



**York and Scarborough
Teaching Hospitals**
NHS Foundation Trust

Retinal vein occlusion

Information for patients, relatives and carers

Department of Ophthalmology

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How your eye works

Your retina is a delicate tissue that lines the back of your eye and is sensitive to light. It 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.

The retina is supplied with blood by a delicate network of blood vessels. These blood vessels can be damaged by diabetes, hypertension (high blood pressure) and other conditions.

Most light entering your eye is focused onto a tiny area of your central retina called the macula. The macula is vital because it lets you recognise colours and see the fine detail needed to carry out activities such as reading and writing. The rest of your retina, called the peripheral retina, gives you peripheral or side vision.

The retina receives all the nutrients it needs to continue working via blood in the arteries and removes any waste that is produced through veins. Blood travels around your whole body keeping every part nourished and working and this includes your eyes.

Retinal vessel occlusion

A retinal vessel occlusion is a blockage in the blood vessel of your eye that can result in sight loss. There are two types of retinal blood vessels, arteries and veins. Either of these can become blocked and each of them can affect the eye in different ways.

The visual loss caused by retinal vein and artery occlusions is painless. It is usual for only one eye to be involved at a time, but occasionally both eyes may be affected at the same time.

You have been diagnosed with a vein occlusion. While it's possible to be unaware that you've had a vein occlusion, it usually changes your vision in some way, though this may improve with time.

What causes an occlusion?

The main cause of retinal artery or vein occlusion is atherosclerosis. Atherosclerosis is a problem with the condition of the inside wall of blood vessels. Blood vessels are like tubes. They are usually wide and smooth so that the blood flows easily through them. In some people, the inside of the blood vessels become narrow and sticky. This can make it difficult for the blood to easily flow through them. These narrow patches are called atherosclerotic plaques (or an atheroma) and are often described as hardening or thinning of the vessels. These sticky patches can catch debris in your blood, which in turn makes the plaque bigger. Blood clots can also form on these plaques, again making them bigger, and reducing blood flow. As these plaques grow, they can cut off some, and potentially all of the blood flowing through the vessel.

Veins and arteries run very closely together at the back of the eye and cross over each other. If someone has narrowing of their retinal arteries due to atherosclerosis, this can cause the hardened arteries to press onto the nearby veins. This in turn can cause the vein to narrow, potentially causing a blockage. When a vein in the retina is blocked, it is called a retinal vein occlusion.

What are the risk factors?

Factors which increase your risk of retinal vessel occlusion include:

- age – most retinal vessel occlusions happen in people over 65
- hypertension (high blood pressure)
- high cholesterol levels
- glaucoma or raised intraocular (eye) pressure
- diabetes
- smoking
- obesity

Your GP can diagnose circulation problems like hypertension and prescribe medication to help control them and limit the chance of related complications. If you are diabetic, then good diabetic control can help reduce the risk of blood vessel problems.

Lifestyle changes can also help to reduce your risk of atherosclerosis, which can also go some way to reverse the development of atherosclerotic plaques. These steps are also likely to improve your general health as a whole, reducing your risk of developing conditions like diabetes, stroke, and cardiovascular disease as well as keeping your eyes healthy.

- **Stopping smoking.** Smoking reduces the amount of oxygen your blood can carry, as well as damaging the lining of blood vessels and making atherosclerosis more likely. Talk to your doctor or pharmacist for help with giving up.
- **Eating a healthy diet.** This includes consuming different fruits and vegetables, whole grains, lean meats, poultry without skin, and seafood. A healthy diet is low in salt, added sugar, saturated fats, and refined grains.
- **Drinking less alcohol.** While there is some evidence that alcohol can have a protective effect on coronary heart disease in small quantities, this is still dependent on many other factors including age, and lifestyle. Discuss your individual circumstances with your doctor to get help and advice on this.
- **Keeping active.** It is thought that even a modest increase in physical activity reduces your risk of atherosclerosis as well as coronary heart disease.
- **Maintaining a healthy weight.** People who are overweight are more likely to have poor diets and lead sedentary lifestyles. Their lipid (fats like cholesterol) levels in their blood are also likely to be high.

People with a high eye pressure are more likely to have a vessel occlusion. Your optician can tell if you have high eye pressure and refer you to an ophthalmologist if needed. Glaucoma is where your eye pressure causes damage to the optic nerve at the back of your eye. If you have glaucoma, keeping your eye pressure under control can prevent damage to your optic nerve as well as lowering your risk of a retinal vessel occlusion.

Retinal vein occlusion (RVO)

If you have a retinal vein occlusion, you may notice your sight in one eye dimming or blurring over a period of days, leaving you with poor vision.

The retinal veins drain away used blood from the retinal cells. When one of these veins becomes blocked, then the used blood cannot drain away. This causes the blood to collect in the veins, which causes swelling and haemorrhages (bleeding). These areas of swelling and bleeding damage the cells of the retina, which can affect your sight. How much sight is affected depends on where the blockage takes place.

