With premium cataract surgery as the final frontier in vision rehabilitation for millions of the aging populace in the world, we must learn the art of maintaining a Premium mindset in not only designing their vision but also in correcting or enhancing their outcomes to optimal endpoints.

I strongly believe that although cataract surgery is the most frequently performed surgery in the world, no case should be treated as routine. As every case is unique, each patient deserves, not only the correct surgery performed using the best technology, but also a designed concept to meet their visual requirements that is tailored to each case individually. Thus, at the outset, it is important to understand the differentiation between premium and customized premium cataract surgery. The most important question to ask when a patient is diagnosed as cataract is, “Cataract and what else?” I teach my fellows with an analogy to the game of bowling. First pick all the pins i.e. associated ammetropia, presbyopia, pathology etc and then aim for a “Strike”. To have two pins standing at the end of a throw could be human error, mistake or complication but to not aim to “Strike” is unacceptable! Cataract surgery may be the only surgery the patient has in his lifetime and thus places on us the responsibility to correct as many visual dysfunctions as possible during the one surgery they need anyways (i.e. cataract surgery). Cataracts may have associated refractive errors, i.e., myopia, hyperopia, astigmatism, and when all of these factors are considered for each individual patient, the surgical plan unfolds clearly as we target to correct every ammetropia, pathology or previous surgery complication in our detailed examination and proceed to deliver Best Vision Potential (BVP). The Gulani 3T system is a simple method of designing a Premium cataract surgery plan for each patient. By using the Gulani 3T system (Gulani AC: Vision a la Carte, ESCR, Barcelona, 2015), which comprises Target, Technology and Technique the surgeon first determines the patient’s customized visual goals (Target). Next, the technologies to be considered are the type of lens implant: monofocal, multifocal, toric, accommodating, or dual IOLs; the cataract extraction technology: femtosecond laser/phacoemulsification; intraoperative aberrometry measurement systems, combinations such as LASIK laser vision surgery/diamond astigmatic incisions; and two- or three-dimensional visualization systems including the recently FDA-approved incision sealants (Figure 1). And finally, the surgical technique should be based on cataract densitometry analysis, associated pathologies, and planned incision site placement. Thus, Cataract surgeons have now, the technology and techniques available to tailor cataract surgery to suit the individual needs of each patient Designer Cataract surgery.

(Gulani AC: Designer Cataract Surgery IIRSI, India. 2015)

Additionally, cataract surgery can also be planned in stages if an accurate endpoint is not possible by single surgery.

Having performed numerous permutations and combinations, I have summarized staged cataract surgery into two simple strategies: Inside-Out (Figure 2) and Outside-In staged (Figure 3) surgery. Armed with this information, the surgeon can then dedicate a plan personalized to each patient. Rather than being intimidated by technology or its indispensability, one can confidently pick the technology most applicable in each case. Understanding of lens implant criteria, tear film correction, angle Kappa, spherical aberration, pupil size...
(photopic and mesopic) and occupation along with base refractive errors and higher order aberrations will lead to appropriate selection of implant technology towards consistent outcomes. For example, Multifocal IOLs are inherently contrast reducing. We therefore perform spherical aberration matching to get maximum vision out of this IOL. Post-myopic LASIK patients usually have positive spherical aberration, and post-hyperopic LASIK patients usually have negative spherical aberration. Now, we know that certain lens implant technologies like The AMO Tecnis multifocal IOL (Abbott laboratories, Abbott park, IL) reduces SA by 0.27 µm whereas the Bausch + Lomb Akreos and Crystalens has an SA of 0. These criteria can be used to our advantage in post-refractive patients who have spherical aberrations that could reduce their vision experience.

And finally, the most important aspect of Premium Cataract Surgery that is not usually taught and becomes the Achilles heel for surgeons is the training and understanding of what to do when Premium implants don’t work. With a worldwide referral base of unhappy premium IOL patients, I personally suggest never to remove the lens implant as a “Knee-jerk reaction” but first to assess the situation respecting the previous surgeon and trying to make that implant “Work”! No matter what the cause is of an unhappy patient after premium cataract surgery, it is in most cases possible to correct the vision and increase patient satisfaction. Complications associated with cataract surgery can be simplified by the following analysis scheme:

Gulani Cataract Complication Analysis:

I. Surgery related complications:
   a. Anatomical like corneal damage, iris damage etc
   b. Inflammation
   c. Optical pathway (ie. pupil, lens centration etc)

II. IOL based problems:
   a. IOL Power
   b. IOL optics in relation with Corneal optics
   c. IOL defects (broken/cracked/Subluxated)

III. Patient symptomaticity:
   a. Dysphotopsia (IOL capture)
   b. Psychological

c. Glares/Haloes etc

Anatomic damage can be corrected in the appropriate sequence, keeping in mind the least-interventional Corneoplastique techniques for restoring the anatomy in planning for the optimal optical outcome. Optical pathway complications can be addressed in pupil-IOL relations with many approaches, minimal of which could be the Donnenfeld Argon Iris Laser (at site of decentered pupil edge) technique. Intraocular lens-based complications can be related to defective intraocular lenses (IOLs), such as broken haptics and damaged optics, which resulted from a manufacturing issue or from handling before or during surgery. In such cases, an IOL exchange can be performed safely to restore the visual quality (Figure 4). Poor vision also can result from a less-than-optimal choice of IOL based on determining the angle kappa, spherical aberrations level, refractive errors, and corneal irregularities and not matching them with the appropriate IOL with the correct optic. Some patients can be negatively or psychologically affected or unprepared for improper or unexpected endpoints such as glare and halos. They may find relief only with exchange of the IOLs. Thus it is important that the patient is adequately educated about and prepared for the visual outcomes.

