

Real world comparative results of three commonly used MIGS, Hydrus, iStent and OMNI

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Introduction

Minimally invasive glaucoma surgery (MIGS) procedures have emerged as new treatment modalities to reduce intraocular pressure and slow down the progression of optic nerve damage.¹ Much of the clinical evidence derives from randomised control trials.

As their adoption becomes more widespread, it is critical to examine if these claims translate to real-world benefits.¹

Methods

- Retrospective Chart review
- Participant Inclusion criteria:
 - All patients who underwent iStent, Hydrus and Omni at the Princess Alexandra Eye Pavilion from 16/05/2022 to 15/05/2023.
- Follow-up period: 24 months
- Primary outcomes – Success Rates:²
 - IOP reduction >20% from baseline
 - IOP < 21 mmHg
 - No reoperation required
 - No persistent hypotony (IOP>5)
 - Maintain Light Perception (LP)
- Secondary outcomes:
 - Absolute IOP reduction
 - Relative IOP reduction in percentage
 - Decrease in number of anti-glaucoma medication
 - Number of follow-up visits
 - Complications, including reoperations

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Results

Table 1: Baseline Demographics:

	Hydrus	Omni	iStent	p-values
	60 eyes (of 58 unique patients)	49 eyes (of 44 unique patients)	15 (of 13 unique patients)	
Age (years)	75.7 ± 7.6	73.7 ± 11.6	81.5 ± 4.7	0.02
Male Sex, n (%)	32 (55%)	25 (57%)	8 (62%)	0.71
Phakic, n (%)	56 (93%)	40 (82%)	15 (100%)	0.05
Duration (years)	9.0 ± 7.5	8.5 ± 6.3	6.2 ± 6.5	0.36
Baseline IOP	18.7 ± 5.9	22.5 ± 7.1	21.7 ± 4.7	<0.01
Baseline BCVA (LogMAR)	0.25 ± 0.42	0.20 ± 0.18	0.34 ± 0.57	0.45
Baseline anti-glaucoma meds	2.2 ± 1.1	2.8 ± 1.1	2.1 ± 0.9	<0.01
PO acetazolamide	2 (3%)	5 (10%)	2 (13%)	0.18
Standalone procedures	4 (7%)	9 (18%)	0 (0%)	0.05
Glaucoma types, n (%)				
Primary Open Angle	32 (53%)	26 (53%)	6 (40%)	0.63
Normal Tension	20 (33%)	9 (18%)	5 (33%)	0.19
Angle-closure	4 (7%)	3 (6%)	0 (0%)	0.87
Pseudo-exfoliative	1 (2%)	3 (6%)	3 (20%)	0.03
Pigment dispersion	2 (3%)	4 (8%)	1 (8%)	0.46
Uveitic	0 (0%)	1 (2%)	0 (0%)	0.52
Juvenile-onset	0 (0%)	2 (4%)	0 (0%)	0.38
Ocular hypertension	1 (2%)	0 (0%)	0 (0%)	0.99
Steroid-induced	0 (0%)	1 (2%)	0 (0%)	0.52
Previous Ophthalmic Surgeries, n (%)				
Prior Cataract surgeries	4 (7%)	9 (18%)	0 (0%)	0.05
Selective laser trabeculoplasty	Once: 12 (20%) Twice: 2 (3%)	Once: 7 (14%) Twice: 2 (4%)	Once: 1 (7%) Twice: 0 (0%)	0.48 0.99
Laser peripheral iridotomy	2 (3%)	1 (2%)	2 (13%)	0.19
Trabeculectomy	3 (5%)	1 (2%)	0 (0%)	0.78
Retinal surgeries	0 (0%)	2 (4%)	0 (0%)	0.38

Figure 1: Success Rates of each procedure (p-value 0.46)