The veins are spread out all over the retina, but join together to form larger veins, there are four branch veins that join together to form the central retinal vein that leaves the eye through the optic nerve at the back of your eye. If the blockage is in the central retinal vein (known as a central retinal vein occlusion or CRVO) it can affect all your vision in that eye. If it is in one of the branch retinal veins (known as a branch retinal vein occlusion or BRVO), then it will usually affect a smaller area of your sight in that eye.

What is the treatment for a retinal vein occlusion?

The sight loss caused by branch retinal vein occlusion may cause no or little visual loss, and can get better without any treatment. If you have a central retinal vein occlusion, more of your vision will be affected. Some of the changes to your vision may be caused by the swelling and bleeding the occlusion causes. If this swelling improves and the blood is reabsorbed, your sight may get better. Because of this, your ophthalmologist may choose to wait for a few months before starting any treatment.

Your ophthalmologist will discuss with you whether you need treatment depending on whether you have developed any complications from the vein occlusion. If treatment is recommended they will explore which type of treatment you need and the timing of the treatment. Treatment is not always needed when you first have a vein occlusion, but you will still be monitored by the eye clinic. It is likely that you will continue to be monitored for around two years, whether you have treatment or not.

Your ophthalmologist may also recommend that you see your GP. Your GP will try to find out if there is an underlying risk factor that may have caused this. Sometimes the blood tests (and possibly other investigations) do not find anything wrong. If a cause is suspected, then it can be treated or managed to reduce the risk of another occlusion occurring in the other eye.

If you have a retinal vein occlusion, one or more of the following complications may mean you need treatment:

- macula oedema (swelling of your central retina)
- neovascularisation (new blood vessel growth)
- high eye pressure (glaucoma).

Macular oedema

The most common need for treatment is if you have macular oedema – this is when your central macular area of your retina is swollen with fluid. It is caused by a damaged vein, which leaks fluid and collects at your macula. Macula oedema can cause problems with your central vision, leading to difficulties recognising faces, reading or watching television with that eye.

If you have macular oedema you will be monitored by the eye clinic at regular intervals.

There are two main treatments for macular oedema, anti-VEGF injections and steroid injections.

Anti-VEGF injections

Anti-VEGF stands for anti-vascular endothelial growth factor. Vascular endothelial growth factor is a protein produced by cells when there is not enough oxygen or blood flow to an area. It promotes leakiness of blood vessels and can stimulate the growth of new blood vessels in that area. Anti-VEGF drugs work by blocking these chemical signals helping to reduce swelling in the macula.

Anti-VEGF medication is given as injections into the eye. Normally you will need a course of injections over a number of months. At the beginning your eye will be checked at the hospital every four to eight weeks. You may be given further injections if your ophthalmologist thinks they are needed.

Anti-VEGF medicines are injected into the vitreous, which is the jelly that fills the inside of your eye. This is called an intravitreal injection. The injection needs to be given in a clean sterile room or an operating theatre to reduce the risk of infection.

Before the injection, you'll be given anaesthetic eye drops to make your eye numb, antiseptic drops to clean the eye and if necessary an antibiotic drop to help prevent you from getting an infection. The injection is not usually painful, but your eye may be a little sore after the anaesthetic wears off.

The RNIB have more information about anti-VEGF treatment on their website, or by calling their Helpline 0303 123 9999.

Steroid injections

Steroids are used to control swelling and this is usually given in the form of an implant about the size of a grain of rice. This implant is injected into your eye in a similar way to an anti-VEGF injection. It slowly releases a steroid for up to six months, though more than one implant might be required after the previous one has worn off.

Possible complications of anti-VEGF injections and steroid implants

All medicines and treatments can have side effects. It's not always possible to predict whether you will experience any side effects but most people do not have any complications. When deciding on a treatment, your doctor will consider your individual circumstances before recommending a specific one. If you are concerned by any possible side effects or complications, it is best to discuss this with your ophthalmologist.

Intravitreal injections come with the risk of infection (approximately one in 1,000). This is minimised with the use of sterile equipment, and using a clean room. There is also a risk of a retinal detachment from an injection (approximately one in 7,000). The most common side effects reported are: a gritty sensation after the injection for a number of hours; floaters in the vision; redness and haemorrhage (bleeding) at the site of the injection, eye pain from the injection, and headache.

Steroids can cause side effects in the eye, but the risks of using steroids are considered smaller than the risk to your vision if no treatment was given.

Steroids are known to cause cataracts (clouding of the lens in your eye). They can also increase the pressure within your eye, which can lead to glaucoma. These side effects do not happen to everyone, and they can be managed if they occur.

Cataracts can be treated using surgery to remove the cloudy lens and replacing it with an artificial one. Raised eye pressure and glaucoma can be managed with eye drops to help lower your eye pressure.

Neovascularisation (new vessel growth)

If a large part of your retina is affected by the retinal vein occlusion, like in a central retinal vein occlusion, areas of the retina become starved of oxygen. This is called ischaemia. The eye responds to ischaemia by attempting to grow new blood vessels, a process called neovascularisation. This is nature's way of trying to repair the damage by growing a new blood supply to the oxygen-starved area of your retina.

