SAFETY OF THE ANTERIOR VITREOUS DETACHMENT INDUCED BY MICROPLASMIN, OR PHARMACOLOGIC VITREOLYSIS TO SEPARATE THE POSTERIOR CAPSULE FROM THE ANTERIOR HYALOID

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BACKGROUND AND AIM OF THE PROJECT

Congenital cataract is a severe sight-threatening eye condition if not treated appropriately. Nowadays standard surgical procedure in congenital cataract surgery requires a primary posterior capsulorhexis in all cases, independently of the choice of intraocular lens (IOL) implantation, due to the high risk of visual axis reopacification otherwise. In many cases, this procedure will be associated with anterior vitrectomy and IOL optic capture later on (1). A recent study had demonstrated that bag-in-the-lens IOL implantation was an excellent alternative to lens-in-the-bag IOL implantation with optic capture and does not require an anterior vitrectomy. All newborns and young children operated at our department for congenital cataract are treated by using this surgical technique, because of its reduced rate of visual axis reproliferation (2).
When we performed these surgeries, we often encountered a dysgenesis of the vitreolenticular interface (involving posterior lens capsule, Berger's space and anterior hyaloid membrane) with a variable adherence of the anterior hyaloid to the centre of the posterior lens capsule, even in cases without persisting fetal vasculature, making it more difficult to separate the anterior hyaloid membrane from the posterior lens capsule. Mechanical dissection of the vitreous strands from the posterior lens capsule using ocular viscoelastic devices (OVD) is feasible but difficult to perform and time-consuming.

Based on the experimental and clinical experience of the use of microplasmin in the posterior segment to relief vitreoretinal traction (3), the question raised whether or not this molecule could also be beneficial in congenital cataract surgery by separating enzymatically the anterior hyaloid or the fetal vascular proliferative membrane from the posterior lens capsule. The aim of this project is to establish the feasibility, safety and clinical application of the use of microplasmin at the vitreolenticular interface to promote the separation of the anterior hyaloid from the posterior lens capsule.

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MATERIALS AND METHODS / DEVELOPMENT OF THE PROJECT

The proposed study set-up includes cataract surgery in 24 rabbit eyes using the bag-in-the-lens IOL implantation technique. In one eye, after having induced a primary posterior continuous curvilinear capsulorhexis, a 0.1 ml solution containing 125 μg of microplasmine will be instilled at the level of the anterior hyaloid with a variable exposure time (1, 5, 30 and 60 minutes) before further manipulation will be initiated. In the contralateral eye, acting as a control eye, the same procedure will be performed with an instillation of 0.1 ml balanced salt solution. The next step consists in further separating the anterior hyaloid from the posterior capsule using OVD and the ease by which this clinical manoeuvre can be done will be evaluated and videotaped.

The postoperative follow-up at well-defined time intervals will consist in the evaluation of visual axis reproliferation and ocular inflammation, posterior segment complications and anterior vitreous anatomy.

CONCLUSION

The aim of this project is to establish the feasibility, safety and clinical application of the use of microplasmin at the vitreolenticular interface to promote the separation of the anterior hyaloid from the posterior lens capsule. This is a complete new approach and concept that has not yet been studied or even questioned up till now. However, with the advent of new surgical techniques in cataract surgery and the wish of the pediatric cataract surgeons to improve their surgical outcome, the vitreolenticular interface is expected to raise in interest for the coming years.

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