Suprachoroidal outflow as a surgical target for the treatment of glaucoma

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Disclosures

- Aeon
- Alcon
- Allergan
- AqueSys
- Bausch & Lomb
- Calhoun Vision
- Carl Zeiss Meditec
- ForSight Labs
- Glaukos
- InnFocus

- IRIDEX
- iScience Interventional
- Ivantis
- Merck & Co
- NeoMedix
- Ocunetics
- QLT
- SOLX
- Transcend Medical
- TrueVision Systems
Two main physiologic outflow paths for aqueous humor:

- Trabecular pathway
- Uveoscleral pathway
Uveoscleral outflow path

- Considered pressure independent and contributes **up to 57% of total aqueous outflow**\(^1\)

- Aqueous exits primarily through the sclera and choroidal blood vessels

- The highest point of resistance is the **ciliary body**
Suprachoroidal outflow as therapeutic target

**Robust pressure gradient**
Pressure differential between anterior chamber and suprachoroidal space is 4 mmHg (at physiological range)

**Continuous, absorptive reservoir**
Single point access to the suprachoroidal continuum with up to 160x more surface area vs the trabecular meshwork

**Pharmacologic precedent**
Prostaglandins – first-line therapy and most effective medical treatment – acts on uveoscleral pathway

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1. Emi K, Pederson JE, Toris CB. Hydrostatic pressure of the suprachoroidal space. IOVS. 30(2):233-238
Supraciliary stenting creates a conduit to the suprachoroidal space.

**Cyclodialysis cleft**
Historically used procedure which was effective but limited in duration, as the ciliary body cleft would eventually close.

**Supraciliary Stent in situ**
Supraciliary stenting allows for a “controlled cyclodialysis” that is repeatable and permanent to overcome ciliary body flow resistance.


Current ab interno supraciliary devices in US clinical studies

CyPass Micro-Stent

iStent Supra

Caution: Investigational devices. Federal (US) Law limits these devices to investigational use.
Supraciliary micro-stent implantation
Challenges with trabecular outflow path

**Downstream resistance**
Discrete canalicular system and episcleral venous back pressure limits outflow potential.

**Variability in collector channel location**
Placement of two stents may be required for optimal placement with respect to collector channels.

**Smaller anatomical target**
Trabecular meshwork and Schlemm’s canal provide significantly smaller surgical target vs. the ciliary body band.
Suprachoroidal outflow – promising MIGS target

• Potential for best-IOP-lowering efficacy based on physiological mechanism

• Preliminary safety results from international experience in line with other MIGS devices

• Anatomical approach makes for more elegant procedure

• Overall – suprachoroidal outflow represents a very promising MIGS approach