

Modular Glaucoma Implant with Variable Flow

Technology #19627

Applications

This minimally invasive implantable device provides a more effective option for glaucoma treatment for patients with open angle glaucoma, angle closure glaucoma, and other forms of glaucoma.

Problem Addressed

Glaucoma is a disease caused by high intraocular pressure (IOP) due to poor drainage of the aqueous humor from the anterior chamber. This can damage the optic nerve, leading to blindness if left untreated. Trabeculectomy, the removal of trabecula meshwork and adjacent structures to relieve IOP, is currently the most common method for treating Glaucoma due to its long-term success rate. However, it is an invasive procedure that requires a skilled surgeon and often results in scarring. Other treatments include minimally invasive glaucoma surgery (MIGS) devices, daily medication, laser surgery, and glaucoma drainage devices. These devices are limited in efficacy due to problems with adherence, flow control, clogging, or stability in fixation within the eye. These challenges can be solved by using this easily inserted glaucoma drainage device that features flow rate adjustability, flow redirection in the case of clogging, and improved mechanical fixation with minimal scarring.

Technology

This device is designed to treat Glaucoma by emptying aqueous humor from the anterior chamber to the suprachoroidal space. It is composed of two main components: a fixation stent designed to be inserted into the Schlemm's canal and drainage tubes that interface with the fixation stent via snap fits. Both components are made of biocompatible and hydrophobic polyimide. They are also non-porous, encouraging biological fixation. The fixation stent is designed to match the curvature of the Schlemm's Canal, and to protrude into the anterior chamber. This provides stability without sutures and visual confirmation of proper surgical insertion. The fixation stent enables the surgeon to adjust the flow rate of aqueous humor because it allows for up to five drainage tubes to be inserted into it. Additionally, surgeons can utilize the drainage tubes to redirect flow in the case of clogging.

Advantages

- Improved mechanical fixation
- Minimally invasive only requiring two corneal incisions without sutures for fixation
- Ease of insertion with visual confirmation
- Surgeons with varied skill levels can easily use the device
- Flow rate adjustability
- Capable of redirecting flow in the case of clogging
- Fewer subsequent procedures
- Minimal scarring

Categories For This Invention:

Medical Devices
Surgical
Life Sciences
Clinical Applications
Ophthalmology

Intellectual Property:

Modular glaucoma implant
US Patent Pending

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Image Gallery:

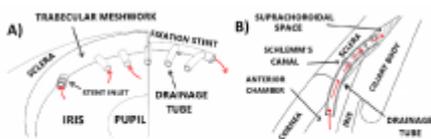


Figure 6. (See above to: A) The fixation stent is placed behind the trabecular meshwork, with inserted drainage tubes puncturing through it. The inlet of the fixation stent also protrudes out of the trabecular meshwork and into the anterior chamber. B) Section view of eye and drainage tube. Aqueous humor flows from the anterior chamber through the drainage tubes into the suprachoroidal space. (Note that all fluid flow paths are shown in red.)