



# AN EVALUATION OF OBJECTIVE VISUAL OUTCOMES AND SUBJECTIVE VISUAL EXPERIENCE AFTER BILATERAL IMPLANTATION OF TORIC INTRAOCULAR LENSES

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## ABSTRACT

To compare objective visual outcomes and subjective visual experience after bilateral implantation of toric intraocular lenses. A prospective observational study was performed on 216 eyes of 108 patients treated between 2016 to 2020 for Cataract with astigmatism (cylinder  $\leq$  -4.00 Diopters). The 216 consecutive eyes that had undergone for bilateral cataract surgery with phaco and implantation of Toric Intraocular lens. Refractive predictability, change in mean spherical equivalent refraction, postoperative uncorrected visual acuity (UCVA), and subjective visual outcome were compared at, 1 month following surgery. Pre operatively 216 eyes of 108 patients had visual acuity between 1mFC to 6/18. After implanted toric IOL 166 patients have 6/6 visual acuity and 49 patients have 6/9 visual acuity and 1 patients have 6/12 visual acuity. The p-value was  $<0.0000001$  which is  $<0.05$ , i.e. statistically significant when testing with two different pre-operative astigmatism of Subjective test reading and post-operative astigmatism of Subjective test reading in patients with astigmatism between 1D-4D. In subjective questioner patient show rating between 7 to 10 out of 10, this shows satisfaction for distance & near vision after implantation of toric intraocular lens. Overall patients were satisfied with visual performance because of less amount of refractive power.

**KEY WORDS:** PRE OP: Pre-Operative, POST OP: Post-Operative, IOL: Intraocular lens

## INTRODUCTION

Cataract, or clouding of the crystalline lens in the eye, is presently the foremost form of visual impairment in the biosphere and surgery to remove cataracts is now the utmost communal surgical procedure in the developed world, undertaken by ophthalmologists.<sup>1</sup> The demand for cataract extraction and intraocular lens (IOL) implantation has grown due to enhancements in the healthcare establishment, which has increased life expectancy (Foster, 2000). In addition, visual expectation and task demands are increasing within the older population, particularly with the demands of mobile communication. Since the initiation of intraocular lenses (IOLs) in the 1950's, designs have advanced to not only optimize the spherical power of the eye for distance vision, but also aim to achieve spectacle independence through correction of astigmatism and by increasing the range of clear focus in the presbyopic eye.<sup>2,3</sup>

## MATERIAL & METHODOLOGY

It was a Participatory, Multidisciplinary, observational study conducted at Keshvi eye hospital; Surat with purposive sample of 216 eyes of 108 patients who fulfill the inclusion criteria to evaluate the objective visual outcomes and subjective visual experiences after bilateral implantation of toric intraocular lenses. Study also assesses the predictability and stability of bilateral toric intraocular lens (IOL) implantation in cases of cataract with preexisting astigmatism. In present study Preoperative Assessment includes Patient's Demographic data, detailed history, complete structured 10-item questionnaire, General examination of ocular adnexa, intraocular pressure, visual Acuity, K reading and IOL power calculated with IOLMaster & Ascan. For each eye, the relevant preoperative assessment parameters, including flat and steep K values and the axis of each, was enter into an online toric IOL calculator to determine the axis placement of the IOL and the appropriate IOL model.



For Surgical Preoperatively, initial markings are made with the patient sitting up to avoid cyclorotation. The eye is marked at 0 degree and 180 degree while using a slitlamp, which is equipped with an angle-measuring reticule eyepiece. During surgery, these reference marks is use to determine the desired axis of IOL orientation, which then was marked using Meridian (Axis) marker. Marking was performed with dye or ink; Surgeons are operating superiorly or will place the incision on the steepest axis of astigmatism. The IOL was placed in the capsular bag using the Delivery System. No limbal relaxing incisions or any other surgical procedures was allowed. Surgery on the second eye followed 7 to 30 days after surgery on the first eye.

