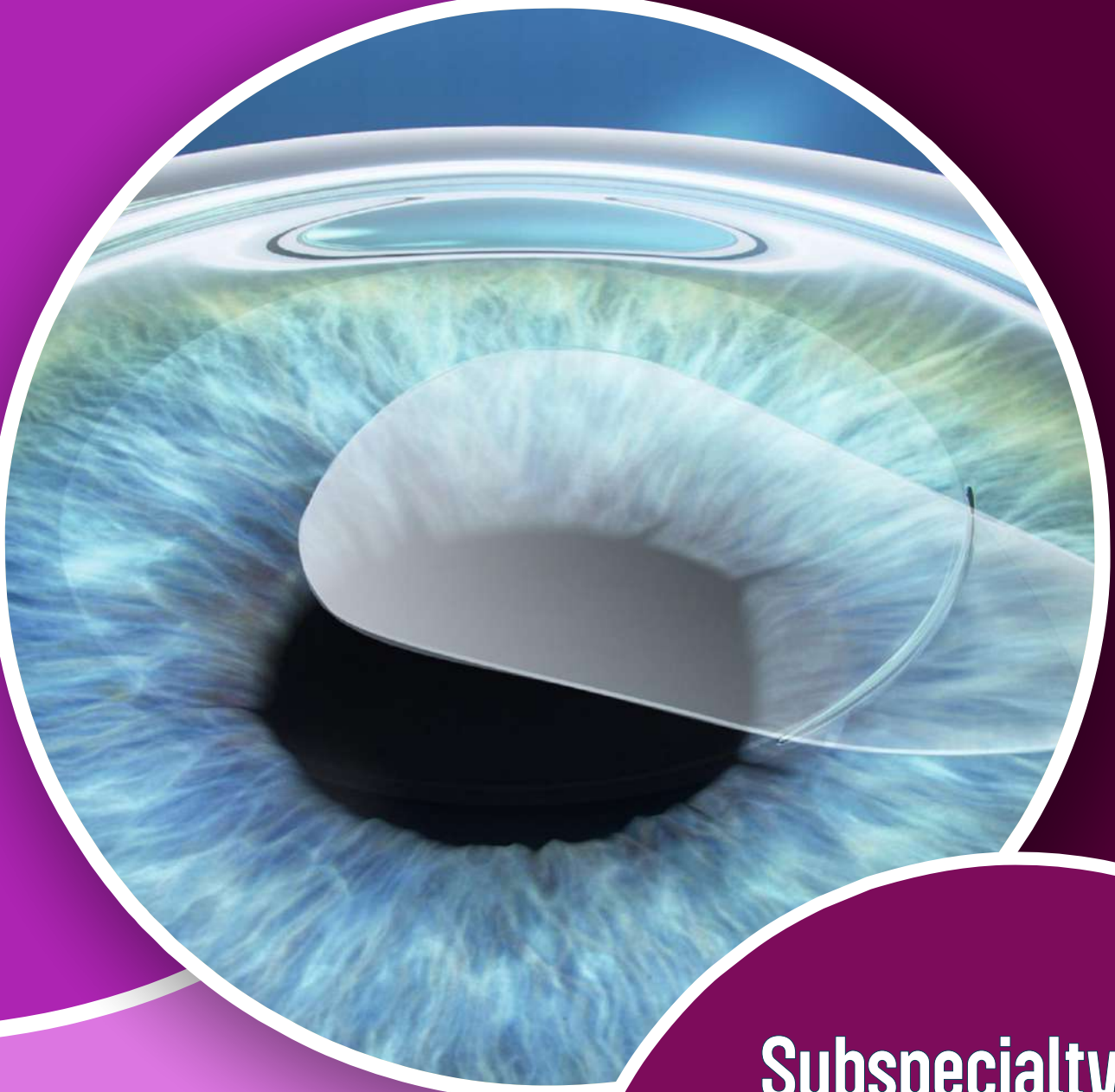
Refractive Surgery 2024

A Vision for 2024 and Beyond



AIOC 2024

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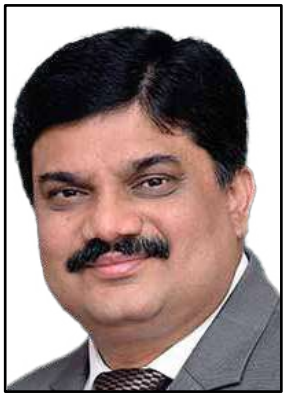

