

Information for Patients

Treatment of Retinal Vein Occlusion (RVO)

What is a Retinal Vein Occlusion (RVO)?

The retina is the light sensitive layer at the back of the eye acting like a film that captures light and is therefore responsible for what we see. Blood reaches the retina through only one artery and leaves the retina through only one vein but these have many smaller branches that help to supply the whole surface of the retina with oxygen. A RVO is a blockage of the vein as a whole or of a smaller branch of the main vein that takes blood from the retina back to your heart. When the vein or one of its branches gets blocked, the retina is affected, often causing a sudden painless loss of vision.

There are 2 types of retinal vein occlusion:-

- **Branch Retinal Vein Occlusion (BRVO).**

BRVO are due to an obstruction of one of the four branch retinal veins. Each vein drains about one quarter of the retina.

- **Central Retinal Vein Occlusion (CRVO).**

CRVO is due to obstruction of the main vein formed from the four branches which drain blood from the retina.

Loss of vision is generally more severe if the central retinal vein is affected.

What causes it to block?

There are many causes of a blocked vein in the retina, but most commonly this is due to high blood pressure, raised cholesterol levels in the blood,

smoking, diabetes, glaucoma, certain rare blood disorders or simply as a result of aging. Sometimes the cause is not found. The doctor may request blood tests to determine the cause of this problem and may check your blood pressure. It is essential to identify and treat any risk factors to reduce the risk to the other eye and prevent further vein occlusion to the affected eye.

What is Macular Oedema and how is this caused by the Retinal Vein Occlusion?

When the vein gets blocked some blood leaks out. Clear fluid also leaks out causing 'water logging' of the retina. This damages your sight. The centre of the retina is responsible for your sharp vision, such as seeing people's faces or watching television. This central part of the retina is called the macula. If this central part becomes 'waterlogged' you get what we call 'Macular Oedema' and this causes your vision to deteriorate.

RVO may also affect the eye in other ways, for example, by reducing the blood flow and the amount of oxygen reaching the eye. Macula oedema is the most important cause of visual loss related to RVO. If left untreated macula oedema can lead to irreversible loss of central vision. This is not always the case, however, and in some cases the swelling improves without treatment. The doctor will discuss this with you following your examination and advise you of the likely prognosis both with and without treatment.

How is RVO diagnosis confirmed?

Diagnosis of RVO is confirmed by:

- **Optical Coherence Tomography (OCT)**

This is a non-invasive test that uses light and light waves to make a map of the retina at the back of your eye to show up any damaged areas. It is undertaken at every visit.

- **Fluorescein Angiography (FFA)**

This is a diagnostic photographic test that uses a special dye called fluorescein which will be injected into a vein in your arm or hand. This gives a

detailed view of the back of your eye and is usually only done once to confirm your diagnosis before starting treatment and is only repeated later if required.

Treatment of RVO

Until recently the treatment for RVO was laser treatment which helped in certain cases. For patients with branch retinal vein occlusion laser may still be offered initially because one of the criteria for having the newer injection treatments is failure to respond to laser treatment. In cases of central retinal vein occlusion laser is reserved for those patients who are at risk of complications due to the production of new blood vessels. The decision to use laser will be discussed with you.

Intravitreal injections (Injections into the vitreous jelly inside the eye)

Currently the most effective treatments for RVO are injections administered into the eye. There are two types of injections:-

- i) Anti-VEGF injections Aflibercept (Eylea) and Ranibizumab (Lucentis).
- ii) Steroid injection. Dexamethasone (Ozurdex).

Eylea and Lucentis are given by injection into the eye and act to slow or stop the growth of the abnormal blood vessels and leakage. These injections act in similar ways by blocking the effects of the hormone which causes these blood vessels to form and grow. Steroid injections (Ozurdex) are another option which act to reduce the inflammation in the retina caused by the RVO. The doctor who sees you will discuss the various options with you. Further information on each individual medication is listed below so you can read the information which relates specifically to the medication recommended for you.

