

Case report

Goniosynechialysis for secondary angle closure glaucoma in aphakic patient after pars plana vitrectomy

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ABSTRACT

Purpose: To report the effectiveness of Goniosynechialysis (GSL) treating elevated intraocular pressure (IOP) in an aphakic eye with peripheral anterior synechiae (PAS) formation after vitrectomy.**Observations:** A 39-year-old gentleman with history of lamellar keratoplasty for corneal ectasia and blunt trauma to the right eye necessitating vitrectomy and lensectomy presented to our glaucoma unit with a secondary angle closure and an IOP of 50 mmHg. This was successfully treated with GSL and one year after surgery, the patient maintains a normal IOP without the use of medication.**Conclusions and importance:** GSL may successfully restore angle integrity in aphakic patients following vitreoretinal surgery and avoid the need for a glaucoma drainage device.

1. Introduction

Secondary glaucoma manifesting as elevated intraocular pressure (IOP) is a common complication of pars plana vitrectomy particularly with silicone-oil filled eyes.¹ Up to 30% of patients developed secondary glaucoma within 2 years postoperatively.¹ Most cases of secondary glaucoma can be treated medically; more invasive interventions are reserved for cases refractory to medical treatment.²

Goniosynechialysis (GSL) is a surgical technique to manage angle closure secondary to peripheral anterior synechiae (PAS). Stripping PAS can restore the aqueous flow to the trabecular meshwork and subsequently decrease IOP.³ However, little is known about GSL outcomes for secondary angle closure glaucoma in aphakic patients, although the procedure has successfully restored aqueous outflow in phakic and pseudophakic patients with secondary angle closure.^{4,5} Here we present a case of secondary angle closure glaucoma in an aphakic patient that was successfully treated with GSL.

2. Case report

A 39-year-old patient with history of lamellar keratoplasty in right eye for corneal ectasia after LASIK for both eyes at age 25 years-old was referred following blunt trauma to the right eye, which resulted in dehiscence of the graft and cataract. Resuturing of penetrating

keratoplasty with partial lens aspiration and anterior vitrectomy was done elsewhere, the patient was referred to us for subsequent management.

Slit lamp examination showed corneal graft with moderate edema, secure sutures between 12 and 4 o'clock, mild anterior chamber cellular reaction with hyphema, nasal dyscoria and cortical lens materials below the temporal iris of the right eye. The fundus was not visible. B-scan ultrasonography revealed dense vitreous opacities with membrane formations (Vitreous haemorrhage) and total (360°) haemorrhagic choroidal detachment of the right eye. The patient underwent pars plana vitrectomy and removal of the remaining lens material in the right eye by the vitreoretinal surgeons. No gas or oil had been used during this surgery as retinal examination had been normal and the presence of retinal breaks had been excluded during an internal search at the end of the surgery.

Four days after the surgery, he complained of severe headache, right eye pain and foreign body sensation. 9% sodium chloride ointment and 2% sodium hyaluronate drops were used post-operatively as a lubricant to decrease eye dryness. Slit lamp examination revealed a quiet anterior segment without obvious peripheral synechiae (Fig. 1). IOP measured by Tono-pen was 46 mmHg. Fundus was normal with a healthy round disk and flat macula. B-scan ultrasonography revealed mild diffuse opacities within the vitreous cavity, shallow choroidal detachment temporally, slightly irregular macular area, but a flat retina. He was

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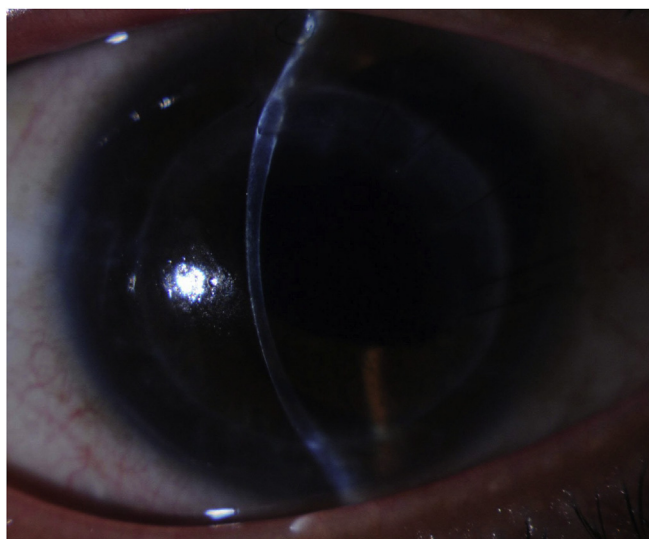


