THE ACUTE GLAUCOMAS

The acute glaucomas make up about 10% of the total number of glaucoma patients. This group is mainly comprised angle closure glaucomas. The rest is made up of some secondary open angle glaucomas with rapid increase in intra-ocular pressure.

PRESSURE INSIDE THE EYE (IOP: INTRA-OCULAR PRESSURE)

The eye requires pressure inside it to remain firm and to function normally. This is maintained by the flow of aqueous fluid. It is produced at the ciliary body behind the coloured iris. It passes forwards through the pupil and leaves the eye in front of the pupil where the iris meets the edge of the clear front window of the eye, the cornea. This junction or angle has a trabecular mesh work structure linked to a channel known as Schlemm’s Canal, where the fluid leaves the eye. There is also uveal tissue where further fluid can leave the eye. The normal range of pressure and its measurement is important in the diagnosis of glaucoma.

**Angle Closure Glaucoma**

Angle closure glaucoma happens in a specific group of patients. These are normally older people, mainly women, who have a small eye with a shallow front portion or anterior chamber. In these people the iris is angled forwards and the angle between the iris and the cornea, which is the clear front window of the eye, is narrowed. As patients get older the lens in the eye grows and causes the narrowing to increase. Patients in this group are often long-sighted and certain ethnic groups are more likely to get this disease. It is thought that the attacks come on as the pupil is semi-dilated and the fluid which forms behind the pupil causes the iris to bulge forwards because of the pupil resting snugly on the surface of the lens allowing a little pressure to build up behind the iris. This bowing forwards causes the already narrow angle to close. Some people experience some episodes of raised pressure due to this before a more sustained attack is noticed.
Symptoms
The symptoms of these sudden raises in pressure are hazy vision and typically halos around lights. There can also be discomfort as pressure in the eye reaches high levels, such as 50 or 60 millimetres of mercury (normal range 10 to 20). In some cases the patient can become nauseous and vomit and some patients have been thought to have abdominal problems because of this.

Diagnosis of Acute Glaucoma
The diagnosis of acute glaucoma is on examination made by haziness of the cornea, an oval semi-dilated pupil, a red and congested eye, and very elevated (high) pressure.

Treatment of Angle Closure Glaucoma
Patients with angle closure glaucoma need urgent treatment as they are at risk of losing all their vision if the pressure is not controlled. Diamox tablets are given, which act on the ciliary body and reduce the amount of aqueous fluid which is produced. This treatment can be given in an urgent situation as an intravenous injection. Also, pilocarpine drops, which constrict the pupil, are given on a frequent basis to try to break the attack. In addition patients may be given steroid eye drops to relieve some of the redness and congestion. Some patients may be given glycerol to drink, which also helps to reduce the pressure within the eyeball.

Once pressure has been controlled then the next stage is to try and treat the cause of the closing angle, which is the bowing forwards of the iris. Treatment is to make a hole in the peripheral iris or coloured part of the eye. This may be done with a laser treatment known as a YAG laser iridotomy. It may also be done as a surgical treatment, known as a surgical iridectomy.
YAG Laser Iridotomy

A YAG laser peripheral iridotomy involves creating a tiny opening (see Fig. 2 and Fig. 3) in the iris as seen in the diagram, allowing the fluid from behind the pupil to flow to the front of the pupil. This allows the iris to flop backwards to deepen the periphery of the front chamber, allowing the angle to open wider. The treatment is carried out after some anaesthetic drops are placed on the eyeball. A contact lens is normally placed onto the surface of the eye and the laser applied through the contact lens onto the surface of the iris. There may be a few treatments or flashes of bright light until the doctor is satisfied that the hole has been made properly. In most cases this treatment should cure the acute glaucoma problem and obviously follow up appointments will be given.

Complications of YAG Laser Iridotomy
Most patients have some blurring of vision for a short while. Complications could be bleeding from the iris, which may cause further pressure problems. Raised pressure after the treatment may be noted immediately or in the long term. The opening in the iris may not be permanent and may close again. When the treatment has worked and the eye has settled down and it is thought the pressure remains normal on no treatment you may be discharged from the clinic. Some people find that the pressure remains a little elevated and it is necessary to use the same sorts of drops as in chronic glaucoma and be followed up.

Conversion to Chronic Angle Closure Glaucoma
Some people have a more severe attack of acute glaucoma where it has been left untreated for longer than desirable. Their pressure will be harder to control afterwards, as the eye has now developed chronic angle closure because of long term damage to the drainage angle. These patients have become chronic glaucoma patients and there is another leaflet for this. Fortunately, this does not happen often but can require more treatments to control the pressure.

Secondary Open Angle Glaucoma with Rapid Raised Pressure
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**Neovascular (new blood vessels)**

The main problem in this group is patients who have had a diagnosis of a retinal vein occlusion, usually a central retinal vein occlusion with loss of vision and hemorrhages on the retina. This is dealt with in another leaflet and behaves similarly to some patients who may have developed very advanced diabetic retinopathy. Patients in both these groups have developed the growth of abnormal new blood vessels in the eye, also within the drainage angle. Treatments include retinal laser for the original condition. There may be a role for anti-VEGF, such as in wet macular degeneration patients, to make the blood vessels regress. Some of these patients may be offered a ciliary body laser treatments.

**Inflammatory**

Some patients with uveitis or inflammation in the anterior chamber of the eye may experience raised pressure. The treatment is to give mild steroid drops to treat the inflammation and also treatment to the pressure, such as glaucoma drops and Diamox tablets. Another group of patients are known as steroid responders. These are patients who are using steroid drops for any eye problem, whether it is inflammation or post-operative, such as following a cataract operation. Some patients are known to increase the intra-ocular pressure quite dramatically due to exposure to steroids. It doesn’t necessarily take that long to happen and that is why people on steroid drops need to have their pressures monitored. This may be more common in myopic or short-sighted patients.

**Patient Advice**

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**Acknowledgements**

International Glaucoma Association (diagrams)