

Outcomes of Ab interno Gelatin Microstent with MMC using Targeted Supra-tenon's Placement

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INTRODUCTION

- The ab-interno Xen-45 gelatin microstent, has successfully demonstrated similar efficacy and safety to trabeculectomy,¹ however occasional surgical failure occurs due to fibrosis of the filtering bleb, and obstruction of the stent.²
- Placement of the microstent in the supra-tenon's space is believed to maximize aqueous outflow, while preventing obstruction, limiting fibrosis of the bleb, and promoting long-term patency.^{3†}
- This study was designed to assess the outcomes of targeted supra-tenon's placement of the microstent compared to non-targeted placement.

METHODS

Study Population

- Retrospective single-center case series
- 65 and 77 eyes receiving non-targeted and targeted supra-tenon's ab-interno Xen-45 gelatin microstent placement respectively ± phacoemulsification were identified
- Eyes that had undergone previous surgery (glaucoma/corneal/retinal), had atypical forms of glaucoma, or had less than 1 month of follow-up duration were excluded.

Outcome Measures

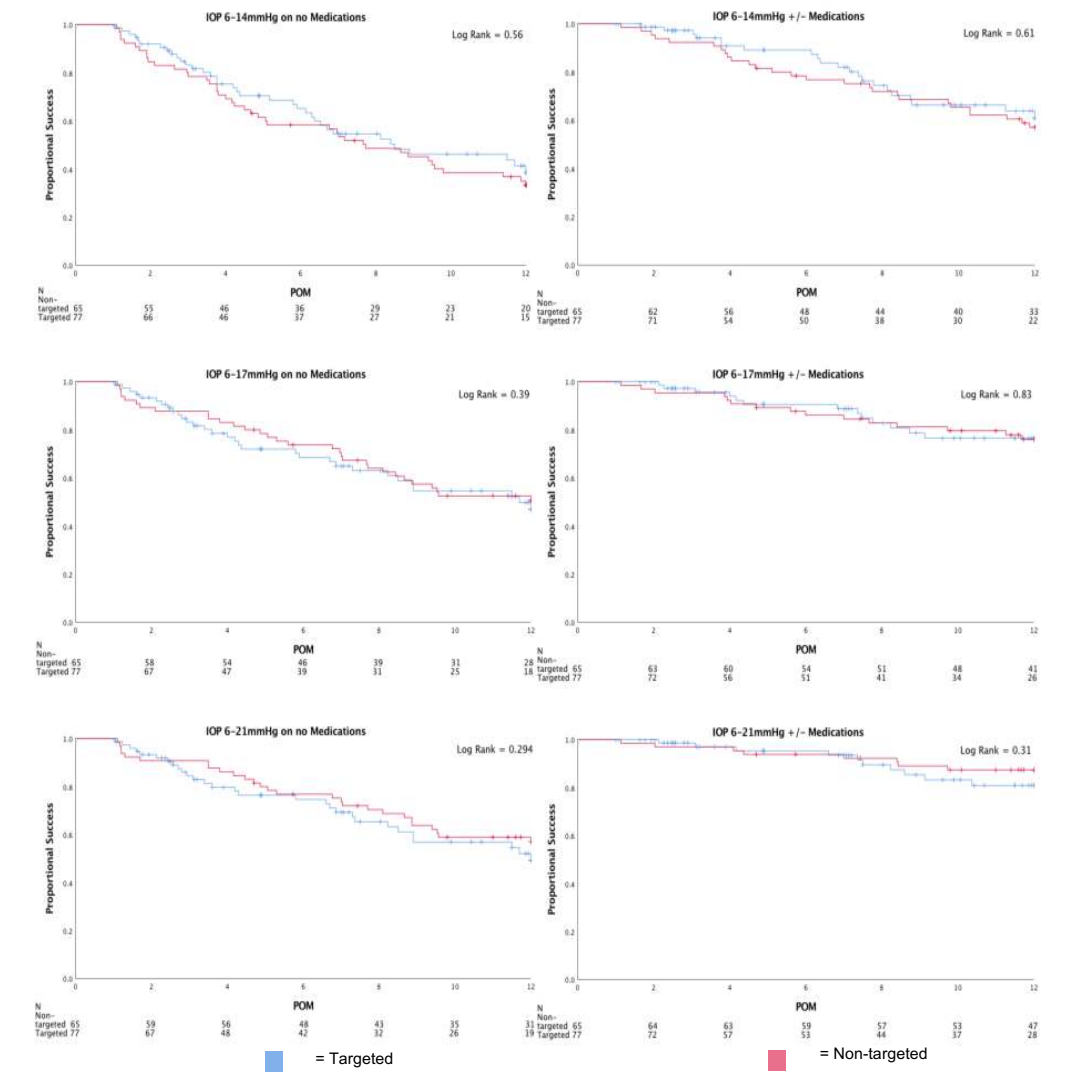
- Primary outcome was IOP of 6-17 mm Hg with no glaucoma medications, secondary outcomes included IOP of 6-14 and 6-21 on no medications, and then the same IOP cutoffs allowing for medications.
- Time to failure was defined as two consecutive postoperative visits after postoperative month 1 with IOP outside the specified range despite in-clinic interventions (including needling ± MMC).
- Secondary outcomes included postoperative classes of IOP lowering medication, number of complications, postoperative interventions, and reoperations.

