

Ocular Hypotony Causing Choroidal Detachment Following Scleral Fixation of Intraocular Lens – A Case Report

Idris Saka¹, Modupe Balogun¹, Gafar Folohunso Yusuf²

¹Department of Ophthalmology, Lagos State University Teaching Hospital, Ikeja, Nigeria, ²Forever Vision Eye Center, Mushin, Lagos, Nigeria

Abstract

This article reports a case of choroidal detachment (CD) probably from reduced volume of the globe and ocular hypotony following scleral fixation of intraocular lens (SFIOL) in a diabetic. Ocular hypotony is a complication of intraocular surgeries such as glaucoma filtering procedures, penetrating keratoplasty, and vitreous surgery. Urgent identification and management of CD is important to ensure a favorable visual outcome. We report a case of CD from prolonged ocular hypotony (OH) following SFIOL in a Nigerian male. Our patient was a 59-year-old diabetic male who presented with poor vision in left eye following cataract surgery. Left eye examination revealed quiet anterior segment with aphakia and a normal posterior segment. A +10 Dioptre sphere lens over the index eye improved visual acuity to 6/12. He was scheduled for SFIOL which was uneventful. He developed sudden decline in vision 1 week postoperative, examination revealed a serous choroidal detachment that resolved completely with high dose oral and topical steroids, systemic vitamin C, and doxycycline to a final unaided visual acuity of 6/24 at 2 weeks, and 6/9 at 3 months.

Keywords: Choroidal detachment, ocular hypotony, scleral fixation of intraocular lens

INTRODUCTION

Ocular hypotony (OH) is a clinical condition in which the intraocular pressure (IOP)/volume is sufficiently low to cause anatomical and physiological disruptions in the affected eye.^[1] In normal eyes, IOP is maintained by the delicate balance between aqueous production and outflow. The level of IOP where a diagnosis of clinical ocular hypotony is made is usually less than 6.5 mmHg^[2]; some literatures however quote higher values of IOP up to 8 mmHg as anatomical and physiological features of hypotony can be found.^[3] OH can result from a host of ocular and systemic conditions, most commonly are surgical interventions aimed at reducing intraocular pressure such as trabeculectomy and tube implant, cataract surgery with or without vitreous loss, vitreoretinal surgeries, and penetrating keratoplasty. Uveitis, topical, and oral medications such as acetazolamide, cyclodialysis cleft, rhegmatogenous retinal detachment, and proliferative vitreoretinopathy from retina or vitreous surgeries can also cause OH.^[4,5] On clinical examination, OH could present with soft eye on digital palpation, folds in the descemet membrane, shallow anterior chamber, maculopathy, retinal/choroidal folds, and

papilledema.^[6] Treatment of ocular hypotony aims at identifying the underlying cause and treatment with medical or surgical intervention as required.^[6]

Choroidal detachment is a clinical condition that results from separation of the sclera from the choroid leaving the potential space between the structures to be filled with either serous inflammatory fluid or hemorrhage. Serous choroidal detachment (SCD) is relatively common and carries a better prognosis. Hemorrhagic choroidal detachment can be either expulsive or non-expulsive, in either case, prompt intervention is key though visual prognosis is usually poor.^[7]

Scleral fixation of intraocular lens (SFIOL) is a surgical procedure usually indicated in cases where intraocular lens

Address for correspondence: Dr Saka Idris,

Department of Ophthalmology, Lagos State University Teaching Hospital,
1-5 Oba Akinjobi Way, 101233, Ikeja, Nigeria.
E-mail: Idris.sansan@gmail.com

Received: 13 June 2022 **Revised:** 28 July 2022

Accepted: 13 October 2022 **Published:** 29 April 2023

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

How to cite this article: Saka I, Balogun M, Yusuf GF. Ocular Hypotony Causing Choroidal Detachment Following Scleral Fixation of Intraocular Lens – A Case Report. *Niger J Ophthalmol* 2023;31:41-4.

