Pneumatic retinopexy for rhegmatogenous retinal detachment in a patient on anticoagulant therapy with phakic anterior chamber intraocular lens

Utku Limon[1]

ABSTRACT

A 42-year-old male patient treated with pneumatic retinopexy for rhegmatogenous retinal detachment in his left eye on anticoagulant therapy with phakic anterior chamber intraocular lens (IOL) is presented. The methods currently used in the treatment of rhegmatogenous retinal detachments are scleral buckling, pars plana vitrectomy (PPV), and pneumatic retinopexy. However, the development of cataracts after PPV may be difficult to treat in a patient with an anterior chamber lens. Also, intraoperative and postoperative hemorrhagic complications after PPV and scleral buckling surgery may negatively affect the surgical results. Pneumatic retinopexy should be considered as the first treatment method for patients with anterior chamber IOL on systemic anticoagulation or antiplatelet agents to protect them from surgical difficulties of cataract surgery and hemorrhagic complications of PPV and scleral buckling.

Keywords: Pneumatic retinopexy**,** Rhegmatogenous retinal detachment**,** Systemic anticoagulation, Anterior chamber intraocular lens.

INTRODUCTION

The methods currently used in the treatment of rhegmatogenous retinal detachments are scleral buckling, PPV, and pneumatic retinopexy.[1] For many years, scleral buckling has been the first choice of treatment for retinal detachments. The success rate of scleral buckling in one operation varies between 75% and 88%.[2] Subretinal hemorrhage was the most common and dangerous type of perioperative hemorrhagic complication after scleral buckling surgery, especially with subretinal drainage. Also, in scleral buckling surgery on systemic anticoagulation or antiplatelet agents; hemorrhage from extraocular tissues and tissue trauma is common which makes surgery difficult.[3]

Today, PPV has become the most commonly used method in the treatment of rhegmatogenous retinal detachments. The success rate of PPV in one operation is around 90%.[4] In many studies; in patients on systemic anticoagulation or antiplatelet agents, there are many hemorrhagic complications after PPV.[5,6]

In pneumatic retinopexy, retinal reattachment is provided by intravitreal gas injection, head position, and laser treatment. The success rate of pneumatic retinopexy in one operation is around 65-85%. The most important advantage of pneumatic retinopexy compared to the other two methods is that it does not require an incision.[7] Therefore, the probability of hemorrhagic complications during the procedure is lower in patients on systemic anticoagulation or antiplatelet agents. In this case report, we presented a patient on warfarin therapy with rhegmatogenous retinal detachment with anteior chamber IOL whom treated with pneumatic retinopexy.

Case Report

A 42-year-old male patient presented with visual loss that occurred within the last 1 week in his left eye. At the initial visit, his best corrected visual acuity (BCVA) was 0.8 decimal in the right eye and 0.05 decimal in the left eye. There were anterior chamber IOLs with clear lenses in the anterior segment examination in both eyes.

1- Assoc. Prof., World Eye Hospital Eye Clinic, Retina Department, Konya, Türkiye

Received: 26.06.2023
Accepted: 02.01.2024
J Ret-Vit 2024; 33: 82-85
DOİ:10.37845/ret.vit.2024.33.13

Correspondence Adress:
Utku Limon
World Eye Hospital Eye Clinic, Retina Department, Konya, Türkiye
Phone: +90 506 848 7190
E-mail: utku_limon@hotmail.com

Intraocular pressure was 11 mm Hg in the right eye and 12 mm Hg in the left eye. In the right eye fundus examination, there was peripapillary atrophy and prominent choroidal vessels. In the left eye fundus examination, the patient had rhegmatogenous retinal detachment with a single break at the 10 o'clock meridian of the equatorial retina. The tear had a size of about 1 o'clock hour meridian of the retina. Retinal detachment involves the macula and the upper retina between 3 and 9 o'clock hours (Figure 1). The patient was on anticoagulant therapy warfarin for valvular heart disease for 3 years. The patient's international normalized ratio (INR) was 4.2. The patient had been treated with phakic IOL implantation for myopia (18.00 diopters right and 19.00 diopters left) in a different center 10 years ago. We treated the patient with pneumatic retinopexy.

Pneumatic retinopexy procedure

Before the procedure; a prophylactic laser was applied to the attached peripheral retina. All procedures were performed in the operating room under sterile conditions with topical anesthesia (%0.5 Proparacain, Alcaine, Alcon). A sterile lid speculum and drape are utilized. We used povidone-iodine for sterilization of the ocular surface and eyelashes. First, we performed 0.3 ml paracentesis with a 30 gauge needle. Then we injected intravitreal 0.5 ml 100% SF6 gas at a distance from 4 mm of the limbus. The gas injection was made from the temporal side of the left eye at the highest point by turning the head 45 degrees from the break and bullous detachment in the opposite direction. When the injector was removed from the sclera, a cotton swab was pressed into the injection area and the patient's head was turned to a different side. After gas injection, central retinal arterial pulsation and whether the gas is in the vitreous cavity are checked with an indirect ophthalmoscope. Afterward, the patient was immediately placed in the prone position. Topical steroids and antibiotics were given. Steamroller maneuver was applied. After the gas injection, the patient was laid face down for 4 hours. Then, the patient was positioned by slowly moving his head 30 degrees every hour so that the break remained on the hill. On postoperative day 3, the retina was reattached and we performed laser around the break.