RESULTS

Baseline Characteristics

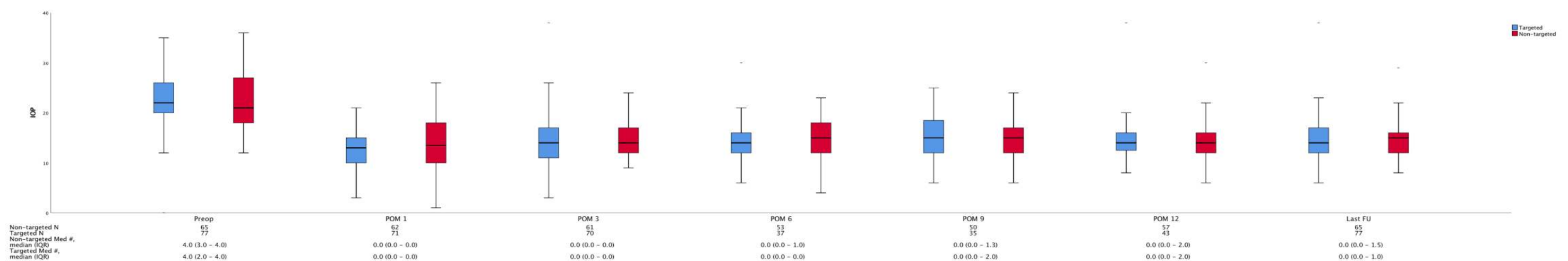
Baseline Characteristics	Xen Non-targeted (n = 65)	Xen targeted (n = 77)
Demographics		
Age, median (IQR), yrs	65.4 (55.8 – 71.6)	78.0 (70.0 – 83.6)
Left eye, no. (%)	32 (49.2)	36 (46.8)
Female gender, no. (%)	27 (41.5)	49 (63.6)
Diabetes, no. (%)	22 (33.8)	11 (14.3)
Ethnicity, no. (%)		
White	41 (63.1)	59 (76.6)
Asian	12 (18.5)	11 (14.3)
Black	8 (12.3)	2 (2.6)
Other	4 (6.1)	5 (6.5)
Preoperative BCVA (logMAR), median (IQR)	0.2 (0.1 – 0.3)	0.3 (0.2 – 0.5)
Decision IOP and Glaucoma Lowering Medications		
IOP >21 mmHg, no. (%)	32 (49.2)	42 (54.5)
IOP, median (IQR), mmHg	21.0 (18.0 – 27.5)	22.0 (19.5 – 26.0)
Medication classes, median (IQR)	4.0 (3.0 – 4.0)	4.0 (2.0 – 4.0)
Glaucoma Type and Severity		
Disease Type, no. (%)		
Primary open angle	48 (73.8)	42 (54.5)
Pseudoexfoliation	7 (10.8)	21 (27.3)
Pigment dispersion	3 (4.6)	0 (0.0)
Primary angle closure	1 (1.5)	7 (9.1)
Combined mechanisms	6 (9.2)	7 (9.1)
Cup-to-disc ratio, median (IQR)	0.9 (0.8 – 0.9)	0.8 (0.7 – 0.9)
Preoperative MD, median (IQR)	-8.4 (-14.1 to -4.2)	-1.7 (-8.0 to 0.0)
Disease Severity, no. (%)		
Mild (0 to >-6.0 dB)	23 (35.4)	52 (67.5)
Mod-Severe (≤-6.0 dB)	42 (64.6)	25 (32.5)
Previous ocular laser/surgery		
Laser peripheral iridotomy, no. (%)	8 (12.3)	16 (20.8)
Laser trabeculectomy, no. (%)	47 (72.3)	41 (53.2)
Other Characteristics		
Concomitant cataract surgery, no. (%)	24 (36.9)	38 (49.4)
Follow-up duration, median (IQR)	12.9 (11.9 – 14.5)	10.1 (4.0 – 12.6)

