

Vitreotomy and Delamination for Proliferative Diabetic Retinopathy

What is this surgery and why has it been recommended?

If you have proliferative diabetic retinopathy and have been told you need a “vitrectomy and delamination”, this page will help explain what the surgery involves and what you can realistically expect. This is one of the more complex operations in eye surgery, but modern techniques have made it considerably safer than when it was first developed.

Understanding why surgery might be needed

Diabetes can damage the small blood vessels in the retina. When this damage is severe, areas of the retina lose their blood supply and the eye responds by growing new blood vessels. This is called proliferative diabetic retinopathy.

Unfortunately, these new vessels are fragile and abnormal. They grow in the wrong place – on the surface of the

retina and into the vitreous gel – rather than within the retina where they should be. They cause problems in two ways: they bleed, causing vitreous haemorrhage that blocks vision; and they develop scar tissue that contracts and pulls on the retina, potentially causing tractional retinal detachment.

Laser treatment works well in many cases by reducing the drive for new vessel growth. However, once significant scar tissue has formed, or if bleeding obscures the view for laser, or if the retina is being pulled by contracting membranes, surgery becomes necessary.

What does “delamination” mean?

The term refers to the careful surgical separation of the fibrovascular membranes (scar tissue and abnormal blood vessels) from the underlying healthy retina. These membranes grow on the surface of the retina and become adherent at multiple points. During surgery, the membrane must be meticulously peeled away without damaging the retina itself.

What happens during surgery?

The operation takes between one and three hours depending on complexity. Three tiny ports are created through the white of the eye. The vitreous gel is removed first. Then the surgeon identifies the plane between the membrane and retina and carefully separates the two using tiny scissors, picks and forceps.

Once the membranes have been removed, laser treatment is applied to the peripheral retina. If any holes have been created during dissection, these are treated and the eye may be filled with gas or silicone oil to support the retina while it heals.

Anaesthetic

This operation is performed under local anaesthetic as standard. An injection around the eye numbs it completely. You will be awake but the operating area is screened so you do not see the instruments. Most patients tolerate this well.

Will I need an injection before surgery?

There is strong evidence that an anti-VEGF injection given before surgery makes the operation safer. It reduces bleeding during surgery, shortens operating time, and reduces the likelihood of needing silicone oil. I typically recommend an injection approximately one week before surgery.

What are the realistic chances of success?

It is important to have realistic expectations. The goal is primarily to stabilise the condition and prevent further deterioration, though many patients do achieve meaningful improvement.

The largest UK study examined outcomes in over 500 eyes:

- About 63 in every 100 achieved "visual success" (gaining two or more lines of vision)
- About 15 in every 100 experienced visual loss
- The remaining 22 in every 100 were stable
- About 15 in every 100 required a second operation

The most important predictor of final visual outcome was

the vision before surgery – eyes with better preoperative vision tend to achieve better results.

What are the risks?

This is major surgery, and all patients need to understand there is a risk of a poor outcome. I quote a risk of about 10 in every 100 for a very poor outcome with little or no useful vision. The main causes are:

Retinal detachment: The retina can detach after surgery, particularly if holes were made during dissection. This may require further surgery.

Rebleeding: The abnormal vessels can bleed again. Minor bleeds usually clear; significant rebleeding may require another operation.

Infection: Rare (about 1 in every 1,000) but serious.

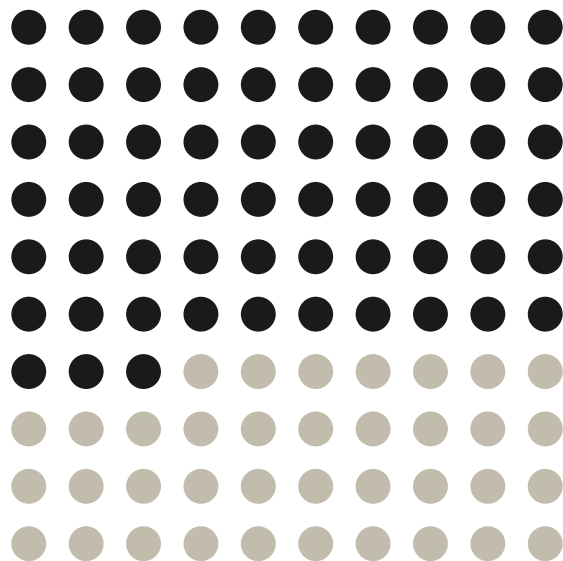
Cataract: If you still have your natural lens, vitrectomy will accelerate cataract formation. The timing is variable, but most patients need cataract surgery within the first year after surgery. For this reason, I often recommend

combined cataract surgery at the same time.