At postoperative month-6 BCVA was 0.8 in his left eye and retina was attached (Figure 2).

DISCUSSION

Warfarin is an anticoagulant used in the management of patients with cardiovascular diseases. The anticoagulant activity of warfarin is through inhibition of vitamin K-dependent gamma-carboxylation of coagulation factors II, VII, IX and X. The anticoagulant effect of warfarin can continue for 36 to 72 hours after ingestion until normal clotting factors have been cleared from the patient's

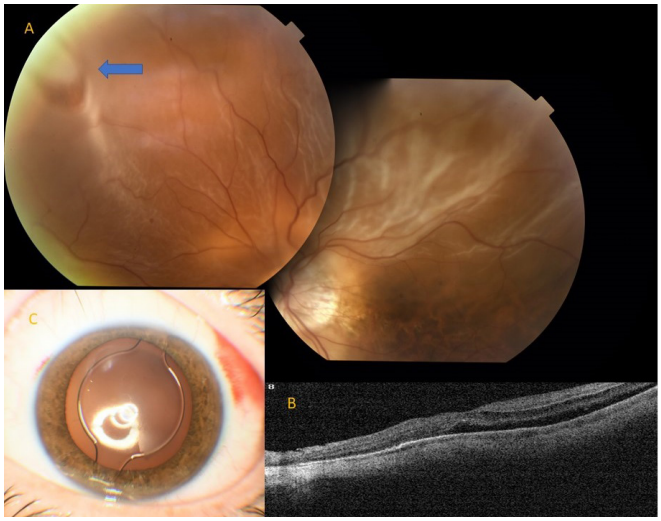

Figure 1: A- *Preoperative montage posterior segment photo of macula-off retinal detachment from a superonasal retinal tear (blue arrow) in a 42 years old male patient on warfarin therapy (INR 4.2)* **B-** *Macula is off in the optical coherence tomography image of the same patient.* **C-** *The same patient has a phakic intraocular lens in the anterior segment photo.*

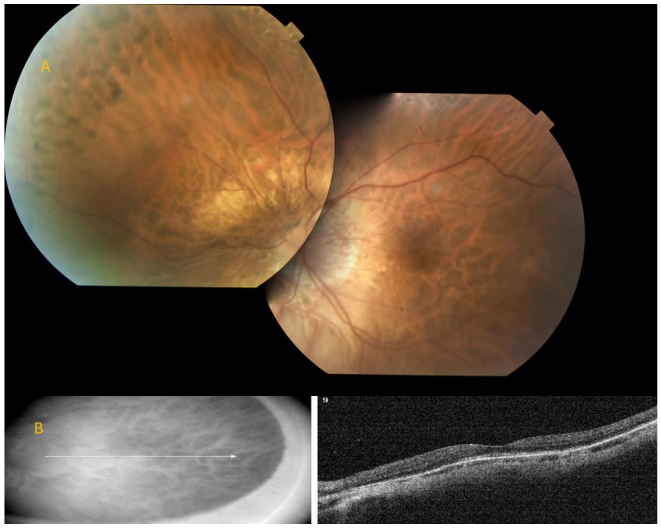

Figure 2: A-B- *6th month posterior segment photo and optical coherence tomography image of the same patient in figure-1 after pneumatic retinopexy treatment. Retina is attached with superonasal laser-induced chorioretinal scars.*

circulation.[8] The most commonly used laboratory test in the monitorization of warfarin therapy is INR. In many cardiovascular diseases, INR is expected to be between 2 and 3. As the INR increases, the probability of bleeding increases.[9] In this case report our patients' INR was 4.2 and the possibility of hemorrhagic complications is high after PPV and scleral buckling. Also, this patient had an anterior chamber IOL that may present difficulties and hemorrhagic complications in possible cataract surgery during or after PPV. To the best of our knowledge, there was not any case that have these features reported before in the literature.

It is a question mark for patients and doctors whether warfarin should be discontinued prior to PPV due to possible hemorrhagic complications such as subconjunctival hemorrhage, hyphema, vitreous hemorrhage, subretinal hemorrhage, and suprachoroidal hemorrhage. In Patel et al.[10] study, an online survey was sent to 167 members of the British and Eire Association of Vitreoretinal Surgeons (BEAVRS). Their findings demonstrate that 56 of 71 (78.9%) surgeons would not stop warfarin,14(19.7%) would, and one (1.4%) was unsure. Six would stop warfarin 48 h pre-surgery, seven would stop it 72 h before, and one would stop it>72 h before.

Some studies have reported that PPV is risky in patients on warfarin therapy.[11,12] For example; in the Narendran et al.[13] study 1 of 7 patients using warfarin developed suprachoroidal hemorrhage and 3 of them had vitreous hemorrhage after vitreoretinal surgery. They concluded that; the association of warfarin with bleeding was statistically significant.

