



Bouquet of glaucoma surgery which one to choose

Ahmed Elkarmouty MD, FRCS

Glaucoma Service

Moorfields Eye Hospital, London. UK



introduction

- There are lots of glaucoma surgery nowadays
With more and more investments going into inventing glaucoma implants.
- Allergan bought the XEN for 300 million USD

Ideal Glaucoma Surgery

- Efficacious
- Safe
- Minimal recovery time
- Minimal patient discomfort
- Cheap
- Minimal risk
- Minimal disease progression

Different options

Traditional

- Trabeculectomy
- Shunt implant (valved or non valved)
- Diode
- ALT
- YAG iridotomy

New Lasers

- SLT
- Iridoplasty
- Micro pulse
- ECP

MIGS

MIGS procedures share 5 key characteristics:

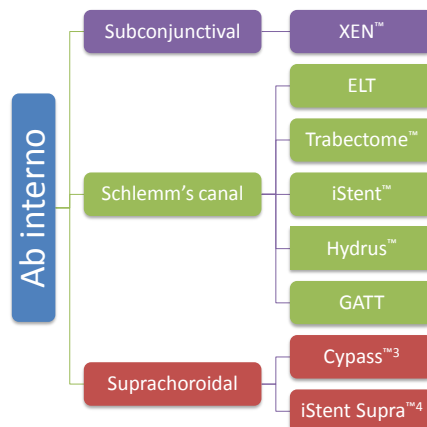
- Ab interno microincision avoiding conjunctival scarring, in case later glaucoma surgery is required.
- Minimal trauma
- At least modest efficacy, making them a reasonable option in selected patients.
- Favourable safety profile.
- Rapid recovery.

MIGS

1. Implanted MIGS

- **Increasing trabecular outflow:**
 - i Stent (Glaukos).
 - Hydrus Microstent (Ivantis).
- **Targeting the suprachoroidal space:**
 - CyPass Micro-Stent (Alcon).
- **Opening a subconjunctival filtration pathway:**
 - XEN 45 Gel Stent (Allergan).

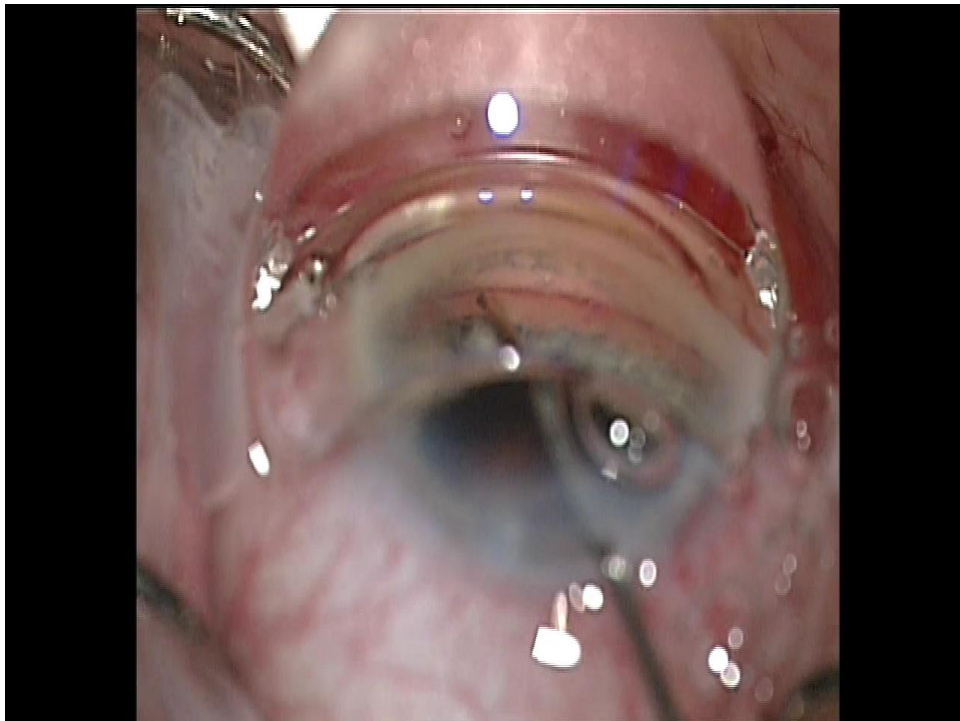
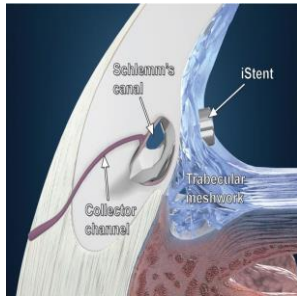
Ab interno approaches

