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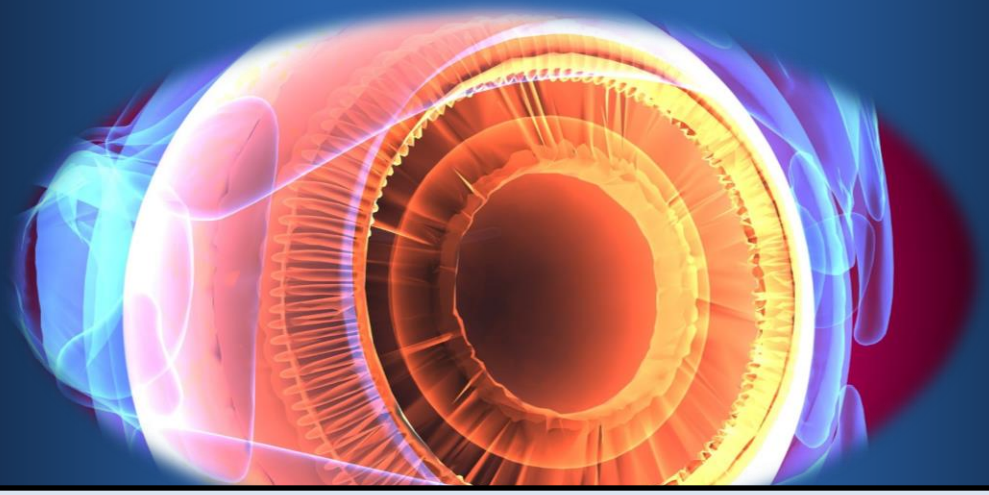

Dear Doctor,

Greetings from Micro Labs Limited. We are happy to bring you 'Ophthal Focus' which contains latest and interesting news in the field of Ophthalmology.

This issue contains

- **The effect of Toric Intraocular Lens Implantation in Cataract patients with irregular corneal steep and Flat meridian**
- **Corneal Cross-Linking as Treatment in Paediatric Keratoconus: Comparison of Two Protocols.**
- **Pigmentary retinopathy masked by asymmetric acquired phenomena**

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Looking forward to your valuable feedback

Best Regards,
Medical Team, Micro Labs Limited

The effect of Toric Intraocular Lens Implantation in Cataract patients with irregular corneal steep and Flat meridian

Background: Most common cause of visual impairment in elderly people is cataract. About 60% of the subjects have over 0.75 diopters (D) of corneal astigmatism and 20% of the subjects have astigmatism 1.5 D or greater. Even after cataract surgery if this astigmatism is not uncorrected, it results in reduced visual acuity and increased spectacle dependence. The role of Toric intraocular lens (toric IOL) is not only replacing opaque lens but also correcting corneal astigmatism.

Aim: This study aimed at assessing the effect of toric intraocular lens implantation in cataract subjects with irregular corneal steep and flat meridian.