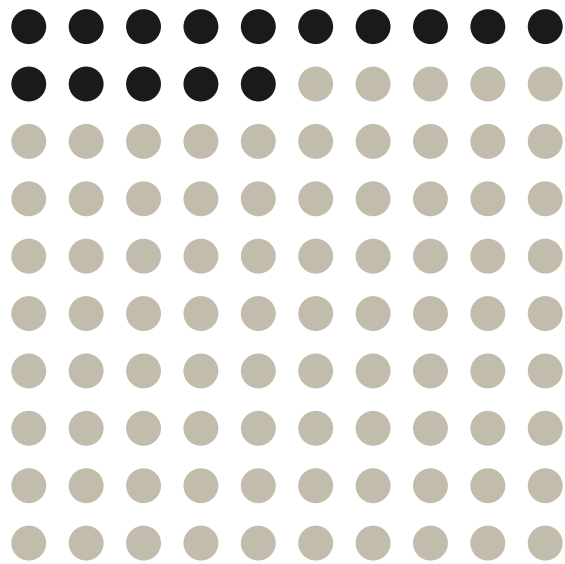
Neovascular glaucoma: In some cases, new blood vessels can grow on the iris and block fluid drainage, causing severely raised pressure.

The main risks at a glance

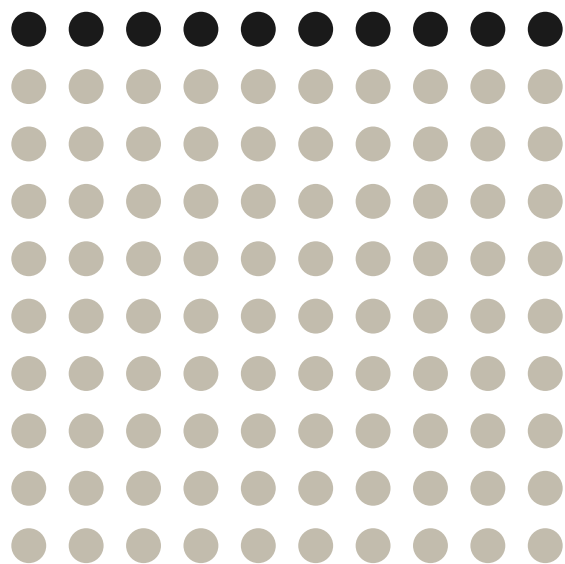
Each grid below is 100 people who have the operation; the shaded dots are those affected.



About 63 in every 100 – a visual success, gaining two or more lines of vision.



About 15 in every 100 – a loss of vision.



About 10 in every 100 – a very poor outcome, with little or no useful vision.

After surgery

If you have a gas bubble: The gas absorbs over 2 to 10 weeks. You will see a dark area at the top of your vision

which descends as the bubble shrinks. You absolutely must not fly while there is gas in your eye – the gas will expand at altitude and can cause blindness.

If you have silicone oil: This provides longer-term support but does not absorb. It usually needs removal in a second operation 3 to 6 months later. Unlike gas, you can fly with silicone oil.

There is an important consideration with silicone oil: about 3 to 6 in every 100 patients experience unexplained loss of central vision either while the oil is in the eye or after removal. The mechanism is not understood. This is one reason we aim to remove silicone oil once the retina is stable, rather than leaving it indefinitely.

Things to look out for

Pain: This operation should not be painful. Significant pain – particularly with headache above the eye – may indicate raised pressure or infection. Contact your eye unit urgently.

Deteriorating vision: If vision worsens, or if you notice a shadow encroaching (particularly from below), this may in-

dicate retinal detachment. Contact your eye unit urgently.

The importance of ongoing diabetes management

Surgery addresses the current problem but does not cure the underlying disease. Excellent control of blood glucose, blood pressure and cholesterol all reduce the risk of recurrence. Work closely with your diabetes team.

Summary

Vitrectomy and delamination is a complex but well-established procedure for the complications of proliferative diabetic retinopathy. While approximately two-thirds of patients achieve meaningful visual improvement, around 15 in every 100 lose vision, and the final outcome depends heavily on the state of the eye before surgery. Surgery should be seen as one part of a lifelong strategy to manage diabetic eye disease.

Further reading

- Jackson TL, et al. The Royal College of Ophthalmologists' National Ophthalmology Database Study of vitreoretinal surgery: Report 6, Diabetic vitrectomy. JAMA Ophthalmol. 2016;134(1):79-85. Free full text available
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If you have had eye surgery and are concerned, see emergency contacts.

Emergency contacts: <https://www.vitygas.com/information/emergency-contacts/>

NHS patients call Limpsfield Ward or the East Surrey Hospital switchboard. Private patients use the mobile number provided.