Transcript Details
This is a transcript of an educational program. Details about the program and additional media formats for the program are accessible by visiting: https://reachmd.com/programs/eye-on-ocular-health/oct-biomarkers-as-predictors-of-treatment-response-in-rvo-related-macular-edema/37664/

ReachMD
www.reachmd.com
info@reachmd.com
(866) 423-7849

OCT Biomarkers as Predictors of Treatment Response in RVO-Related Macular Edema

Dr. Mimi Maeusli:
You're listening to *Eye on Ocular Health* on ReachMD, and this is an *AudioAbstract*. I'm Dr. Mimi Maeusli, and today, I'll be discussing how we can predict treatment response in retinal vein occlusion-, or RVO-, related macular edema.

Let's start with some context. RVO remains a leading cause of sudden, often severe, vision loss worldwide, and is the second most common retinal vascular disorder after diabetic retinopathy. The most vision-threatening complication of RVO is macular edema: fluid leaking into the central retina that blurs vision and disrupts daily function.

We do have effective therapies for macular edema, like anti-vascular endothelial growth factor injections, corticosteroid implants, and laser photocoagulation. But here's the challenge: outcomes are unpredictable. Some patients regain excellent acuity, but others plateau despite aggressive treatment. That uncertainty makes it difficult to counsel patients and design personalized care.

This is where imaging becomes critical. Optical coherence tomography, or OCT, is already indispensable in RVO, providing high-resolution, cross-sectional views of the retina. OCT doesn't just confirm the presence of edema—it also shows detailed structural features, which we now call OCT biomarkers. And those biomarkers are important because they may help us forecast treatment response.

So the key question that arises is: can baseline OCT biomarkers predict outcomes in RVO?

A systematic analysis published in *Ophthalmology Science* in 2025 took a closer look at this issue. Researchers reviewed the literature on OCT biomarkers in macular edema from both branch and central RVO. The review included patients treated with anti-vascular endothelial growth factor agents, corticosteroid implants, or laser. Their goal was to see which baseline features consistently predicted visual and anatomical outcomes.

So, what did they find? Well, looking at the results, several clear patterns emerged. The integrity of the ellipsoid zone was the most reliable predictor of better visual response. Patients with intact ellipsoid zone bands at baseline were far more likely to gain vision, underscoring the importance of preserved photoreceptor structure.

Central retinal thickness also carried prognostic value, but with nuance. A thicker retina at baseline often meant more potential for improvement once fluid was treated. But it didn't always guarantee better final acuity.

Other OCT features pointed to worse outcomes. Hyperreflective foci, large intraretinal cysts, disruption of the retinal pigment epithelium, and subretinal fluid were consistently linked with limited visual recovery.

What's striking is how stable these findings were across treatments. An intact ellipsoid zone predicted good outcomes with both anti-vascular endothelial growth factor therapy and dexamethasone implants. Hyperreflective foci predicted poor response regardless of therapy. And these patterns held true in both branch and central RVO, even though central RVO eyes generally had worse overall prognosis.

Now, the review did come with some limitations. Most included studies were retrospective, and imaging protocols varied widely. Plus, while evidence was strongest for ellipsoid zone integrity and hyperreflective foci, other potential biomarkers—like choroidal thickness or OCT angiography metrics—still need validation.

Even so, the consistency of results across multiple studies and treatment types gives us a clear clinical message. OCT biomarkers—

especially ellipsoid zone status, central retinal thickness, and hyperreflective foci—provide valuable prognostic information in RVO. Incorporating them into baseline assessment can sharpen prognostic accuracy, refine patient counseling, and support more individualized management strategies.

This has been an *AudioAbstract* for *Eye on Ocular Health,* and I'm Dr. Mimi Maeusli. To access this and other episodes in our series, visit ReachMD.com, where you can Be Part of the Knowledge. Thanks for listening!

Reference:

Hatamnejad A, Nanji K, Grad J, et al. Predicting treatment response in retinal vein occlusions using baseline optical coherence tomography biomarkers: a systematic review. *Ophthalmol Sci.* 2025;5(4):100742. doi:10.1016/j.xops.2025.100742