

Commentary: Malignant Glaucoma - Have we finally found an answer?

The authors describe a patient with aqueous misdirection (AM) following a phacotrabeculectomy procedure, which persisted after primary management with pars plana vitrectomy (PPV) and Ahmed glaucoma valve implantation.^[1] She could be successfully treated with irido-zonulo-hyaloido-vitrectomy (IZHV).

AM or malignant glaucoma is a dreaded complication and, though fortunately rare, can be one of the most frustrating glaucoma conditions to manage. Untreated, the condition often has a relentless course leading to corneal decompensation and glaucomatous optic neuropathy and blindness. It is now being increasingly recognized that the most important factor in the successful management of this condition is re-establishing the posteroanterior aqueous communication. This is well illustrated in this report.

Shaffer *et al.*^[2] first hypothesized that direct communication between the vitreous and anterior chamber was necessary for reversing the AM process. Since then, the surgical management of AM has chiefly been a PPV with the establishment of a posteroanterior communication.^[3,4]

In a review comparing the relapse rates of different therapeutic interventions for AM, Debrouwere *et al.*^[3] found the combined technique of IZHV (and phacoemulsification if the patient had a cataract) to have the lowest relapse rate compared with vitrectomy or YAG capsulotomy with hyaloidotomy.

Doing only a vitrectomy may drain the aqueous outflow into the anterior chamber^[5] but removing only the central vitreous is often not enough, because the ciliolenticular blockade is not completely eliminated. This is amply evident in the case described, wherein a PPV proved inadequate to resolve the AM.

The intact hyaloid face plays an important role in the pathophysiology of AM.^[6] The key factor for successful treatment is disrupting the posterior capsule and hyaloid face. Laser capsulotomy and hyaloidotomy or surgical intervention have been advocated in an attempt to restore normal aqueous flow with disruption of the hyaloid face with variable success rates.^[6] The reported success rate of laser treatment varies in the literature between 50 and 100%, but these are mostly small case series with short follow-up periods.^[4]

Lois and colleagues first described zonulo-hyaloido-vitrectomy, a procedure similar to the IZHV we know today, through an existing peripheral iridotomy and reported 100% success rate with no recurrences over a median of 5.5 months in five cases.^[7] Pakravan *et al.*^[8] refined the technique similar to the one described, in which there is a creation of a new stab incision and the opening of the iris, zonula, and the vitreous cavity. In the 24 eyes in their series, the anterior chamber remained deep in 91% of eyes and glaucoma could be controlled with medication.

Despite the favorable reports, the technique must be approached with caution. There may be situations when there is AM in young phakic eyes with a clear lens. Current 25-G vitrectomy techniques have allowed a core vitrectomy with an anterior approach IZHV to alleviate AM and also preserve the crystalline lens.^[9] It is also important to remember that in long-standing synechial closure, just an IZHV may not be enough. In the patient described, there was an Ahmed glaucoma valve (AGV). However, usually, some glaucoma surgery would be required along with the IZHV for long-term intraocular pressure (IOP) control. There may also be some concern about IOL stability after zonulectomy. A literature review revealed no patient in any previous reports who had an IOL subluxation. This is likely because only a few zonules are removed in this procedure in order to avoid IOL instability. Another cause for caution is the possible damage to the retina by the vitrector owing to poor visualisation. It is important

to remember to redirect the vitreous cutter to the center of the vitreous cavity and visualize the tip behind the lens after peripheral iridectomy.

Nevertheless, IZHV appears to be a simple and effective approach to a difficult problem. Because of its easy access from the anterior chamber, this procedure can easily be performed by an ophthalmologist not familiar with the posterior approach. It appears that the beast of malignant glaucoma may well have been finally tamed.

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Access this article online	
Quick Response Code:	Website: www.ijo.in
	DOI: 10.4103/ijo.IJO_134_19

Cite this article as: Kaushik S. Commentary: Malignant Glaucoma - Have we finally found an answer? *Indian J Ophthalmol* 2019;67:1206-7.