

Persistent High Intraocular Pressure (IOP) After Phaco Vitrectomy In A Case Of Trauma

Xianxin Gao¹, Rong Zhao¹, Guohua Wang¹, Xiaonian Liu¹

Abstract:

This report delineates a case of persistent intraocular pressure (IOP) after trauma, phaco vitrectomy, necessitating repeated surgical interventions for effective management. A 51-year-old male presented with a history of right eye basketball injury, reporting a month-long experience of a dark shadow in his vision. Initial assessment revealed visual acuity (VA) of 50/100 in the right eye and 80/100 in the left eye, accompanied by elevated IOP (25 mmHg) and several ocular anomalies, including lens opacity and vitreous hemorrhage. Surgical procedures, including phacoemulsification, intraocular lens (IOL) implantation, vitrectomy, gas-liquid exchange, and retinal laser photocoagulation, were performed on the right eye. Despite these interventions, persistent high IOP necessitated further management, including anterior chamber punctures followed by tube implant. *Al-Shifa Journal of Ophthalmology* 2024; 20(1): 40-43. © Al-Shifa Trust Eye Hospital, Rawalpindi, Pakistan.

1. Yichang Aier Eye Hospital of Aier Eye Hospital, Yichang 443000, Hubei Province, China.

Originally Received: 12 Sep 2022

Revised: 29 Sep 2023

Accepted: 5 April 2024

Correspondence to:

Xianxin Gao

Yichang Aier Eye Hospital of Aier Eye Hospital, Yichang 443000, Hubei Province, China.

gaoxianxin@163.com

Introduction:

Traumatic glaucoma are a group of secondary glaucoma that occur because of various mechanisms occurring after injury to the eye. In addition to glaucoma, trauma may also result in various anterior and posterior segment complications. Pars plana vitrectomy (PPV) is a widely employed surgical procedure for the treatment of posterior segment ocular diseases. However, postoperative elevation of IOP is a frequently encountered complication, with reported incidences ranging from 8.4% to 83.3%. This complication, if left unaddressed or poorly managed, can lead to irreversible visual impairment. Herein, we present a case of high IOP following blunt ocular trauma, vitrectomy, and concomitant cataract surgery, necessitating multifaceted management strategies.

Case Presentation:

A 51-year-old male presented to the Comprehensive Eye Department one month after sustaining a basketball-related eye injury. He reported transient visual impairment followed by progressive eye

swelling, prompting medical attention. Upon examination, elevated IOP in the right eye, along with various ocular abnormalities including cataract and vitreous hemorrhage was noted. However, the retina was found flat. After initial medical management for the raised IOP and intraocular inflammation, surgical intervention (phacoemulsification, IOL implantation, vitrectomy, and retinal laser photocoagulation) was performed. Although post operatively visual acuity of

the right eye improved, the patient continued to experience persistent elevation of IOP. Subsequent management involved systemic anti-inflammatory therapy, local infection prevention, and multiple anterior chamber punctures aimed at mitigating elevated IOP.

Despite of these interventions, the IOP still remained high and the patient was advised to undergo glaucoma drainage device implant.