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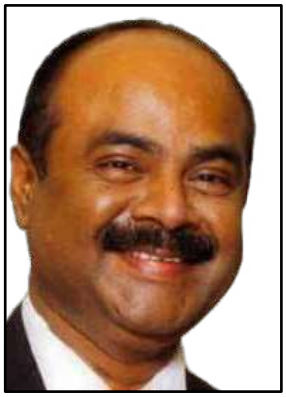

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CLEAR

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Complications of Phakic IOL

Dr. Gaurav Luthra

Microkeratome LASIK- Basics and Role in 2024

Dr. Harshul Tak

Evolution and BASICS

Dr. Jeewan Titiyal

Complications of Refractive Surgery

Dr Jod Mehta

Corneal inlays may be biological or biomaterial based. A non-refractive inlay was the KAMRA implant, made from PVDF, which was placed under a deep lasik flap or pocket. Long term complications such as corneal haze and hyperopic shift can be seen in as many as 35% of cases. Here we describe a strategy in order to reduce the haze to improve functional visual outcome for the patient.

Evolution and BASICS

Dr. K P Reddy

IPCL – Design and Experience

Dr. Kamal Kapoor

Role of Refractive Lens Exchange – When and Choice of IOLs

Dr Keiki Mehta

ATOS

Dr. Kishore Pradhan

REFRACTIVE SURGERY

Enhancing Vision with Presbyond Laser Blended Vision: A Monovision Approach

Dr Krishna Prasad Kudlu

Presbyond Laser Blended Vision (LBV) stands out as a cutting-edge solution for addressing presbyopia, a common age-related visual impairment. This abstract delves into the core principles, efficacy, and safety considerations of Presbyond LBV, emphasizing its integration of the monovision approach.

Presbyond LBV strategically employs advanced laser technology to induce a controlled disparity between the eyes, with one eye optimized for distance vision and the other for near vision. This monovision concept leverages the brain's remarkable ability to reconcile differing focal points, resulting in expanded depth of field and reduced reliance on reading glasses.

Clinical trials have consistently demonstrated the effectiveness of Presbyond LBV in enhancing both near and distance visual acuity. Patient satisfaction rates are high, with few reported adverse effects. Moreover, the flexibility of this approach allows for reversibility and fine-tuning to accommodate individual preferences and needs.

In summary, Presbyond LBV offers a compelling solution for individuals seeking freedom from the constraints of presbyopia. By embracing the monovision principle, it provides a customizable and effective means of restoring visual function and improving overall quality of life. Continued research and long-term evaluation will further solidify its standing as a leading refractive option for presbyopic patients.

Toric Marker for Lenticule Based Refractive Surgery: 'Clear'ing Concepts

Dr Kumar Doctor

NO FINANCIAL DISCLOSURES

As refractive surgeons, we have transcended from PRK to LASIK and now to flapless lenticule extraction based refractive surgery. My experience with the Lenticule based refractive surgery (CLEAR- corneal lenticule extraction for advanced refractive correction) has been a learning process. [1,4]

Steps of the surgery were routine:

1. Marking the corneal axis with a standard toric marker for cyclotorsion BUT ONLY in case of cylindrical power of -0.75 dc and above
2. Performing femtosecond CLEAR laser with two incisions - anterior and posterior
3. Dissecting the planes
4. Extraction of lenticule
5. Washing interface with fluid

Initial few cases were straightforward high myopic eyes which were directly treated, without corneal astigmatic marking, which resulted in successful outcomes

Thereafter we started performing a number of cases, both pure spherical powers and compound myopic astigmatism, which did not yield satisfactory results. There were aberrations postoperatively, which led us to thinking that there could be a better way to eliminate the residual cyclotorsion. [2,3]

We also noted that during the femtolaser application, the axis marks did not extend all the way within the applanated area due to the camera angulation of the machine.

