

DESIGNER CATARACT SURGERY



ARUN C. GULANI, MD
Ophthalmologist & Director
Gulani Vision Institute, Jacksonville, FL

One of the inevitable privileges of aging is the development of cataracts – the gradual clouding of our natural crystalline lens. Today, cataracts affect more than 22 million Americans over the age of 40 are affected and as the US population ages, more than 30 million Americans are expected to have cataracts by the year 2020. In India, especially in the rural parts of the country, this could be the most reversible cause of blindness.

The only solution is a surgical procedure that removes cataracts, and

replaces them with an artificial lens implant (since cataract was a lens to begin with). This is arguably the most common surgical procedure in medicine. Millions of cataract surgeries are performed throughout the world every year and it is called a “routine” procedure but I believe that “no cataract surgery should be routine.” In fact, my personal outlook is that “cataract surgery is an endeavor to help patients see what they have been missing and also an opportunity to plan for the best vision they can have for the rest of their life.”

With such an outlook, eye doctors are encouraged to classify every cataract patient into four categories and then individually plan to address all of their correctable visual issues using Custom designed Cataract Surgery with New Generation Lens Implants and/or staged Lasik Laser Vision Surgery.

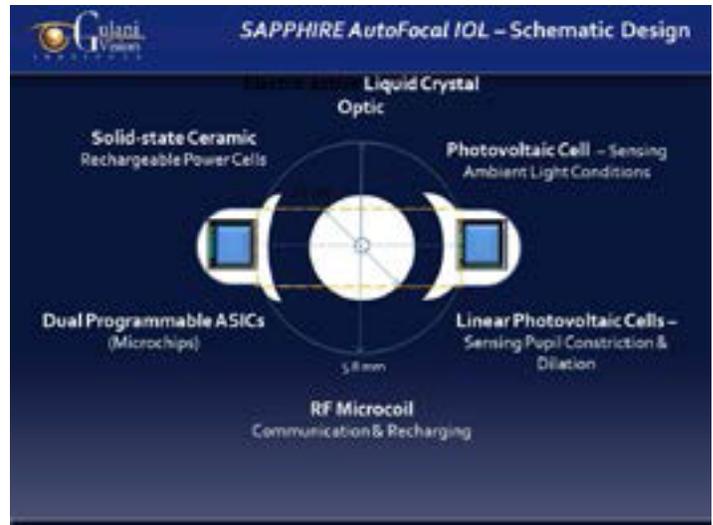
GULANI “CATARACT CATEGORY CLASSIFICATION”

- I. Cataracts with Associated Refractive Errors (i.e. Nearsightedness, Farsightedness, Astigmatism)
- II. Cataracts with Previous Eye Surgery (i.e. RK, Lasik. etc)
- III. Cataracts with Associated Pathology (i.e. Fuchs disease, Corneal scar, Keratoconus. etc)
- IV. Enhancing Previous Cataract Surgery (ie. Residual glasses, correction, haloes. etc)

CUSTOM CATARACT SURGERY & NEW TECHNOLOGY LENS IMPLANTS (IOLS)

Custom cataract surgery is performed as an outpatient procedure

using the “No Needles”, “No Patch” & “No Stitch” technique with computer programmed High Speed Ultrasound along with Diamond instruments. The cataract is replaced with an artificial lens implant (IOL). Exciting advances in IOL designs now give patients the option to choose between a Monofocal, Toric, Multifocal and Accommodating Presbyopia-Correcting IOLs ((like bifocal / multifocal / progressive glasses) which provide



a range of vision at near and distance, thereby allowing a person to perform most of their daily activities with reduced or no dependence on glasses.

Now, if you combine the analogy of a camera to a cataract patient, most cataract patients do wear some glasses or contact lenses for associated nearsightedness or farsightedness and or astigmatism – the 3 common refractive errors – and of course, they all have presbyopia (since they are usually more than 40 years old).

