Retinal Vein Occlusion

A retinal vein occlusion (RVO) is when one of the veins in the retina becomes blocked. It may lead to varying degrees of vision loss, depending on the severity and location of the blockage. It affects about 1 to 2% of people over 40, although most cases occur in people over 60. Although the amount of vision loss can be significant, especially if it affects the central part of the retina (macula), this disease will not cause total or black blindness. It usually only occurs in one eye, although about 10% of people with RVO will eventually develop the problem in the other eye. Measures can be taken to reduce the risk of it recurring or affecting the other eye.

How the eye works

Light passes through the cornea at the front of your eye, and is focused by the lens onto your retina. The retina is a delicate tissue that lines the inside of your eye. The retina converts the light into electrical signals that travel along the optic nerve to your brain. The brain interprets these signals to "see" the world around you.

Light from the object you are looking at directly is focused onto a tiny area of the retina called the macula at the back of the eye. The macula is about 4 mm across and is responsible for detailed central vision and most colour vision. It provides the vision you need to read, recognise faces, drive a car, see colours clearly, and any other activity that requires detailed, fine vision. The rest of the retina gives you side vision (peripheral vision).

The retina is a very active nerve tissue and requires a constant blood supply. **Arteries** carry freshly oxygenated blood from the heart and lungs to all the cells in the body, including those in the retina. **Veins** take away the blood that has been used by the cells and return it to the lungs and heart to be refreshed with oxygen and other nutrients.

Virtually any blood vessel in the body can become blocked. For example, when a blood vessel blockage occurs in the brain, it is called a stroke. Although blockages of the retinal arteries can occur, they are quite rare and will not be covered by this factsheet. Blockage of a retinal vein is known as a retinal vein occlusion (RVO).

Causes of retinal vein occlusion

The main cause of a retinal vein occlusion is from the formation of a blood clot. This usually occurs where a retinal artery crosses over a vein, slightly constricting it, resulting in a slowing down of blood flow. When blood flow slows, the blood tends to thicken, forming a clot. The likelihood of a clot forming may be increased in some people who have damaged blood vessel walls as a result of high blood pressure, high cholesterol, smoking, diabetes or some other disorders that affect blood clotting. When blood vessel walls are damaged, they tend to become sticky, catching any debris in the blood making the obstruction bigger. Many of these issues are more likely to occur as we get older, however, retinal vein occlusions can occur in younger healthy individuals.

The retinal veins normally drain the used blood from the retinal cells back to the heart and lungs. When one of these veins becomes blocked then the used blood cannot drain away properly. This causes the blood to 'back up' in the system. This blocking and pooling of blood can cause the retinal area to swell and may also cause areas of haemorrhage (bleeding). These areas of swelling and backed up blood can damage the cells of the retina and therefore damage sight. The extent of the sight loss depends on where the blockage takes place.

Risk factors for retinal vein occlusion

There are a number of common risk factors for this damage to retinal veins and hence occlusions. They are quite familiar since the problem of damaged arteries and veins can cause other problems like heart attacks and strokes. The main risk factors are:

- Age (most retinal vein occlusions happen in people over 60)
- High blood pressure
- High blood lipid levels
- Diabetes
- Smoking
- Overweight

Although nothing can be done about our age, all the other risk factors can be controlled. Regular visits to the GP (to diagnose and manage any circulation problems like high blood pressure and high blood lipid levels), good diabetic control, a healthy diet and stopping smoking can all help to reduce the risk of experiencing a retinal vein occlusion. In people who have already had a retinal vein occlusion, it is important to get these risk factors

under control to reduce the risk of another occlusion in the same or the other eye.

Symptoms of retinal vein occlusion

Most people with a retinal vein occlusion notice a gradual, painless loss of vision, although if the blockage is well to the side of the retina (away from the central macula), there may be little or no vision loss noticed. In nearly all cases, only one eye is affected. Any change in vision should be checked immediately by an eye care professional such as an ophthalmologist or optometrist. Even if there are no vision problems, a comprehensive eye exam should be performed every two years as obvious symptoms are not always present. The eye care professional may also be able to pick up other eye problems such as macular degeneration, glaucoma or diabetic retinopathy at an early stage before they cause any problems.

Treatment of retinal vein occlusion

In some cases, the sight loss from a retinal vein occlusion can improve on its own, and the ophthalmologist may simply decide to monitor the eye. In other cases, treatment will be necessary.

Several treatment options may be used depending on the nature, location and size of the blockage. Because the blood 'backing-up' can cause swelling and bleeding in the affected sector, sight can sometimes improve if this swelling and bleeding can be reduced. In some (but not all) cases, a laser can be used to help control swelling and bleeding and this can mean that sight improves a little. Often laser is also used to stop further damage although sight may not be improved. Blood may obstruct laser delivery to the affected retina and hence may have to be deferred until the blood clears. This clearing may take some time.

Sometimes a retinal vein occlusion can cause fragile, abnormal new blood vessels to grow in the eye. If this occurs, there is a threat of major bleeding inside the eye or, less commonly, the development of blinding glaucoma. The ophthalmologist may recommend regular checks over the following months to ensure that this isn't happening. If new blood vessels do start to grow, then appropriate treatment must be implemented using laser and/or intra-ocular drug injections.

If the central macula is affected and vision is reduced due to swelling of the central macula, treatment with anti-VEGF drugs may be used. Anti-VEGF drugs are administered as injections into the eye. The usual treatment

regimen begins with monthly injections for three months. Then to maintain control of the disease, injections are typically continued on an indefinite basis, or until the swelling has resolved. The interval between these ongoing injections is determined on an individual basis by the eye specialist in consultation with the patient. More information on treatment with injections is available in the Foundation's booklet "Macular Degeneration".

Reducing the risk of retinal vein occlusion

To help reduce the risk of a vein occlusion, it is important to ensure that the heart and circulation is kept as healthy as possible. Circulation problems such as high blood pressure, high blood lipid levels or diabetes increase the risk of a vein occlusion. The GP is the best person to ask about steps to ensure the heart and circulation is kept as healthy as possible. A good diet, low in fat and saturated fat, stopping smoking and moderate exercise can all help avoid circulation problems.

Effect of retinal vein occlusion on sight

Any loss of vision can be a cause of great concern. However, as a retinal vein occlusion typically occurs in one eye only people can normally adjust to their new level of vision.

Initially, it is common for people to be constantly aware of the change in vision. However, after a short time, the better eye gradually 'takes over' (becomes dominant), the brain ignores the bad eye and tasks that were previously difficult usually become easier.

If one eye is affected quite badly, people may feel slightly unbalanced and depth perception can be affected for a period. This can make it difficult to judge distances, such as how far away a table is, or the height of steps. Most people are able to judge these distances better with time and practice but extra care is needed in the first couple of months.

Loss of sight in one eye does not mean the loss of a driver's licence, providing the sight in the other eye remains good. In some cases, it may be wise to delay driving again until the better eye becomes dominant. An optometrist or ophthalmologist should first advise if sight is good enough for driving.

Managing vision loss

When managing vision loss, a key priority is maintaining quality of life and independence. Contacting a low vision organisation can be helpful as they can work with you to assess your individual needs and determine which aids and technologies can help. There are many excellent solutions to help you live well with low vision.

Contact Macular Disease Foundation Australia to discuss your low vision needs and to receive free information on low vision.

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May 2015