operated on at the same time. And based on measurements taken before the surgery, the surgeon calculates where to reattach the muscles [5].

Complications are a big part of strabismus surgery, similar to any other surgery there are many ones involved. One of the main complications is globe perforation. Studies mentioned that it occurs to 8%-12 % in patients undergoing strabismus surgery [13], and the risk of happening is at highest during reattaching the muscle to the sclera. Sometimes it can lead to retinal detachment [11].

Complication like anterior segment ischemia, globe perforation or infection and Endophthalmitis are very common to occur, and even retinal or nerve damage can happen [11,12]. Some other minor complications may be an allergy to the sutures, bleeding, and change in pupil size [11,12].

And of course not forgetting to mention the complication of the general anesthesia [9].

However, the most vital risk of the strabismus surgery is not to manage to attain the desired alignment of the eyes [3]. Overcorrection and under correction is very common to occur after the surgery and are considered inevitable accompaniment to it [5].

The success rate of this surgery changes from one person to another and depends on each person's particular condition, and of course in a lot of times a second surgery is required [3].

**Keywords:** Myectomy Technique; Strabismus surgical; Anesthesia

### Introduction

There is a taboo in many directions and approaches in ophthalmology which we don't really discuss, and especially in the rules and guidelines of squint surgery.

While the traditional approach for strabismus surgeries considers the eye as a machine and tries to fix the problem by changing the mechanical action of the muscles.

In this study, we tried to look at the problem from different angle. We suggest there is maybe also a compass like center in the eyeball or pacemaker in the ocular muscles like the heart muscle. Or there is neurogenic control center (supranuclear) at the brain stem for the ocular muscles [15]. And not to forget the work of the check ligaments and the intramuscular membrane that prevent the slipping action of the muscle as we saw in the CT scan images after the surgery.

In this study, we developed a new technique for squint surgery which depends only on myectomy without any suture.

In comparison with the classical surgical squint techniques which mostly depend on the changing in the mechanical action of the muscle, either by resections or recessions, and such techniques has drawn the laws of the eye movement.

### Material and Methods

A retrospective study was conducted in 2 countries from 2011 until 2015, at Nour Aloyoun private hospital and the Red Crescent clinic in Tripoli, Libya and in Saudi Arabia, at Baish General Hospital, Jazan. Both hospitals approved this study and oral permission was obtained from all patients who took part in this study. The confidentiality of the patients preserved for the study.

Complete evaluation of the patient medical and psychological history is made, the necessary lab tests were demanded, and CT investigation was performed before and after the surgery to evaluate the adjustment of the muscles.

We operated 74 primary strabismus patients (XT-ET and some secondary cases- re-operated) using this new technique. 40 cases in Libya and the 34 in Saudi Arabia.

All patients were evaluated clinically and imagery and the Follow-up were conducted for up to two years.

### Surgical technique

We used local anesthesia (drops and subconjunctival lidocaine injection 1% or 2% with adrenaline 0.5 - 1 ml) around the muscle all the cases except 6 cases (individuals under 12 years old) which we used mild GA to directly assess the results of the surgery, also all patients were injected with atropine (1 mL/0.5 mg) then a small conjunctival wound over the insertion of the muscle not more than 6 mm is done, and loosens the muscle from the eyeball with a surgical hook, after that using a curved artery forceps to hold the muscle so we can stop the bleeding. And myectomy is done after that either on the insertion or 1 mm or 2 mm from insertion depending on the squint degree and we evaluated each case to see whether we have to apply myectomy on the synergist muscle or to perform more dissection especially in the cases with high squint degree.

And for the more extreme cases, the tractional suture was performed in the opposite direction for 1 or 2 weeks.

At the end, the conjunctival wound is closed by bipolar diathermy.

Anesthesia of choice for most of the cases is local anesthesia drops and injection around the muscles, except for patients who are under 12 years anesthesia of choice here is general anesthesia.

The table below shows the number of each case of those made the type of strabismus and the preoperational degree of refraction and the distance of resection.

We used Hirschberg corneal reflex to calculate the degree of squint (1 mm = 15 Δ).

No.of Cases	Type of Strabismus	Degree of Refraction	Muscle Myectomy	Distance of Resection	
9	Esotropia < 20 Δ	Between (+0.5 ~ +3)	5 cases OU Medial rectus Myectomy 4cases one eye Medial rectus Mectomy	Over insertion	-
11	Esotropia of 35 Δ	(Plano ~ +1)	OU Medial rectus Myectomy	1 mm from insertion	-
10	Esotropia > 45 Δ	(+1 ~ +2)	OU Medial rectus Myectomy	2 mm from insertion	Dissection in all 5cases with Traction sutures
15	Exotropia of 50 Δ	(-1 ~ -4)	OU lateral rectus Myectomy	2 mm from insertion	-
5	Residual paralysis of the VI nerve of 60 Δ	(-1 ~ -4) with Amblyopia	OU lateral rectus Myectomy	2 mm from insertion	With Traction- suture
4	Partial of Paralysis VI nerve of 55 Δ	-	OU medial rectus Myectomoy	2 mm from The insertion For the muscle- Which is more para- lyzed and 1 mm for the other	Dissection in all cases
6	Residual right exo- tropia 50Δ	(-2) with amblyopia	OU medial rectus Myectomy	2 mm from the insertion for one muscle	2 cases with traction sutures
4*	Consecutive exotro- pia with anisome- tropia of 55Δ greater to the left eye	Between (-9 OS ~ OD -2)	OU lateral rectus Myectomy	2 mm from the insertion	1 case with trac- tion sutures
5	Cross esotropia	Between (+12 ~ +20)	OU medial rectus Myectomy	2 mm from the insertion	4 cases With dissection and traction sutures
3	Strabismus fixus of 60 Δ	-	OU medial rectus Myectomy	With 2 mm from insertion	All cases with dissection and traction sutures
2	Inferior oblique over action	-	OU inferior oblique Myectomy	With 2 mm from insertion	-

*\*The cases are secondary to previous surgeries*

*Traction sutures were used in 16 % of the cases for two weeks.*

## Results

Out the 74 cases, 68 (92%) were successful with high ocular motility after three months.

Overcorrection and under correction only appeared in 8% (6) of the cases. No other major complications were recorded during and after the surgeries. All those results are supported by documents and images.

### Conclusion

This myectomy technique is a new revolution in our ophthalmic field because it didn't interrupt the integrity of the normal ocular motility and it's simpler, easier, with higher successful rate (92%), require less time, without suturing much more efficient with much less complications.

### Discussion

To prove that this technique is better than the traditional one there, should be both better results and less complication and our study respect both criteria's for the results a 92% of success rate is an incredible number. While using the traditional techniques the rate ranges from 68% to 85% at the best [12,14,15].

And because the nonexistence of suturing during this surgery we managed to avoid one the worst complication that normal techniques may cause, scleral perforation [11-13].

As it may occur in 8%-12% of patients operated [13]. And can lead to serious complications.

Not to forget the required time needed to do the surgery, in this technique 15 to 20 min tops is more than enough while the normal approach needs from 30 min to 2 hours.

This technique didn't require general anesthesia only for individuals under 12 years old, which excluded a lot of other complication due to the general anesthesia.

And last but not least the simplicity of the new technique compared to the normal one.

### Conflicts of Interest

No.

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**Volume 4 Issue 2 October 2016**

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