Fig. 1. Appearance of the right eye at presentation. The lamellar graft was clear and the eye quiet.

started on Acetazolamide 250 mg four times daily, Apraclonidine 1% twice daily and Timolol 0.5% twice daily. He was referred to glaucoma clinic.

The patient presented to the glaucoma clinic with uncorrected visual acuity of 2/200 right eye and 20/200 left eye with no obvious relative afferent papillary defect. IOP was 14 mmHg right eye and 20 mmHg left eye by pneumotonometer. Fundus exam showed a healthy disc and flat macula in both eyes. There were no signs of iris bombe. Right eye gonioscopy revealed widespread low peripheral anterior synechia most pronounced nasally with slightly open angle inferiorly. Three days after glaucoma visit, he complained of severe right eye pain, with an IOP of 50 mmHg by pneumotonometer in the right eye and no pupil block. Anterior segment optical coherence tomography (OCT) showed open angle temporally and peripheral anterior synechia more pronounced nasally (Fig. 2A). A diagnosis of secondary angle closure glaucoma due to PAS was made.

GSL was performed with an anterior chamber maintainer during the surgery to prevent intraoperative hypotony in this aphakic eye. A main incision was made with a 2.2 mm keratome superiorly to access the

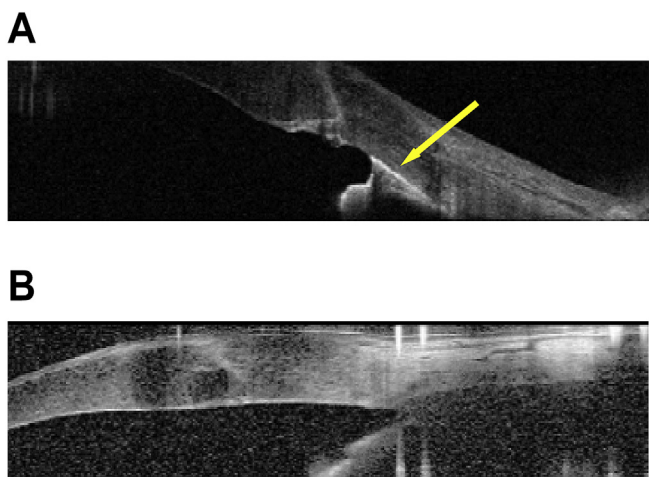


Fig. 2. Anterior segment optical coherence tomography (OCT) showing (a) angle closed by peripheral anterior synechiae (PAS) at presentation (yellow arrow); (b) restored angle recess and absence of PAS after Goniosynechialysis (GSL). (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

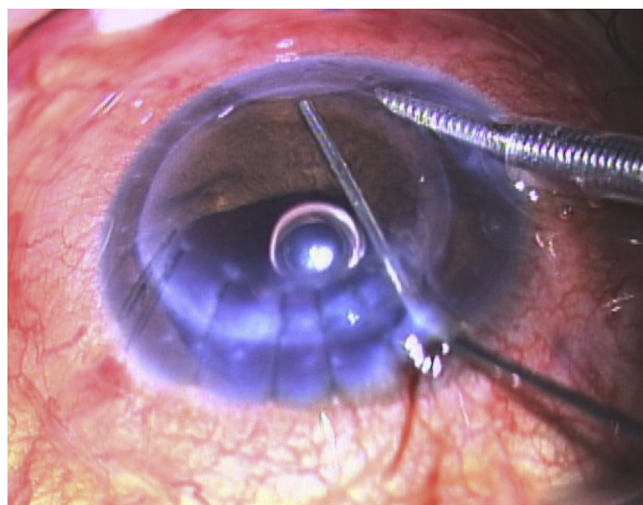


Fig. 3. Goniosynechialysis (GSL) being performed with an angled Castroviejo cyclodialysis spatula (Microsurgical Technology, Redmond, WA) with a 20-gauge Lewicky anterior chamber maintainer (Storz Ophthalmic Instruments, St. Louis) in situ.

inferior angle, then made temporally to access the inferior angle. A blunt cyclodialysis spatula was used to separate the iris from the angle and posterior cornea. Both incisions were sutured with a single 10/0 nylon suture (Fig. 3).