Hence to combat these two hurdles we devised a modified CLEAR toric marker which had extended flange lengths allowing the 0^0,90^0 and 180^0 axes to be visible post application

We performed this axis marking under the guidance of a virtual image guided system used routinely in toric IOL implantation during cataract surgery, which compensated for any possible cyclotorsion and minimised human error in manual marking.

This method gave us accurate and precise results even in high cylindrical cases which gives us a tremendous sense of security.

Lenticule dissection has always been easy. Titration of energy has been essential to our outcomes.

Steps we changed:

1. Marking for ALL cases
2. Removing all bubbles from interface
3. Ironing the bowman membrane
4. Reducing the energy over a number of cases

These steps have resulted in excellent outcomes.

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ASA – Basics, Types and Current Evidence

Dr. M Vanathi

Smooth Incision Lenticule Extraction (SILK): The New Kid on the Block

Prof. (Dr.) Mahipal Sachdev
Centre For Sight, New Delhi

Femtosecond lasers are commonly used in cataract and refractive surgery procedures, such as for flap-creation and laser-assisted lenticule extraction (LALEX). LALEX modifies the anterior corneal radius of curvature by creating an intrastromal lenticule that corresponds to the desired refractive correction, which is then extracted. This alteration of corneal curvature is the foundation of all plano-convex tissue removal techniques, including laser in situ keratomileusis (LASIK), photorefractive keratectomy (PRK) & LALEX.[1,2,3]

ELITA™ is a new generation ophthalmic femtosecond laser surgical system developed by Johnson and Johnson Surgical Vision, Inc. (Milpitas CA, USA), which received CE Mark approval in March 2023 for Smooth Incision Lenticular Keratomileusis (SILK™) and LASIK flap creation. The ELITA system was designed to deliver low energy treatment (40–90 nJ per pulse) through a combination of small focus spot size (approximately 1 m), ultrashort pulse duration (100–200 fs), and ultrafast pulse frequency (10 MHz). ELITA creates virtually no pulse separation (mean spot to spot is about 1 m), which leads to continuous tissue resection with minimal residual tissue bridges, and therefore less lenticule manipulation for tissue removal required by the surgeon. Subsequently, less keratocyte activation and a reduced immune response are expected postoperatively, resulting in faster healing and visual recovery with fewer surgical complications. The system was also designed to produce a biconvex lenticule shape, where the anterior and posterior surfaces are matched, so that corneal micro-folding is minimized or eliminated following lenticule removal.[1]

In a Clinical Trial conducted at Centre for Sight, New Delhi & Narayana Nethralaya, Bengaluru, a total of 170 eyes of 85 patients underwent SILK. Intraoperative surgeon ease of lenticule dissection was rated as grade 0 or 1 in 85.3% of eyes (no/only mild dissection needed). UDVA at 1 day, 1 week, 1 month, and 6 months was 20/20 or better in 65.9%, 85.4%, 91.5%, and 96% of eyes, respectively. No eyes lost any lines of CDVA at 6 months compared to the preoperative. The postoperative MRSE was stable over time, ranging from -0.34 D ± 0.24 D at 1 month to -0.33 D ± 0.23 D at 6 months. MRSE predictability (± 0.50 D) was 93.5% (129/138) at 3 months and 91.1% (113/124) at 6 months. No serious adverse events were noted.

The SILK procedure with the ELITA Femtosecond Laser System was found safe and effective for the treatment of myopic refractive errors with and without astigmatism. Fast visual recovery was demonstrated, with stability achieved by 3 months.

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Retained lenticule in SMILE

Dr. Namrata Sharma

Sizing – How to get the best fit!

Dr. Partha Biswas

Collagen Imaging and role in refractive surgery

Dr. Pooja Khamar

Peripheral Retinal Degenerations and refractive Surgery

Dr. Pramod Bhende

Dr. Purendra Bhasin

REFRACTIVE SURGERY

Topography and Tomography Pearls

Dr. Rajesh Fogla

Top 3 flap complications and management

Dr. Rajesh Sinha

Dry eye disease and Ocular Pain

Dr. Rohit Shetty

SMILE

Dr. Rupal Shah

Phakic Lenses in Challenging Situations

Dr. SPS Grewal

Phakic IOL – Indications and Pre Op Work Up

Dr. Samaresh Srivastava

Zeimer

Dr. Shaady Awadh

Advancement in lenticular Extraction Technologies

Dr. Sheetal Brar

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Femto lasik basics 8 mins

Dr. Sonu Goel

No financial disclosures

Femtolaser science behind flap creation.
Permutation combination of flap creation with FS.
Advantages over MK with long term studies.
Various platforms available with their comparisons.
Newer innovations in FS technology.

