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Glaucoma Treatment Options

Glaucoma is a chronic disease of the optic nerve that can lead to the loss of peripheral vision and eventually blindness if left untreated. There are many risks factors for developing glaucoma including older age, female gender, African American and Hispanic race, and elevated intraocular pressure (IOP). The most significant risk factor is high IOP. A number of large clinical studies have shown that with reduction of IOP, progressive damage to the optic nerve and vision loss can be slowed. The main medicines for glaucoma are eye drops. These work by either reducing the amount of aqueous humor (fluid that the eye produces) or by increasing the outflow of this eye fluid. The goal is to decrease the fluid build-up in the eye thereby reducing IOP. Some patients, however, will require laser and/or incisional surgery to further lower their IOP in order to prevent additional damage to their optic nerve.

The laser surgery called Selective Laser Trabculoplasty (SLT) is performed in the office, requires only a few minutes, and is very effective. The two main incisional surgeries, trabeculectomy and drainage implants, are invasive surgeries that carry significant risks such as infection, bleeding and hypotony (IOP that is too low for the eye to maintain its shape). Because of these risks, these surgeries are generally reserved for moderate to advanced glaucomatous eyes.

Newer technologies, called MIGS (Minimally Invasive Glaucoma Surgeries) have been developed that have significantly fewer risks. These are considered less effective in reducing IOP than the traditional surgeries. Therefore, these surgeries are reserved for eyes that have mild to moderate glaucomatous damage. Eyes with more advanced glaucoma, in general, require lower IOP than those with mild glaucoma in order to prevent vision loss.

Many of these MIGS are performed at the same time as cataract surgery. One such surgery is called the iStent Trabecular Micro-bypass (Glaukos). This is a small (1mm X 0.3mm) titanium stent that is placed in the trabecular meshwork (eyes' drainage area that is damaged in glaucomatous eyes). It works by increasing the outflow of aqueous fluid, thereby reducing the IOP. For the patient, this only adds a few minutes to the length of the surgery without any other side effects or additional incisions. If the surgery is successful, patients may be able to reduce the number of eye drops they are putting in their eye in order to control their glaucoma. So, for example, if they were on 2 drops before cataract surgery, after this combined cataract surgery with the iStent placement, they will likely be able to go down to 1 drop to control their IOP.

Another device is called the Trabectome (NeoMedix). This is a thermal cautery device that can ablate some of the trabecular meshwork. This device literally burns some of the drainage tissue that is not functional in glaucomatous eyes. This is also done at the same time as cataract surgery using the same incision made for cataract surgery. This helps to lower IOP and may also decrease the number of glaucoma drops a patient takes after cataract surgery.

There are also new ways to deliver glaucoma medicines being produced. For example, we may be able to inject glaucoma medicine into the eye that may last for 30-90 days so that patients do not have to remember to take their drops daily. This will give even more options for ophthalmologists to treat your glaucoma and minimize vision loss due to high eye pressure.

Figure: This view is from the special mirror used during surgery for the implantation of the iStent. The small titanium device is inserted into the part of the eye called the trabecular meshwork.