

Triamcinolone Assisted VitreoRetinal Surgery

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The major goal of vitreoretinal (VR) surgery is to remove the vitreous gel and the fibrovascular membranes from the retinal surface. Continuous refinements of the surgical techniques and instrumentations have improved the surgical maneuvers, thus allowing a safer and more effective procedure. In spite of this ameliorations, the poor visibility of the vitreous body and of the membranes, related to their transparency, sometimes makes the surgical posterior vitreous detachment and the epiretinal membranes (ERM) and internal limiting membranes (ILM) peeling challenging. In fact, excessive surgical manipulation, repetitive movements in the vitreous chamber and in the near proximity to the neurosensory retina and optic nerve head may increase the risk for complications and prolong the surgical time. An improved visibility of these structures during vitrectomy, might enhance the safety of the operation and decrease the risk of complications.

Recently, the injection into the mid vitreous cavity of Triamcinolone Acetonide (TA) during pars plana vitrectomy (PPV), has been used to better visualize the transparent vitreous gel and the fibrocellular membranes such as ILM and ERM.¹⁻⁴

Triamcinolone acetonide (Kenacort 40 mg/ml; Bristol-Myers Squibb, Princeton, NJ) is a water insoluble steroid with anti-angiogenic, anti-proliferate and anti-edematous effects that is injected into the vitreous body for the treatment of diabetic macular edema,⁵ choroidal neovascularization,⁶ macular edema secondary to branch⁷ and central vein occlusion,⁸ uveitis,⁹ Irvine-Gass syndrome,¹⁰ and proliferative diabetic retinopathy.¹¹ Moreover, TA is injected into the mid vitreous cavity during vitreous

surgery to highlight the posterior vitreous cortex and the ILM and ERM.^{12,13}

The TA particles become entrapped in the gel structure of the vitreous making the posterior vitreous cortex plainly apparent. The posterior hyaloid is separated from the retinal surface with passive (extrusion needle) or active linear aspiration (vitreous probe) and subsequently removed (Figure 1 – next page).

TA aqueous suspension is also sprayed over the macula and left to settle onto the posterior pole. After removing the particles floating into the vitreous chamber, multiple white particles adhere to the inner surface of the retina, thus providing an excellent view of the ERM (Figure 2 – next page) or ILM (Figure 3 – next page). TA particles allow a sharp contrast between the peeled and the unpeeled retina, thus promoting the removal of the membranes that are readily visualized. ILM TA assisted peeling has been reported during macular hole surgery and diabetic macular edema.^{4,12,13} ERM TA assisted peeling has been performed for macular pucker, proliferative vitreoretinopathy and proliferative diabetic retinopathy.^{2,3}

Furthermore, TA particles improve the visibility of the peripheral vitreous, thus enabling safer shaving of the vitreous base. A further potential benefit with the use of TA during PPV is the decrease of postoperative breakdown of the blood-ocular barrier which results in the inhibition of subsequent fibrous tissue formation.^{2,4}

Side effects caused by the injection of TA include cataract and intraocular pressure elevation.¹⁴ Previous studies have shown no substantial TA related retinal toxicity in animal models¹⁵

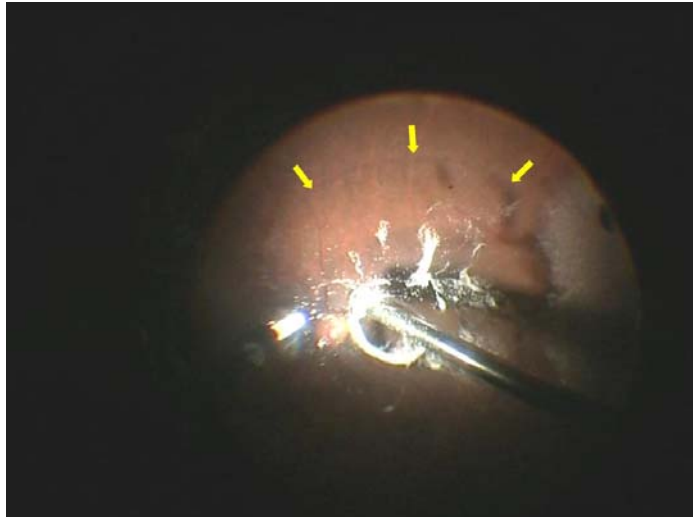


Figure 1: Fundus photograph during TA-assisted pars plana vitrectomy showing surgical posterior vitreous detachment. The arrows point out the enlarging circle of the progressing posterior vitreous detachment.

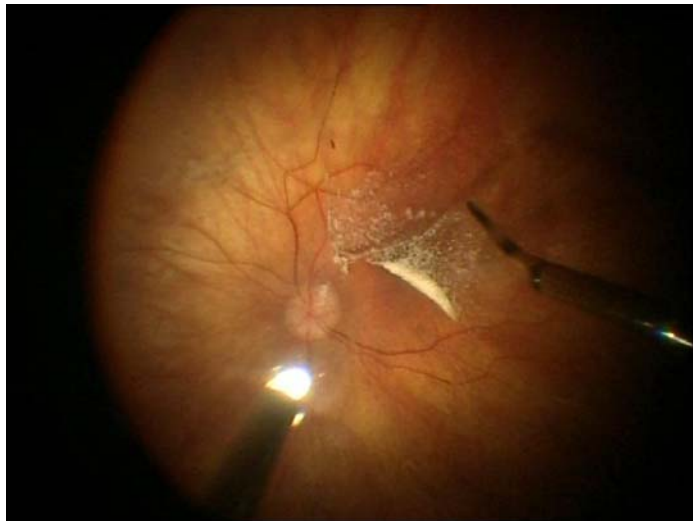


Figure 2: Fundus photograph during TA-assisted pars plana vitrectomy showing epiretinal membrane peeling.

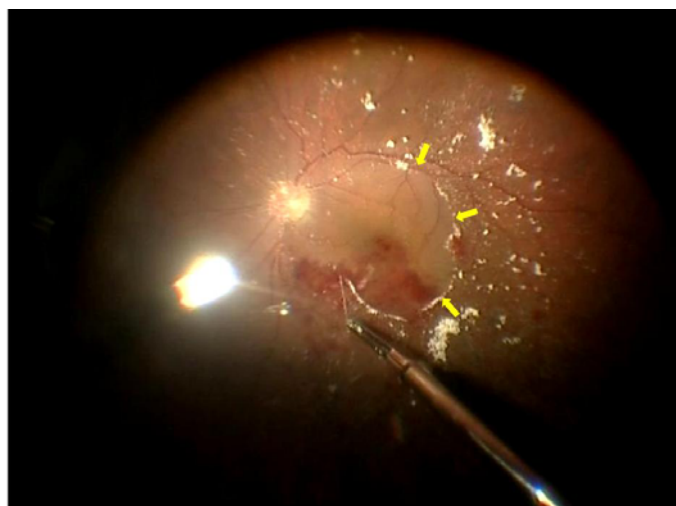


Figure 3: Fundus photograph during TA-assisted pars plana vitrectomy showing ILM peeling. TA particles provide a clear contrast between the peeled and unpeeled retina (arrows).

in vitreous surgery.¹

Although no randomized study has yet been published and a longer follow up period is needed to demonstrate that TA assisted VR surgery has no side effects in the long term, this method may be useful for improving the safety of the surgical procedure of certain VR disorders.

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