Unfortunately, these new blood vessels have weak walls, and grow in the wrong places. They can grow on the surface of the retina or on the iris at the front of the eye. These blood vessels bleed very easily. New blood vessels on the retina can result in more haemorrhages and damage to the retina, or bleeding into the jelly of the eye. At the iris, new blood vessels can cause your eye pressure to rise and lead to glaucoma.

Most people do not get neovascularisation after a vein occlusion, though if you do it can be treated with a laser.

High eye pressure (glaucoma)

New blood vessel growth at the iris can cause your eye pressure to rise and this can lead to glaucoma.

Your eye produces a fluid called aqueous humour, which is always being drained from your eye. The fluid is drained at the angle between your iris and cornea. If you have growth of new blood vessels in this area, it can cause the drainage angle to become blocked and cause the pressure in your eye to rise. If the pressure in your eye is too high, it can cause damage to your optic nerve – this is called glaucoma.

This is rare, but on average happens around 100 days after the initial vein occlusion, hence is often called 100-day glaucoma. It may also be called new vessel glaucoma (NVG), or rubeotic glaucoma.

If your ophthalmologist sees growth of new vessels in this area, then they will offer you laser treatment. You may also need eye drops and more rarely, surgery, to control your eye pressure.

Managing your general health after a vein occlusion

Since the main cause of a vein occlusion is atherosclerosis, and this is affected by a range of general health issues, your GP will have a key role after you have had a vein occlusion. It is likely that they will want to monitor risk factors such as your blood pressure, blood sugar and cholesterol levels more closely, and you may be prescribed new or more medications to help control these. Your GP can also provide advice and help with stopping smoking and with managing your weight, as well as advice on exercise. Taking steps to manage these things can improve your general blood circulation and reduce your chance of having a similar occlusion in your other eye.

Can I still drive?

You may be able to continue driving a car or motorcycle if the vision in your other eye is unaffected by other eye conditions, and can meet the visual requirements for driving. You're required by law to tell the Driver and Vehicle Licensing Authority (DVLA) if you have any eye conditions which may affect your vision in both eyes. Ask your ophthalmologist for advice about whether you can continue driving. Even if you're told that your sight does meet DVLA standards, you may be advised to wait until you have adapted to having poorer vision in one eye before you resume driving.

How will I manage with the change in my sight?

It's completely natural to be upset when you've been diagnosed with a vein occlusion, and it's normal to find yourself worrying about the future and how you will manage with a change in your vision.

How much a vein occlusion will affect your sight varies from person to person. Some people do not notice much difference unless they cover the unaffected eye, and others are very aware of the change all the time. Because you use both eyes together to see in three dimensions (3D), when one eye is affected you may have difficulty judging distances. You may feel clumsy, misjudge steps, pavements and the position of objects, for example cups.

However after a few months you will probably find that this becomes less of a problem. This is because our brains are able to adjust to a new level of vision and are able to make the eye with good sight the dominant one. Usually people find that with time their good eye 'takes over' and that tasks that were previously difficult become easier.

Support Services

If the affected eye was your good eye and you have a sight problem in your other eye, then you may need to make changes or use aids to make the most of your remaining sight.

You can ask your ophthalmologist if you can be referred for a low vision assessment. This is carried out by an optometrist and enables you to explore the use of magnifiers and aids to help you to see things more clearly.

You can also ask to be referred to the York Hospital Trust Sight Support Service, which is available at York, Scarborough and Bridlington Hospitals. These are run by Eye Clinic Liaison Officers or ECLOs, who provide emotional support and practical advice to help people adjust to a change in their vision. They can advise you on how to access community services, such as those offered by your local council, and local and national charitable organisations.

The ECLO can also assist you in finding out whether you're eligible to be registered as sight impaired (partially sighted) or severely sight impaired (blind). Registration can act as your passport to expert help and sometimes to financial concessions.

Further help and support

The RNIB is a national sight loss support charity. It has a helpline and website and can provide advice on the support, advice and services you may need.

RNIB Helpline
0303 123 9999
helpline@rnib.org.uk

Open Monday to Friday 8am to 8pm and Saturday 9am to 1pm.

RNIB address and website:
105 Judd Street
London WC1H 9NE
www.rnib.org.uk [Accessed January 2022]

Acknowledgements

With thanks to the RNIB for allowing us to use the text from their retinal vessel occlusion leaflet for our booklet.

Tell us what you think of this leaflet

We hope that you found this leaflet helpful. If you would like to tell us what you think, please contact:
Mrs F Bailey, Consultant Ophthalmologist, The York Hospital, Wigginton Road, York, YO31 8HE or telephone 01904 721552.

Teaching, training and research

Our Trust is committed to teaching, training and research to support the development of health and healthcare in our community. Healthcare students may observe consultations for this purpose. You can opt out if you do not want students to observe. We may also ask you if you would like to be involved in our research.

Patient Advice and Liaison Service (PALS)

PALS offers impartial advice and assistance to patients, their relatives, friends and carers. We can listen to feedback (positive or negative), answer questions and help resolve any concerns about Trust services.

PALS can be contacted on 01904 726262, or email pals@york.nhs.uk.

An answer phone is available out of hours.

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