Access this article online

Quick Response Code:



Website:

www.nigerianjournalofophthalmology.com

DOI:

10.4103/njo.njo_10_22

implantation in the sulcus or capsular bag is impossible such as large capsular rupture and extensive zonular dialysis. The SFIOL is subjected to various complications such as raised IOP, hypotony, vitritis, cystoid macular edema, and endophthalmitis.^[8]

CASE REPORT

Our patient is a 59-year-old man, known diabetic who presented to the eye clinic with complaints of poor vision of count finger in left eye following cataract surgery at an external eye facility 2 months prior. Examination of the right eye revealed a 6/6 visual acuity in a quiet pseudophakia with normal anterior and posterior segment findings. Examination of the left eye revealed a Visual acuity of 3/60, intraocular pressure or 14 mmHg (air puff tonometer), clear cornea, normal anterior chamber depth and a slightly up drawn pupil, vitreous band extended superiorly into the anterior chamber, posterior segment examination was essentially normal. A +10 dioptre lens over the left eye improved visual acuity to 6/12. He was counseled and scheduled for elective scleral fixation of posterior chamber intraocular lens using the ab externo approach where partial thickness scleral flaps are created at the 3 and 9 o'clock as well as a superior scleral tunnel about 6 to 7 mm wide to allow entry of an intraocular lens. Suture needles are passed beneath one end of the scleral flap to be externalized at the other end, the suture was externalized and sutured to the IOL to be implanted posterior to the Iris. Anterior vitrectomy is done. The wound entries are closed, flaps sutured close followed by superior subconjunctival injection of antibiotic and anti-inflammatory. Procedure was uneventful.

On postoperative day 1, patient had a visual acuity of 2/60 with no improvement with pin hole, intraocular pressure was 6 mmHg, entry wounds were well sealed, and the scleral flaps were well opposed to the scleral bed. He had a clear cornea, deep anterior chamber with mild cellular activity, a fairly oval pupil, and a well centered intraocular lens. A 90D examination of the posterior segment revealed vitreous haze which obscured a detailed view of the retina and was also suspected as the cause of poor visual acuity on day 1.

On postoperative day 4, visual acuity had improved to 6/24 with no improvement with pinhole, intraocular pressure was 8 mmHg. Slit lamp examination revealed a clear cornea, quiet, and deep anterior chamber; the intraocular lens was well centered with a clear vitreous. Posterior Segment examination using a 90D lens revealed a flat retina with pink disc. He was placed on topical steroid and antibiotic drops and was given a 1 week follow up appointment.

At the next follow-up visit which was the postoperative day 10, patient reported a gradual reduction in visual acuity 3 days prior to presentation to 2/60, intraocular pressure was 6 mmHg, the nasal and temporal conjunctivae were injected and retracted over the scleral flap, and the partial thickness nasal scleral flap appeared unevenly necrosed with necrosis extending anteriorly towards base of flap at the limbus, there was also thinning of the underlying scleral bed leaving the sutures exposed. The temporal scleral flap appeared normal. No history of trauma, vigorous eye itching, or eye discharge. The cornea was clear, the anterior chamber was deep and quiet, with a slightly oval pupil and a well centered intraocular lens. Posterior segment evaluation with a 90D lens was obscured by a dense yellow fundal glow. Ocular B-scan features were in keeping with serous choroidal detachment [Figure 1a, b]. Patient had a vitreoretinal consult which confirmed the diagnosis of choroidal detachment and was commenced on high dose oral steroid (1 mg/kg for 1 week followed by slow taper), topical atropine TDS, hourly topical dexamethasone and moxifloxacin. He was also placed on high dose vitamin C (1 g daily for 2 weeks) and doxycycline (100 mg BD for 1 week). He was counseled on his diagnosis, visual prognosis, and the need for regular follow-up.

