Vascular endothelial growth factor (VEGF) is known for its role in diabetic macular edema (DME). Reports indicate that intravitreal bevacizumab, a full-length humanized monoclonal anti-VEGF antibody, is effective in reducing DME. Despite therapeutic options such as laser treatment and vitreoretinal surgery, legal blindness in approximately 90% of patients with type 1 diabetes is caused by proliferative diabetic retinopathy or development of DME. A long-term prospective study has documented a decrease of central retinal thickness following intravitreal bevacizumab, along with a gain in mean visual acuity (VA). The use of intravitreal bevacizumab entails risks inherent in any intravitreal injection, including anterior uveitis, endophthalmitis, and acute retinal pigment epithelial tears. Exacerbation of macular ischemia and the occurrence of nonarteritic anterior ischemic optic neuropathy (AION) have recently been reported. We describe a type 1 diabetic patient with DME who developed AION following intravitreal bevacizumab.

Case Report

A 38-year-old woman with diabetic retinopathy presented with decreased VA. Her vision was 1.0 OD and 0.4 OS. Left-eye fluorescein angiography (FA) showed leaking microaneurysms affecting the fovea and the foveal avascular zone. Optical coherence tomography (OCT) showed DME (Fig. 1). Peribulbar injection of triamcinolone acetonide (TA) was performed, followed by retinal photocoagulation (PHC). One month later, VA improved to 0.6 OS. Intraocular pressure was elevated at 1 month and antiglaucomatous eye drops were prescribed. At 3 months, the patient’s VA remained unchanged and the DME persisted. Because TA and further PHC were no longer options, intravitreal bevacizumab was discussed extensively with the patient and informed consent was obtained. Bevacizumab 0.05 ml (1.25 mg) was injected into the left eye in standard sterile fashion. One week later, OCT confirmed remission of the DME without any change in VA. Three weeks later, she noted a sudden visual field defect OS. Her left eye was positive for relative afferent papillary defect and her visual field showed an inferior altitudinal defect compatible to the swollen disc. Her VA was 0.5 OS at the onset. FA showed poor perfusion of the optic disc and late dye leakage (Fig. 2). Her average HbA1c level was 9.4%. Laboratory tests and radiographies did not reveal other inflammatory or obstructive origins. She was diagnosed with AION. Seven weeks later, the swollen disc resolved spontaneously without any treatment. Her VA improved to 0.8 OS at her last check-up.

Anterior Ischemic Optic Neuropathy Following Intravitreal Bevacizumab

References

Recent studies have demonstrated a significant reduction of the choriocapillaris in primate eyes, progression of capillary nonperfusion area in rabbit eyes, and multiple retinal hemorrhages in diabetic retinopathy after intravitreal bevacizumab, indicating possible risks of circulation disturbances upon treatment. In the present case, the sudden visual defect at 3 weeks after an intravitreal bevacizumab injection may have been an adverse event caused by the pan-VEGF blockage disrupting several isoforms of VEGF. Diabetes is a risk factor for AION. However, the patient had no previous history of any other macrovascular or microvascular incident. No other new inflammatory or vascular occlusive origin was detected, either on angiography or on carotid artery ultrasonography, during the onset of AION. As a consequence, intravitreal bevacizumab may have disturbed an already tenuous state of vascular perfusion, leading to AION and the resultant disc swelling and visual field defect.

We have treated over 100 patients with intravitreal bevacizumab over the last 12 months, and this is the only significant adverse event we have witnessed to date. This case underscores the need to educate patients about the possibility of such an event, and further studies are required to confirm the safety of intravitreal bevacizumab in DME.

Keywords: anterior ischemic optic neuropathy, bevacizumab injection, diabetic macular edema

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Received: September 24, 2009 / Accepted: December 28, 2009
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DOI 10.1007/s10384-009-0790-4