Spotlight

Glaucoma Insights

Branded vs Generics

CME Activities

Glaucoma Awareness

Clinical See All >

Cataract

Clinical Diagnosis

Cornea

Glaucoma

IOL

OCT

Ocular Allergy

Ocular Surface Disease

Pediatrics

Refractive

Retina

Technology

Therapeutic Cataract & Refractive

Understanding Antibiotic Resistance

Contact Us
Editorial
Job Board
Terms and Conditions
Privacy
Do Not Sell My Personal Information

Optimizing individual outcomes through staged cataract surgery

October 1, 2015

Relevant Topics

In this third of a four-part column, Arun C. Gulani, MD, continues the discussion on staged cataract surgery.

Take-home message: In this third of a four-part column, Arun C. Gulani, MD, continues the discussion on staged cataract surgery.

Gloves Off with Gulani By Arun C. Gulani, MD

As outlined in the second part of this series on staged cataract surgery, the procedure can be categorized into two simple strategies: Inside-out and outside-in staged surgery.

The inside-out approach in most cases has a potentially measureable cornea (to determine the IOL power as accurately as possible) and the IOL placement presents the refractive endpoint for the most needed laser ablation profile, i.e., myopic/hyperopic (PRK mode) to then correct the corneal pathology as well as result in emmetropia simultaneously.

With the inside-out staged concept, cataract surgery is performed with the goal of arranging the inner optics of the eye to result in a final optical endpoint that appropriately presents the cornea as a vision rehabilitative platform for correction by laser vision surgery. Therefore, the internal surgery is performed first (cataract surgery) followed by external corneal surgery. This obtains the best vision potential and designed refractive endpoint for each eye.

Conversely, the outside-in approach can be used in patients in whom the corneal status prevents accurate IOL calculation or when the corneal status is a hindrance to safe, planned cataract surgery. These poorly measureable or scarred corneas need to be corrected (Corneoplastique as described in previous columns) with various modalities, such as Intacs (Addition Technology)/amniotic graft/lamellar graft/laser Corneoplastique, etc., and then with this measureable cornea, we proceed to the final internal IOL placement (cataract surgery) toward emmetropia.

In every case I work on, my 5S system works as my mental "coin sorter" to allow me to use more than 50 different refractive surgery techniques to be combined with unlimited permutations of technology while respecting all of my Corneoplastique principles (elegant, brief, topical, least interventional, and visually promising).

Noteworthy cases

Noteworthy cases

The previous column highlighted a few case scenarios of patients who were considered to be complex cases referred to me from around the world. The following case studies outline with images and videos my thought process and journey toward their best vision potential using the outside-in and the inside-out approaches.

(Case 1) This patient had with a dense central corneal scar with multiple RK incisions with cataracts. First, the scar was peeled along with simultaneous laser to a clear and measurable cornea. Cataract surgery then was performed with implantation of toric IOL to reach emmetropia.

Multiple Salzmann's nodules with cataracts were present in case 5 (slide 5). The nodules were peeled and Prokera (Bio-Tissue) was used along with laser to clarity and a measurable cornea. The patient is currently waiting to undergo cataract removal.

(Case 2) PostLASIK ectasia and asymmetric Intac segments were placed to stabilize the cornea and decrease the astigmatism from 7.4 to 0.6 D for improved vision. Cataract surgery was then performed with implantation of a

toric IOL. An excellent visual outcome was achieved to 20/20.

(Case 3) Ectasia following anterior lamellar keratoplasty with corneal instability and cataract in this patient with his only seeing eye. Asymmetric Intacs were implanted to stabilize the cornea and decrease the astigmatism from 10.1 to 2.7 D. With the cornea now measurable, the patient can undergo cataract surgery. The comparative topography illustrates the drop in astigmatism (and keratometry) from preoperatively to after placement of Intacs and before cataract surgery.

More cases

(Case 4) This patient had keratoconus with a very thin, unstable cornea, central scarring, and cataracts. Following my 5S system, I performed a hand lamellar keratoplasty. After the cornea stabilized, measurements for an IOL were performed and the patient achieved an excellent visual outcome with cataract surgery.