Postoperative examinations were performed 1 day after implantation of each IOL. All subsequent postoperative examinations were designated 1month after the date of the IOL implantation. At every postoperative examination, toric IOL orientation was determined by examining the eye at the slitlamp and noting the IOL axis, designated by 6 laser marks on the

optic of the IOL. Manifest refraction and monocular uncorrected distance visual acuity (UDVA) and corrected distance visual acuity (CDVA) was examining at 1st month. The subjective questionnaires were again distributed at 1 month.

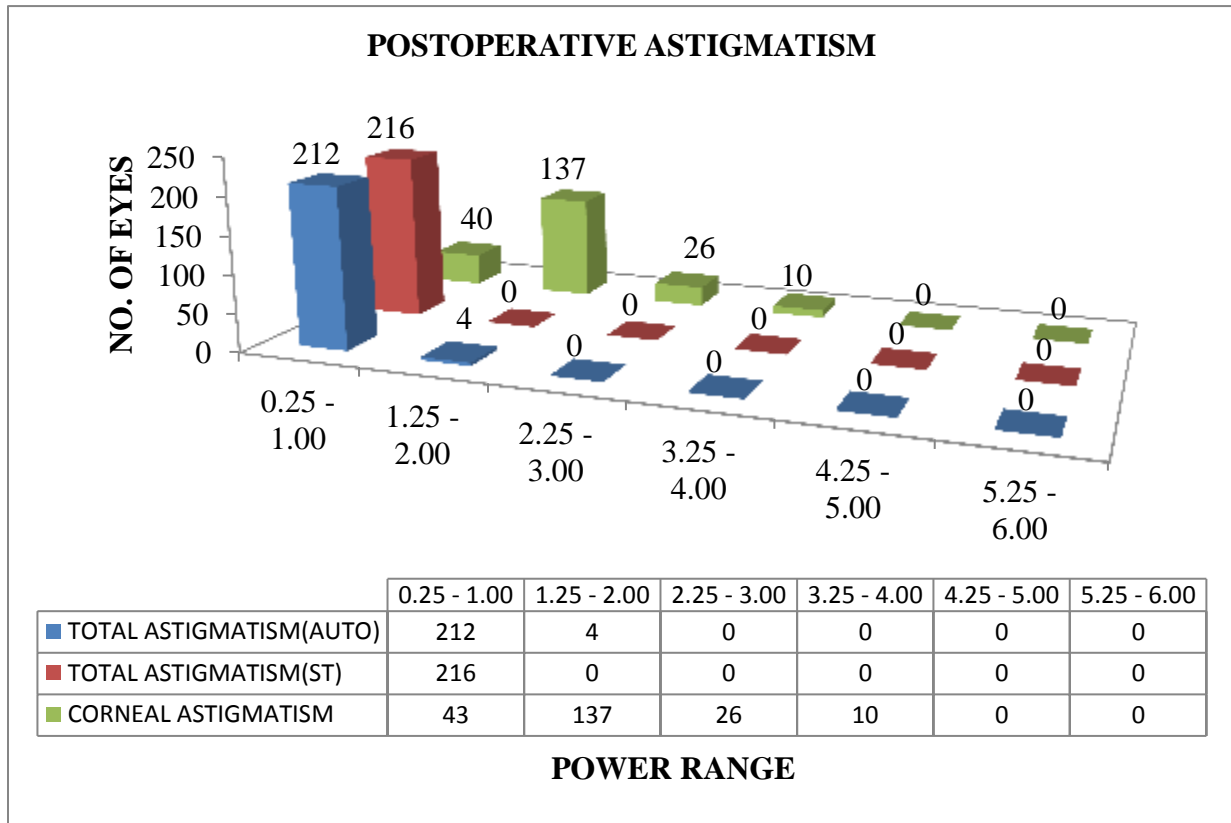
## RESULTS

108 patients with both eyes astigmatism and Cataract were agreed for cataract surgery with toric IOL. The population included was 60 males and 48 females subjects ranged from 18 to 85 years of age.