Most patients' vision will stabilise after treatment and some patients may regain some vision lost. Medication injections may not restore vision that has already been lost, and will not always prevent further loss of vision caused by the disease.

Lucentis and Eylea

What are Lucentis and Eylea?

Lucentis and Eylea are medications that are used to block the action of a hormone, produced in excess in eyes suffering from a retinal vein occlusion

(RVO). This plays a role in the development of central swelling of the tissue at the back of the eye, Cystoid Macular Oedema (CMO).

They are given by injection into the eye.

Why are Lucentis or Eylea being recommended for my eye condition?

Treatment may be recommended to you to improve your vision or prevent any further visual loss. Sometimes the final decision to treat is made on the day of your Macular Treatment Centre appointment depending on tests done on the day.

Lucentis and Eylea have been shown in studies to successfully maintain and/or improve vision in patients with macula oedema related to RVO. Patients on average regain 1 to 2 lines of vision, depending on their level of vision when starting treatment and how serious the blockage of the vein is. Lucentis and Eylea may not always restore vision that has already been lost and will not always prevent further loss of vision by the disease.

Factors that may influence the response to treatment include the damage done by the swelling and the condition of the blood circulation at the back of the eye. It is very important to ensure good control of diabetes, blood pressure and cholesterol with the help of your GP as this is essential for preventing any similar problems from occurring in the future. Maintaining a healthy diet, not smoking and taking regular exercise are also very helpful in preventing further blockages. We will, with your permission, write to your family doctor to provide the information needed in order that they can help you.

How is the treatment given?

You will be awake for the procedure. The pupil (black part of your eye) is dilated and anaesthetic drops are put in to numb the surface of your eye. The skin around your eye and the surface of your eye is washed with an antibacterial solution to reduce the risk of infection. The skin around your eye is then covered in a sterile drape. The medication is injected into the vitreous humour (the jelly like substance inside the back of your eye). You may feel slight pressure on your eye when this is done, but you should not experience pain. After the injection into your eye you may have a gritty feeling in your eye, and there may be bleeding over the white of your eye. You should not

worry about this, it will resolve with time. You might also see floaters; these will become smaller and disappear over a couple of weeks.

Lucentis and Eylea injections are given at repeated intervals into the eye. The precise number of injections that may be necessary can vary considerably between patients. On each monthly visit the decision to give you another injection or not will be made on the day of your Macular Treatment Centre appointment based on your vision, the appearance of the back of your eye and the findings on a special eye scan (OCT).

It is often necessary to attend for eye examinations and/or injections on a regular basis and perhaps for several months. It is very likely that you will need to attend for a follow-up appointment every month for the first year of treatment.

Lucentis and Eylea risks of treatment

The potential risks are outlined below and will be discussed with you by your eye doctor. Not everyone who has the injections will experience side effects, however, as with any medicine; side effects are possible with Lucentis and Eylea.

Risks of intravitreal eye injections

Common side effects which rarely cause any long term problems may include:

- Temporary eye pain (often relieved by pain relief medication)
- Conjunctival haemorrhage (blood shot eye)
- Vitreous floaters
- Irregularities or swelling of the cornea
- Inflammation of the eye
- Visual disturbances such as small specks in the vision

Serious complications of the intravitreal injection procedure are rare and include:

- Bleeding
- Infection (endophthalmitis)
- Retinal detachment
- Cataract formation

Any of these serious complications may lead to severe, permanent visual loss. In the clinical trials, these complications occurred at a rate of less than 1 in 1000 of injections. A discussion of all related risks and benefits from treatment will take place with your eye doctor before you consent to having this treatment.