(Case 5) This patient had Fuchs' dystrophy with a central scar and advanced cataract. Descemets stripping endothelial keratoplasty and cataract removal were performed simultaneously. A toric IOL was implanted. Myopia was achieved as planned. Laser advanced surface ablation was used to then address central corneal scarring and the residual myopia to achieve emmetropia.

(Case 6) An aphakic patient with a scarred, decentered epikeratophakia 17 years previously. According to the 5S system, the epikeratophakia lenticule was removed and when the cornea was measurable and clear, an IOL was implanted. The patient achieved 20/25 uncorrected vision.

(Case 7) A patient with an aggressive and advanced pterygium up to the pupillary apex. Using the sutureless amniotic technique, the pterygium was removed and the corneal divot was filled with extended amniotic membrane. After healing, the patient had an excellent visual outcome. Three years postoperatively, the patient underwent cataract surgery, during which a multifocal IOL (AcrySof ReSTOR, Alcon Surgical) was implanted with the goal of

myopia. Laser PRK was performed to treat myopic astigmatism and correct residual scar in pupillary axis, and 20/20 vision was achieved.

More cases

(Case 8) In this patient with previous radial keratotomy surgeries, the cataract surgery can be performed to manipulate the internal optics that resulted in planned ametropia. Laser ablation profile (myopic or hyperopia) then can be applied to reshape the cornea (flatten or steepen respectively) along with central clearance and enlarging optical zone to emmetropia.

(Case 9) Anterior corneal dystrophy with cataracts, myopia, and irregular astigmatism. A lamellar keratectomy with cataract surgery was performed with myopia as the goal. Laser PRK myopic astigmatism ablation followed to achieve a clear cornea and emmetropia.

(Case 10) This patient had peripheral corneal scars and high irregular astigmatism with cataracts. Because the patient did not want to go through scar surgeries first, I designed her through cataract surgery by overcorrecting with toric IOL implantation so her flat axis (the one on which the VISX laser will work) will be away from her scars and therefore this caused the final axis for treatment to be between the scars rather than on the scars. The laser was then used to correct myopic astigmatism in clearing the center and reaching complete emmetropia.

(Case 11) This patient had high hyperopia and astigmatism with presbyopia and cataract after radial keratotomy. Cataract surgery was planned with implantation of a ReSTOR IOL with the goal of myopia as residual ametropia. Laser PRK was the next surgical step to correct the residual ametropia, myopia, astigmatism, and central irregularities including enlarging the optical zone and the patient had an excellent visual outcome to 20/20 unaided.

Patient/surgeon team

Patient/surgeon team

In my more than 20 years of experience with this designed, staged concept, I have seen patients' enthusiasm as I explain my plan to bring them to an optimal level of vision. The patients become my team member, and they express their excitement as we go from one stage to the next.

Challenging cataract surgeries approached in a staged fashion can be used not only to design vision, but also to optically manipulate the interior of the eye to present stage 2 as the final refractive surgical component.

Go to part four of the series.

References

• Gulani AC. Femtosecond Laser in Refractive Lens Exchange: Surgical Treatment for Presbyopia. Wang M, ed.; Slack Inc., Thorofare, NJ); 2016;109-115.

• Gulani AC. Corneoplastique: Art of LASIK & cataract surgery. ***Ind J Ophthalmol.*** 2014;62:3-11.

• Gulani AC. Evaluating the impact of femto laser-assisted capsulotomy. ***Cataract Refract Surg Today Europe.*** 2014;9:36-50.

• Gulani AC. Shaping the future and reshaping the past: the art of vision surgery. Chapter 98. In: Copeland and Afshari's Principles and Practice of Cornea. New Delhi, India: Jaypee Brothers Medical Publishers, 2013;2:1252-73.

• Donnenfeld E, Gulani AC. Astigmatism correction during cataract surgery. In: Garg H, Alió JL, eds. Femtosecond Laser: Techniques and Technology. 1st ed. Miami; JayPee Highlights Medical Publishers; 2012;21:155-161.

• Gulani, AC. Vision à la carte: Designing vision. ***Ophthalmology Times***. 2013;38:31-33.

• Gulani AC. Corneoplastique. Techniques in Ophthalmology. 2007;5:11-20.

Arun C. Gulani, MD, is founding director and chief surgeon of the Gulani Vision Institute, Jacksonville, FL. Dr. Gulani has no financial interests to declare.