

## Pars plana placement of Ahmed glaucoma valve tube through sclerotomy port in refractory glaucoma: A novel surgical technique

Richa Gupta, Abhishek Varshney

We describe a case of 34-year-old male with post penetrating keratoplasty glaucoma, post trabeculectomy with aphakia in the only seeing eye, in which a modified surgical technique of inserting Ahmed glaucoma valve (AGV) tube in vitreous cavity was done to reduce the risks associated with pars plana incision during pars plana vitrectomy (PPV). A hybrid 20-25 gauge PPV was done concurrently, implant fixed to sclera, and tube inserted through the 25 gauge sclerotomy port in supero-temporal quadrant. Visual acuity and intraocular pressure remained stable during 1-year follow-up.

**Key words:** Ahmed glaucoma valve, glaucoma drainage device, pars plana vitrectomy, refractory glaucoma

Glaucoma drainage devices (GDDs) with tube placed in sulcus, or vitreous cavity are mainstay of management in eyes with disorganized anterior segment due to prior surgeries, like penetrating keratoplasty (PK), or a disease process itself such as neovascular glaucoma.<sup>[1,2]</sup> However, pars plana vitrectomy (PPV) done as an adjunct procedure has risks of sclerotomy related complications which could potentially increase by making an additional port for AGV tube insertion.<sup>[3-7]</sup>

We showcase a novel technique of combining hybrid 20-25 gauge (G) PPV with placement of Ahmed glaucoma valve (AGV; model P7, New World Medical Inc, Rancho Cucamonga, CA, USA) tube through a 25G sclerotomy.

### Case Report

A 34-year-old male presented with best-corrected visual acuity (BCVA) of 20/630 in left eye (OS) and an intraocular pressure (IOP) of 40 mmHg on maximum medical therapy (MMT). The previous surgical history included cataract surgery with

intraocular lens (IOL) implant, PK with IOL explant, and trabeculectomy. OS showed hazy graft, aphakia with 360° peripheral anterior synechiae with superior 200° of perilimbal fibrosis [Fig. 1]. B-scan (OS) revealed total posterior vitreous detachment, attached retina with disc cupping. His right eye (OD) was absolute.

One-eyed status with poor IOP control on MMT necessitated an urgent surgical plan. Hence, AGV implantation with PPV with tube in vitreous cavity was planned. An informed written consent was obtained from the patient.

### Surgical technique

Following peribulbar anesthesia and corneal traction suture, a fornix-based conjunctival flap was created in superior temporal quadrant (STQ) and Tenon's capsule dissected posteriorly. After priming, AGV plate was anchored to the sclera with 9-0 nylon (Aurodon, Aurodon, Madurai, India) sutures.

Limited conjunctival peritomy was done in infero-temporal quadrant (ITQ). A sclerotomy was made 3 mm behind the limbus using a 20G MVR blade and a 20G infusion cannula was fixed with 6-0 polyglactin suture (Vicryl, Johnson and Johnson, Aurangabad, India) in a mattress fashion. The 25G sclerotomy at STQ was made 4 mm behind limbus and was directed perpendicular to sclera [Fig. 2a]. Sclerotomy in the supero-nasal quadrant (SNQ) was bi-planar and beveled. A hybrid 20-25G PPV was performed. After a thorough vitreous base excision, the SNQ port was closed with 6-0 polyglactin suture. The tube was trimmed, bevel up, to an intravitreal length of 6 mm and inserted through the 25 G sclerotomy port in STQ [Fig. 2b]. It was fixed to the sclera and covered with a