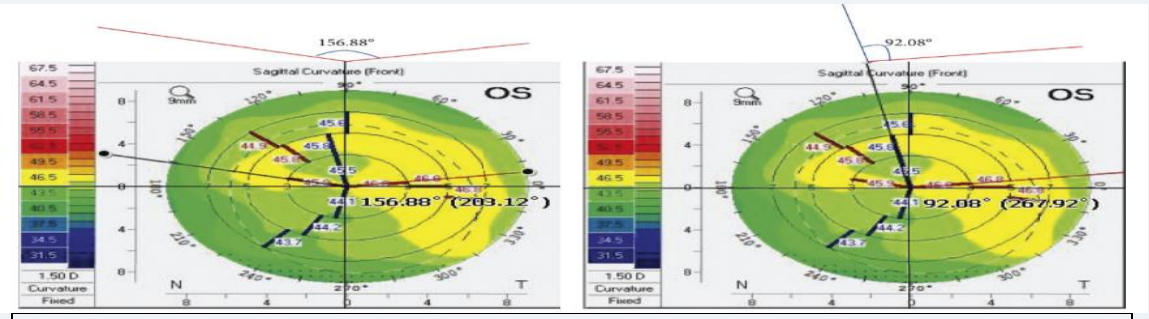
Methods: Retrospective chart review and data analysis was performed in this study. 112 eyes of 78 subjects underwent toric intraocular lens implantation. Steep meridian deviations were classified as 0, 1–9, 10–19, 20–29, 30–39, and over 30°.Steep and flat meridian deviations (not 90°) were classified as 0, 1–9, 10–19, 20–29, and over 30°. Subjects underwent ophthalmological examination. At the preoperative period and postoperative 2, 4, and 6 months Manifest refraction, biometry, and keratometry with the IOLMaster partial coherence interferometry device corneal topography examination, and dilated fundoscopy was examined. Before surgery, the corneal limbus was marked at 0°, 90°, and 180° meridian with the patient in a sitting position. With gentian violet corneal steep axis and 6.0 mm ring was marked. At the steep astigmatic axis surgery was performed through a clear corneal incision. A 2.75 mm clear corneal incision was made using a 2.75 mm double-blade keratome under topical ocular anesthesia. Surgically induced astigmatism was set by 0.5 diopters. To reform and stabilize the anterior chamber sodium hyaluronate 1.0% was used. Using a balanced salt solution hydrodissection and hydrodelineation was achieved. Using 2.75 mm-sized phacotips and infusion/aspiration (I/A) cannulas for micro- and small-incision groups phacoemulsification was performed. In the capsular bag a clear preloaded IOL was implanted. Postoperative treatment included gatifloxacin

0.3%, and fluorometholone acetate 0.01%, eye drops four times a day for four weeks.

Results: Preoperative mean estimated astigmatism of all patients was 0.02 ± 0.12 D. Toric IOL implantation (0.57 ± 0.31 D) was significantly decreased compared to its preoperative value. Compared to preoperative value Postoperative mean total corneal astigmatism was also decreased. Compared to preoperative values postoperative mean UCVA and mean BCVA was improved compared to preoperative values.

Parameters	0 degree	1–9 degrees	10–19 degrees	20–29 degrees	Over 30 degrees
Eyes (n)	20	30	32	18	12
Preop total corneal astigmatism (D)	1.72 ± 0.90	1.85 ± 0.90	1.96 ± 0.64	2.08 ± 1.39	2.13 ± 1.05
Preop mean UCVA (logMAR)	0.40 ± 0.15	0.42 ± 0.13	0.41 ± 0.14	0.42 ± 0.21	0.43 ± 0.17
2-month postop mean UCVA (logMAR)	0.08 ± 0.03*	0.09 ± 0.04*	0.13 ± 0.04	0.16 ± 0.05	0.19 ± 0.07
4-month postop mean UCVA (logMAR)	0.09 ± 0.03*	0.09 ± 0.03*	0.15 ± 0.06	0.15 ± 0.09	0.21 ± 0.11
6-month postop mean UCVA (logMAR)	0.09 ± 0.04*	0.10 ± 0.04*	0.14 ± 0.05	0.18 ± 0.08	0.20 ± 0.09
6-month Postop mean UCVA (logMAR)	0.09 ± 0.04*	0.10 ± 0.04*	0.14 ± 0.05	0.18 ± 0.08	0.20 ± 0.09

Preoperative and postoperative total corneal astigmatism (D) and uncorrected visual acuity (UCVA) according to the steep meridian deviation.



1.Steep and flat meridian deviation and the steep meridian deviation was 23.12° l180–156.88 l, and the steep and flat meridian deviation was 2.08° l90–92.08 l.

Conclusion: In corneas with steep meridian deviations and steep and flat meridian deviations of more than 10° correction of astigmatism with toric intraocular lens implantation is not accurate. Therefore toric intraocular lens implantation in subjects with irregular corneal meridian should be cautiously performed.