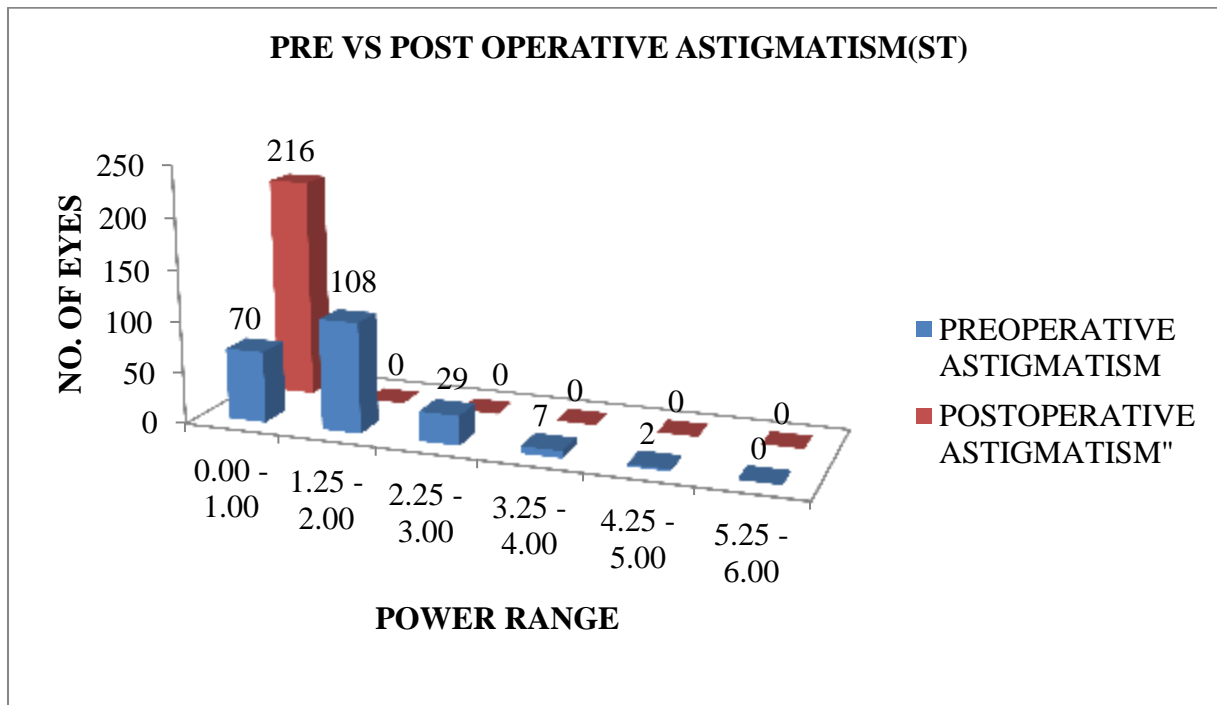
Pre operatively 216 eyes of 108 patients had visual acuity between 1mFC to 6/18. After implanted toric IOL 166 patients have 6/6 visual acuity and 49 patients had 6/9 visual acuity and 1 patients have 6/12 visual acuity. There was no significant difference between pre and post K-reading. But post-operative visual acuity was better and there was no residual astigmatism because it was corrected by implantation of toric IOL.

Demographic and Preoperative parameters in astigmatic eyes that underwent cataract surgery with Toric intraocular lens implantation	
Parameter	Toric IOL (n= 108 patients, 216 eyes)
Male/female (%)	44/56
Age (Y)	59.39
Sphere (D)	-0.3495
Cylinder (D)	-1.09954
Mean Spherical Equivalent Refraction (D)	-0.89931
postoperative parameters in astigmatic eyes that underwent cataract surgery with Toric intraocular lens implantation	
Parameter	Toric IOL (n= 108 patients, 216 eyes)
Sphere (D)	-0.03
Cylinder (D)	-0.02
Mean Spherical Equivalent Refraction (D)	-0.04