Complications of Lucentis/Eylea in other parts of body

There may be an increased risk of experiencing blood clots, which may cause heart attack or stroke, after intravitreal injection of medicines such as Lucentis and Eylea. However a low incidence of this was seen in the clinical trials and the risk is not thought to be significant. Evidence from studies suggests that patients with a history of these conditions may be at a greater risk. If you have had a stroke or heart attack, please discuss this with your eye doctor.

Coincidental risks

Whenever a medication is used in a large number of patients coincidental problems may occur that could have no relationship to the treatment. For example, patients with high blood pressure or smokers are at increased risk of heart attacks and strokes. If one of these patients being treated with Lucentis/Eylea suffers a heart attack or stroke, it may be caused by the high blood pressure and/or smoking and is not necessarily due to their eye treatment.

Dexamethasone Implant (Ozurdex)

What is Ozurdex?

Ozurdex is an anti-inflammatory drug. It is a type of steroid called dexamethasone. The medication is contained within a long-lasting implant that is injected directly inside the eye. As the implant slowly dissolves in the vitreous gel it releases dexamethasone for up to six months. Ozurdex is an alternative treatment with potentially fewer injections than anti-VEGF medications but more potential side effects and at the time of writing available evidence suggests may not be quite as effective.

In addition to the risks associated with intravitreal injections outlined above, steroid injections such as Ozurdex can specifically increase the risk of:

- Cataract formation.
- Glaucoma (raise in eye pressure leading to potential damage to the nerve in the eye).

The risk of eye pressure rise is 1 in 4 but the great majority can be controlled with eye drops and most of the time even these drops can be withdrawn. The likelihood of losing vision because of intraocular pressure rise is less than 1 in 100.

Reducing the risk of infection

If you have an eye infection on the day of your planned treatment, the injection may have to be delayed until the infection has resolved. Please inform your doctor or nurse if you have a red or sticky eye. Your injection may also not be possible if you have an infection in any other part of the body currently requiring treatment. The doctor who assesses you will advise if this is the case. If you have an infection but are still well enough to attend for your appointment it is better to keep the appointment.

In order to minimize the risk of infection staff in the injection room will be wearing face masks during your procedure. We also aim to keep conversation to a minimum and we therefore ask that during your injection, conversation is kept to a minimum.

You may also be prescribed eye drops to use at home after the procedure which need to be used for the duration advised.

Is the treatment guaranteed to work?

Although Lucentis, Eylea and Ozurdex have been shown to be effective for the majority of patients, the treatment might not work for you. Your condition may not get better or may become worse despite these injections. Any or all of the complications described above may cause decreased vision and/or a possibility of blindness. Additional procedures may be needed to treat these complications. During follow up visits or phone calls, you will be checked for possible side effects and the results will be discussed with you.

What if I do not have treatment?

You do not have to receive treatment for your condition. However, without treatment, your central vision may start or continue to get worse over a fairly short period of time and reach the point where treatment may no longer help. Although macular oedema alone hardly ever causes complete blindness, it can reduce the vision to the point where it is only possible to see outlines to the side (known as peripheral vision) or movements, but no fine detail because of loss of central vision. RVO can affect your eye also in other ways, for example by causing a bleed inside your eye or raising the pressure inside your eye and making it uncomfortable. Such problems may still progress despite treatment for macula oedema and can be the cause of temporary or permanent visual loss. Additional treatments, such as a course of laser therapy, may be required to deal with such problems.

Patient responsibilities

If you experience any of the following, please contact the hospital as soon as possible:

- Eye pain.
- Blurred vision or reduced vision.
- Sensitivity to light.
- Redness of your eye (increasing compared to immediately after your injection).
- Sticky discharge from your eye.