References: Hwang HS, Kim HS, Kim MS, Kim EC. The Effect of Toric Intraocular Lens Implantation in Irregular Corneal Steep and Flat Meridian Nov. 2021.

Corneal Cross-Linking as Treatment in Pediatric Keratoconus: Comparison of Two Protocols

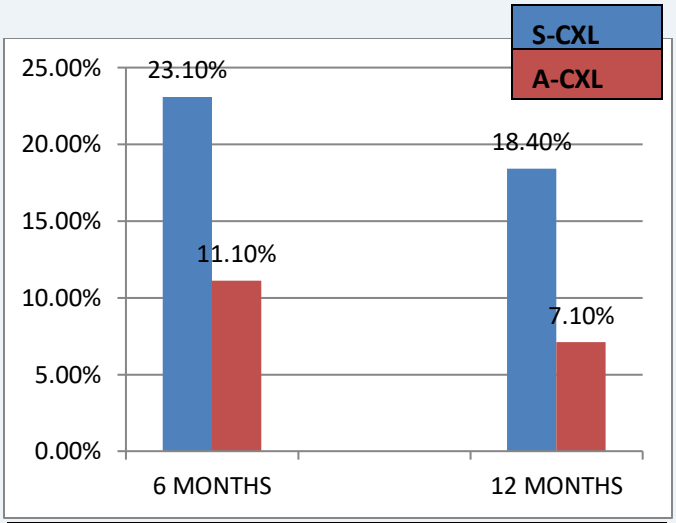
Background: Keratoconus (KCN) is a progressive bilateral corneal ectatic disorder which can cause visual impairement. Studies have revealed that onset of the disease at a younger age results in a more aggressive and progressive course of the disease than adult onset.

Aim: The objective of this study was to compare the outcomes of accelerated and standard collagen cross-linking (CXL) in terms of visual acuity, keratometry, and tomographic parameters in pediatric population.

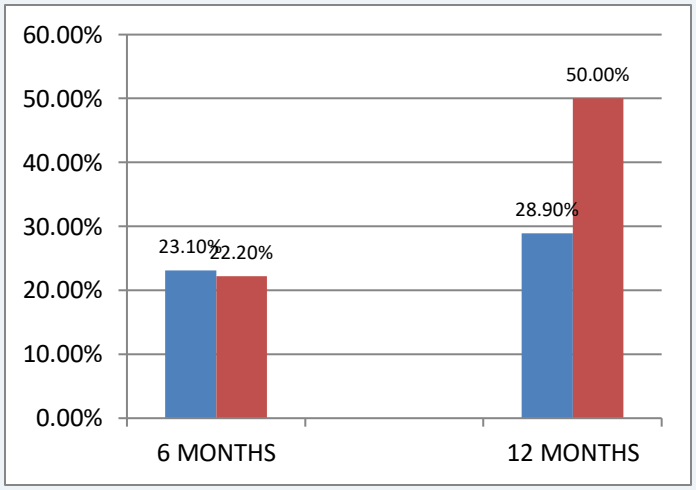
Methods: This was a retrospective study in which the files of the subjects who underwent S-CXL and A-CXL for keratoconus were reviewed . Before the procedure CXL was performed under topical anesthesia, with oxybuprocaine hydrochloride 0.4% eye drops. Before and at 6 and 12 months following treatment changes in uncorrected distance visual acuity (UCDVA), tomographic keratometry parameters, best corrected distance visual acuity (BCDVA),and endothelial density count (EDC) was assessed. The eye characteristic changes (deltas) between intergroup was compared to assess differences between the study groups. Using a paired T test with a threshold for significance at $\alpha = 0.05$ the measured parameters before and at multiple points after intervention within each study group (intragroup), before versus 6 months after treatment and before versus 12 months after treatment was compared to assess either an improvement or worsening following the intervention.

