



Treatment of Malignant Glaucoma

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Abstract

Malignant glaucoma is one of the most challenging conditions in ophthalmology. The exact etiology of this complication is not fully understood, and its management is usually challenging. This brief report discusses current treatment strategies for this relatively uncommon form of secondary glaucoma.

Keywords: Glaucoma, malignant glaucoma, treatment.

Introduction

Malignant glaucoma, or aqueous misdirection syndrome, is characterized by a uniform shallowing or flattening of both the central and peripheral anterior chambers in an eye with normal to elevated intraocular pressure despite patent iridotomies. It is most commonly encountered after filtration surgery and cataract extraction, in eyes with closed angles, and after laser iridotomy, capsulotomy, cyclophotocoagulation, suture lysis, photocoagulation, or following the onset of topical miotic therapy (1-8).

Although the exact mechanism of malignant glaucoma remains unclear, an alteration in the anatomical relationship of the lens, ciliary body, and anterior hyaloid face causing aqueous misdirection and blockade has been suggested in the pathogenesis. The aqueous is thought to be entrapped inside the vitreous cavity as aqueous pockets, resulting in forward movement of the iris-lens diaphragm, which causes the secondary angle closure glaucoma (1, 9).

The first line of treatment in malignant glaucoma is aqueous suppressants, such as beta-blockers, alpha adrenergic agonists, or topical and oral carbonic anhydrase inhibitors. Cycloplegics and hyperosmotic agents, including oral glycerol, isosorbide, or intravenous mannitol, are other important

components of treatment. The goal is to decrease aqueous humor production, shrink the vitreous body, and move the iris-lens diaphragm backward. Approximately 50% of cases respond to medical therapy, but recurrence is common following cessation of cycloplegics (1, 9, 10).

Peripheral iridotomy should be performed initially to exclude the pupillary block mechanism, or if there is a question of the patency of a previous iridotomy (8).

Neodymium: yttrium-aluminum-garnet (Nd: YAG) laser posterior capsulotomy and hyaloidotomy have been used in aphakic or pseudophakic eyes that are refractory to medical treatment with varying degrees of success. The mechanism was proposed to relieve the blockade and reverse the aqueous misdirection (2, 11-14).

Direct argon laser application through a peripheral iridectomy has also been used in an attempt to shrink the ciliary processes and relieve the cilio-lenticular block of the anterior flow of aqueous (15, 16).

Transscleral diode laser photocoagulation, which reduces aqueous production and its flow, is another option in the treatment of malignant glaucoma (17).

In cases that are refractory to medical and/or laser treatment, surgical treatment must be used.

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A pars plana vitrectomy (PPV) has been reported to treat pseudophakic malignant glaucoma in 67% to 100% of cases (2, 11). Vitrectomy was thought to prevent aqueous accumulation inside the vitreous cavity (2). However, this may not be enough to break the cycle of malignant glaucoma because the ciliolenticular aqueous blockade cannot be completely eliminated by removing the central vitreous only, and aqueous accumulation may continue despite the procedure (18). It requires vitreoretinal surgical expertise and cannot be performed easily and safely by an anterior segment surgeon.

In a retrospective series, the relapse rate was 100% after medical therapy, 75% after YAG laser capsulotomy and a hyaloidotomy, 75% after a conventional vitrectomy, and 66% after a anterior vitrectomy in combination with an iridectomy-zonulectomy (19). It was postulated that all of the tissues (iris, lens capsule, anterior hyaloid, and anterior vitreous) had to be removed completely in order to create a permanent passage between the anterior chamber and the vitreous cavity, a task not easily accomplished by PPV alone (20).

We have already reported our surgical approach in 2 cases of pseudophakic malignant glaucoma, which consisted of peripheral iridectomy, zonulectomy, hyaloidectomy, and anterior vitrectomy successfully performed by an anterior segment surgeon using a vitreous cutter inserted through a clear corneal incision (9). This technique creates a permanent passage between the anterior chamber and the vitreous cavity by eliminating the aqueous misdirection and helps us to understand the pathogenesis of the disease better.

Because malignant glaucoma is a relatively rare disease, it is difficult to compose a large study group. Its management is usually challenging and varies according to the patient. The success of treatment will increase when the pathogenesis of the disease is better understood.

Disclosures

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