

Corneal Endothelial Cell Density after Ab-Interno Gelatin Microstent Implantation: Comparison with Post-operative Year 1

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INTRODUCTION

- The Xen-45 ab-interno gelatin microstent (Allergan, Dublin, Ireland), is a bleb-forming microinvasive glaucoma surgery (MIGS) device that has successfully demonstrated similar efficacy and safety to trabeculectomy.¹
- Amongst the main advantages of Xen is the ability to create a bleb without dissection or tissue disruption, potentially minimizing the damage to corneal endothelial cell density (ECD).²
- This study was designed to provide insight into the long-term impact of Xen implantation on ECD.

METHODS

Study Population

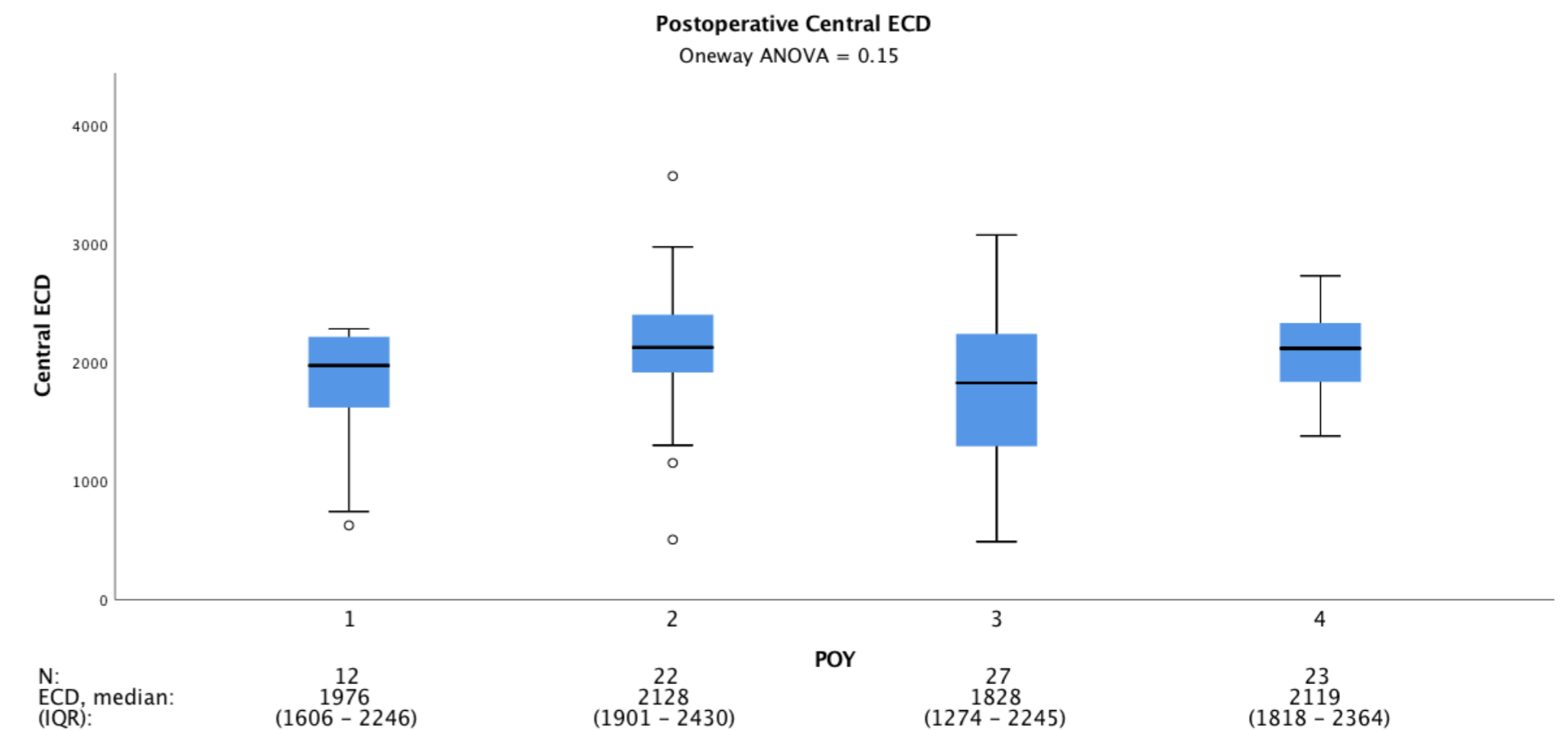
- Combined retrospective-prospective single-center study.
- 82 eyes of 64 patients that received Xen ± phacoemulsification between September 2011 to September 2018 had central ECD measurement performed ranging from post-operative year 1 to 4.
- Eyes that had undergone previous ocular surgery were excluded (corneal, glaucoma, retina).

