

Bevacizumab for the Management of Retinal Vein Occlusions

Results suggest that intravitreal bevacizumab improves patient outcomes.

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Branch retinal vein occlusion (BRVO) and central retinal vein occlusion (CRVO) are common causes of vision loss. Macular edema is the major source of vision compromise in these patients. Vascular endothelial growth factor (VEGF) is released by ischemic retina and causes excessive vascular permeability. Bevacizumab (Avastin, Genentech) is a potent VEGF inhibitor that has potential benefit for these debilitating conditions.

Retina specialists have been using it off-label for a variety of retinal vascular conditions, most commonly exudative age-related macular degeneration (AMD). There has been increasing interest in its use for retinal vein occlusions (RVO). It is unclear how long and how frequent treatments should be administered. The time, inconvenience, risk, and costs of injections are some of the issues that favor less frequent dosing regimens. In our study, we sought to evaluate the outcomes of intravitreal bevacizumab (IVB) treatment for the management of both BRVO and CRVO with an as-needed or "on-indication" approach. These results were presented at

the annual meeting of the American Society of Retina Specialists in October 2008.

METHODS

We performed an institutional review board approved, retrospective consecutive chart review of all RVO patients treated with IVB from October 2005 to October 2007 with a minimum of 4 months follow-up.

Only patients treated on an as-needed basis were studied. All patients had vision and optical coherence tomography (OCT) measurements at each visit. Best-corrected or pinhole visions were used in the study. Retreatment criteria were a decrease in vision and/or persistent or recurrent edema on OCT. Leakage on fluorescein angiogram (when performed) or increased intraretinal hemorrhages were also used as treatment criteria. Patients who had prior vitrectomy or intraocular triamcinolone were excluded. In our retrospective review, patients were treated on as-needed basis after the first or second injection (some received

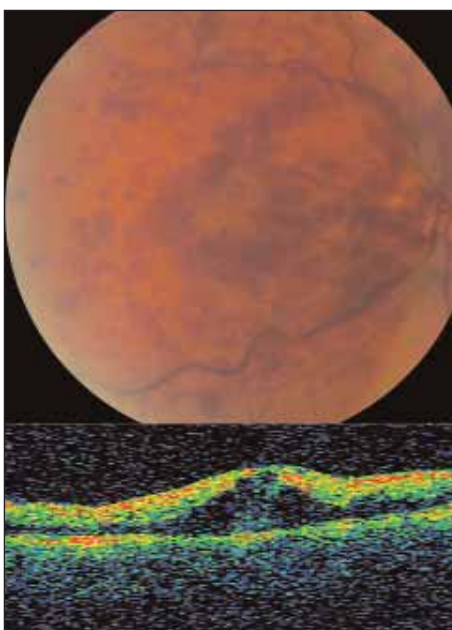


Figure 1. Acute CRVO; vision is 20/200.

a second injection even if the retina was dry on OCT). Patients were typically seen on 4- to 8-week intervals or if new symptoms developed, but intervals tended to extend over time later in the study if the patient was stable.

RESULTS

A total of 112 patients were identified: 24 with BRVO and 88 with CRVO. The mean patient age was 71 years for both BRVO (range, 36–89 years) and CRVO (range, 55–90 years). The mean follow-up was 14 months (range, 4–30 months). There were no injection-related complications.

Of the patients with BRVO, 96% were nonischemic and 68% were of acute onset (<1 month). Mean baseline vision was 20/200 (Figure 1 provides an example); mean final vision was 20/80 ($P=.003$). During the study, patients achieved a mean best vision of 20/60 ($P<.001$). At the final visit, 35% achieved at least 20/40 vision compared with 8% initially, and 21% were 20/200 or worse compared with 42% initially. A mean of one injection per 18 weeks was performed with the as-needed approach. At the final visit, 54% gained more than two lines, 8% lost greater than two lines, and 38% were stable within two lines. At the best visit, 71% gained greater than two lines, none lost greater than two lines, and 29% were stable within two lines. The mean visual acuity increase was 3.3 lines ($P<.05$) after the first injection and an 1.3 additional lines after the second injection ($P<.05$). The mean OCT thickness decreased from 472 μm to 311 μm from initial to final visits ($P<.001$).

Of the CRVO patients, 94% were nonischemic and 87% were of acute onset (<1 month). Mean baseline vision was 20/200; mean final vision was 20/150 ($P=.03$). During the study, patients achieved a mean best vision of 20/60 ($P<.001$; Figure 2 provides an example). At the final visit, 26% achieved at least 20/40 vision compared with 5% initially, and 39% were 20/200 or worse compared with 44% initially. A mean of one injection per 12 weeks was performed. At the final visit, 42% gained more than two lines, 13% lost greater than two lines, and 45% were stable within two lines. At the best visit, 56% gained greater than two lines, 3% lost greater than two lines, and 31% were stable within two lines. The mean vision increase was three lines ($P<.001$) after the

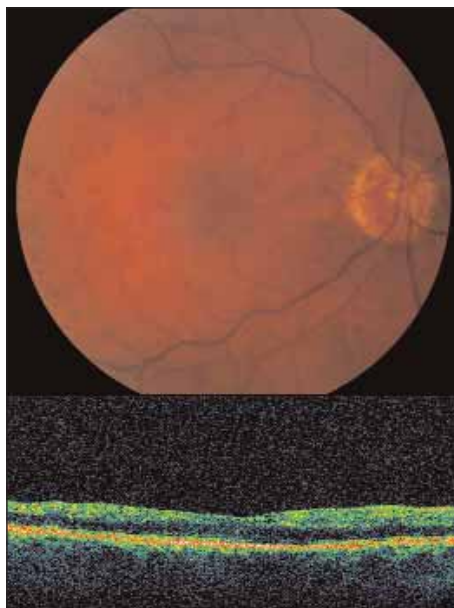


Figure 2. Five weeks after first injection with bevacizumab. Vision is 20/50.

first injection and one additional line after the second injection, which was not statistically significant. The mean OCT thickness decreased from 543 μm to 415 μm from initial to final visits ($P<.001$).

CONCLUSIONS/ANALYSIS

In our study, IVB seemed to significantly affect the natural history of nonischemic RVOs. Many patients responded with initial vision improvement, 71% for BRVO and 56% for CRVO, and most of the improvement seen occurred after the first injection. With treatment on an as-needed basis, there was regression in vision from the best-achieved to the final vision in all patients, but more regression occurred for

patients with CRVO than patients with BRVO. However, even with this regression, patients were still significantly improved from baseline. Patients with CRVO seemed to require more frequent injections when treated on an as-needed basis than patients with BRVO. The data seem to suggest that all patients would likely do better with more frequent maintenance injections, much like the results seen in (AMD) patients.

This study is limited by its retrospective design and nonstandardized follow-up. Patients would likely do even better with an as-needed approach if strict monthly follow-up was maintained. Based on this study and experience, our practice pattern has shifted to more frequent examinations with an as-needed approach or regular maintenance injections for patients who wish to visit less often or monocular patients. Further study is warranted, but this treatment seems to improve the outcomes of patients suffering from retinal venous occlusive disease. ■

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