At the same time, it should be kept in mind that it may be more difficult to stop bleeding and surgery time will be longer after an iatrogenic complication during PPV surgery in patients operated with high INR ratios. If we had PPV surgery to our patient who had on warfarin therapy with a phakic intraocular lens, we would have to do cataract surgery after a certain time. Before cataract surgery, perhaps while removing the phakic intraocular lens, complications such as iris hemorrhage would occur. Therefore, a minimally invasive procedure of pneumatic retinopexy should be preferred in the selected appropriate patient group who are under warfarin therapy.

In the Hillier et al.[14] study (PIVOT study) pneumatic retinopexy provided more than 4.9 letters, less vertical metamorphopsia, less need for cataract surgery, and reduced morbidity at the 12th month when compared with PPV. In their study in the 12th month primary anatomical success was 80.8% in the pneumatic retinopexy group and 93.2% in the PPV group.

Pneumatic retinopexy should be considered as an alternative treatment method for selected patients on warfarin therapy. In this way, these patients can be protected from hemorrhagic complications of PPV and scleral buckling. At the same time; the patient is protected from systemic embolic events that may occur due to the discontinuation of the warfarin.

REFERENCES

1. Shanmugam PM, Ramanjulu R, Mishra KCD, et al. Novel techniques in scleral buckling. Indian J Ophthalmol 2018;66:909-15. https://doi.org/10.4103/ijo.IJO_136_18
2. Yan H. Scleral buckling with a noncontact wide-angle viewing system in the management of rhegmatogenous retinal detachment. Eur J Ophthalmol 2017;27:98-103. https://doi.org/10.5301/ejo.5000819
3. Bemme S, Lauermann P, Striebe NA, et al. Risk of perioperative bleeding complications in rhegmatogenous retinal detachment surgery: a retrospective single-center study. Graefes Arch Clin Exp Ophthalmol 2020;258:961-9. https://doi.org/10.1007/s00417-019-04554-1
4. Hodson TS, Isom RF, Parke DW. Non-Lasered Drainage Retinotomies for Repair of Primary Rhegmatogenous Retinal Detachments. Ophthalmic Surg Lasers Imaging Retina 2018;49:955-60. https://doi.org/10.3928/23258160-20181203-08
5. Ryan A, Saad T, Kirwan C, et al. Maintenance of perioperative antiplatelet and anticoagulant therapy for vitreoretinal surgery. Clin Exp Ophthalmol 2013;41:387-95. https://doi.org/10.1111/ceo.12017
6. Mason JO, Gupta SR, Compton CJ, et al. Comparison of hemorrhagic complications of warfarin and clopidogrel bisulfate in 25-gauge vitrectomy versus a control group. Ophthalmology 2011;118:543-7. https://doi.org/10.1016/j.ophtha.2010.07.005
7. Ling J, Noori J, Safi F, et al. Pneumatic Retinopexy for Rhegmatogenous Retinal Detachment in Pseudophakia. Semin Ophthalmol 2018;33:198-201. https://doi.org/10.1080/08820538.2016.1190849
8. Sun MT, Wood MK, Chan W, et al. Risk of Intraocular Bleeding With Novel Oral Anticoagulants Compared With Warfarin: A Systematic Review and Meta-analysis. JAMA Ophthalmol 2017;135:864-70. https://doi.org/10.1001/jamaophthalmol.2017.2199
9. Talany G, Guo M, Etminan M. Risk of intraocular hemorrhage with new oral anticoagulants. Eye (Lond) 2017;31:628-31. https://doi.org/10.1038/eye.2016.265
10. Patel R, Charles S, Jalil A. Antiplatelets and anticoagulants in vitreoretinal surgery, with a special emphasis on novel anticoagulants: a national survey and review. Graefes

Arch Clin Exp Ophthalmol 2017;255:1275-85. https://doi.org/10.1007/s00417-017-3664-3

11. Mantopoulos D, Vavvas DG, Fine HF. Perioperative Risks of Antiplatelet and Anticoagulant Drugs in Vitreoretinal Procedures. Ophthalmic Surg Lasers Imaging Retina 2017;48:4-8. https://doi.org/10.3928/23258160-20161219-01
12. Brown JS, Mahmoud TH. Anticoagulation and clinically significant postoperative vitreous hemorrhage in diabetic vitrectomy. Retina 2011;31:1983-7. https://doi.org/10.1097/IAE.0b013e31821800cd
13. Narendran N, Williamson TH. The effects of aspirin and warfarin therapy on haemorrhage in vitreoretinal surgery. Acta Ophthalmol Scand 2003;81:38-40. https://doi.org/10.1034/j.1600-0420.2003.00020.x
14. Hillier RJ, Felfeli T, Berger AR, et al. The Pneumatic Retinopexy versus Vitrectomy for the Management of Primary Rhegmatogenous Retinal Detachment Outcomes Randomized Trial (PIVOT). Ophthalmology 2019;126:531-9. https://doi.org/10.1016/j.ophtha.2018.11.014