Postoperative	Xen	
	Non-targeted (n = 65)	Targeted (n = 77)
Xen Specific Complications, no. (%)		
Encapsulated bleb	6 (9.2)	3 (3.9)
Blocked Xen	1 (1.5)	7 (9.1)
Exposed Xen	3 (4.6)	2 (2.6)
Bent Xen	0 (0.0)	4 (5.2)
Bleb leak	2 (3.1)	1 (1.3)
Iris Xen touch	2 (3.1)	1 (1.3)
Migrated Xen	0 (0.0)	2 (2.6)
Blebitis	0 (0.0)	2 (2.6)
General Complications, no. (%)		
Choroidal effusion	6 (9.2)	7 (9.1)
Hyphema	9 (13.8)	3 (3.9)
Cornea edema	1 (1.5)	4 (5.2)
Iritis	0 (0.0)	4 (5.2)
Malignant glaucoma	2 (3.1)	1 (1.3)
Macular edema	2 (3.1)	1 (1.3)
Shallow AC	0 (0.0)	3 (3.9)
Vitreous hemorrhage	0 (0.0)	2 (2.6)
Dellen	1 (1.5)	1 (1.3)
Retinal detachment	0 (0.0)	0 (0.0)
Endophthalmitis	0 (0.0)	0 (0.0)
Interventions, no. (%)		
Needling with MMC	20 (30.8)	25 (32.5)
Needling without MMC	1 (1.5)	6 (8.0)
AC reformation	6 (9.1)	4 (5.3)
Anterior chamber tap	2 (3.0)	5 (6.7)
Iris sweep	2 (3.0)	0 (0.0)
Laser trabeculectomy	1 (1.5)	0 (0.0)
Laser peripheral iridotomy	0 (0.0)	0 (0.0)
Reoperations, no. (%)		
Glaucoma valve	5 (7.6)	1 (1.3)
Xen explant	2 (3.0)	1 (1.3)
Trabeculectomy	0 (0.0)	2 (2.7)
Microshunt	0 (0.0)	2 (2.7)
Bleb revision	1 (1.5)	1 (1.3)
Xen amputation	0 (0.0)	1 (1.3)
Cyclophotocoagulation	0 (0.0)	0 (0.0)
Goniosynechialysis	0 (0.0)	0 (0.0)
Total	8 (12.1)	8 (10.7)



CONCLUSIONS

- Targeted supra-tenon's placement of the ab-interno Xen-45 gelatin microstent showed similar outcomes as the non-targeted placement.
- Multivariable analysis identified no baseline characteristics that led to greater risk of failure between targeted and non-targeted microstent placement, including preop IOP >21mmHg, MD ≥-6dB, glaucoma type, age ≥75y/o
- These are encouraging results as they suggest the ease of using the ab-interno Xen-45 gelatin microstent.



1. Schlenker MB, Gulamhusein H, Conrad-Hengerer I, et al. Efficacy, Safety, and Risk Factors for Failure of Standalone Ab Interno Gelatin Microstent Implantation versus Standalone Trabeculectomy. In: Ophthalmology. ; 2017.
 2. Fea AM, Spinetta R, Cannizzo PML, et al. Evaluation of Bleb Morphology and Reduction in IOP and Glaucoma Medication following Implantation of a Novel Gel Stent. J Ophthalmol. 2017.
 3. Lewis RA. Ab interno approach to the subconjunctival space using a collagen glaucoma stent. J Cataract Refract Surg. 2014;40(8):1301-1306.

DISCLOSURES Dr. Iqbal Ike K. Ahmed is a consultant for Allergan