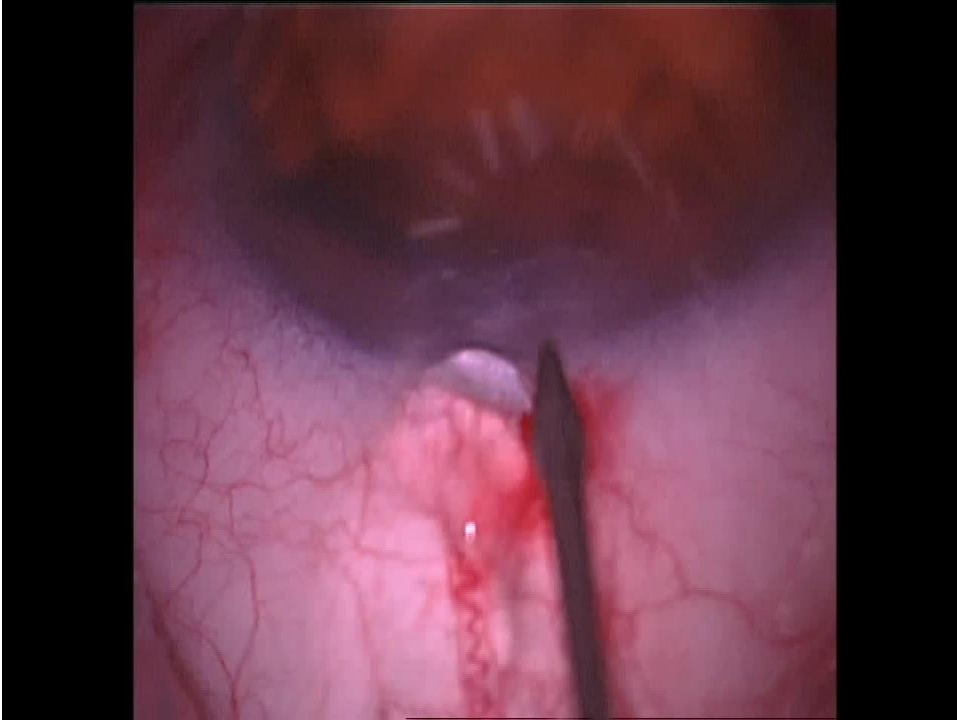


iStent/ hydrus



Cypass





MIGS

2. Nonimplant MIGS:

- Trabectome (NeoMedix).
- Kahook Dual Blade (New World Medical).
- Gonioscopy-assisted transluminal trabeculotomy
GATT.
- Ab interno canaloplasty (ABiC).
- Endoscopic cyclophotocoagulation (ECP).

AB externo ?!!

- Innfocus (conjunctival dissection)
- XEN ?!!

EXPECTATIONS

- Schlemm's canal based procedures (Trabectome, iStent or Hydrus Microstent) have all been shown to lower IOP significantly to 16–17 mmHg while offering a significant reduction in medication

- In the Duette study where a standalone Cypass stent was inserted in patients who were medically uncontrolled awaiting filtration surgeries, a significant 35% reduction of IOP was observed at 12 months and 83% of patients did not proceed to formal filtration surgery .

- When a lower target IOP is required, Xen implant can be considered both as a standalone procedure or combined with cataract surgery. Published results demonstrated the ability to achieve a lower teen IOP at 12 months, but with a higher level of postoperative care required than Schlemm's canal surgery

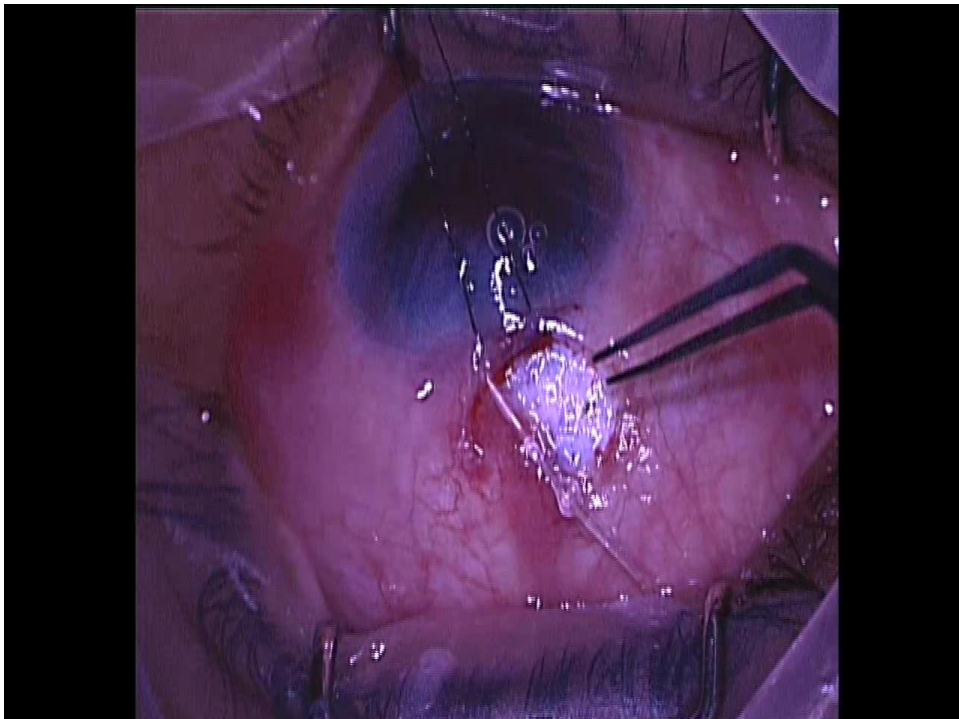
Comparing iStent versus CyPass with or without phacoemulsification in patients with glaucoma: a meta-analysis

