The eyeWatch

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The eyeWatch

The world’s first adjustable drainage system for the surgical treatment of glaucoma
Glaucoma filtration surgery (GFS) has been shown to be more effective at preventing disease progression than other primary treatment modalities in open angle glaucoma. If it were possible to avoid complications associated with poor flow control, primary GFS would probably be offered more widely.

GFS: Design, material, and manufacturing deficiencies have left this potential unfulfilled in existing GDDs, all of which exhibit problems with poor flow control and suboptimal tissue compatibility. The role of GDDs in contemporary GFS remains poorly defined, but possibilities offered by new biomaterials and the goal of accurate flow control have stimulated considerable recent interest in GDD development. This review traces the progress of GDD design through to the present and beyond.
Success rates

Data from the pTVT study, 3-year follow-up
Problems with Baerveldt, Molteno

- Requires early post-op flow-restrictor (ligature, stent, …)
- Re-intervention required for removal of the flow-restrictor
- Hypotony may persist (occurrence depends on surgical technique)
- No Predictability
- High rate of corneal damages
Problems with Ahmed valve

- The valve brings constant additional fluidic resistance
- Leads to higher overall IOPs (higher failure rates)
- Hypotony may still occur
- No predictability
- High rate of corneal damages
The Solution

eyeWatch System
The eyeWatch system

- eyeWatch implant
- eyePlate
- eyeWatch Pen

eyeWatch Revolutionizing the surgical treatment of glaucoma

www.rheonmedical.com
Ideal solution

**eyeWatch**
- flow resistance control
- avoid hypotony
- post-op pressure control

**nozzle**
- smaller diameter
- rigid
- avoid cornea touch
- reduce corneal edema
- reduce endothelial cell loss

**eyePlate**
- soft
- less wide
- reduce diplopia
- increase efficiency

www.rheonmedical.com
eyeWatch - working principle
eyeWatch  Revolutionizing the surgical treatment of glaucoma

eyePlate

Ahmed

Baerveldt

eyePlate

FP-7
184 mm²

BGI-350
350 mm²

BGI-250
250 mm²

eyePlate-200
200 mm²

eyePlate-300
300 mm²
Adjustment procedure

The eyeWatch Pen is used to measure and adjust the position of the eyeWatch implant.

**Pos 0**
The position 0 of the eyeWatch device is the fully open position. The resistance to flow is minimal.

*When should this position be selected?*
1. IOP is high (e.g., > 18 mmHg)
2. Usually the final position to be adopted at mid/long-term follow-up

**Pos 1-3**
Positions 1 to 3 mean that the eyeWatch implant is partially open. Pos 3 is more resistive to flow than Pos 1. These positions should be selected during the phase of fibrosis formation usually happening after 2 to 4 weeks after surgery.

*When should these positions be selected?*
IOP is rather high (e.g., 13-18 mmHg).

**Pos 4-5**
Positions 4 and 5 mean that the eyeWatch implant is partially closed. Pos 5 is more resistive to flow than Pos 4. These positions should be selected during the first weeks after surgery when fibrosis develops.

*When should these positions be selected?*
IOP is low (e.g., 5-8 mmHg).

**Pos 5-6**
Positions 5.5 - 6 mean the eyeWatch implant is fully closed. This is the position that should be chosen for the first days after surgery to avoid hypotony.

*When should this position be selected?*
1. Position to be set during and shortly after surgery.
2. IOP is extremely low (< 5 mmHg).

*Important note:* The positions of eyeWatch implant are not directly correlated to any IOP, meaning one cannot predict the target IOP once the implant is adjusted. It is therefore important to always measure the IOP of your patient 15 minutes after each adjustment.
Example of IOP curve with the eyeWatch system
Current users

Dr. Kniestedt
Zürich, Switzerland

Prof. Mermoud
Lausanne, Switzerland

Dr. Au
Manchester, UK

Prof. Lim
London, England

Prof. Detorakis
Heraklion, Greece

Prof. Topouzis
Thessaloniki, Greece

Dr. Chaves
Alicante, Spain
Clinical Data - IOP evolution

(143 patients, Switzerland - Dr. Mermoud / Dr. Kniestedt / Dr. Au / Dr. Lim / Dr. Topouzis / Dr. Detorakis)
Clinical Data - IOP comparison (Baerveldt)

