CASE STUDY

THE EYEWATCH FOR GLAUCOMA

Problem – Challenge

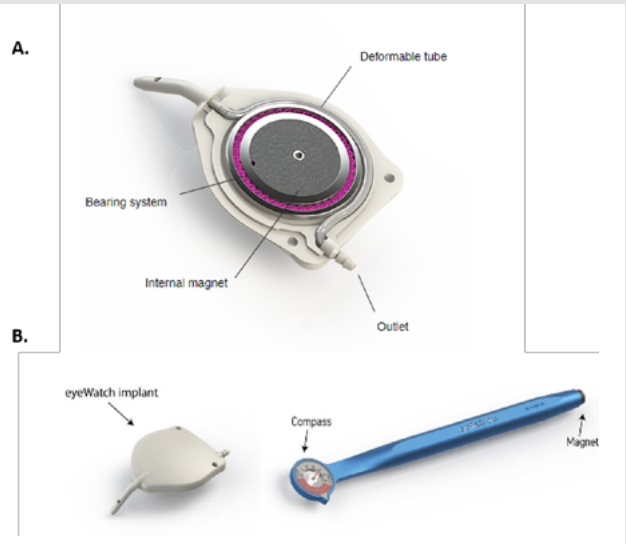
Glaucoma is one of the leading causes of blindness, afflicting more than 75 million people worldwide. The disease most often occurs due to an increase in a patient's intraocular pressure (IOP). The optic nerve can be damaged when this pressure gets too high, and, if left untreated, result in vision loss.

Glaucoma is first treated with eye drops but at some point, the eye drops are no longer enough and surgery is needed to lower the patient's IOP by using glaucoma drainage devices called aqueous shunts. The problem with these shunts is that they have a fairly high rate of post-surgical complications and often lead to surgical failures when the patient's IOP is not sufficiently controlled.

Solution

EPFL's Laboratory of Hemodynamics and Cardiovascular Technology (LHTC), headed by Prof. Nikos Stergiopulos developed the first non-invasive pressure-adjustment system in the world for treating glaucoma. The idea stemmed from the meeting of an ophtamologist studying at the LHTC and the strong expertise of the laboratory in mechanics and medical devices. The patented technology relies on a rotatable magnetic disk (see Figure A.), which is controlled by an outside control unit (see Figure B), that selectively compresses the drainage tube so that the fluidic resistance can be adjusted to maintain intraocular pressure (IOP) within the optimal clinical-targeted range. The first prototypes were developed at the EPFL-LHTC: an implantable tiny curved device that was only 0.7 mm thick and named the eyeWatch.

Rheon Medical was incorporated on 24 March 2010, licensed the patented technology and raised funds to carry out the clinical trials needed for market approval. In 2019, Rheon obtained the CE mark and in 2021 from the US Food and Drug Administration (FDA) the Breakthrough Device Designation for the eyeWatch. Today, the eyeWatch has been used successfully in over 250 patients across Europe, and the number of centers adopting the device is rising. Centers in Italy, Germany, Spain and the UK have recently started using Rheon's technology, and distribution agreements with firms in the United Arab Emirates, Turkey, Greece, Israel and Hong Kong have also been secured.



A. eyeWatch device
B. eyeWatch and external control unit ("eyepen")