Case Report

Visible Blood Flow in a Case of Rubeosis Iridis

Masaki Tanito Sho Ichioka Yuji Takayanagi Akiko Ishida

Department of Ophthalmology, Shimane University Faculty of Medicine, Izumo, Japan

Keywords

Central retinal vein occlusion · Neovascular glaucoma · Rubeosis iridis · Slit lamp examination

Abstract

A 72-year-old Japanese woman presented to our hospital with decreased vision. At the initial visit, her best-corrected visual acuity (BCVA) and intraocular pressure (IOP) in her right eye (OD) were 0.02 and 36 mm Hg, respectively. By slit lamp examination, rubeosis iridis was observed on the iris surface. With higher magnification observation, movement of clustered RBCs were clearly observed; the blood drained into episcleral vessels that were connected with the main trunk of rubeosis iridis. She was diagnosed with the neovascular glaucoma secondary to central retinal vein occlusion OD. She underwent panretinal photocoagulation, intravitreal injection of aflibercept, and Ahmed Glaucoma Valve implantation. At 2 weeks post-operatively, the BCVA and IOP OD were 0.2 and 7 mm Hg, respectively; rubeosis iridis was partially regressed and movement of RBCs was not observed. Acquisition of directional flow by the connection of the main trunk of neovessels with the episcleral vessels and reduction of flow speed by the high IOP could explain the reason for visible blood flow in our case.

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Introduction

Rubeosis iridis, a neovascularization of the iris, is a complication that develops secondary to ischemic ocular conditions including retinal vein occlusion, diabetic retinopathy, and carotid artery stenosis and may result in visual loss due to neovascular glaucoma. Previous studies have used fluorescein angiography [1, 2] or optical coherence tomography angiography [3] for detection of iris neovascularization, however, even with the use of these modal-

Correspondence to:
Masaki Tanito, tanito-oph@umin.ac.jp

ities, real-time observation of blood streams in the neovascular lumen is still difficult. We report a unique case of neovascular glaucoma in which movement of RBCs in the rubeosis iridis could be observed without applying any special techniques.

Case Report

A 72-year-old Japanese woman presented to our hospital with decreased vision in her both eyes. Her medical history included diabetes mellitus and dementia; her ocular history included cataract surgery >10 years ago in her right eye (OD). At the initial visit, her best-corrected visual acuity (BCVA) and intraocular pressure (IOP) in her left eye (OS) were light sense and 12 mm Hg, respectively; presence of mature cataract was likely the reason of decreased BCVA OS. The decimal BCVA and IOP OD were 0.02 and 36 mm Hg, respectively. By slit lamp examination, rubeosis iridis was observed on the iris surface OD (Fig. 1a). With a higher magnification observation, movement of clustered RBCs were clearly seen (Fig. 1b; online suppl. Video 1; for all online suppl. material, see www.karger.com/doi/10.1159/000513795); the blood drained into episcleral vessels that were connected with the main trunk of rubeosis iridis (Fig. 1c, d). By gonioscopy, entire angle was closed due to peripheral anterior synechia OD. By funduscopy, optic nerve head color was pale and patchy retinal hemorrhages were scattered in the peripheral fundus OD. She was diagnosed with neovascular glaucoma, secondary to central retinal vein occlusion OD. She underwent panretinal photocoagulation and intravitreal injection of aflibercept (Eylea, Bayer Yakuhin Ltd., Osaka, Japan), followed by pars plana vitrectomy and Ahmed Glaucoma Valve (model FP7, New World Medical, Rancho Cucamonga, CA, USA) implantation with tube insertion into vitreous cavity. At 2 weeks postoperatively, the BCVA and IOP OD were 0.2 and 7 mm Hg, respectively; rubeosis iridis was partially regressed (Fig. 2a), and movement of RBCs was not observed. At 4 weeks postoperatively, rubeosis iridis regressed further (Fig. 2b).

Fig. 1. **a** A 72-year-old woman with neovascular glaucoma following central retinal vein occlusion in her right eye. **b** By slit lamp examination, movement of RBC clusters is clearly observed in the neovascular vessels without applying any examination technique. **c, d** Blood drains into episcleral vessels that are connected with the main trunk of rubeosis iridis.

Fig. 2. Slit lamp photographs at 2 (**a**) and 4 (**b**) weeks after the glaucoma surgery.

Discussion/Conclusion

During the formation of iris neovascularization, new vessels start to emerge independently around the pupillary margin and at the iris root (at this stage the vessels are likely the terminal vessels), in subsequent stages penetrating anterior iris surface and merging; thereby giving the iris the red flush that led to the name “rubeosis iridis” [4]. At the stage of rubeosis iridis, detection of neovascular vessels is not troublesome, however, the observation of streaming blood is difficult even with the use of fluorescein angiography and optical coherence tomography angiography [1–3].

In cases of iris neovascularization, blood flow is not detectable probably due to too low/small amount of flow in the terminal vessels and too fast speed of flow in the rubeosis iridis. Acquisition of directional flow by the connection of the main trunk of neovessels with the episcleral vessels and reduction of flow speed by the high IOP could explain the reasons of visible blood flow in our case although the clinical relevance of this phenomenon on IOP and ischemia is not clear. If our speculation is correct, applying pressure to eyes by using contact lens or other devices may make blood flow visible in eyes with rubeosis iridis, but this is required to be tested.

Statement of Ethics

This study adhered to the tenets of the Declaration of Helsinki. The patient provided written informed consent for publication of this case report and any accompanying pictures.

Conflict of Interest Statement

The authors have no conflict of interests for this study.

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Author Contributions

M.T., S.I., Y.T., and A.I. treated the subject and collected the clinical data. M.T. wrote the manuscript, and S.I., Y.T., and A.I. revised the manuscript. All authors approved the final version of the manuscript. The authors agree to be responsible for all aspects of this work.

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