You should avoid rubbing your eyes or swimming for three days following each injection to reduce the risk of infection. Please keep any post-injection appointment or scheduled telephone calls so that potential complications can be checked for. Although the likelihood of serious complications affecting other organs of your body is low, you should immediately contact your GP or attend your local Accident and Emergency Department if you experience:

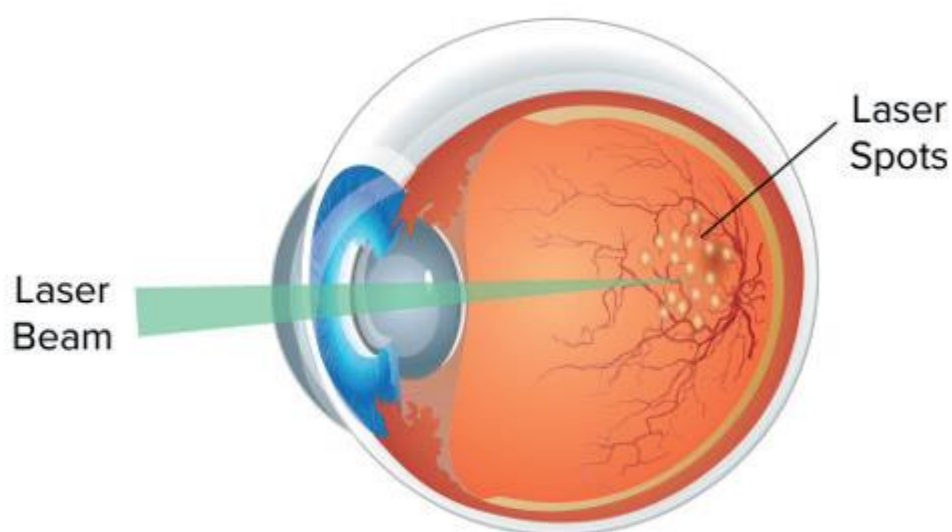
- Abdominal pain.
- Abnormal bleeding.
- Chest pain.
- Severe headache.
- Slurred speech.
- Sudden limb weakness or numbness.

What other treatment options are available?

Other forms of treatment are also available for macula oedema related to RVO. These may include treatment with a conventional or 'hot' laser (only suitable for cases of BRVO and not CRVO).

The laser treatment most commonly used in macular oedema is Macular Grid laser. A small number of patients with retinal vein occlusions develop abnormal blood vessels on either the iris at the front of the eye or on the retinal surface. These abnormal blood vessels can bleed or cause a marked pressure rise in the eye, leading to further loss of vision and, sometimes, pain. This can normally be prevented by a specific type of laser treatment to the retina (called Pan Retinal Photocoagulation or PRP laser). This treatment is aimed at stabilising and preserving the condition of the eye and so will not improve vision.

Laser Coagulation



What if I change my mind?

If you have any concerns, please discuss these with the doctor. You can change your mind about your treatment at any time. If you require further advice or do not understand anything contained in this leaflet or are having problems following your injection, please contact the Macular Treatment Centre on (0161) 276 3341/5572 Monday, Wednesday, Thursday 8.00 am – 8.30 pm, Tuesday, Friday 8.00 am – 6.00 pm, Saturday 8.00 am-2.30 pm.

You may also contact the Emergency Eye Centre on (0161) 276 5597 available every day from 8.00 am – 9.00pm including public holidays.

If your problem is urgent and the departments above are closed or you are unable to get an answer, please ring Ward 55 available 24 hours every day on (0161) 276 5512.

Further Information

If you would like further information, there are many sources of advice available. Brochures/posters from many relevant patient support groups are available in the clinics in Manchester Royal Eye Hospital, please ask.

Henshaws Patient Support in the Out-patient Department,
Manchester Royal Eye Hospital
Telephone (0161) 276 5515

Henshaws Manchester

www.henshaws.org.uk or telephone (0161) 872 1234

Royal National Institute of Blind People (RNIB)

www.rnib.org.uk or telephone RNIB helpline on 0303 123 999 Monday – Friday 8.45 am – 6.00 pm and Saturday 9.00 am – 4.00 pm.

The Macular Society.

Find out more at www.macularsociety.org/ or telephone the Macular Society Helpline on 0845 241 2041.