Results: 53 eyes of 44 subjects were included in this study. Fourteen eyes (13 subjects) received S-CXL treatment (26%), while 39 eyes (34 subjects) received A-CXL treatment (74%). In the A-CXL group progression in Kmax was observed after 12 months in 7 (18.4%) eyes and in 1 (7.1%) eye of the standard CXL group. After 12 months in 11 (28.9%) eyes of the A-CXL group improvement in Kmax, defined as a reduction in 1 D or more was found and in 7 (50%) eyes of the S-CXL

group. No significant difference in the mean deltas between the groups, except UCDVA after 12 months K1 front after 6 months. Compared to baseline there was no significant difference in visual acuity means after 6 months. Improvement in BCDVA in the A-CXL group was observed after 12 months. After 12 months there was only insignificant improvement in mean UCDVA with better results in the S-CXL group. There was no significant difference between the two protocols postoperatively in BCDVA, Kmax, Kmean, pachymetry, or corneal astigmatism.



Progression of keratoconus in the study population at 6 and 12 months after CXL.



Regression of keratoconus in the study population at 6 and 12 months after CXL.

Conclusion: For stabilizing progressive keratoconus in pediatric population A-CXL is as safe and effective as S-CXL. Further studies are required with a longer follow-up and larger sample-size. Considering the long-term results of 9 mW A-CXL and its safety and efficacy profile, it should be preferred to S-CXL for reducing treatment time and improving patients' comfort.

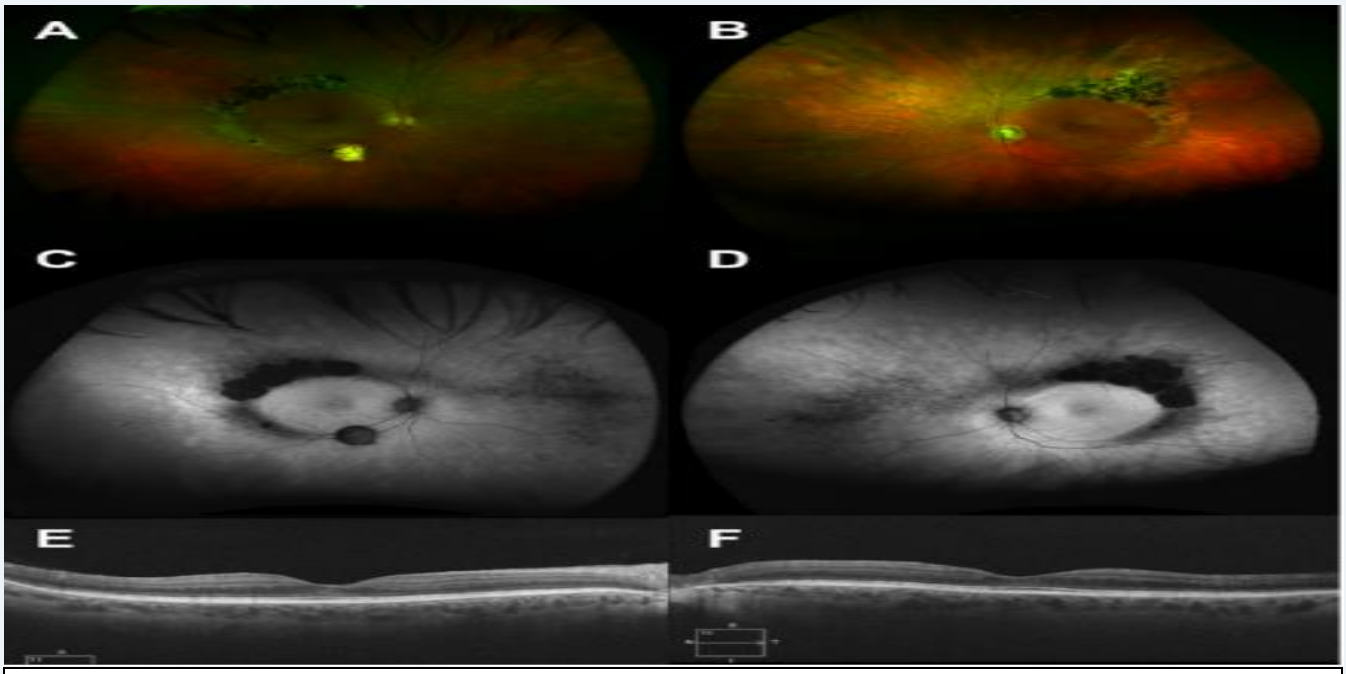
Reference: Hed S, Matlov Kormas R, Shashar S, Malyugin BE, Boyko M, Knyazer B. Corneal Cross-Linking as Treatment in Pediatric Keratoconus: Comparison of Two Protocols. Journal of Ophthalmology. 2021 Nov 3;2021.