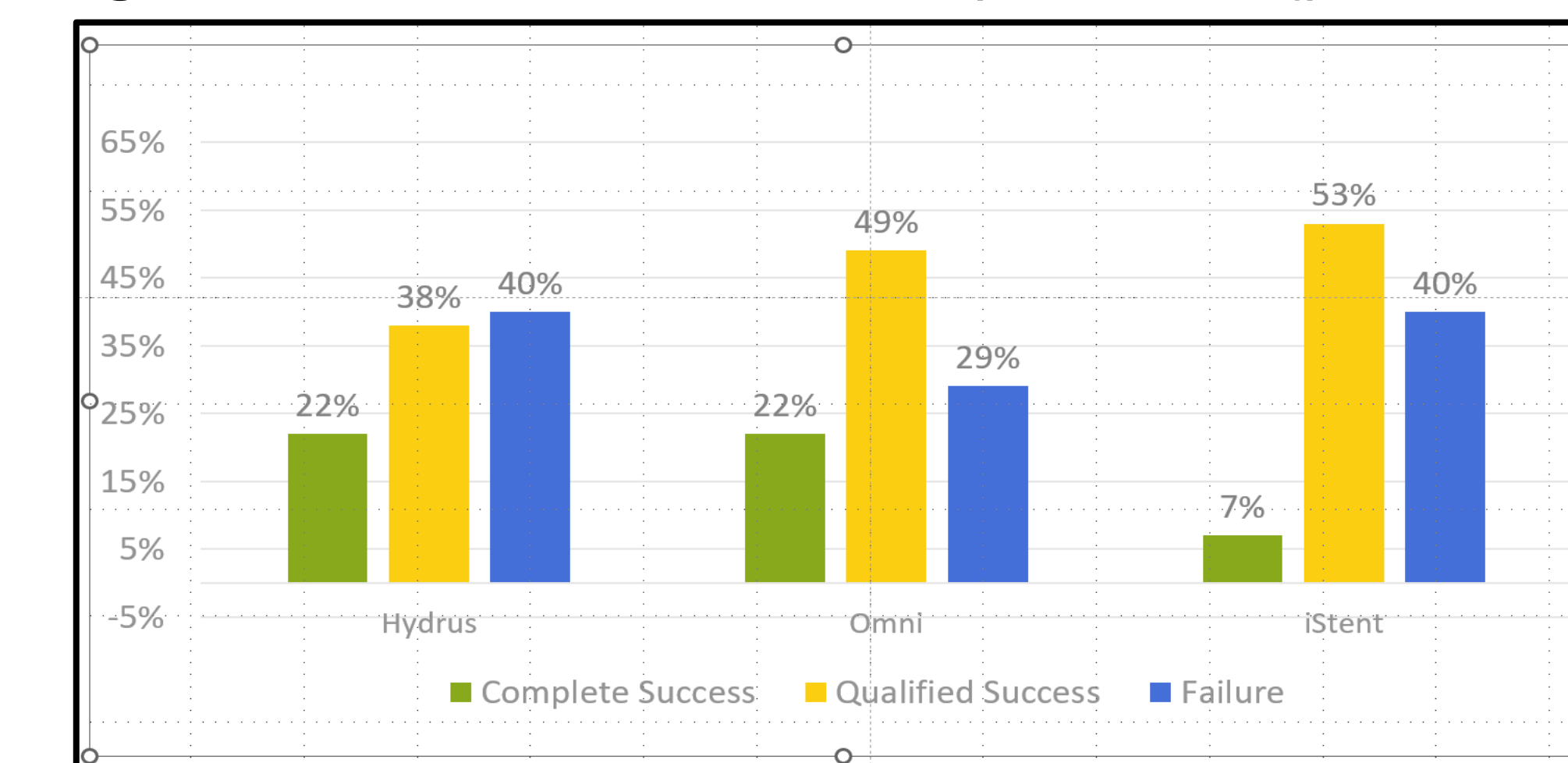


Figure 2: IOP at baseline and at end of Year 2

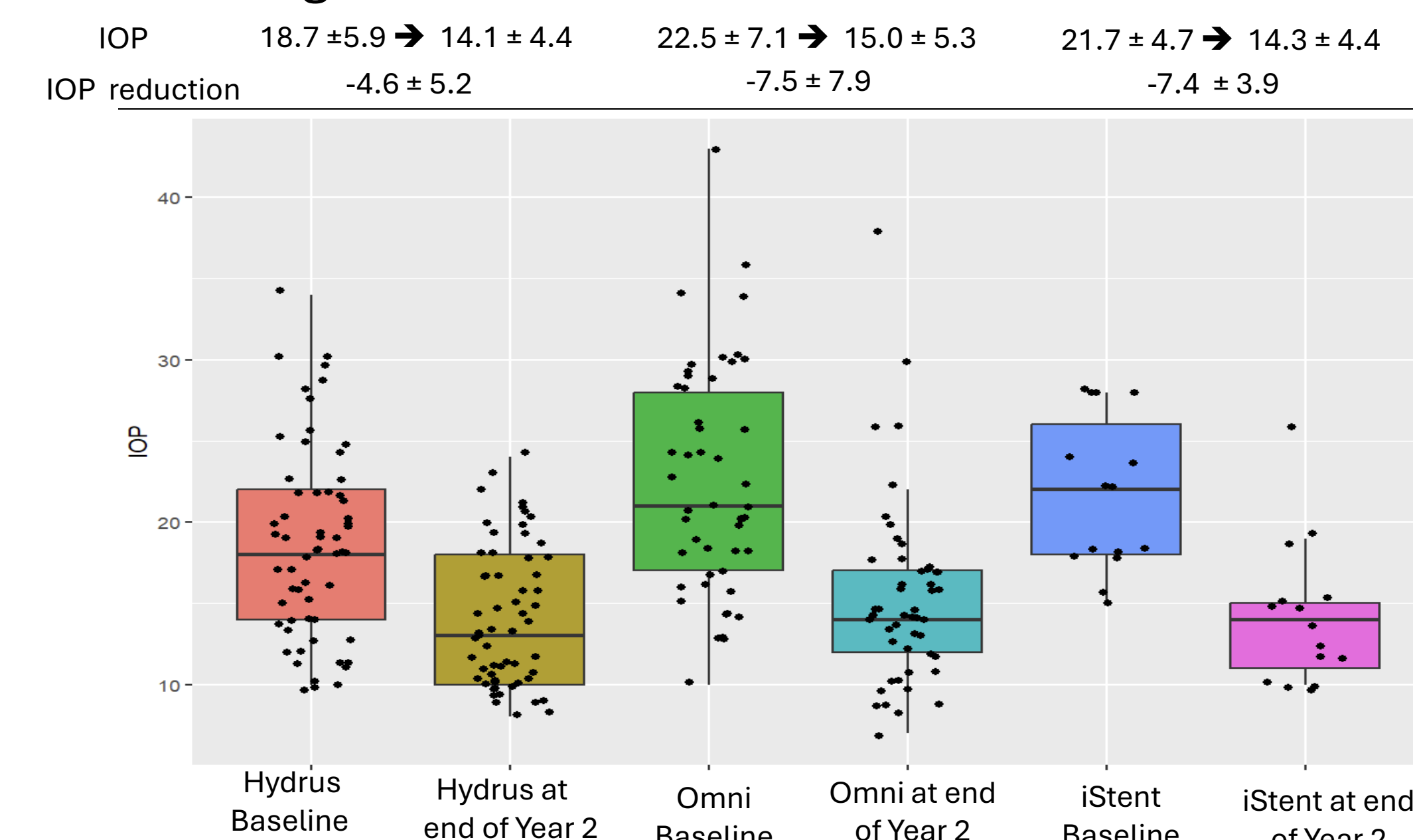


Figure 3: Number of anti-glaucoma medications at baseline and end of Year 2

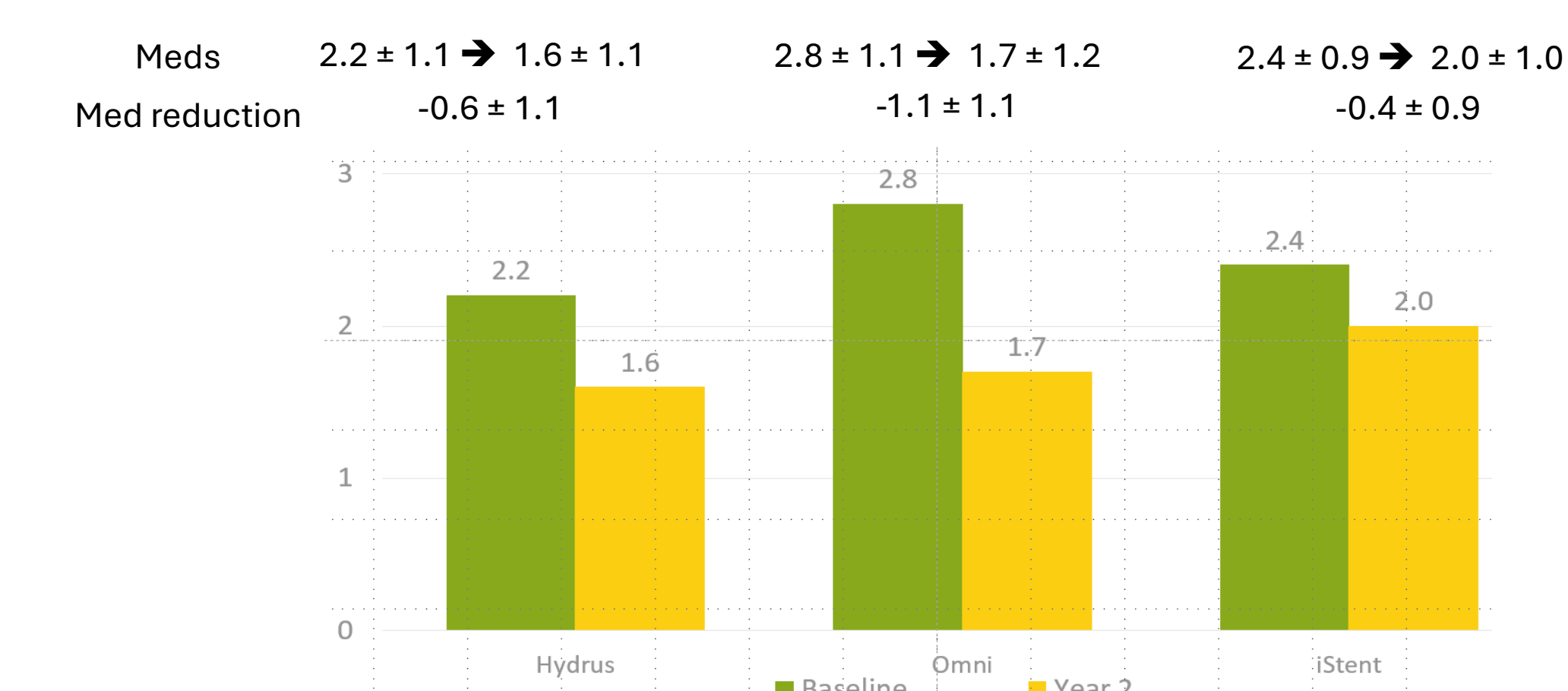


Table 2: Re-operations, Adverse effects and Number of follow-up appointments

	Hydrus	Omni	iStent	p-values
Re-operations	7 (11%)	10 (20%)	3 (20%)	0.40
Adverse effects				
Cystoid Macular oedema	6 (10%)	1 (2%)	0 (0%)	0.13
Corneal decompensation	0 (0%)	1 (2%)	0 (0%)	0.52
Number of follow-up visits	6.1 ± 1.5	6.4 ± 1.8	4.5 ± 1.3	<0.01

Discussion

