Glaucoma

Introduction

Glaucoma is a disease of the optic nerve. Progressive damage of the optic nerve will lead to irreversible reduction in visual acuity, visual field loss and blindness. Currently, the main stay of treatment of glaucoma relies on reduction of intraocular pressure, which may help in slowing down the progressive damage of the optic nerve.

When the desirable intraocular pressure cannot be achieved by medication alone, glaucoma surgery may be required. The level of intraocular pressure is a result of the balance of fluid secretion and outflow inside the eye ball. Glaucoma surgery can lower the level of intraocular pressure by either diminishing the production of fluid inside the eye or by increasing the outflow of fluid away from the eye. Usually, the intraocular pressure can be lowered by the surgery.

Unfortunately even upon optimization of intraocular pressure, the damaged optic nerve and related vision functions cannot be restored. In some circumstances, if the intraocular pressure cannot be sufficiently controlled after the operation, topical or oral anti-glaucoma drugs may still be required. If there is still imbalance of intraocular fluid secretion and outflow after the operation, you may need another operation to prevent further deterioration.

The Procedure

The procedure is usually performed under local anaesthesia. The doctor will apply medications to numb the procedure site and you will remain awake throughout. General anaesthesia may be used in special circumstances.

The followings are common surgical procedure to increase the drainage of intraocular fluid in the management of glaucoma patients:

1. Trabeculectomy:

   - The procedure is to create a small drainage site in the wall of the eyeball to facilitate the outflow of intraocular fluid in a controlled manner. With the use of special instrument, a tiny piece of tissue is removed from the wall of the eyeball to create a small hole as the drainage site. Intraocular fluid can then be drained through the hole to re-enter the bloodstream. As a result, eye pressure can then be reduced and stabilized.

2. Non penetrating glaucoma surgery:
   - A similar procedure as trabeculectomy but a very thin layer of tissue is kept behind. A piece of collagen implant may be used to maintain the patency of the drainage site.

3. Glaucoma Implant:
   - There are different types of glaucoma implants including the traditional types with tube and plates or newer minimally invasive glaucoma surgical devices (MIGS).
   - Upon implantation of these devices inside the eye, the aim is to reduce the resistance of fluid flow within the eye or to drain the fluid outside the eye via an additional pathway.
   - Traditional glaucoma implant is made of inert material like special plastic or silicone and is composed of a tube (about 1 cm long) and a plate of various size (about 1 to 1.5 cm in diameter).The tube is put inside the eye to drain the fluid out. The plate increases the surface area available to facilitate absorption of the drained fluid.

4. Needling procedure
   - When there is fibrosis over previous drainage site, the scar can obstruct the pathway of fluid outflow. With the use of needle, some of the scars can be removed to improve the drainage.

5. Anti-metabolites (such as Mitomycin C or 5-Fluorouracil) which delay wound healing may be used to improve the success rate of the glaucoma operation.

To decrease the production of fluid inside the eye,

- Cyclophotocoagulation
  The procedure usually involved the use of laser to destroy the tissue producing the fluid.

Possible Risks and Complications

In general, glaucoma surgery is a safe operation and risk of glaucoma surgery is low. However, apart from possible complications related to anaesthesia, complications can occur occasionally even days, weeks, months or years after the surgery including:

- Wound gapping
- Bleeding in the eye
- Infection

- Chronic inflammation
- Irritation or discomfort in the eye
- Exposure of implant
- Formation of button hole in conjunctival flap covering the fluid outlet with uncontrolled leakage of eye fluid
- During the initial postoperative period, low / high intraocular pressure may occur; the vision may be affected during this initial period of a couple of weeks
- High intraocular pressure requiring use of laser to improve eye fluid drainage for reduction of pressure
- Low intraocular pressure and shallow anterior chamber requiring injection of viscoelastics
- Recurrence of intraocular fluid secretion and outflow imbalance in eye and a second surgery is needed
- Development of cataract or deterioration of pre-existing cataract
- Double vision
- Corneal decompensation
- Degenerative changes in the eye with drop in vision
- Loss of vision

Complications related to anti-metabolites
- Corneal surface toxicity
- Keratitis
- Corneal scleral melting
- Cataract
- Thin bleb or bleb leak
- Hypotony
- Maculopathy
- Decrease in visual acuity

Before the Procedure
- You should continue to use the usual eye drops or medications unless directed by doctor otherwise.
- Inform your doctor if you have other systemic disease such as hypertension, stroke, heart disease, diabetes or take western medication (especially blood thinners like Aspirin or Warfarin), traditional Chinese medicine or healthy supplements on a regular basis.

After the Procedure
- Keep eye patch or eye shield on if any as directed by doctor
- Use eye drops or eye ointment as prescribed, those medications will help to prevent infection and inflammation

- Keep the wound clean and do not rub your eye
- Do not expose your eye to water during showering
- Avoid washing your hair during the first week after the operation in order to prevent dirty water getting into the eye causing infection
- No swimming
- Wear clothes with buttons and not pullovers so as to avoid the clothes coming in contact with the operated eye causing infection
- Ensure adequate lighting during night time when you go to toilet in order to prevent falls as you may not be accustomed with one eye being patched after the operation
- Avoid unnecessary straining after surgery. If you have constipation, take liberal amounts of vegetables and fruits to alleviate your constipation
- You may be recommended to sleep on the side opposite to the operated eye and protect the operated eye during sleep by wearing an eye shield.

Follow Up

- For several weeks following the surgery, your eye doctor will observe your eye closely and examine you frequently. During this time period, the eye pressure has not yet stabilized. Avoid lifting heavy objects, bending or straining.
- You must follow instructions strictly on taking medications and see the doctor as scheduled.
- Eyeball pressure and signs of recurrence will be monitored. You may need to restart eye drops to control glaucoma if the pressure shoots up again or even another operation if the pressure is uncontrolled.
- If you have any excessive bleeding, severe pain, fever or signs of wound infection such as redness, swelling or large amounts of foul-smelling discharge coming from your eye, see your doctor immediately or attend the nearby Accident and Emergency Department.

Remarks

This is general information only and the list of complications is not exhaustive. Other unforeseen complications may occasionally occur. The actual risks may be different for different patients. During the operation, unpredictable condition may arise, and additional procedures may be performed if necessary. For further information, please contact your doctor.