Pigmentary retinopathy masked by asymmetric acquired phenomena

Patient description: A 49-year-old woman presented with retinal pigmentation. Due to a compressive optic neuropathy treated by surgery in childhood she had long-standing poor left visual acuity (VA). The subject had chronic angle closure glaucoma, treated with bilateral laser peripheral iridotomies (PIs) and left lensectomy.

Visual acuity was 6/9.5 and 6/24 in right and left eyes on examination. Left relative afferent pupillary defect, patent bilateral PIs, left pseudophakia and intraocular pressure of 12 mm Hg bilaterally was observed. No evidence of intraocular inflammation. In the left eye of the subject significant cupping and pallor was observed. Most notable at the superotemporal vascular arcades there was symmetrical perivascular nummular pigmentation with associated chorioretinal atrophy. Autofluorescence imaging highlighted the extent of retinal pigment epithelial (RPE) atrophy. Preserved foveal photoreceptor structures, no macular oedema/schisis and absent retinal nerve fibre layer in the left eye, in keeping with advanced optic neuropathy was revealed by optical coherence tomography. Advanced visual field loss in the left eye was showed in static perimetry.

Rod responses were absent on full field electroretinogram and cone responses were delayed and attenuated. A homozygous likely pathogenic mutation was detected which has been reported as responsible for autosomal recessive enhanced S-cone syndrome (ESCS), also known as Goldmann-Favre syndrome. ESCS is a disorder of photoreceptor in which short-wavelength sensitive cone photoreceptor (S-cone) progenitors fail to fully differentiate into rods or long/medium wavelength-sensitive cone photoreceptors supported by pathological , electrophysiological evidence.It is caused by mutations in the NR2E3 gene. Symptoms are night blindness. VA was ≥6/12 in 57% of eyes, with 66% of patients meeting VA standards for driving and only 7% considered legally blind at a mean of 26.6 years.



Widefield colour Photographs of the right (A) and left **(B**) eyes showing predominantly superotemporal perivascular nummular pigmentation. **Widefield autofluorescence imaging of right (C)** and left **(D)** eyes delineates the extent of RPE atrophy. **Optical coherence tomography** shows preservation of the photoreceptor layers within the macula **(E, F).**

Conclusion: Primary photoreceptor disease may be masked by other pathologies. In assessing the health of the retinal pigment epithelium, helping to delineate symmetry and severity of disease Autofluorescence imaging is invaluable. Although therapies are not yet available/approved for most inherited retinal degenerations (IRDs), some conditions are entirely/largely stationary and may benefit from genetic diagnosis for prognostic and family planning, and may allow access to future gene therapy.

Reference: Sanderson KG, Stephenson KA, Dockery A, Keegan DJ. Pigmentary retinopathy masked by asymmetric acquired phenomena. BMJ Case Reports CP. 2021 Nov 1;14(11):e246982.