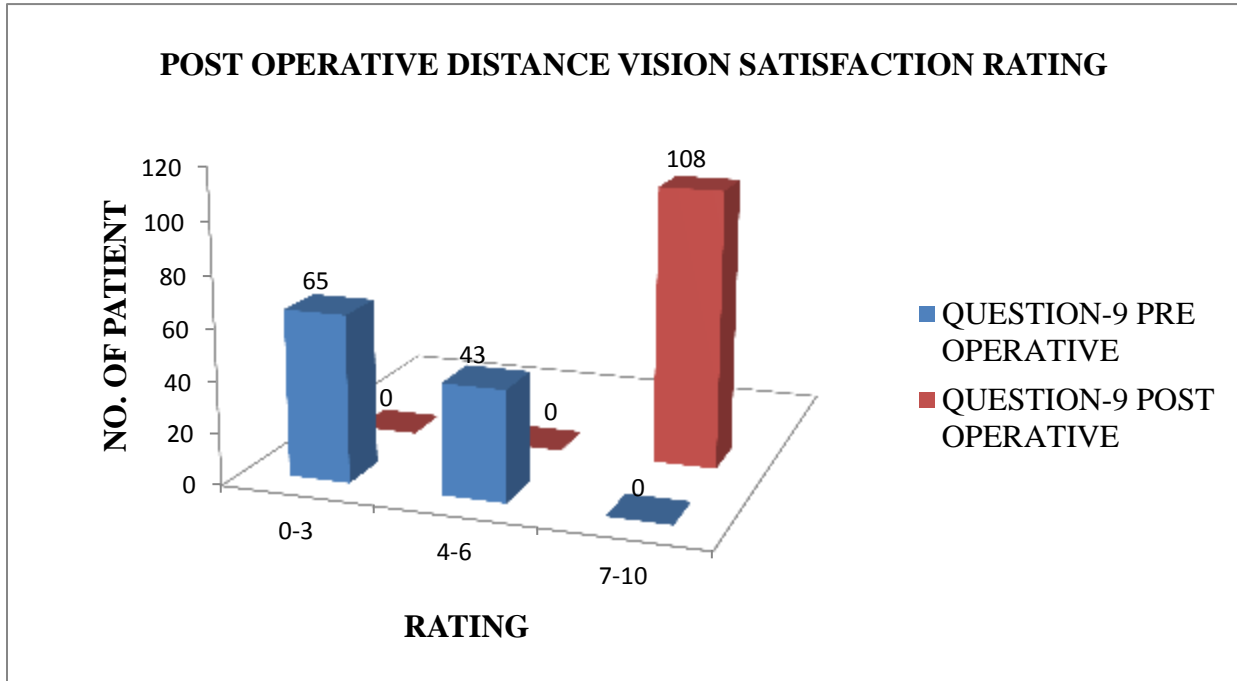
**Table : I Pre and Post Operative Refractive Error**



Graph: I Post-operative Astigmatism



Graph: II Pre VS Post-operative Astigmatism (Subjective Test)



**Graph: III Post-operative Distance vision Satisfaction Rating**

The p-value was  $<0.0000001$  which is  $<0.05$ , i.e. statistically significant when testing with two different pre-operative spherical equivalent reading and post-operative spherical equivalent reading in patients with cataract.

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The results indicate that phacoemulsification and posterior chamber toric IOL implantation is an effective option to correct pre-existing astigmatism in cataract surgery. In subjective questioner patient show rating between 7 to 10 out of 10, this shows satisfaction for distance & near vision after implantation of toric intraocular lens.

## CONCLUSION

Present study summaries that the implantations of binocular toric IOL in astigmatic patients were

effective option to correct pre-existing astigmatism in cataract surgery with implantation of toric IOL.

There was no significant difference between pre and post K-reading. But post-operative visual acuity is better and there is no residual astigmatism because it was corrected by implantation of toric IOL. Overall patients were satisfied with visual performance because of less amount of refractive power. Patient also grade high satisfaction visual rating in post-operative subjective visual experience.

## REFERENCES

1. Requirement for and optimization of premium intraocular lenses Gurpreet Bhogal 2012 Aston University.
2. Analysis and correction of corneal astigmatism in modern pseudophakia By Catriona Ann hamer Health and Human Sciences Doctoral Training Centre 2015.
3. Evaluation of modern intraocular lenses Phillip Buckhurst 2011 Aston University.