

Intravitreal Bevacizumab in Diabetic Macular Edema Improved Visual Acuity, Retinal Thickness

BY CHRISTOS HARITOGLOU, MD

Intravitreal injection of bevacizumab (Avastin; Genentech, San Francisco) improved visual acuity and decreased retinal thickness, even in cases of diffuse diabetic macular edema that was nonresponsive to previous treatments with photocoagulation, intravitreal triamcinolone, or vitrectomy.

My colleagues from the Department of Ophthalmology, Ludwig-Maximilians-University, in Munich, and I conducted a prospective, consecutive, noncomparative case series of 51 consecutive patients with diffuse diabetic macular edema. We published our results in *Retina*.¹ The case series included 26 females and the mean age was 64 years.

Patients included in our series had a wide range of diffuse diabetic macular edema that did not respond to other treatments. Patients were included independently of the size of the leakage area, retinal thickness as determined by optical coherence tomography (OCT), visual acuity, age, metabolic control, type of diabetes, or previous treatments.

COMPLETE EXAMS AT EACH VISIT

At each visit, patients underwent complete eye examination, including BCVA, slit-lamp exam, intraocular pressure measurement, stereoscopic biomicroscopy of the macula, retinal thickness measurement by OCT, fluorescein angiography, and fundus photography.

We treated all patients with a 0.05-mL injection containing 1.25 mg bevacizumab, and all patients were followed for at least 6 weeks. There were 23 patients who completed 12 weeks. Sixteen patients had received at least two intravitreal injections. With respect to previous treatment, 35% had focal laser therapy, 37% had full-scatter panretinal laser therapy, 12% had vitrectomy, and 33%

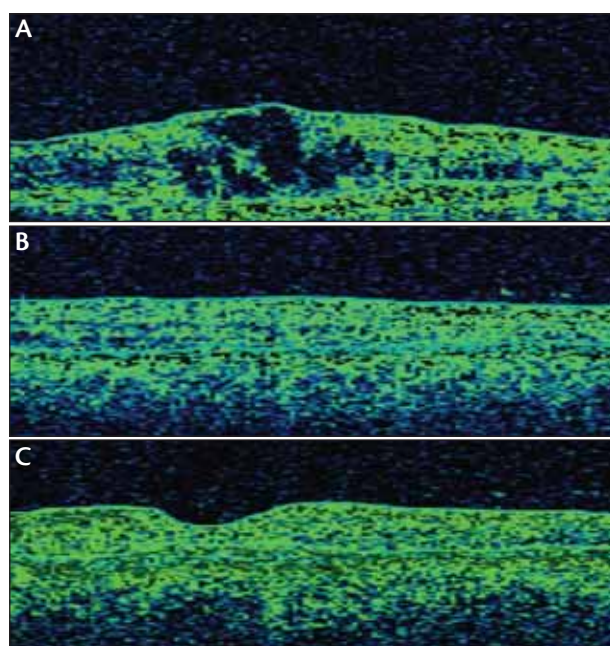


Figure 1. Cystoid macular edema in association with diabetic retinopathy. Top image is before treatment, middle is 4 weeks after initial treatment, and the bottom is 8 weeks after initial treatment.

had intravitreal injection of triamcinolone.

The mean diameter of the foveal avascular zone was 503 μm , with 49% with values of $>500 \mu\text{m}$. We found that at baseline, the mean visual acuity $\pm\text{SD}$ was 25.88 \pm 14.43 Early Treatment of Diabetic Retinopathy Study (ETDRS) letters (0.86 \pm 0.38 logMAR of Snellen letters). Mean central retinal thickness using OCT $\pm\text{SD}$ was 501 \pm 163 μm (range, 252-1,031 μm).

After injection, the mean visual acuity $\pm\text{SD}$ increased

to 0.75 ± 0.37 logMAR of Snellen letters at 6 weeks ($P=.001$). At 12 weeks, some regression to 0.84 ± 0.41 logMAR of Snellen letters was observed. Changes in ETDRS letters were not significant throughout the follow-up. Mean retinal thickness \pm SD decreased to 425 ± 180 μ m at 2 weeks ($P=.002$), 416 ± 180 μ m at 6 weeks ($P=.001$) and 377 ± 117 μ m at 12 weeks ($P=.001$).

We found a weak correlation between changes in retinal thickness and visual acuity ($r = -0.480$ and $P=.03$ at 6 weeks; $r = -0.462$ and $P=.07$ at 12 weeks). The increase in visual acuity after 6 weeks as measured by ETDRS charts could be predicted best by baseline visual acuity. No other factors investigated, such as age, thickness by OCT, or previous treatments, were predictive for the increase in visual acuity.

IMPROVEMENT SEEN IN DIFFUSE DIABETIC EDEMA

Even in cases of diffuse diabetic edema not responding to previous treatments, we saw an improvement in visual acuity and retinal thickness shortly after intravitreal injection of bevacizumab.

The follow-up period of our study was too short to provide specific treatment recommendations, however, we feel that the short-term results should encourage further prospective studies with different treatment groups and longer follow-up.

Diabetic retinopathy is a common ocular complication of diabetes and it is the most common causes of blindness in people of working age. Laser treatment is not always beneficial, especially in macular edema. Much of the damage characterized by diabetic retinopathy is understood to result from retinal vascular leakage and nonperfusion mediated by numerous growth factors, including vascular endothelial growth factor (VEGF).

Pharmacologic inhibition of VEGF appears to be a promising strategy for ocular diseases, in which breakdown of the blood-retina barrier and neovascularization play an important pathogenetic role. Bevacizumab is a full-length monoclonal antibody that is approved for the treatment of metastatic colorectal cancer. Now it has emerged as a therapeutic strategy for age-related macular degeneration, with promising functional results. It seems reasonable to assume the agent could be helpful in other retinal diseases.

The intravitreal injection of VEGF inhibitors provides new treatment strategies for a variety of retinal diseases and offers patients a true perspective of visual recovery. ■

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1. Haritoglou C, Kook D, Neubaur A, et al. Intravitreal bevacizumab (Avastin) therapy for persistent diffuse diabetic macular edema. *Retina*. 2006;26:999-1005.

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