

Non-Penetrating Glaucoma Surgery

FACT SHEET

(The term 'glaucoma' refers to a characteristic pattern of damage to the optic nerve)

Non-Penetrating glaucoma surgery (NPGS) is a collective term for a number of surgical techniques that aim to slow or stop glaucoma progression by reducing intra-ocular pressure (IOP). The defining feature of NPGS is the lack of penetration or incision into the eye at the time of surgery. This is in contrast to traditional glaucoma surgery such as trabeculectomy where an opening allowing the fluid (aqueous) to flow from the inside to outside the eye is fashioned on purpose. NPGS instead preserves the integrity of the membrane (known as the trabecular meshwork) across which aqueous humour naturally drains out of the eye. There are 3 main NPGS techniques in use:

1. **Deep Sclerectomy:** a block of scleral tissue (the white of the eye) approximately 3mm x 3mm is removed and Schlemm's canal opened but the trabecular meshwork is left intact. Aqueous can then filter across the trabecular meshwork and drain away from the eye via a number of pathways including via Schlemm's canal, the supra-choroidal space, intra-scleral pathways and via the sub conjunctiva.
2. **Viscocanalostomy:** a similar technique to Deep Sclerectomy with the exception that Schlemm's canal is dilated using a clear surgical jelly (viscoelastic) and the scleral flap is sutured down tightly at the end
3. **Canaloplasty:** again, Schlemm's canal is exposed in the same manner as Deep Sclerectomy. A suture is then placed through Schlemm's canal and tied off to create tension and therefore open Schlemm's canal. The scleral flap is sutured down tightly at the end.

These techniques are only suitable for eyes in which the angle between the iris and cornea is open. If there is contact between these structures, then the angle is blocked and no aqueous will flow across the trabecular meshwork into the site of surgery. Therefore, eyes with angle closure glaucoma of any cause requiring surgical lowering of intra-ocular pressure are generally not suitable for NPGS.

NPGS has both advantages and disadvantages relative to other glaucoma surgery techniques. Of benefit is the relative lack of inflammation and speed of recovery after surgery. There is usually a lower requirement for anti-inflammatory eye drops and changes to vision in the period after surgery are often less marked. On average fewer post-operative visits are required.

The complication profile is also different. Eyes are much less likely to experience hypotony (intra-ocular pressure too low) following surgery. Leak of aqueous humour from the eye is also uncommon and there are fewer complications related to the presence of a bleb (the area of conjunctiva on the top part of the eye where fluid drains into). If the eye still has its natural crystalline lens (i.e. has not yet had cataract surgery), then this is less likely to evolve into a cataract.

These benefits are offset by the fact that IOP reduction after NPGS is on average less than with other techniques including trabeculectomy. Eyes requiring very low intra-ocular pressure, for example less than 10mmHg, are probably not suitable for NPGS. It is also the case that NPGS is technically more difficult than other glaucoma surgery techniques and for this reason is only offered by glaucoma sub specialists and limited to a few highly specialised centres. For this reason, access to NPGS is more limited than other glaucoma surgery techniques.

Our Mission: To eliminate glaucoma blindness

T: 02 9906 6640 F: 02 9439 8736 e: glaucoma@glaucoma.org.au w: www.glaucoma.org.au

CC0914135