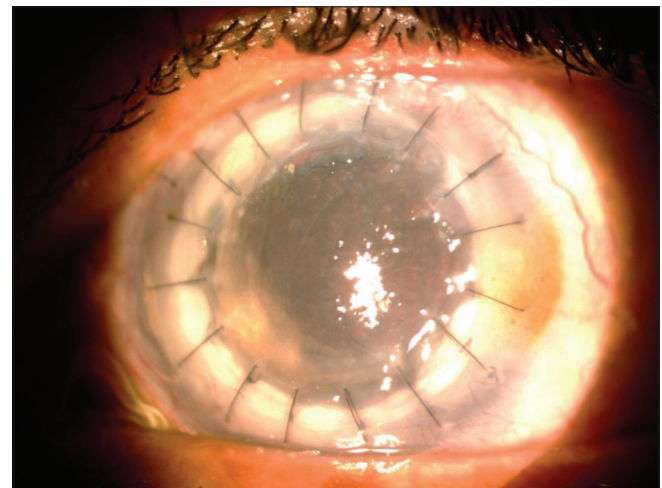


Figure 1: Preoperative slit lamp photograph showing hazy corneal graft

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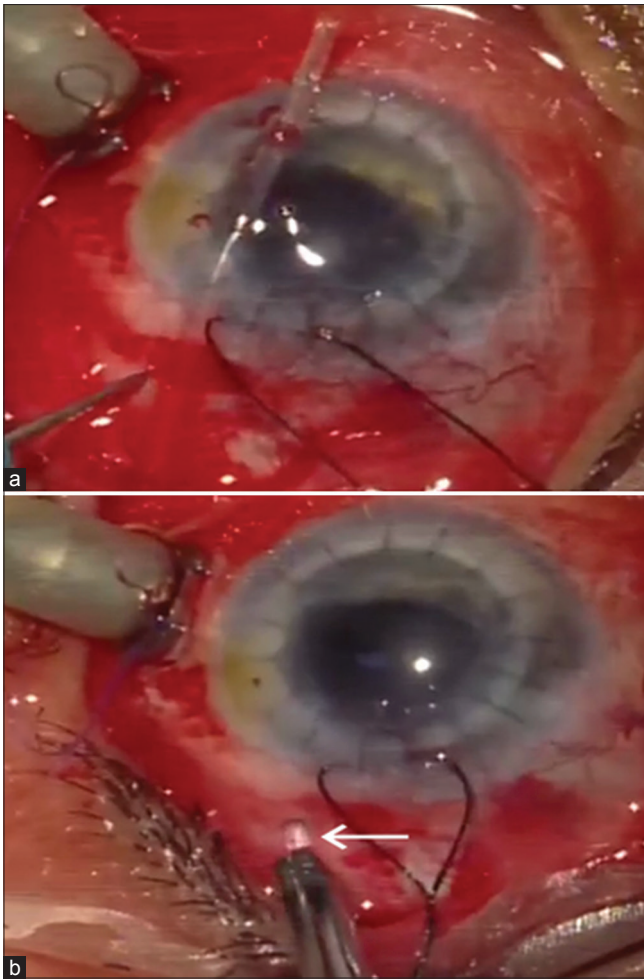
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**Figure 2:** (a). Intraoperative snapshot showing perpendicularly directed trocar for STQ sclerotomy. (b). Intraoperative snapshot showing insertion of AGV tube through STQ sclerotomy port (white arrow)

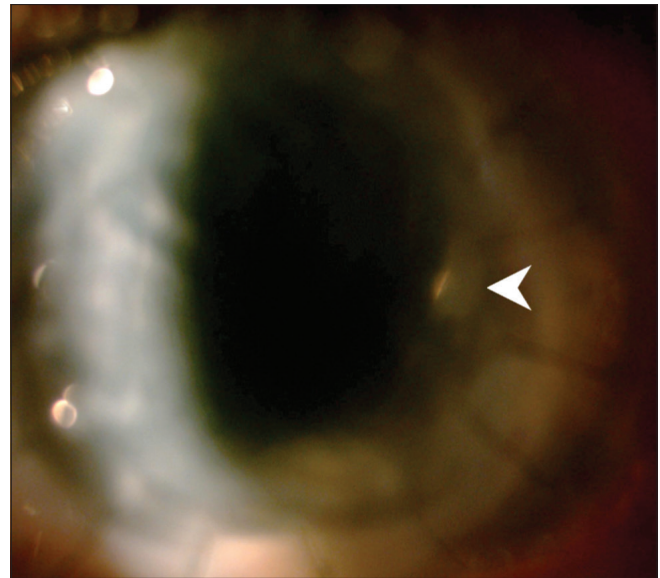
scleral patch graft with 9-0 nylon sutures. The ITQ sclerotomy port and conjunctival peritomy were then closed using 6-0 polyglactin sutures (Please refer to Video 1).

Postoperatively, the patient received cycloplegic drops and intensive steroids, tapered over next 8 weeks.

First-day post-op IOP was 10 mmHg. AGV was well positioned with its tube visible in anterior vitreous cavity in STQ [Fig. 3]. Patient achieved useful BCVA of 20/200 at the follow-up of 2 months. IOP remained stable with no encountered hypertensive phase. At the final follow-up of 1 year, visual acuity was 20/200, IOP was 12 mmHg, and the corneal graft remained clear. No choroidal effusions or macular folds were noted. The patient was lost to follow-up thereafter.

## Discussion

The advent of pars plana placement of GDD tube has enhanced the surgery's success rate in recalcitrant glaucomas.<sup>[5]</sup> Prior or concurrent PPV is done to facilitate tube entry and avoid its blockage by vitreous. But the pars plana incision made for vitrectomy incites fibro-vascular proliferation (FVP) similar to a scleral wound after perforating injuries and may be attributed to exaggerated wound healing.<sup>[5,7]</sup> The complications have been studied using ultrasound bio-microscopy and may range from



**Figure 3:** Postoperative slit lamp photograph showing AGV tube in anterior vitreous cavity (white arrowhead)

a limited fibro-vascular in-growth at the sclerotomy site to extensive vitreous incarceration and anterior hyaloidal FVP, leading to tractional retinal or choroidal detachments.<sup>[3,7,8]</sup>

## Conclusion

We propose this technique as a simple modification of pars plana tube insertion to minimize the number of entry wounds, and hence the associated complications. It is a potential option in the cases of complex glaucomas needing GDD without compromising on the surgical outcome.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that his name and initial will not be published and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

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