CASE REPORT

Intravitreal injection of bevacizumab before pars plana vitrectomy in tractional retinal detachment

ABSTRACT

Objectives
To describe the role of preoperative intravitreal bevacizumab in patients with tractional retinal detachment undergoing pars plana vitrectomy.

Methods
Five eyes of 5 patients with tractional retinal detachment and excessive fibrovascular membrane secondary to proliferative diabetic retinopathy received a single dose of 1.25 mg of intravitreal bevacizumab 5 to 7 days prior to the scheduled pars plana vitrectomy. Pre- and postinjection, intra- and postoperative fundus photos were taken. Intraoperative outcomes were evaluated based on change in the severity of vitreous and intraretinal hemorrhage, change in size of vessel caliber, amount of neovascularization, and the variability of the size of the fibrovascular membrane.

Results
The amount of hemorrhage, vessel caliber, neovascularization, and fibrovascular membrane were decreased significantly. Minimal bleeding during dissection of the fibrovascular membrane was noted.

Conclusion
Intravitreal injection of bevacizumab showed promise as an adjunct in the surgical treatment of tractional retinal detachment secondary to proliferative diabetic retinopathy.

Keywords: Proliferative diabetic retinopathy, Bevacizumab, Vascular endothelial growth factor, Tractional retinal detachment, Pars plana vitrectomy

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DESPITE major advances in the medical management of diabetes mellitus (DM), diabetic retinopathy remains a leading cause of blindness worldwide. Proliferative diabetic retinopathy (PDR) is one of the major causes of severe visual loss among patients with DM. Almost half a century ago, Michelson identified the role of growth factors in the development of retinovascular diseases. By 1994, Aeillo recognized high levels of vascular endothelial growth factor (VEGF) in the vitreous of patients with PDR, prompting animal studies on VEGF. It was found that intravitreal injection of VEGF into normal primate eyes resulted in neovascularization, formation of microaneurysms, and increased vascular permeability. On the other hand, VEGF inhibition resulted in suppression of iris and retinal neovascularization. Human clinical studies also consistently demonstrated correlation of VEGF levels with the severity of PDR, such as the degree of retinal and iris neovascularization. VEGF was found to be a potent inducer of vascular permeability, playing an important role in diabetic macular edema. Studies also concluded that there was a reduction of VEGF levels in the vitreous following successful laser treatment.

Bevacizumab (Avastin, Genentech, San Francisco, California), a humanized monoclonal recombinant antibody that binds all isoforms of VEGF, is approved by the United States Food and Drug Administration for the treatment of metastatic colon cancer. Several studies involving intravitreal injection of bevacizumab in patients with choroidal neovascularization, central-retinal-vein occlusion, and PDR, reported favorable preliminary results. Initial animal trials concluded that a 2.5-mg dose intravitreally injected is nontoxic to the retina and optic nerve.

Recently, intravitreal bevacizumab has been used as a preoperative adjunct for the repair of tractional retinal detachment (TRD) in severe PDR. A case series by Ishikawa and colleagues involving 8 eyes with TRD secondary to PDR concluded that pretreatment with intravitreal bevacizumab is likely effective in vitrectomy for severe PDR. An interventional, randomized, prospective study by Rizzo and colleagues, likewise, noted that preoperative intravitreal bevacizumab was well tolerated and reduced active neovascularization, thus facilitating pars plana vitrectomy (PPV).

We report a case series of 5 patients who underwent preoperative intravitreal injection of bevacizumab demonstrating its efficacy as an adjunct to PPV.

CASE REPORT

This case series involved 5 eyes of 5 patients, 4 males and 1 female, aged 26 to 49 years, with preoperative visual acuity ranging from hand movement to counting fingers at 5 feet (CF5). All eyes had TRD with fibrovascular membrane (FVM) secondary to PDR. One eye was complicated by total rhegmatogenous retinal detachment (RRD) while another had extensive subhyaloid hemorrhage. Patients underwent routine ophthalmologic examination including fundus photography and fluorescein angiography (FA). Patients were asked to sign a consent form after extensive discussion of the risks and benefits of the treatment.

Bevacizumab 1.25 mg was injected followed by surgical repair in 5 to 7 days. One day prior to the surgery, postinjection fundus photos and fluorescein angiogram were taken. The 5 patients then underwent pars plana vitrectomy, membrane peeling, air-fluid exchange, endolaser, and silicon-oil injection. Intravitreal injection and surgical repair of TRD was done by a single surgeon.

Preoperatively, outcome measures observed were change in amount of vitreous and intraretinal hemorrhage, change...
Our results indicated that intravitreal injection of bevacizumab was an effective adjunct in the surgical treatment of TRD secondary to PDR.

**References**