Real-world Experience & Outcomes Following Introduction of Toric Intraocular Lens Implantation in a National Health Service (NHS) District General Hospital

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Introduction

Cataract surgery is the most common elective operation performed on the national health service (NHS). Although the primary aim is to improve visual acuity, achieving spectacle independence is an increasingly important factor to account for.

Corneal astigmatism may be a limiting factor in achieving freedom from glasses. Clear corneal incisions & limbal relaxing incisions can be used to reduce astigmatism, however, are limited to smaller degrees of astigmatism, and associated with prolonged operative times and their own complications.

Toric intraocular lenses (IOLs) are an alternative option to treat corneal astigmatism. Unfortunately, these lenses are not readily available through the NHS, and real world data on their use and outcomes are lacking.

In Leighton Hospital, we introduced a toric IOL service for patients undergoing cataract surgery. The following audit aims to evaluate refractive outcomes following introduction of this service.

Aims

Evaluate refractive outcomes following Toric lens implantation, including:

- Pre- & Post-operative cylinder prescription
- Change in spherical equivalence following surgery.
- Improvement in best corrected visual acuity
- Rate of significant complications, including clinically significant lens rotation

Methods

Patients listed for cataract surgery with corneal astigmatism ≥1.5 dioptres on biometry were offered a toric implant. Those wishing to proceed were referred to the corneal team with a Pentacam® topography to exclude any contra-indications to toric implants.

The appropriate lens power was selected using the online Raytrace calculator. A Rayner RayOne 610T toric implant was used for all patients. All surgeries were performed by a senior specialty doctor or a corneal consultant.

Patients were seen 7 days post operatively. The lens axis was checked and, if needed, lens repositioning was performed in the operating theatre. Patients were then listed for their second eye or discharged. All post-operative refraction took place in the community with instructions on feeding results back to the hospital.

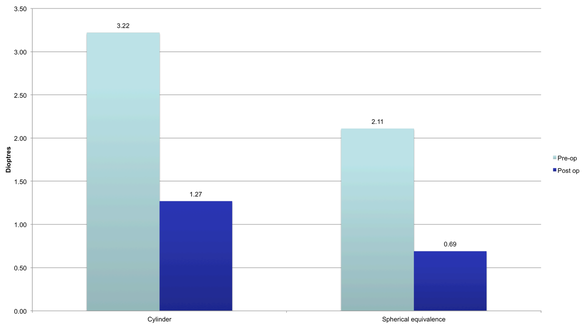
Results

Between December 2018 and November 2020, 32 eyes of 25 patients received a toric lens implant. 29 post-operative refractions were received.

All patients (n=29/29, 100%) had a reduction in cylindrical power (mean improvement 1.96D) and improved spherical equivalence (mean improvement 1.42D) following surgery.

93% eyes (n=27/29) had an improved final visual acuity, following surgery, with a mean improvement of 0.33 (LogMAR); 7% (n=2/29) remained unchanged.

6.9% of patients (n=2/29) had significant lens rotation which required repositioning to improve final visual acuity.



Graph 1: Mean pre-operative and post-operative cylindrical power (pre-operative value corneal astigmatism and post-operative cylinder) and spherical equivalence

	Pre-op BCVA	Post-op UDVA	Post-op BCVA	Cylinder		Spherical equivalence	
				Pre-op	Post-op	Pre-op	Post op
Mean	0.40	0.28	0.07	-3.22	-1.10	-2.11	-0.69
Median	0.30	0.20	0.10	-3.13	-1.00	-2.56	-0.63
SD	0.35	0.23	0.46	1.44	0.91	4.24	0.91

Table 1: Summary Table of results
BCVA: Best Corrected Visual Acuity; UDVA: Unaided Distance Visual Acuity; SD: Standard Deviation

Conclusions

Toric lenses can be used to successfully treat and reduce corneal astigmatism as evidenced by our refractive outcomes where all patients had a reduced cylinder prescription.

The improved spherical equivalent translates into smaller prescriptions, and so, improves unaided visual acuity.

Although 2 patients had significant lens rotation, a recognized risk of toric lenses, early recognition and intervention resulted in a positive final outcome. This risk may be minimized by improved surgical experience, and appropriate post-operative patient instructions.

Introduction of a toric IOL service has resulted in predictable refractive correction in patients undergoing cataract surgery, with favourable outcomes when treating patients with significant corneal astigmatism (≥1.5 dioptres).