Take home

Both FS and MK lasik are safe and effective with no statistical difference in udva, cdva.
Fs scores for more predictable thickness less hoa, better contrast, longer tbut.

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Staar ICL – Design and Experience

Dr. Sri Ganesh

RIL – Design and Experience

Dr. Sujatha Mohan

Management of Epithelial Ingrowth (EI)

Dr. Vardhaman Kankariya

Post LASIK Epithelial Ingrowth

EI is a rare complication of LASIK characterized by epithelial invasion into the flap-stromal interface. During post-LASIK healing, proliferating epithelial cells may migrate into the flap interface, leading to ingrowth. Ingrowth may be self-limiting and asymptomatic in most cases; however, ingrowth can sometimes obscure vision or cause astigmatic changes. EI can also be associated with flap melt, which is the keratolysis of flap tissue secondary to collagenase released by hypoxic, intra-flap epithelial cells.

The reported incidence range of EI in primary LASIK is from 0% to 3.9% with lower incidence observed for FS-LASIK compared to m-LASIK [1]. The lower incidence of EI in FS-LASIK may be attributed to reduced trauma during flap creation. Flap lift enhancement surgeries have a higher incidence of postoperative EI (10%-20%). FS-LASIK also appears to have an advantage in flap lift enhancements, as evidenced by Letko et al. who reported less EI in FS-LASIK cohort compared to mechanical LASIK cohort[2].

The treatment of EI depends on the severity of visual compromise. The Probst classification is commonly used to grade EI. Grade 1 is characterized by thin and difficult-to-detect growth and typically does not require treatment. Grade 2 involves epithelial nests affecting the flap edge, while grade 3 exhibits pronounced growth with haze around the flap edge. Grade 4 EI is characterized by cells invading the visual axis along with flap melt. Grades 3 and 4 require urgent treatment. Mechanical debridement, with or without adjunctive agents, is the main modality for treating EI. Adjunctive therapy includes ethanol (dilute: 50%, 70%, and 100%), 0.02% mitomycin C (MMC), flap suturing, fibrin glue, and amniotic membrane. The recurrence of EI can occur in 0%-36% of patients, so it is important to inform patients about the possibility of retreatment. The evidence suggests that debridement with fibrin glue has the lowest rate of recurrence (0%-7.9%) [3]. For grade 4 EI, flap amputation and penetrating keratoplasty may be necessary to improve visual outcomes[3].

Post SMILE Epithelial Ingrowth

EI is also rare in reported literature for SMILE with estimated incidence range of 0.016%-0.5%. EI can occur postoperatively when epithelial cells invade through the lenticule incision or intraoperatively through the seeding of epithelial cells during suction. The progression of these ingrowths can lead to visual disturbances, reduction in visual acuity, and foreign body sensation. The risk factors for EI may include cap rupture, diabetes mellitus, tears of the incision, or epithelial dystrophy of basement membrane. EI incidence in reported literature varies.

The treatment of ingrowths includes irrigation and removal via vitreoretinal forceps or spatula with topical antibiotics and steroids thereafter. One documented case utilized hydrogel ocular sealant after the scraping of the ingrowth[4]. A case report by Nijdam et al. suggested that the application of low-energy neodymium-doped yttrium aluminum garnet (Nd-YAG) laser after the removal of the ingrowth could be effective. A novel method for the treatment of advanced central epithelial ingrowth has been successfully conducted by Kankariya et al.[5]. The method utilizes CIRCLE (Carl Zeiss Meditec AG, Jena, Germany) software to create a "cap to flap" conversion, allowing greater and safer access to the original interface site so that the ingrowth can be excised. Thus, there is less corneal epithelial damage due to less difficulty in gaining entry to the corneal insult.

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Post-refractive surgery Keratitis

Dr. Vishal Jhanji