APGS
Asia-Pacific Glaucoma Society

MIGS
interest group

Hydrus Microstent

Information sheet

Hydrus Microstent

What is the Hydrus Microstent?

The Hydrus Microstent is a crescent-shaped, implantable microstent made of nitinol (a metal alloy of nickel and titanium with super-elastic properties) (Figure 1). It is approximately 8mm in length and roughly the size of an eyelash.

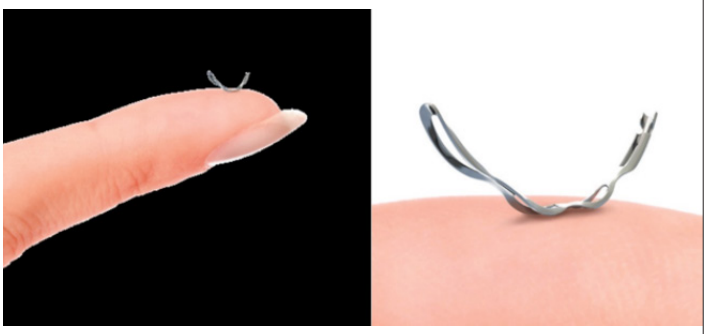

Figure 1.
(A) The size of a Hydrus Microstent in comparison with a finger. (B) A magnified view of a Hydrus Microstent.*(Courtesy of Ivantis, Inc., California, United States).*

The Hydrus Microstent is inserted into the Schlemm's canal, which is the natural drainage canal of the eye (Figure 2). It bypasses the trabecular meshwork, which is a structure that drains fluid from the eye and is often obstructed in patients with glaucoma. It also expands the Schlemm's canal, allowing enhanced flow through the eye's drainage system. The length and curvature of the implant are designed to occupy approximately 90˚ or 3 clock hours of the Schlemm's canal. Glaucoma is a disease in which the pressure within the eye builds up and damages the eye nerve. Treatment of glaucoma involves lowering the eye pressure.

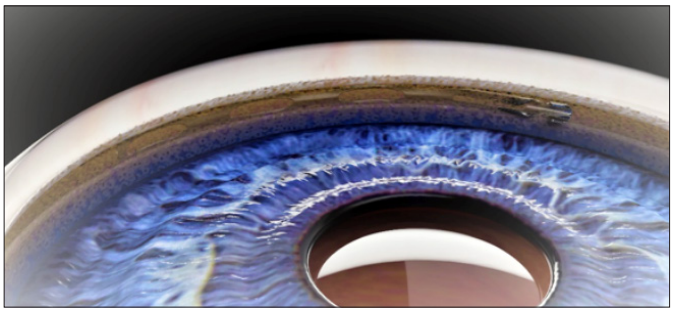

Figure 2.
Illustration showing the Hydrus Microstent in the Schlemm's canal, the natural drainage canal of the eye. *(Courtesy of Ivantis, Inc., California, United States).*

The Hydrus Microstent is permanent and well-accepted by the body. It will stay in the eye to drain fluid from the eye. This reduces the pressure in the eye hence slows down glaucoma progression and preserves the vision.

If you are scheduled for magnetic resonance imaging (MRI) after Hydrus Microstent insertion, you would need to inform your doctor that you have this implant in your eye. You can still undergo MRI safely in a specified MR environment under specified conditions (this information can be obtained from your eye doctor). Because of the very small dimensions of the Hydrus Microstent implant, heating and artifacts will not pose a problem or added risk for MRI under these specified conditions.

The Hydrus Microstent is most often used in patients with mild and moderate open angle glaucoma who wish to reduce the number of glaucoma medications required. Patients usually choose to have the Hydrus Microstent

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inserted at the same time as cataract surgery, though some undergo Hydrus Microstent surgery by itself. If you have very advanced glaucoma, the Hydrus Microstent is unlikely to lower your eye pressure sufficiently.

The Hydrus Microstent will not reverse any damage already caused by glaucoma, improve your vision or cure your glaucoma.

What are the advantages of the Hydrus Microstent?

The Hydrus Microstent is less invasive compared with other conventional glaucoma surgeries (such as trabeculectomy or tube shunt implants). Only a very small cut in the eye is required to insert the Hydrus Microstent and unlike conventional glaucoma surgeries, stitches are usually not required. Hence, the surgery is faster and more straightforward with a quicker recovery time. Unlike conventional glaucoma surgeries, the Hydrus Microstent is unlikely to have much effect on your spectacles power.

The Hydrus Microstent has an excellent safety profile, with much less complications reported compared with conventional glaucoma surgeries. In particular, the rate of sight-threatening complications (e.g. major bleeds at the back of the eye, infection) are extremely rare. The safety profile of Hydrus Microstent surgery is similar to that of cataract surgery alone. If subsequent conventional glaucoma surgery is required after Hydrus Microstent surgery, they can still be performed and the Hydrus Microstent would not make subsequent conventional surgeries less effective.

