



British and Éire Association of Medical Retina Specialists

Retinal Vein Occlusion (RVO) is a condition where one of the veins in the retina becomes blocked, leading to impaired blood flow and fluid leakage in the retina. The retina, located at the back of the eye, is responsible for capturing light and sending visual signals to the brain. When a retinal vein becomes occluded (blocked), it can cause significant visual problems due to the backup of blood and fluid, leading to swelling, bleeding, and potential vision loss.

Types of Retinal Vein Occlusion

There are two main types of RVO:

1. Central Retinal Vein Occlusion (CRVO):

- This occurs when the central retinal vein, which drains blood from the retina, becomes blocked at its point of entry into the eye. CRVO is more common in older adults and is often associated with underlying health conditions, such as hypertension (high blood pressure), diabetes, and glaucoma.

2. Branch Retinal Vein Occlusion (BRVO):

- This type occurs when one of the smaller branches of the central retinal vein becomes blocked. BRVO usually affects a specific area of the retina and is often less severe than CRVO. It may be more localized and can result from conditions such as high blood pressure or atherosclerosis (hardening of the arteries).

Causes and Risk Factors

RVO is caused by a blockage in the retinal veins, often due to clots or other obstructions in the blood flow. Some common causes and risk factors include:

- **Atherosclerosis:** Hardening or thickening of the arteries can lead to blood clots, which may block retinal veins.
- **Hypertension:** High blood pressure can cause damage to the blood vessels in the retina, increasing the risk of vein occlusion.
- **Diabetes:** Poor blood sugar control can lead to changes in the blood vessels, making them more prone to blockages.
- **Glaucoma:** Elevated intraocular pressure can increase the risk of retinal vein occlusion, particularly CRVO.
- **Blood clotting disorders:** Conditions that increase the likelihood of blood clotting, such as deep vein thrombosis or hypercoagulable states, can contribute to retinal vein occlusion.
- **Age:** RVO is more common in people over the age of 50.
- **Smoking:** Smoking is a risk factor for atherosclerosis and other vascular diseases, which can contribute to RVO.
- **High cholesterol:** Elevated cholesterol levels can increase the likelihood of plaque buildup in the arteries, leading to occlusion of retinal veins.

Symptoms of Retinal Vein Occlusion

The symptoms of RVO depend on the type of occlusion and the extent of the blockage. Common symptoms include:

- Sudden vision loss: Depending on the location and severity of the blockage, vision loss may occur in one eye. This may be partial or complete.
- Blurred or distorted vision: The vision may become blurry or distorted due to swelling in the retina.
- Flashes or floaters: Some people with RVO experience the sensation of seeing flashes of light or floating spots in their vision.
- Colour vision changes: There may be difficulty distinguishing between colours or noticing that colours appear less vibrant than usual.
- Dark or shadowy areas: In some cases, a portion of the visual field may appear dark or obstructed, similar to a shadow or curtain across the field of vision.

Diagnosis of Retinal Vein Occlusion

If RVO is suspected, an eye doctor will perform a series of tests to confirm the diagnosis:

1. Comprehensive Eye Exam:

- The eye doctor will conduct a detailed exam of the retina using a special instrument called an ophthalmoscope to check for signs of swelling, haemorrhages (bleeding), and other abnormalities in the retina.

2. Fluorescein Angiography:

- A dye is injected into the bloodstream, and a camera takes pictures of the retina to detect areas of blockage, leakage, or abnormal blood vessel growth.

3. Optical Coherence Tomography (OCT):

- OCT is a non-invasive imaging technique that provides high-resolution, cross-sectional images of the retina. It can reveal any fluid buildup or swelling in the retina caused by the occlusion.

4. Visual Field Test:

- A visual field test may be performed to detect areas of vision loss, especially peripheral (side) vision.

5. Fundus Photography:

- High-resolution images of the retina are taken to document the condition of the retina and track any changes over time.

Treatment for Retinal Vein Occlusion

Treatment for RVO is aimed at reducing the swelling in the retina, preventing further complications, and preserving vision. The specific treatment depends on the type of RVO and its severity. Common treatment options include:

1. Anti-VEGF Injections:

- Anti-vascular endothelial growth factor (VEGF) therapy involves injecting medications such as Lucentis (ranibizumab), Eylea (aflibercept), or Avastin (bevacizumab) into the eye. These drugs block the action of VEGF, a protein that

promotes the growth of abnormal blood vessels. Anti-VEGF therapy helps reduce swelling, leakage, and the growth of abnormal blood vessels in the retina.

2. Steroid Injections or Implants:

- Steroids, such as triamcinolone, can be injected into the eye to reduce inflammation and swelling. Alternatively, a steroid implant like Ozurdex may be used, which slowly releases medication over time to reduce retinal swelling.

3. Laser Therapy:

- Focal laser photocoagulation is used to treat areas of the retina that are leaking fluid, especially in cases of BRVO. This treatment helps seal leaking blood vessels and reduces swelling.
- In some cases of CRVO, pan-retinal photocoagulation may be used to treat abnormal blood vessel growth and reduce the risk of further complications.

4. Treatment of Underlying Conditions:

- Managing risk factors such as high blood pressure, diabetes, and high cholesterol is crucial in preventing further vein occlusions and improving overall eye health. Blood thinners or anticoagulant medications may be prescribed if there is a risk of blood clots.

5. Vitrectomy (for severe cases):

- In cases of significant haemorrhaging or complications like macular oedema or tractional retinal detachment, a vitrectomy may be performed. This surgical procedure involves removing the vitreous gel from the eye and may also involve the removal of scar tissue.

Prognosis

The prognosis for RVO depends on several factors, including the type of occlusion, the location of the blockage, the severity of damage to the retina, and how early the condition is treated.

- Central Retinal Vein Occlusion (CRVO): CRVO tends to have a poorer prognosis compared to BRVO, particularly if the occlusion is severe or complicated by complications like macular oedema or retinal ischemia (lack of oxygen in the retina). However, early treatment with anti-VEGF injections can help manage swelling and improve vision.

- Branch Retinal Vein Occlusion (BRVO): BRVO generally has a better prognosis, as the blockage often affects a smaller area of the retina. In many cases, vision may improve over time, especially with treatments that reduce oedema or address abnormal blood vessel growth.

Without treatment, both CRVO and BRVO can lead to permanent vision loss, particularly if the macula becomes involved or if complications such as glaucoma develop.

Prevention of Retinal Vein Occlusion

Although RVO cannot always be prevented, managing risk factors is key to reducing the likelihood of a blockage. Some preventive measures include:

- Control blood pressure: Keeping blood pressure in check is one of the most effective ways to reduce the risk of RVO.
- Manage diabetes: Proper blood sugar control and regular eye exams are important for preventing diabetic-related eye conditions, including RVO.
- Maintain a healthy lifestyle: Eating a balanced diet, quitting smoking, exercising regularly, and maintaining healthy cholesterol levels can reduce the risk of cardiovascular disease, which is linked to RVO.
- Routine eye exams: Regular eye exams can help detect early signs of retinal vein occlusion or other eye diseases, allowing for early treatment and better outcomes.

Conclusion

Retinal Vein Occlusion (RVO) is a serious eye condition that can lead to vision loss if not properly treated. With prompt diagnosis and treatment, many people with RVO can experience improved vision and reduced risk of complications. Managing risk factors such as high blood pressure, diabetes, and high cholesterol, along with regular eye exams, can help prevent RVO or detect it early for more effective treatment.