

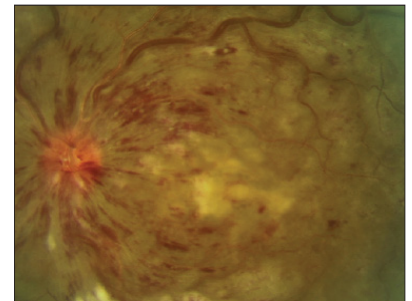


Central Retinal Vein Occlusion

A Central Retinal Vein Occlusion (CRVO) is a blockage of the blood flow in the retina. CRVO occurs in about 1 out of every 1,000 individuals. The blockage is usually temporary, but the resulting damage and complications can be ongoing. The most common complication is cystoid macular edema, or swelling in the center of the retina which directly blurs the vision. The second most common complication is retinal neovascularization, or growth of abnormal blood vessels which can lead to bleeding (vitreous hemorrhage) or detachment of the retina.

HOW DOES CRVO OCCUR?

The retina is fed by a system of blood vessels like a tree, with the trunk in the optic nerve and branches extending to the farthest edges of the retina. A central retinal vein occlusion is a vein blockage in the trunk of the tree. This results in poor blood flow to the entire retina. While blood flow usually returns, the blood vessels in some or all of the retina may be permanently damaged.



WHY DOES CRVO OCCUR?

The main causes for CRVO include age, high blood pressure, diabetes, and high cholesterol. Other risk factors include oral contraceptives, and high eye pressure or glaucoma. In rare cases, CRVO may be due to an underlying blood clotting disorder.

WHAT IS CRVO WITH MACULAR EDEMA?

In some cases, the damaged blood vessels leak fluid (like a hose with holes in it) and the fluid accumulates in the center of the retina, blurring the vision. This is called cystoid macular edema (CME) and treatment (most often injections, less often laser or surgery) is discussed later in this handout.

WHAT IS CRVO WITH MACULAR ISCHEMIA?

In other cases, the damaged blood vessels shut down, like a tree that had its branched pruned. The pruned areas lose their blood flow. If this happens in the center of the retina (macular ischemia), the vision can be permanently reduced. Treatment of macular ischemia is limited.

WHAT IS CRVO WITH SECONDARY NEOVASCULARIZATION?

In some cases, the pruning of the tree results in sick parts of the retina releasing help signals. Those help signals cause the eye to grow new blood vessels, but those blood vessels grow in the wrong places such as in the front of the eye or out of the retina. The abnormal blood vessels may bleed into the middle of the eye (the vitreous) causing decreased vision. Treatment (most often laser, sometimes injections or surgery) is discussed later in this handout. In severe cases, the abnormal blood vessels may turn into scar tissue that physically pulls the retina away from the wall of the eye, sometimes requiring surgical repair.

TREATMENT OF CRVO AND ITS COMPLICATIONS

Anti-VEGF injections

The mainstay of treatment for CRVO with CME is the injection of anti-VEGF injections into the eye (see separate handout on injections). Anti-VEGF medications are non-steroid medications that suppress leakage or proliferation by damaged blood vessels. Anti-VEGF injections usually have to be repeated regularly in order to control the edema. Your BARA physician will talk to you about frequency of treatment and choice of medication in your particular case. There are several anti-VEGF medications currently used to treat CRVO with CME:

- Bevacizumab (Avastin) has been used off-label in the eye for more than 15 years
- Ranibizumab (Lucentis) is FDA-approved and is very similar to bevacizumab
- Byooviz and Cimerli are FDA approved biosimilar medications, considered equivalent to Lucentis
- Aflibercept (Eylea) is FDA-approved and works slightly differently than bevacizumab and ranibizumab

All of these medications are injected at intervals of one month or longer depending on the specific case. All of these medications are considered safe and effective.

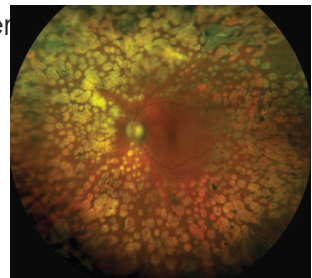
Steroid injections

Steroid injections last longer than anti-VEGF injections in general. They carry a risk of cataract progression or elevated eye pressure. There are three steroid medications and delivery methods currently used to treat CRVO with CME:

- Subtenon **triamcinolone** is an injection around the side of the eye, under the stretchy clear tissue on the outside of the eye
- Intravitreal triamcinolone (**Triesence**) is an injection of steroid particles into the eye
- Intravitreal dexamethasone (**Ozurdex**) is an injection of a tiny solid slow-release implant into the eye

Laser photocoagulation

Laser can be used to treat neovascularization in the front or back of the eye in the setting of CRVO. Panretinal photocoagulation (PRP) is a laser treatment that ablates peripheral retina that have lost their blood supply; this is a permanent treatment usually meant to treat neovascularization and prevent further growth of the abnormal blood vessels and prevent further bleeding.



Bay Area Retina Associates

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Bay Area Retina Associates is a group practice of retinal surgeons. All members of the group are board-certified by the American Board of Ophthalmology and have completed fellowship training in the medical and surgical care of retinal diseases. All BARA surgeons have expertise in the treatment of common diseases such as age-related macular degeneration, diabetic retinopathy and retinal detachment, as well as rare diseases. We have served the Bay Area community for more than 40 years.