The first day after surgery, the eye was quiet with mild conjunctival injection, a clear graft, with IOP of 06 mmHg (without IOP medication) and a flat retina. At the first post-operative week, the patient maintained a normal IOP (11 mmHg) and a year after the surgery, his IOP remains controlled without medication. A repeated OCT, showed a restored anterior angle recess and absence of PAS (Fig. 2B).

3. Discussion

To the best of our knowledge, this is the first case that described successful GSL for aphakic patient with peripheral anterior synechia following vitreoretinal surgery. GSL was described as an effective procedure in reducing IOP and re-establishing the outflow in synechial angle closure glaucoma after vitreoretinal surgery in pseudophakic eye.⁴ Additionally, GSL successfully controlled IOP below 21 mmHg in phakic patients developed synechial angle closure glaucoma after they underwent vitreoretinal surgery.⁵ Thus, GSL is shown to be viable alternative to filtration surgery for long-term management after vitreoretinal surgery in phakic and pseudophakic patients. Although, most of glaucoma cases following vitreoretinal surgery can be managed medically, some cases require surgical management.⁶

There are several mechanisms by which angle-closure glaucoma can develop following vitreoretinal surgery. These include angle closure due to peripheral anterior synechiae, prolonged inflammation and steroid response. In silicone-oil filled eyes, glaucoma can result from migration of oil from the vitreous cavity into the anterior chamber, or pupil block.² In addition, vitrectomy itself is considered as a risk factor for elevated IOP.⁷ In our patient, glaucoma developed because of PAS and angle closure following vitreoretinal surgery. The development of PAS was possibly due to the initial traumatic event, but more likely due to inflammation after vitreoretinal surgery, given that the patient had normal IOP prior to the surgery.

For those who developed primary angle closure glaucoma, the successful rate of GSL was higher among aphakic patients with less complications compared to phakic and pseudophakic patients.⁸ GSL is not without complications. Although no complications occurred in our case, complications include; minor haemorrhage, fibrin exudate, choroidal haemorrhage, choroidal detachment and failure to control IOP

where further surgical management was needed.⁸

In our patient, GSL was performed within a month of initial vitrectomy. The therapeutic window of GSL plays very important role for successful procedure following synechial angle closure within six months or even up to one year.⁹ He had no history eye glaucoma and most likely he had normal trabecular function prior to the initial increase. The short duration of synechial angle closure and aphakia probably increased the successful rate of GSL in this patient.

Long standing PAS causes damage to the trabecular outflow function.⁹ In such cases IOP elevation may be less likely to be controlled with GSL, and additional glaucoma surgery may be needed in the form of an aqueous shunt in aphakic eyes. Glaucoma drainage devices are associated with more complications such as endophthalmitis, choroidal haemorrhage, suprachroidal haemorrhage, corneal decompensation, tube blockage and repeat surgeries.¹⁰ GSL is much safer with less complications and easier to perform in comparison to filtration surgeries.⁸ In case of failed GSL, a glaucoma drainage device can be reserved as a secondary option.

In conclusion, we present an aphakic patient who developed high IOP following vitrectomy which was successfully treated with GSL. This procedure can be an effective method to lower IOP in aphakic eyes with PAS formation after vitrectomy and may avoid the need for a glaucoma drainage device, at least in the short-term.

Patient consent

Consent to publish this case report was not obtained. This report does not contain any personal information that could lead to the identification of the patient.

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Conflicts of interest

The authors declare that there is no conflict of interest.

Authorship

All authors attest that they meet the current ICMJE criteria for Authorship.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at <https://doi.org/10.1016/j.ajoc.2018.07.008>.

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