(Baerveldt data retrieved from AVB Study (Christakis et al., 2013))

<table>
<thead>
<tr>
<th>Time</th>
<th>eyeWatch</th>
<th>Baerveldt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 2</td>
<td></td>
<td></td>
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<tr>
<td>Month 1</td>
<td></td>
<td></td>
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<tr>
<td>Month 2</td>
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<tr>
<td>Month 3</td>
<td></td>
<td></td>
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<tr>
<td>Month 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 3</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Condition</th>
<th>eyeWatch</th>
<th>Baerveldt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypotony</td>
<td>0%</td>
<td>4%</td>
</tr>
<tr>
<td>Persistent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Success rate</td>
<td>90%</td>
<td>66%</td>
</tr>
<tr>
<td>Complete</td>
<td>38%</td>
<td>11%</td>
</tr>
</tbody>
</table>

Complete success rate (Baerveldt data retrieved from AVB Study (Christakis et al., 2013))
Clinical Data - Number of medications (Baerveldt)

(Ahmed data retrieved from AVB Study (Christakis et al., 2016))
Direct comparison eyeWatch vs Ahmed (under Press, J. Glaucoma)

<table>
<thead>
<tr>
<th>Performance</th>
<th>Ahmed</th>
<th>eyeWatch + Baerveldt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Success rate</td>
<td>58%</td>
<td>89%</td>
</tr>
<tr>
<td>Complete success rate</td>
<td>50%</td>
<td>67%</td>
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<table>
<thead>
<tr>
<th>Complications</th>
<th>Ahmed</th>
<th>eyeWatch + Baerveldt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choroidal effusion</td>
<td>18%</td>
<td>0%</td>
</tr>
<tr>
<td>Retinal haemorrhage</td>
<td>9%</td>
<td>0%</td>
</tr>
<tr>
<td>Diplopia</td>
<td>9%</td>
<td>0%</td>
</tr>
</tbody>
</table>
Endothelial cell loss & Corneal complications

Ahmed & Baerveldt

<table>
<thead>
<tr>
<th></th>
<th>Flexible</th>
<th>Rigid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter</td>
<td>0.63mm</td>
<td>0.48mm</td>
</tr>
</tbody>
</table>

Corneal endothelial cell loss (%)
Ahmed: -12%¹
Baerveldt: -13%²

Corneal endothelial cell loss (%)
eyeWatch: -5%³

EyeWatch Rescue of Refractory Hypotony After Baerveldt Drainage Device Implantation: Description of a New Technique

Sina Elahi, MD,* Giorgio E. Bravetti, MD,* Kevin Gillmann, MBBS, FEBOphth, MArch,* Adan Villamarin, PhD,† Léopold Meeus, MD,* Nikos Stergiopoulos, PhD,† Kaveh Mansouri, MD,* and André Mermod, MD*
Safety - MRI scans

The eyeWatch implant is MRI safe. It has been demonstrated that the eyeWatch implant is compatible with MRI scans up to 3 Tesla. Several patients have safely undergone an MRI scan after eyeWatch implantation. The implant's magnet however may create a local artefact around the operated eye.

Important note:
It is essential that after an MRI scan, the patient should refer to a trained ophthalmologist for verification (and likely adjustment) of the eyeWatch's magnet position as it might have changed during the scan.

- no discomfort or pain during scan
- small artifact

• Visit required shortly after scan for repositioning
• Patient card provided
Safety - Frequent questions

Airport scans and daily situations

**Airport security:**
The magnetic field in the vicinity of the eyeWatch implant is negligible and is not noticed by airport scans. Likewise, electromagnetic fields at airport security gates will not interfere with or change the functional position of the eyeWatch implant. **Travelling with an eyeWatch is therefore totally safe.**

**Daily situations:**
External magnets such as fridge magnets or induction cookers can be a source of strong magnetic fields. In general, it is not expected that such magnets should affect the eyeWatch's functional position. However, in the unlikely event where such a magnet comes close to a patient's eye (2-3 mm), **it would be recommended for the patient to visit his/her ophthalmologist for verification of the eyeWatch's functional position.**
Safety - Reporting

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Merci de votre attention