Outcome Measures

- Primary outcome was central ECD after at least 1 year since Xen implantation.
- Secondary outcomes included post-operative intraocular pressure (IOP), number of IOP lowering medications, interventions, complications, and reoperations.

RESULTS

Baseline Characteristics	Xen (n = 82)
Demographics	
Age, median (IQR), yrs	66.5 (56.2 – 72.3)
Left eye, no. (%)	40 (48.8)
Female gender, no. (%)	43 (52.4)
Diabetes, no. (%)	22 (26.8)
Ethnicity, no. (%)	
White	49 (59.8)
Asian	17 (20.7)
Black	3 (3.7)
Other	13 (15.8)
Preoperative BCVA (logMAR), median (IQR)	0.2 (0.2 – 0.5)
Decision IOP and Glaucoma Lowering Medications	
IOP >21 mmHg, no. (%)	33 (40.2)
IOP, median (IQR), mmHg	19.5 (17.0 – 25.0)
Medication classes, median (IQR)	3.5 (3.0 – 4.0)
Previous ocular laser	
Laser peripheral iridotomy, no. (%)	13 (15.9)
Laser trabeculoplasty, no. (%)	36 (43.9)
Glaucoma Type and Severity	
Disease Type, no. (%)	
Primary open angle	41 (50.0)
Pseudoexfoliation	14 (17.1)
Pigment dispersion	2 (2.4)
Combined mechanisms	7 (8.5)
Others	18 (22.0)
Cup-to-disc ratio, median (IQR)	0.8 (0.7 – 0.9)
Preoperative MD, median (IQR)	-9.8 (-16.1 to -4.0)
Disease Severity, no. (%)	
Mild (0 to >-6.0 dB)	27 (32.9)
Mod-Severe (≤-6.0 dB)	55 (67.1)
Other Characteristics	
Concomitant phacoemulsification, no. (%)	42 (51.2)
Follow-up duration, median (IQR)	34.6 (26.9 – 48.5)



Postoperative	Xen (n = 82)
Complications, no. (%)	
Choroidal effusion	6 (7.3)
Encapsulated bleb	3 (3.7)
Shallow AC	3 (3.7)
Cornea edema	2 (2.4)
Iritis	2 (2.4)
Hypotony maculopathy	1 (1.2)
Vitreous hemorrhage	1 (1.2)
Hyphema	1 (1.2)
Interventions no. (%)	
Needling with MMC	25 (30.5)
Needling without MMC	4 (4.9)
AC reformation	8 (9.8)
Laser trabeculoplasty	2 (2.4)
Anterior chamber tap	1 (1.2)
Reoperations, no. (%)	
Microstent	2 (2.4)
Glaucoma valve	1 (1.2)
Microshunt	1 (1.2)

Postoperative IOP and Medications Course			
Timepoint	IOP (mmHg), median (IQR)	# of Meds, median (IQR)	N
Preop	19.5 (17.0 – 25.0)	3.5 (3.0 – 4.0)	82
POY 1	14.5 (12.0 – 17.0)	0.0 (0.0 – 1.0)	76
POY 2	14.0 (12.0 – 16.0)	0.0 (0.0 – 2.0)	66
POY 3	13.0 (11.0 – 15.0)	0.0 (0.0 – 2.0)	48
POY 4	13.0 (12.0 – 15.0)	0.0 (0.0 – 2.0)	27

CONCLUSIONS

- Post Xen implantation did not show a significant reduction in central ECD at post-operative year 4 when compared to post-operative year 1.
- In addition to having comparable safety and efficacy as trabeculectomy,¹ the Xen microstent offers a good alternative for the management of refractory glaucoma in terms of post-operative ECD.
- Future studies comparing longer post-operative ECD to pre-operative measurements will provide further insight into the effect of Xen implantation on ECD.

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