Case Scenarios
These case scenarios represent the application of logic based principles of Corneoplastique, in applying least intervention, brief, topical, elegant and visually promising techniques to achieve best visual potential (BVP) while trying in most cases to honor the original surgeon’s standing as well as choice of technology and making “Premium” Lens Implants work.

Case 1 was that of a patient who was referred to me after undergoing implantation of a multifocal IOL with a poor and unsatisfactory visual endpoint. The patient’s surgeon following Multifocal lens implant had resulted in an IOL surprise following which multiple laser and LASIK enhancements resulted in corneal scarring with a final vision of 20/200. Additionally this patient also underwent YAG capsulotomy. The patient was extremely angry with...
her surgeon and concerned as a result of the surgeries. Following my 5S system, I first wanted a “Measurable” cornea and hence performed Laser PRK with scar peel to correct the scarring and achieved a clear measurable cornea which refracted to a hyperopic endpoint of +6.00D and best-correct the vision of 20/25.

Now, as planned I was aiming to correct this “Measurable and Accurate” refractive error so a Lens based correction was the path that I zeroed down to. Considering the fact that this patient had undergone a YAG capsulotomy and therefore this lens implant could not be exchanged without detrimental maneuvers, I planned a piggyback lens implant. (Corneoplastique principles maintained: Brief, topical, aesthetically pleasing, least interventional and visually most promising) and brought this patient to 20/20 unaided for distance and near.

**Case 2** (Figure 5) was that of a patient who was referred with dense central corneal scar status post previous Radial Keratotomy surgery and had recently undergone cataract surgery. The On-Cornea scar in these kind of cases can be peeled off in the right plane resulting in improved vision (without need for any transplant) and he was already pleased with his vision so much that he deffered the planned Laser corneal ASA surgery to emmetropia. Another patient was referred by his eye surgeon following implantation of an Accommodative IOL in an eye with previous Radial keratotomy (RK). Before a knee jerk reaction of exchanging the implant, I always look at refractive errors and offer simulation to look for symptomatic improvements (BVP). Once you correct their ocular surface, you can attack the refractive errors using surface Laser ASA (New Carpet over Broken Tiles) and achieve visual satisfaction. Most patients with RK and for that matter any previous corneal surgeries who have bad endpoints after multifocal and premium IOL implants usually have some residual refractive error, most often astigmatism. I encourage surgeons to make sure that the refractive endpoint is always neutral before blaming the IOL implant. These cases can be corrected easily with corneal refractive surgery to excellent endpoints, thus maximizing the impact of the premium lens implant to achieve optimal vision. (Gulani AC: Corneal Scars; A Refractive Surgery. Hawaiian Eye Meeting, Hawaii. 2016)

**Case 3.** In this case, the patient had undergone a Multifocal lens implant and was unhappy with her vision. After treating her obvious dry eye, I refracted her and determined her astigmatism to be stable and on simulation she found improvement in her vision with that correction. We then proceeded with Laser vision surgery and achieved 20/20 vision. She noticed improved vision but came back to me and after another detailed consultation (where she explained her agony) and informed consent (remember she was 20/20 now) I agreed to remove her Multifocal lens and maintained her 20/20 vision using a monofocal lens implant. Next day she was 20/20 and very happy (nee, relieved). An example of a case where psychologically, a patient can actually feel so traumatized by what she felt was a “time-bomb” in her eye.

**Case 4** (Figure 6) was that of a 60-year-old patient with keratoconus who had undergone implantation of an aspheric IOL a couple of years ago and sought my consult for his poor resultant vision of 20/200. On presentation, he had a well-placed multifocal lens implant with intact posterior capsule, deep AC with healthy endothelium and keratoconus with hyperopia and astigmatism along with steep keratometry and anterior corneal scarring. Following my 5S system, I wanted to correct the following issues:

- Hyperopia,
- Astigmatism,
- Central scarring,
- High Keratometry

The single surgery that could correct all of these is Myopic-Astigmatic Laser ASA so to perform that surgery, I first had to make his refraction myopic and hence planned a piggyback IOL to make him Myopic and after a month measured him and proceeded with Laser ASA in Myopic mode to correct his refractive errors while flattening his Keratometry and clearing the central scar as a welcome side effect to unaided 20/20 vision.
Thus we made his own lens implant work and honored his surgeon’s desire and corrected their relation and trust in each other.

Premium cataract surgery can be used to design vision in patients with confidence and consistency to match rising patient demands for vision at all distances without glasses. Additionally, patients who have undergone premium cataract surgery can also be salvaged and corrected or enhanced to their optimal vision endpoints as we can see in examples above. Rising beyond technology and technique to aim for optimal visual targets in all patients we can confidently then suggest premium surgery to cataract patients turning their visual deficits into enhanced vision experiences. It is therefore possible in many cases of unsatisfied patients to deliver their desired vision by making their premium technologies work!

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Author Affiliation:

Arun C Gulani MD, MS
Former Chief of Cornea & Refractive Surgery University of Florida
Director and Chief, Gulani Vision Institute in Jacksonville, Florida-USA
Email:gulanivision@gulani.com