

Upgrading Suture less Strabismus Surgeries

Mahmoud Ali Rageh MD*

Emeritus Professor of Ophthalmology -Research Institute of Ophthalmology, Former Head of Pediatric Ophthalmology Unit -Research Institute of Ophthalmology, Cairo, Egypt

***Corresponding Author:** Mahmoud Ali Rageh MD, Emeritus Professor of Ophthalmology -Research Institute of Ophthalmology, Former Head of Pediatric Ophthalmology Unit -Research Institute of Ophthalmology, Cairo, Egypt.

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The use of tissue adhesives in strabismus surgery is known for more than 40 years. However, few reports on this subject have been published and most of the reports were experimental.

All techniques described the use of tissue adhesives to weaken an extra ocular muscle either by recessing it [1] or to apply a suture less faden operation [2].

To Our Best Knowledge, No Study Applied Tissue Adhesives To Strengthen An Extra Ocular Muscle.

The use of tissue adhesives in strabismus surgery avoids operative and post operative risks related to sutures i.e: perforation, vitreous haemorrhage, retinal detachment and endophthalmitis.

Different types of tissue adhesives have been described in the literature and included the cyanoacrylate group Methyl [2], Octyl [3], N-butyl [4], and Adal-1 [5], tissue adhesives.

The fibrin glue [6], the gelatin-resorcin-formaldehyde-glutaraldehyde(GRFG), and albumin glutaraldehyde [2],

The criteria of tissue adhesive selection were based on the fact that the adhesive should be the least harmful and toxic as well as the most precise in the expected distance of recession, placation and myopexy with sufficient resistance to separation and acceptable inflammatory reaction.

In most reports checking the tensile strength of adhesion with the digital dynamometer was about to be the same in all groups [6]. The normal muscle active force in human equals 60-95g [7] achieving 100g in a saccadic movement [8].

The weight that detaches the muscle from the sclera in the first post operative day in case of sutures equals 238 gf and with cyanoacrylate 94 gf. After 45 days the weights that detach the muscle from the sclera equal 576 gf and 520 gf for sutures and cyanoacrylate respectively [2]. Concerning the distance of recession presented measures close to the expected distance when sutures or cyanoacrylate were used. Other tissue adhesives showed grater variability [2].

Fibrin glue is the most biocompatible adhesive and is the one producing the minimal inflammation. It has a potential risk of being a vehicle for blood-transmitted diseases, because it is composed of blood derivatives. The possibility of obtaining its components from a single selected donor [9,10] or preferably, from the patient [11,12] may resolve this problem. Viral contamination was recorded [13].

Furthermore, the literature provides reports of fatal reactions secondary to the use of fibrin adhesives [13]. The etiology is not understood but anaphylaxis related to aprotinemia has been reported [14].

GRFG adhesive produces the greatest inflammatory reaction and toxicity at the the site of application (rabbit sclera) [15].

Previous studies and our recent study carried in the Research Institute Of Ophthalmology in Cairo, proved that cyanoacrylate tissue adhesives performed best in suture less strabismus procedures, characterized by precision in the expected parameters for recessions and plications, sufficient resistance to separation and acceptable inflammatory reactions.

Cyanoacrylates with longer chains have better tolerance .This fact is related to the velocity of polymer degradation, the lower its degradation, the lower its toxicity [16].

Our Recent Study Is Pioneer In Assessing Muscle Plication And Recession With Iso-Amyl-2 Cyanoacrylate Tissue Adhesive In Humans.

A comparative histologic studies for strabismus surgeries with and without sutures using the ordinary and electron microscopes were applied on New Zealand white rabbits.

We concluded that the use of a small suture less fornical conjunctival incision whenever possible combined with the use of ISO-AMYL-2 CYANOACRYLATE sterile adhesive in extra ocular muscle surgery is safe in humans and provide a rapid, safe, economic procedure, irritation free early post operative period and has a long lasting stable result .Ultrastructural muscle damage is less with tissue adhesives than with sutures.

No muscle slippage or loss were encountered in all cases with no other serious operative or post operative complications.

Weakening Or Strengthening An Extra Ocular Muscle Is Possible With The Use Of Tissue Adhesives.

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