

Case report

Pars plana vitrectomy in the management of ghost cell glaucoma

Ahmed M. Abu El-Asrar & Saleh A. Al-Obeidan

Department of Ophthalmology, College of Medicine, King Saud University, Riyadh, Saudi Arabia

Accepted 6 February 1995

Key words: ghost cell glaucoma, vitrectomy, trauma, vitreous hemorrhage

Abstract

In this report we describe, herewith, 5 cases of ghost cell glaucoma that followed spontaneous vitreous hemorrhage complicating branch retinal vein occlusion in a phakic eye (one case), and traumatic vitreous hemorrhage (4 cases). Because intraocular pressure was uncontrolled, pars plana vitrectomy was performed to remove the reservoir of ghost cells. Vitrectomy resulted in successful control of intraocular pressure without medications and visual improvement.

Introduction

Ghost cell glaucoma is a recently described form of secondary open angle glaucoma that occurs as a consequence of vitreous hemorrhage. Following vitreous hemorrhage, the red blood cells (RBCs) degenerate into ghost blood cells (GBCs) and pass slowly into the anterior chamber through a disruption in the anterior hyaloid face [1]. The pressure rise is due to primary obstruction of the intertrabecular spaces by the nonpliable GBCs [2, 3].

When medical therapy fails in cases of dense and old vitreous hemorrhage, vitrectomy is effective in controlling the intraocular pressure by removing the source of ghost cells and also in improving vision by clearing the intraocular opacities [4]. In this report we present our experience in 5 cases with this infrequent indication for pars plana vitrectomy.

Case 1

A 45-year-old hypertensive man was referred with the chief complaint of decreased vision, severe pain, and redness in the right eye of one week duration. The patient underwent laser photocoagulation for branch retinal vein occlusion in the right eye elsewhere 5 months prior to presentation that was followed by vitre-

ous hemorrhage. Examination revealed a visual acuity of light perception, with good light projection in all quadrants in the right eye and 20/20 in the left eye. The intraocular pressure was 48 mmHg in the right eye and 14 mmHg in the left eye. Examination of the left eye was normal. The right eye had moderate ciliary injection, and slit lamp examination showed mild bullous keratopathy and corneal stromal edema. The anterior chamber showed 4+ khaki-colored GBCs. The GBCs layered in the angle inferiorly, creating a 20% khaki-colored 'pseudohypopyon'. There were no evidence of rubeosis iridis. The lens showed mild posterior subcapsular opacities. There was no lens subluxation, and no clinical evidence of anterior hyaloid face disruption. On gonioscopic examination the anterior chamber angle was open without evidence of neovascularization. The anterior vitreous gel showed dense yellow-colored blood. The retina could not be visualized because of the dense vitreous hemorrhage. B-scan ultrasonography showed a dense vitreous hemorrhage without evidence of retinal detachment. A clinical diagnosis of ghost cell glaucoma was made. Despite maximum antiglaucoma therapy intraocular pressure was 30 mmHg. A pars plana vitrectomy was performed and as much of the opaque vitreous gel as possible was excised. The retina was seen to be attached and the macula appeared normal. The blood vessels along the upper temporal arcades were noted to be sheathed with

patches of neovascularization. Argon laser endophotocoagulation was applied in a scatter pattern along the distribution of the obstructed upper temporal vein. One year after surgery the intraocular pressure was 12 mmHg without medications, and visual acuity was 20/30.

Case 2

An 8-year-old boy was struck in the left eye by a piece of stone 5 days prior to referral. Examination revealed a visual acuity of 20/20 in the right eye and light perception, with good light projection in all quadrants in the left eye. The intraocular pressure was 16 mmHg in the right eye, and 35 mmHg in the left eye. Examination of the right eye was unremarkable. The left eye showed total hyphema. B-scan ultrasonography revealed dense vitreous hemorrhage and flat retina. Sick cell disease was ruled out. The patient was treated with oral acetazolamide, topical timptol 0.5%, and propine 0.1%, and the antifibrinolytic agent tranexamic acid. Twelve days later, the hyphema cleared, and the intraocular pressure was controlled. The antiglaucoma medications and tranexamic acid were discontinued. Gonioscopy revealed an open angle for 360° without recession. Two weeks later, the patient presented with a painful, red left eye. Visual acuity was counting fingers at 2 feet. The intraocular pressure was 40 mmHg. Slit lamp examination revealed moderate ciliary injection, and mild, diffuse bullous keratopathy. The anterior chamber showed 4+ GBCs. The lens was clear without evidence of subluxation. There were no clinically detectable discontinuities of the anterior hyaloid face. Dense hemorrhage was present in the anterior vitreous gel. The retina could not be visualized because of the dense vitreous hemorrhage. B-scan ultrasonography revealed a dense vitreous hemorrhage with a shallow retinal detachment noted inferiorly. A diagnosis of ghost cell glaucoma was made and the patient underwent a pars plana vitrectomy. A retinal dialysis was noted inferiorly, that was treated with cryotherapy and supported on a scleral buckle. An intraocular gas bubble was used to tamponade the retinal break during the initial postoperative time. Postoperatively the eye healed without complications. The retina became reattached, and the retinal break was sealed. When the patient was last seen one year later, the intraocular pressure was 14 mmHg without medications, and visual acuity was 20/80.

Case 3

A 38-year-old male was referred 5 days after repair of a corneo-scleral laceration that followed blunt trauma to the right eye. Examination revealed a visual acuity of counting fingers at one foot in the right eye, and 20/30 in the left eye. The intraocular pressure was 34 mmHg in the right eye, and 15 mmHg in the left eye. Examination of the left eye was unremarkable. Slit lamp examination of the right eye showed moderate ciliary injection, and the corneo-scleral laceration seemed well healed. The anterior chamber showed 60% hyphema. There were posterior synechiae and the lens was clear. B-scan ultrasonography revealed a dense vitreous hemorrhage. No evidence of retinal detachment or an intraocular foreign body was seen. Sick cell disease was ruled out. The patient was treated with antiglaucoma medications, and topical atropine and steroid compounds. Twenty days later, the intraocular pressure of the right eye was 30 mmHg despite maximum medical therapy. The anterior chamber showed 4+ GBCs. The hyphema cleared, but a dense yellow fibrinous clot was left on the anterior lens capsule in the pupillary area. Gonioscopy revealed an open angle for 360° without recession. A clinical diagnosis of ghost cell glaucoma was made. Tissue plasminogen activator 25 µg in 0.1 ml was injected into the anterior chamber, that resulted in complete dissolution of the fibrinous clot. The lens was clear, and there was no subluxation. There was no clinical evidence of anterior hyaloid disruption. A dense yellowish brown blood was seen in the anterior vitreous gel. Two days later, a pars plana vitrectomy was performed on the right eye. The vitreous hemorrhage was removed and no complications occurred. Postoperatively, vision improved to 20/60, and intraocular pressure was 20 mmHg without antiglaucoma medications during a follow-up of 7 months.

Case 4

A 20-year-old male was referred with the chief complaint of decreased vision, pain, and redness in the right eye. The patient sustained a blunt trauma to the right eye by a wooden stick 25 days prior to presentation. Examination revealed a visual acuity of hand motions, with good light projection in all quadrants in the right eye and 20/25 in the left eye. The intraocular pressure was 47 mmHg in the right eye and 12 mmHg in the left eye. Examination of the left eye