Published online 2019 Jan 31.

[Ali Mahdavi Fard](#), [Sangita P. Patel](#), [Leili Pourafkari](#), and [Nader D. Nader](#)

Main results:

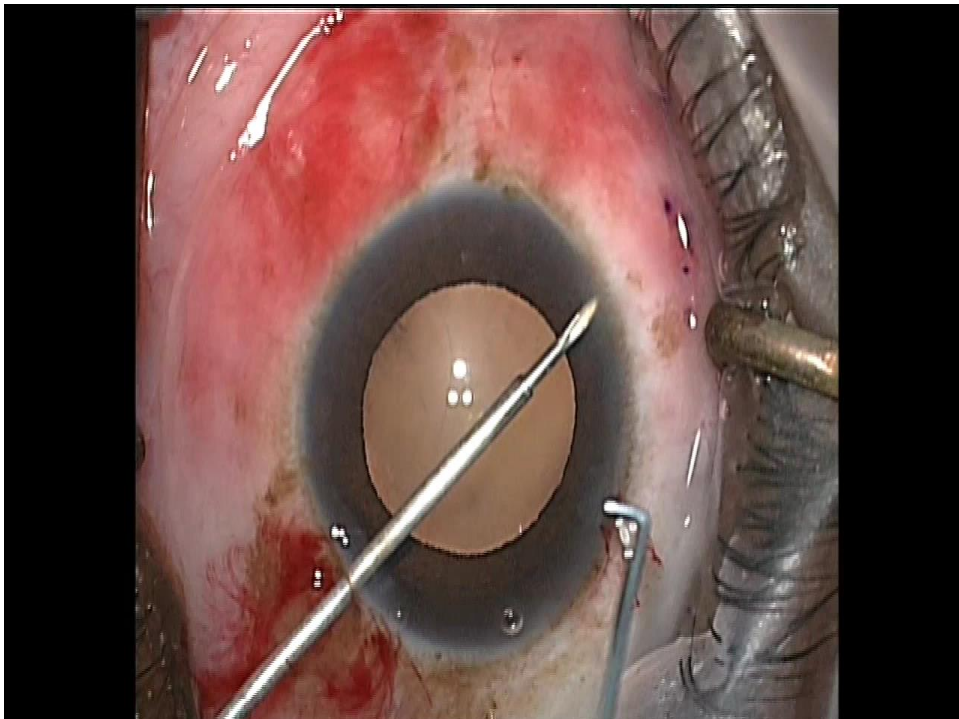
A total of 33 out of 446 publications retrieved have been enrolled. The mean changes in IOP in the groups with one iStent and more than two iStents with concurrent cataract extraction were -3.78 ± 0.53 mmHg and -3.89 ± 0.73 mmHg, respectively. The mean differences in IOP in the groups with one iStent and more than two iStents without concurrent cataract extraction were -3.96 ± 0.25 mmHg and -7.48 ± 0.55 mmHg, respectively. The mean changes in IOP in the groups with CyPass implantation with and without concurrent cataract extraction were -4.97 ± 1.38 mmHg and -8.96 ± 0.16 mmHg, respectively.