Real-world retrospective collection of data for these three groups of patients.

Similar success rates of iStent, Hydrus and Omni in achieving target IOP reduction.

Omni is more effective in reducing the number of anti-glaucoma medications.

iStent requires fewer post op follow up, but less effective in achieving medication-free status than the other two treatment modalities.

Limitations include retrospective nature of the study, single-centred with predominant Caucasian population and selection bias, based on surgeons' discretion

References:

1. Chan PPM, Larson MD, Dickerson JE Jr, Mercieca K, Koh VTC, Lim R, Leung EHY, Samuelson TW, Larsen CL, Harvey A, Töteberg-Harms M, Meier-Gibbons F, Shu-Wen Chan N, Sy JB, Mansouri K, Zhang X, Lam DSC. Minimally Invasive Glaucoma Surgery: Latest Developments and Future Challenges. Asia Pac J Ophthalmol (Phila). 2023 Nov-Dec 01;12(6):537-564. doi: 10.1097/APO.0000000000000646. Epub 2023 Nov 27. PMID: 38079242.
2. Gedde SJ, Feuer WJ, Shi W, Lim KS, Barton K, Goyal S, Ahmed IIK, Brandt J; Primary Tube Versus Trabeculectomy Study Group. Treatment Outcomes in the Primary Tube Versus Trabeculectomy Study after 1 Year of Follow-up. Ophthalmology. 2018 May;125(5):650-663. doi: 10.1016/j.ophtha.2018.02.003. Epub 2018 Feb 21. PMID: 29477688.