On day 4 after commencement of treatment, visual acuity had improved to 6/24, intraocular pressure was 8 mmHg, and choroidal detachment had completely resolved on B-scan [Figure 2a, b]. The nasal scleral flap was completely necrosed. Patient was scheduled for conjunctiva advancement where a conjunctiva hood was raised over the thinned scleral bed.

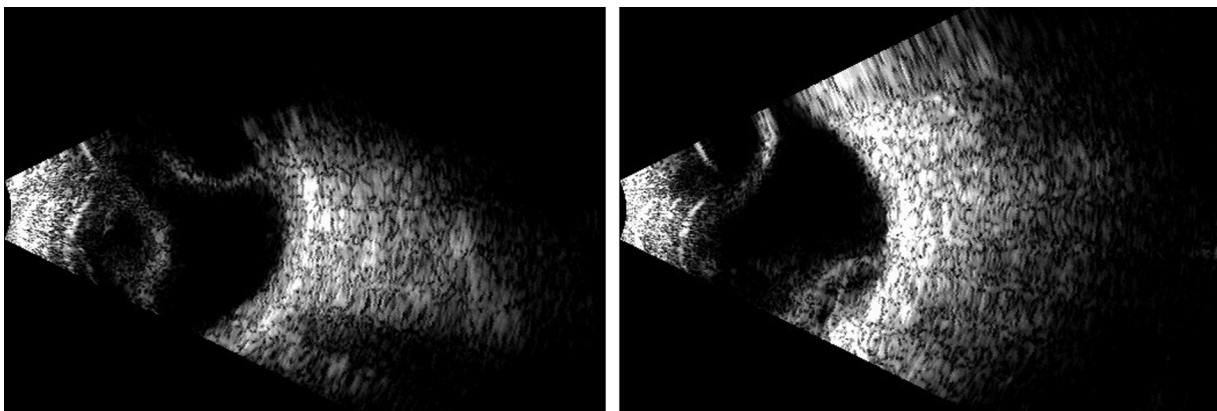


Figure 1: Ocular B-scan of the left eye of the patient showing serous choroidal detachment.

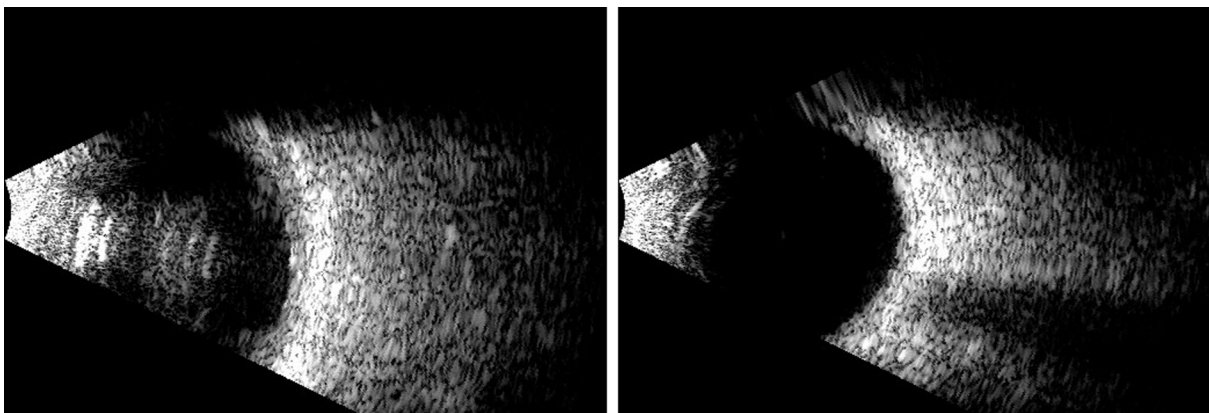


Figure 2: Repeat Ocular B-scan of the left eye of the patient 4 days after therapy showing complete resolution of serous choroidal detachment.