Three-Year Follow-up of a Novel Aqueous Humor MicroShunt

Battle, Juan F. MD; Fantes, Francisco MD; Riss, Isabelle MD; Pinchuk, Leonard PhD, DSc, NAE; Albuquerque, Rachel MD; Kato, Yasushi P. PhD; Arrieta, Esdras MD; Peralta, Adalgisa Corona MD; Palmberg, Paul MD, PhD; Parrish, Richard K. II MD; Weber, Bruce A. MBA; Parel, Jean-Marie PhD

Results: Fourteen patients received the MicroShunt alone and 9 with cataract surgery. At 1 (n=23), 2 (n=22), and 3 (n=22) years of follow-up; the qualified success rate (IOP \leq 14 mm Hg and IOP reduction \geq 20%) was 100%, 91%, and 95%; mean medicated IOP was reduced from 23.8 \pm 5.3 to 10.7 \pm 2.8, 11.9 \pm 3.7, and 10.7 \pm 3.5 mm Hg, and the mean number of glaucoma medications/patient was reduced from 2.4 \pm 0.9 to 0.3 \pm 0.8, 0.4 \pm 1.0, and 0.7 \pm 1.1, respectively. The most common complications were transient hypotony (13%, 3/23) and transient choroidal effusion (8.7%, 2/23), all resolved spontaneously. There were no leaks, infections, migrations, erosions, persistent corneal edema, or serious long-term adverse events.



Four-year results of a minimally invasive transscleral glaucoma gel stent implantation in a prospective multi-centre study

Markus Lenzhofer MD1 | Inga Kersten-Gomez MD2 | Arsham Sheybani MD3 | Husayn Gulamhusein MD BHSc4 | Clemens Strohmaier MD PhD1 | Melchior Hohensinn MD1 | H Burkhard Dick MD2 | Wolfgang Hitzl PhD1 | Lisa Eisenkopf MD2 | Fady Sedarous MD4 | Iqbal I. Ahmed MD4,5 | Herbert A. Reitsamer MD1,6

Results

Mean best-medicated baseline IOP was 22.5 ± 4.2 mmHg and decreased significantly to 13.4 ± 3.1 mmHg 4 years postoperatively (-40% , $n = 34$, $P < 0.001$). Mean number of IOP lowering medication decreased significantly from 2.4 ± 1.3 preoperatively to 1.2 ± 1.3 (-50% , $n = 34$, $P < 0.001$) postoperatively. Visual field mean deviation showed no significant change between preoperative and postoperative examinations. Complete surgical failure rate per year was 10%.

Factors affecting choice

- COST
- Age
- General and mental health
- Target IOP
- Type of glaucoma
- Severity of glaucoma
- Condition of conjunctiva and other ocular operations.
- Logistics for follow up
- Intolerance to drops

Cost

- Surgery Time
- Trained glaucoma specialist
- Post-op FU frequency
- Post-op interventions
- Device cost



CONJUNCTIVA CONDITION

- TUBE: Non virgin conj including long years of drops, chemical burns.
- Traby: uveitics (non specific anterior uveitis)
- MIGS



Age

- Goniotomy (PEDIATRIC)
- Trabeculotomy/ GATT
- MIGS
- Traby
- Tube
- Diode

long life expectancy, be wise in choosing an operation that doesnt waste any card

Health condition

probably aim for one definitive procedure before they get an issue with their general condition that makes surgery impossible

Traget IOP

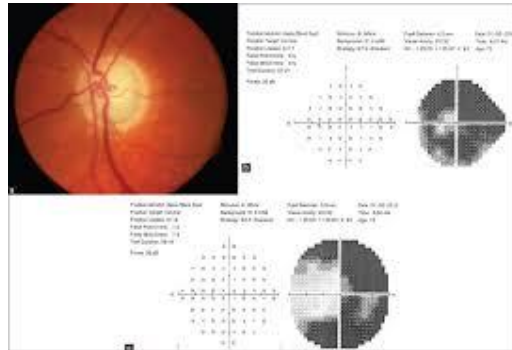
- Traby : single digit IOP (OFF DROPS)
- TUBE : mid teens with drops
- MIGS NO BLEB: HIGH TEENS OFF DROPS
- MIGS WITH BLEB: mid teens off drops
- Laser in glaucoma: modest effect and not for long time even

Type of glaucoma

- ACG: phaco unless angle is open after PI
- POAG: SLT / MIGS (EARLY STAGE)/ / Traby/
Tube
- NTG: Traby
- SECONDARY GLAUCOMA: probably tube
“If in doubt put a shunt”

SEVERITY OF GLAUCOMA

- OHT/ EARLY: SLT/ MIGS+ PHACO/ TRABY
- Moderate: MIGS/ TRABY/ TUBE
- Severe / close to fixation: Traby/ tube (NO MIGS)



Follow up/ after care

- Traby : intensive fu
- Tube / MIGS : not intensive follow up

Drops problem

- Traby has the highest chance of achieving optimal iop off drops for loooong years

preferences

- For patients and Doctors.

Thank you

- ahmedelkarmouty@hotmail.com
- www.migs.org