In previous clinical studies, the Hydrus Microstent usually lowers eye pressure to the mid-to-high teens with a reduction in the number of glaucoma medications.[1-3] Of course, results may vary between different patients.

How is the Hydrus Microstent inserted into the eye?

The Hydrus Microstent can be inserted into the eye either at the same time as cataract surgery or by itself. Eyedrops are used to make the eye numb and some surgeons may also give an injection around the eye so that you won't feel pain or discomfort during the procedure. In some hospitals, you may also receive light sedation during the surgery so that you will feel more relaxed and comfortable. You will be awake during the procedure and should not feel any pain during the surgery.

Only a very small cut in the eye is required to insert the Hydrus Microstent, which does not require stitches (Figure 3). The procedure usually takes approximately 5 to 10 minutes. At the end of the procedure, the operated eye is covered with an eye shield and may also be padded. You will usually be able to go home the same day as your operation.

Figure 3.
The Hydrus Microstent is introduced into the eye through a very small cut and inserted into the natural drainage canal of the eye. *(Courtesy of Chelvin Sng).*

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What precautions should I take after undergoing Hydrus Microstent surgery?

You should avoid strenuous activities for the first month, including swimming, jogging, contact sports and vigorous exercises. It would be advisable to cover the operated eye with an eye shield at night for a few weeks after the surgery, so as to avoid accidental injury to the eye while you are sleeping. Eye make-up should be avoided for about 4 weeks after the surgery. Reading or watching the television will not harm your eye and you may continue with these activities as usual.

Your doctor will prescribe you with antibiotic and anti-inflammatory eyedrops. Immediately after the surgery, you may still need to continue the glaucoma eyedrops in the operated eye. It is important to use these eyedrops as instructed by your eye doctor. If your other eye requires glaucoma eyedrops as well, they will still need to be continued as usual after the surgery.

The nature of your work will determine the length of time you would need to take off work after the surgery, though most people take two to three weeks off.

What are the risks associated with the Hydrus Microstent?

The Hydrus Microstent has an excellent safety profile, with the rate of complications similar to cataract surgery alone.[1-3] It is not appropriate for persons with allergic reactions to nickel.

During the Surgery

There is a small risk of damage to the other structures in the eye during the surgery, including the iris (the structure made of muscle which controls the size of your pupil and is in front of the lens) and the cornea (the transparent structure in front of the eye which allows light into the eye). If you are not undergoing cataract surgery at the same time, there is also a potential risk of the surgery damaging your lens and causing a cataract. Bleeding in the front of your eye may occur during the surgery, which usually resolves on its own within two weeks after the surgery.

Depending on the structure of your eye, it may not be possible to implant the Hydrus Microstent in some eyes.

After the surgery

The most common complication after the surgery is bleeding in the front of your eye, which usually resolves on its own within two weeks after the surgery. Occasionally, the Hydrus Microstent may become blocked by iris, and an additional laser procedure may be necessary to relieve this blockage. If the Hydrus Microstent is not positioned well, it may require a second surgery to re-position or remove the implant. After any eye surgery, inflammation frequently occurs and this resolves within 3 months in the vast majority of eyes with the Hydrus Microstent. It is also possible that the cells at the back of the cornea may decrease after any eye surgery, which can lead to swelling of the cornea if the number of cells is too low. However, previous studies have shown little difference in the decrease in corneal cells between eyes that underwent combined Hydrus Microstent and cataract surgery compared with those that underwent cataract surgery alone. If your eye pressure is still not low enough after Hydrus

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Microstent surgery, your glaucoma may progress and you may need to re-start your glaucoma medications or further surgeries may be required to control your eye pressure. The Hydrus Microstent would not make subsequent conventional glaucoma surgeries less effective.

Serious complications after Hydrus Microstent (e.g. vision loss, major bleeds at the back of the eye, infection, detachment of the retina [light-sensitive tissue lining the back of the eye]) are fortunately extremely rare. However, every time you undergo an eye surgery, these serious complications can potentially occur, though the risk of these occurring with the Hydrus Microstent is significantly less than that associated with conventional glaucoma surgeries.[2-3]

What are the alternatives to the Hydrus Microstent?

Glaucoma can be treated with medications to lower the pressure in the eye. However, many patients do not use glaucoma medications as regularly as they should, experience side effects from the medications or are allergic to them. The medications may also not reduce the eye pressure sufficiently, and surgical procedures may be required to control the eye pressure and prevent further vision loss from glaucoma.

A laser procedure called selective laser trabeculoplasty may be appropriate for some patients with open angle glaucoma, though in other patients it may not reduce the eye pressure sufficiently or may need to be repeated. Conventional glaucoma surgeries include trabeculectomy or tube shunt implants, which are effective in lowering the eye pressure but are associated with potentially serious complications. Besides the Hydrus Microstent, other minimally invasive glaucoma surgery devices are also available. Please consult your eye doctor regarding the most appropriate surgery or glaucoma device for you.

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