At 3 months postoperative, all topical and oral medication had been tailed off to a stop and eventual unaided visual acuity had improved to 6/9. The conjunctiva and sclera was quiet with a clear cornea, deep and quiet anterior chamber, fairly round pupil, with a well centered intraocular lens. The vitreous was clear and the retina was flat with a normal appearing optic nerve head.

DISCUSSION

Cataract surgery with intraocular lens (IOL) implantation is the most popular implant surgery in the world with about 10 million surgeries performed each year in the world and this is due to global strategies, improved surgical techniques, and lower rate of complications.^[9,10] In the absence of ocular and systemic comorbidities/complications, every cataract surgeon aims to restore a patient's vision to 6/6 without the aid of correction.^[11] One of the most common intraoperative complications following cataract surgery is posterior capsule rupture.^[12] Posterior capsule rupture may lead to vitreous prolapse into the anterior chamber and even the wound.^[13] SFIOL serves to implant the intraocular lens in the posterior chamber. Complication of SFIOL includes cornea edema, ocular hypotony, raised intraocular pressure, lens tilt, vitreous hemorrhage, cystoid macula edema, suprachoroidal hemorrhage, choroidal detachment, retinal detachment.^[8,14,15] We hypothesize that the multiple entry point through the eye wall, reduced vitreous volume, and associated inflammation might be contributory in the hypotony reported in this case.

Following vitrectomy, replacing the lost vitreous volume is very important to prevent complications such as ocular hypotony that can lead to choroidal detachment and rarely delayed expulsive hemorrhage. Ocular volume can be replaced with balanced salt solution (BSS), sodium hyaluronate, or air.^[16]

Ocular inflammation leads to a breach in the blood-aqueous and blood-retina barrier and this can lead to extravasation of fluid and blood into tight space of which the suprachoroidal space is one; it can also lead to ciliary shut-down which can

cause hypotony. Our patient had a serous choroidal detachment (CD) that was most probably due to ocular inflammation associated with hypotony. The maximum vertical height of the detachment was 6.6mm and this resolved within 4 days of intense oral and topical steroids along with cycloplegics. The incidence of choroidal detachment varies with literature, and it can range from 2.8% to 33.9% depending on the type of procedure, patient demographics, and the method of diagnosis.^[17,18] Risk factors for post-surgical choroidal detachment include long axial length, older age, lens status, and systemic hypertension.^[17] Serous CD can be severe enough to warrant surgical intervention, indications include anterior chamber shallowing, persistent reduced visual acuity, prolonged choroidal detachment.^[19] Our patient however did not need surgical intervention as there was significant improvement by the 4th day following therapy.

Our patient had scleral flap necrosis; he was placed on oral Vitamin C and oral doxycycline to improve wound healing and anti-collagenase effect. This is approached by either a conjunctiva hood if the underlying uvea is not visible or a scleral patch graft in cases of severe scleral thinning.^[20] Scleral flap amputation and necrosis are complications of partial thickness scleral flap.^[21] Flap necrosis can be infectious or non-infectious. Our patient had no feature suggestive of an infectious scleral flap necrosis. Risk factors for non-infectious flap necrosis include excessive scleral cauterization, excessively thin sclera flap, trauma, cryotherapy, chemical induced (e.g., Mitomycin, 5 fluorouracil), radiation, autoimmune disease such as scleromalacia, vasculitides, and delayed wound healing in systemic conditions like as diabetes mellitus.^[21] The etiology of scleral flap necrosis in this case was hypothesized to be due to a thin scleral flap and background diabetes mellitus. He however showed significant sign of improvement following anterior conjunctiva advancement.

Ultrasound biomicroscopy (UBM) in cases of ocular hypotony is a useful tool in assessing the ciliary body and the role it plays in the mechanism of ocular hypotony.

Ocular hypotony is a common complication of ocular surgery including procedures such as scleral fixation of intraocular lens, it is important that the cataract surgeon with posterior capsule rupture manages vitreous loss properly, controls inflammation, and ocular volume should be monitored by routine intraocular pressures assessment to prevent complications such as choroidal detachment.