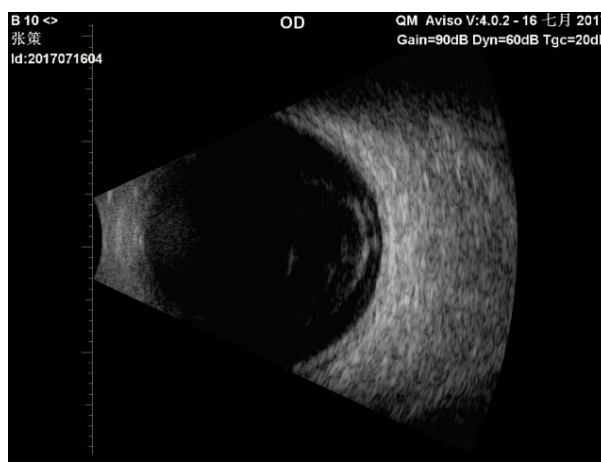
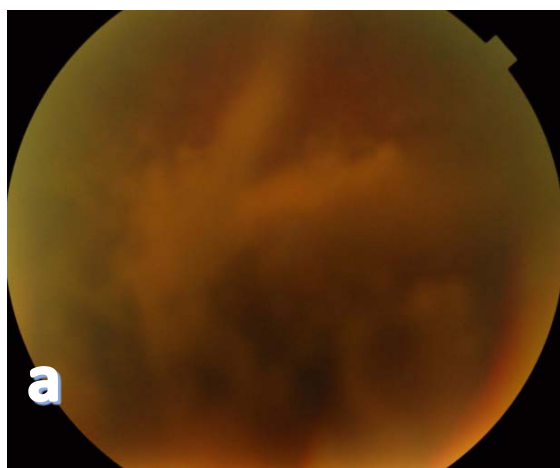


Fig.1 Right eye vitreous hemorrhage. Fundus photography reveals that the fundus view is not clear due to vitreous hemorrhage.

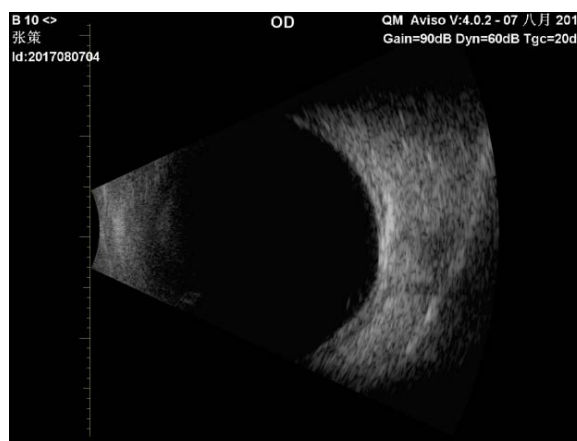
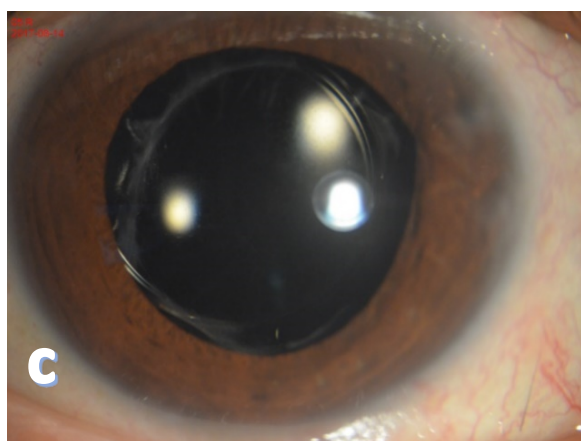


Fig.2 Anterior segment of the right eye after surgery and IOL implant. B ultrasound of the right eye indicates that the vitreous blood is cleared.

Discussion:

Analysis of this case reveals several potential mechanisms underlying elevated IOP after blunt ocular trauma and vitrectomy. These encompass damage to the trabecular meshwork, inflammation-

induced debris blockage, intraocular hemorrhage, alterations in lens morphology and position, vitreous herniation, Schwaltz syndrome and angle recession^{1,2,3}. Treatment modalities for elevated IOP following trauma are diverse, each bearing

its unique advantages and drawbacks. While PPV has revolutionized the management of posterior segment ocular pathologies, it also poses the risk of postoperative complications such as elevated IOP.⁴

