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RESIDENTS

EyeWorld journal club

Review of "Clinical outcomes of riamcinolone-assisted anterior vitrectomy after phacoemulsification complicated by posterior capsule rupture"

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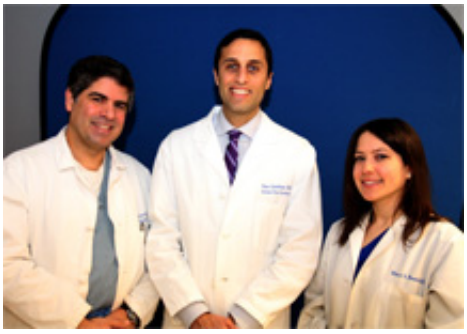
This month, an interesting study on triamcinolone-assisted anterior vitrectomy is published in JCRS. These studies are difficult to do, and I asked the U Penn residents to review this paper.

David F. Chang, M.D., chief medical editor



From left to right: Tomas Aleman, M.D., Kian Eftekhari, M.D., and Hilary Brader, M.D. Source: Paul Tapino, M.D.

Posterior capsular rupture is a feared complication of cataract surgery. This is especially relevant for residents as they have a higher rate during their training.[1] Learning how to prevent rupture of the posterior capsule and preparing for it preoperatively are part of the training of every cataract surgeon.[2] However, deciding on a management strategy once it has happened is controversial and is dependent on the individual surgeon's training and preference. Damage to the anterior vitreoretinal barrier after a posterior capsular break is known to increase the frequency of postop complications of cataract surgery.[3] Among them is an increased rate of endophthalmitis, rhegmatogenous retinal detachments, and cystoid macular edema.[4] Incomplete removal of prolapsed vitreous from the anterior chamber further increases the frequency of such complications and can by itself lead to persistent intraocular inflammation, IOP elevations and vitreocorneal contact with corneal edema, all of which can impact the final visual outcome. It is thus critical that appropriate removal of the prolapsed vitreous occurs following this complication. Difficult visualization of an otherwise mostly transparent structure has long challenged vitreoretinal surgeons and prompted the use of diverse solutions that make the vitreous visible to the surgeon. The literature on such maneuvers in posterior segment surgery is abundant but comparatively scarce regarding its use in anterior segment vitrectomy.[5,6,7]

In the March issue of the Journal of Cataract & Refractive Surgery, Kasbekar et al. report their experience using triamcinolone acetonide during anterior vitrectomy in cataract surgery complicated by posterior capsular rupture with vitreous prolapse into the anterior chamber. The authors should be commended as this is the first study in which the use of triamcinolone acetonide during anterior vitrectomy was compared to a control group in which triamcinolone was not used. Their work was a retrospective, case-control study. They reviewed the pre- and postop records of patients from their own practice who had posterior capsular rupture with vitreous prolapse into the anterior chamber during

phacoemulsification. They compared the outcomes in patients who had anterior vitrectomy with (n=17) versus without (their control group, n= 34) the use of intracameral triamcinolone acetonide. Patients with incomplete records were excluded. The groups were not matched for age or ocular comorbidities, which is understandable given the retrospective design. There was consistency among the surgeons who chose to use triamcinolone acetate; Kenalog 40 mg/mL was diluted in a 1:1 ratio with balanced salt solution and injected into the anterior chamber before the anterior vitrectomy began but after the posterior capsular rupture was identified. They then proceeded with vitrectomy and attempted to remove all vitreous strands before washing out the excess triamcinolone acetonide with balanced salt solution. All patients, whether they had triamcinolone or not, had an intraocular lens placed in the sulcus or capsular bag. Their postop regimen included an antibiotic and a steroid drop.

The authors compared postop best corrected visual acuity, intraocular pressure (IOP), presence of vitreous strands and/or cystoid macular edema (CME) between the two groups. They found no statistically significant difference between the postop best corrected visual acuity or IOP between the two groups. Of note, there was a relatively larger improvement in visual acuity in the no-triamcinolone (1.13 to 0.29 logMAR) compared to the triamcinolone (0.74 to 0.13 logMAR) group. The significance of this difference is hard to explain with the data presented and may reflect different baseline characteristics between the groups, which could not be matched in this setting. There was also a trend toward higher IOP at one-week postop in the triamcinolone group compared to the control, a difference that disappeared three months after the surgery. Vitreous strands were noted post-op in 1/17 patient in the triamcinolone group and in 7/34 patients in the no-triamcinolone group. This was also not statistically significant but appears to be the most salient of the differences found. CME was identified in three patients in the no-triamcinolone group postop, two of which were found to be in association with a branch vein occlusion and with vitreomacular traction. The relevance of this postop complication is unclear given the small sample size and the fact that there is no indication that a systematic search, either with fluorescein angiography or with optical coherence tomography, for this complication ever occurred in every patient from each group. Again, this is also understandable given the design of this study.

The small sample size or the retrospective nature of this study, both recognized by the authors as limitations, should not overshadow the fact that this work will serve as the starting point for larger prospective inquiries into this topic. The work also raises a number of important questions that need to be addressed. For example, the use of triamcinolone with the increased visualization of the vitreous may lead to more extensive and aggressive anterior vitrectomy maneuvers, especially in non-experienced surgeons. One can argue that this may indirectly increase the rate in which inadvertent vitreoretinal tractions may occur with a potential increase in the rate of vitreoretinal complications. Would it be preferable to approach the vitreous prolapse through a pars plana approach, a change that may be dependent on the magnitude of the vitreous prolapse itself? Do we have to be concerned about deposition of triamcinolone crystals in the capsular bag or intraocular lens, especially near the visual axis?8 Previous studies have reported no adverse visual

outcomes of such deposits in the macula following triamcinolone-assisted posterior vitrectomy,9 but their frequency and visual impact following anterior vitrectomy is yet to be determined. To which extent is the existence of complications, particularly CME and other vitreoretinal changes, a result of the violation of the anterior vitreous alone or due to the incomplete removal of the prolapsed vitreous? If the complications are predominantly a function of the amount of vitreous left inadvertently in the anterior chamber, as previous data suggest (for vitreoretinal complications), then the authors' work would predict a reduction in the frequency of such negative outcomes with the use of triamcinolone-assissted anterior vitrectomy. Their results, however, will have to stand the test of its use in larger groups of patients. Ethical issues are always a consideration in work that involves surgery as the authors astutely pointed out. But data from existing large observational studies involving cataract surgery by phacoemulsification and/or anterior vitrectomy could have been used as "historical controls" and may be used in the future to answer similar questions, perhaps without having to embark in much more difficult and time-consuming, prospective, randomized, case-control studies.

The evidence so far tempts us to conclude that the use of intracameral triamcinolone is a benign and safe procedure that will facilitate visualization and removal of vitreous from the anterior chamber. However, every procedure or modification of an existing procedure, no matter how small, should be approached with caution as there is virtually no intervention that is risk- free. Thus it may be premature to reach such a conclusion. As briefly outlined above for a couple of scenarios, there are many potential unforeseen interactions that may indirectly influence the outcomes of our cataract surgeries, specifically the long-term outcomes, if triamcinolone-assisted anterior vitrectomy becomes widespread and routinely used. Larger prospective observational studies or meta-analysis of existing large observational studies may be needed to address these issues. We congratulate the authors and will be on the lookout for articles that will continue to explore this topic following their lead.

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