Limitations

We had no access to a UBM and this is seen as a limitation to this case report.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

- Wang Q, Thau A, Levin A.V., Lee D. Ocular hypotony: a comprehensive review. *Surv Ophthalmol* 2019;64:619-38.
- Schubert HD. Postsurgical hypotony: relationship to fistulization, inflammation, chorioretinal lesions, and the vitreous. *Surv Ophthalmol* 1996;41:97-125.
- Abbas A, Agrawal P, King AJ. Exploring literature-based definitions of hypotony following glaucoma filtration surgery and the impact on clinical outcomes. *Acta Ophthalmol* 2018;96:e285-9.
- Zacharia PT, Deppermann SR, Schuman JS. Ocular hypotony after trabeculectomy with mitomycin C. *Am J Ophthalmol* 1993;116:314-26.
- Fine HF, Biscette O, Chang S, Schiff WM. Ocular hypotony: a review. *Compr Ophthalmol Update* 2007;8:29-37.
- Demeler U. Surgical management of ocular hypotony. *Eye* 1988;2:77-9.
- Bellows AR, Chylack LT, Hutchinson BT. Choroidal detachment: clinical manifestation, therapy and mechanism of formation. *Ophthalmology* 1981;88:1107-15.
- Egbu E, Igwe N, Olatunji P, Oluwaniyi J, Saka I. Outcome of Sclera Fixated Intraocular Lens for Complicated Cataract Surgeries in an Eye Institute, Southwestern Nigeria; 2020.
- Khanna R, Pujari S, Sangwan V. Cataract surgery in developing countries. *Curr Opin Ophthalmol* 2011;22:10-4.
- Rao GN, Khanna R, Payal A. The global burden of cataract. *Curr Opin Ophthalmol* 2011;22:4-9.
- Behndig A, Montan P, Stenevi U, Kugelberg M, Zetterström C, Lundström M. Aiming for emmetropia after cataract surgery: Swedish National Cataract Register study. *J Cataract Refract Surg* 2012;38:1181-6.
- Chan E, Mahroo OAR, Spalton DJ. Complications of cataract surgery. *Clin Exp Optom* 2010;93:379-89.
- Hong AR, Sheybani A, Huang AJW. Intraoperative management of posterior capsular rupture. *Curr Opin Ophthalmol* 2015;26:16-21.
- Deb AK, Sarkar S, Natarajan K, *et al.* Complications and visual outcome of sutureless, scleral fixated intraocular lens in cases with traumatic aphakia. *Ther Adv Ophthalmol* 2021;13:25158414 211009096.
- Davies EC, Pineda R. Complications of scleral-fixated intraocular lenses. *Semin Ophthalmol* 2018;33:23-8.
- Küçükerdönmez C, Beutel J, Bartz-Schmidt KU, Gelissen F. Treatment of chronic ocular hypotony with intraocular application of sodium hyaluronate. *Br J Ophthalmol* 2009;93:235-9.
- Jung KI, Park HYL, Park CK. Risk factors for choroidal detachment after Ahmed valve implantation in glaucoma patients. *Am J Ophthalmol* 2020;211:105-13.
- Cutolo CA, Negri L, Olivari S, Cappelli F, Traverso CE, Iester M. Choroidal detachment after XEN Gel stent implantation. *J Ophthalmol* 2021;2021:6674505.
- Rezende FA, Kicking MC, Li G, Prado RF, Regis LGT. Transconjunctival drainage of serous and hemorrhagic choroidal detachment. *Retina* 2012;32:242-9.
- Kim SY, Chung WS, Hahn DK. Surgical management of scleral necrosis. *J Korean Ophthalmol Soc* 1995;36:7-12.
- Ruiz-Lozano RE, Garza-Garza LA, Davila-Cavazos O, Foster CS, Rodriguez-Garcia A. The clinical and pathogenic spectrum of surgically-induced scleral necrosis: a review. *Surv Ophthalmol* 2021;66:594-611.