For example, a **CATEGORY I** cataract patient may be wearing Bifocal glasses for farsightedness, astigmatism and presbyopia (reading). We thus see 4 visual factors affected here: Cataract (cloudy vision) 2. Farsightedness 3. Astigmatism 4. Presbyopia The fact that this patient has a medically significant cataract is confirmed. Now, instead of taking such a patient, calling them “Routine” and rushing them through a Cataract surgery “Assembly Line,” your eye surgeon should take this opportunity and correct all of this patient’s visual problems through that one surgery that they need anyways.

Custom Planning for Customized Vision: I have proposed a 3T concept for surgeons when designing a Customized Cataract surgery plan:

I. TECHNIQUE:

1. The Surgical technique based on Cataract Densitometry Analysis.
2. Incision (entry) site and size based on 3-Dimensional Corneal Topography.

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3. Calculations for Lens implant Power, Sizing and Orientation based on IOL Master V, A-Scan Analysis & Scheimpflug Virtual Imaging.

II. TECHNOLOGY:

Type of Lens Implant: Monofocal / Multifocal / Toric / Accommodating / Dual

1. Cataract Removal Technology: Femtosecond LASER/ Phacoemulsification
2. Type of Combinations: Lasik Laser Vision Surgery/ Diamond Astigmatic (AK) Incisions
3. Surgeon Visualization systems: 2D or 3D (3 Dimensional)

III. TARGET:

1. Patient's customized visual goals: Monovision /



Progressive/ Accommodative Vision etc

2. Professional requirements: for example in Pilots and night vision dependent professions

Additionally, combined knowledge of the technologies as well as the optics of the eye will allow measurement of Higher order Aberrations along with Secondary Refractive errors and Optical Zones with Corneal Asphericity (factors that affect vision beyond the three common refractive errors. Armed with all this information, your doctor can then dedicate a plan personalized for each patient.

Getting back to the above patient example with 4 visual issues, such a patient can elect to have cataract surgery using a Multifocal (progressive) lens implant that can correct 3 out of 4 visual issues (1, 2 & 4). Resulting in only one visual issue remaining which is Astigmatism(3). This being a function of the foot ball shaped cornea, it can be addressed with Advanced Laser Vision Surgery

as planned a month after cataract surgery. Thus this patient who could have landed as a “routine cataract surgery” case now has a customized plan for their individual eye and vision goals. Further categories of patients with cataracts would include:

CATEGORY II: Patients who have had eye surgeries in the past to correct their vision (i.e. Lasik, Radial Keratotomy etc) may present with either long term side effects of that surgery, gradually decreasing vision over time or need for modern technology fine tuning. Their vision can be planned using Cataract surgery with specific, New Technology Lens Implants followed by staged, Advanced Laser Vision surgery to excellent visual outcomes.

CATEGORY III. Patients who have associated pathology (ie. Keratoconus, Corneal scars, Fuchs dystrophy) besides cataracts. In such cases, your eye surgeon can plan for the endpoint of vision by first manipulating the optics of the eye using New Technology IOLs with Cataract surgery in preparation for Laser Corneoplastique techniques.

CATEGORY IV. Patients who have undergone cataract surgery elsewhere and have a wrong IOL power in place, complication of the surgery or even those who simply want their cataract surgery of the past ‘Fine Tuned’ to 21st century vision expectations.

In such cases, your eye doctor should be able to study the case and plan to exchange your lens implant for a modern New Technology IOL, “Piggy Back” an IOL on top of their old IOL or even use Advanced Laser surgery to correct their residual glasses prescription so they can see without any glasses or contact lenses. Thus patients with previous cataract surgery can also hope to see without any glasses today.



FUTURE TRENDS: Laser cataract surgery using micron precision Lasers for surgery and lens implants that

can be fine-tuned after surgery (instead of needing exchange) and also become a shade darker in sunlight (just like photocell sunglasses) is a reality. We are presently working with an evolving technology that includes a battery powered lens implant that can change focus based on the patient's immediate vision requirement and also be recharged for over 50 years. So do not fret about being diagnosed with cataracts. Smile and ask your eye doctor if you can now have the vision you always desired with freedom to see at all distances and read without glasses for the rest of your life.

(References will be available on request).