Trabecular Meshwork Stenting Techniques

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Introduction

• TM bypass stent targets the conventional pathway by creating unobstructed aqueous flow to the Schlemm’s canal
• Approved to use in conjunction with cataract surgery for mild-moderate open angle glaucoma
• Low learning curve

Conventional Pathway
Intraoperative Predictors

• **Blood reflux** – distal collector channels

• **Episceral venous fluid wave** – patency

iStent (Glaukos)

• FDA approved 2012

• Titanium, non-magnetic

• Smallest medical device

• Disposable injector system
Prospective, Randomized, Controlled Pivotal Trial of an *Ab Intra* Implanted Trabecular Micro-Bypass in Primary Open-Angle Glaucoma and Cataract

*Two-Year Results*  
*Samuelson et al. Ophthalmology 2019*

- Higher proportion of patients with ≥20% IOP reduction compared to original iStent (66%).
- Simple to use with easier learning curve.
Hydrus Microstent

FSA approved 2018

Dual Mechanism:
1. Aqueous bypass
2. Schlemm’s canal scaffolding

The Horizon Study. Samuelson et al, 2019
Surgical Techniques and Pearls

Optimize Your View

1. Cornea
   - Temporal clear corneal incision
   - Make corneal incisions more anterior
   - Minimize corneal stromal edema
   - Open femto LR1 / AK after stent placement

2. Use dispersive OVD under the gonio prism

3. Fill the chamber with cohesive OVD – slightly supraphysiologic level

4. Tilt patient’s head away from you ∼30° and microscope, adjust accordingly
Shift incisions slightly anterior to reduce bleeding

A bleeding wound will compromise your view and prolong surgical time!
Ergonomics

• Sit comfortably and stabilize your hands

• Place your finger on the release button, ready to deploy

• Be mindful of the tilt and angle your instrumentation appropriately while entering the eye

• Lay the gonio-lens gently on the cornea to avoid corneal striae

Pre-deployment

• Ensure you have good view to the angle, adjust patient’s head or microscope and apply additional OVD to push back the iris or to clear any heme

• Identify TM landmarks from posterior to anterior (CBB -> SS -> PTM -- highlighted by blood reflux)

• Target area with most blood reflux or pigmentation
iStent

- Engage the TM at ~15° angle with the tip of instrument then flatten  
  – (landing an airplane)
- Once inserted, tap the snorkel to ensure proper placement and depth

- dislodged implant can be retrieved with the inserter or micro-forceps
- Remove and replace mal-positioned implant

Superficial implant in scleral spur
iStent inject

- Apply gentle pressure (small dimple) for deployment
- Straighten trocar during delivery
- Aim for 2-3 clock hours apart or area of greatest blood reflux
- Displace the blood to confirm a secure placement

iStent inject

- Retrieve dislodged or superficial stent with micro-forceps for re-implantation
- May experience stents being stuck together or empty deployment
- The injector has 4 releases total
Hydrus

- Requires additional paracentesis
- Adjust the tip upward ~15 degree
- Apply slight torque and posterior pressure to incise and engage the Schlemm’s canal
- Relax the posterior pressure and deploy the stent
- Once stent is released, disengage gently

Schlemm’s canal fibrosis leading incomplete deployment

Reposition with a Sinsky hook at the aqueous inlet

Re-capture the device with the delivery system

Insertion into scleral spur
Take Home Points

- TM bypass stents are used in conjunction with cataract surgery in patients with mild-moderate open angle glaucoma
- Offer modest IOP lowering and excellent safety profile
- Practice with intraoperative gonioscopy and the ergonomics
- Identify TM landmark
- Keep the cornea clear of blood and edema

Thank you

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