A thorough comprehension of the underlying pathophysiological mechanisms and associated risk factors is essential for developing efficient management and preventive strategies. Instances of such cases pose a surgical challenge due to conjunctival scarring resulting from previous retinal surgeries, rendering standard filtering surgeries technically demanding and less likely to succeed, even with the additional use of antimetabolites.^{5,6} Trabeculectomy with mitomycin C is a commonly performed procedure for glaucoma, but its success hinges on the survival of the bleb, while conjunctival scarring post-ocular surgery stands as a significant risk factor for surgical failure. When conservative measures prove insufficient in controlling intraocular pressure (IOP), the placement of a tube implant, like the Ahmed glaucoma drainage valve, may be considered as a permanent solution. This surgical intervention provides a dependable method of facilitating drainage of aqueous humor, effectively reducing IOP and minimizing the risk of optic nerve damage and irreversible vision loss. Therefore, the possibility of tube implantation should be contemplated in cases of stubbornly high IOP following phacoemulsification combined with vitrectomy.^{7,8}

Conclusion:

This case underscores the challenge of managing elevated IOP following blunt ocular trauma and vitrectomy. Comprehensive understanding of the underlying etiology is paramount for informed clinical decision-making and effective treatment strategies. Despite exhaustive efforts, conservative measures such as anterior chamber punctures failed to

achieve sustained IOP control in our patient. In such cases, where medical management proves inadequate, surgical intervention in the form of a tube implant may be warranted as a permanent solution. Tube implants, such as the Ahmed glaucoma drainage valve, offer a reliable means of facilitating aqueous humor drainage, thereby effectively lowering IOP and mitigating the risk of optic nerve damage and irreversible vision loss.

References:

1. Li J, Liu SM, Dong WT, et al. Outcomes of transconjunctival sutureless 27-gauge vitrectomy for vitreoretinal diseases. *Int J Ophthalmol.* 2018;11:408-415. PMID: 29600174 DOI: 10.18240/ijo.2018.03.10
2. Hee Kyung Y, Yang S, Joon W, Kyu Hyung P, Ki Ho P. Intraocular pressure changes after vitrectomy with and without combined phacoemulsification and intraocular lens implantation. *Korean J Ophthalmol.* 2010;24:341-6. PMID: 21165232 DOI: 10.3341/kjo.2010.24.6.341
3. Girkin CA, McGwin G Jr, Long C, et al. Glaucoma after ocular contusion: a cohort study of the United States Eye Injury Registry. *J Glaucoma.* 2005;14:470-473. PMID: 16276279 DOI: 10.1097/01.ijg.0000185437.92803.d7
4. Kovacic H, Wolfs RCW, Kılıç E, et al. The effect of multiple vitrectomies and its indications on intraocular pressure. *BMC Ophthalmol.* 2019;19:175. PMID: 31395046 DOI: 10.1186/s12886-019-1187-x
5. Ivastinovic D, Smiddy WE, Wackernagel W, et al. The occurrence of delayed ocular hypertension and glaucoma after pars plana vitrectomy for rhegmatogenous retinal detachment. *Acta Ophthalmol.* 2016;94:e525-e527. PMID: 26805488 DOI: 10.1111/aos.12925
6. Broadway DC, Chang LP. Trabeculectomy, risk factors for failure

- and the preoperative state of the conjunctiva. *J Glaucoma*. 2001; 10: 237–249.
7. Yamamoto K, Iwase T, Terasaki H. Long-term changes in intraocular pressure after vitrectomy for rhegmatogenous retinal detachment, epi-retinal membrane, or macular hole. *PLoS One*. 2016;11:e167303. PMID: 27898707 DOI: 10.1371/journal.pone.0167303
8. Adel M, Al-Jazzaf, Peter A, Netland, Steve, Charles. Incidence and management of elevated intraocular pressure after silicone oil injection. *J Glaucoma*. 2005;14:40-6. PMID: 15650603 DOI: 10.1097/01.ijg.0000145811.62095.fa

Authors Contribution

Concept and Design: Rong Zhao
Data Collection / Assembly: Guohua Wang
Drafting: Xiaonian Liu
Statistical expertise: Rong Zhao
Critical Revision: Xianxin Gao