Soosan Jacob, MS, FRCS, DNB

One cold winter's morning, while sitting in the airport after a meeting of the American Society of Cataract and Refractive Surgery and thinking about cataract surgery on eyes with subluxated lenses and how sutures are an intra- and postoperative nuisance, I was suddenly struck by the idea of a glued endocapsular device with a haptic that could be transsclerally fixated akin to a glued IOL haptic. At that moment, I experienced a slice of pure happiness and anticipation that was followed by a mix of bliss, excitement, and nervous anticipation as well as an inability to stop contemplating potential problems and their possible solutions. I soon found that research and innovation would be challenging and demanding but also fun and fulfilling.

Early in my career, I decided not to limit myself to one subspecialty, and fortunately, my institution supported this choice. My exposure to multiple subspecialties allowed me to understand similarities between Descemet detachment (DD) and retinal detachment. I identified the need for a new classification of DD based on etiopathogenesis, morphology, and optical coherence tomography features. Classifying the complication into rhegmatogenous, tractional, bullous, and complex DDs permitted me to develop a systematic approach to diagnosis, management, and prognostication. Working across subspecialities also inspired me to create a treatment algorithm based on classification and to describe a new technique called "relaxing descemetotomy" for certain cases of tractional DD. My video of this procedure won the 2013 European Society of Cataract and Refractive Surgeons film festival award (http://www.youtube.com/watch?v=nx5M4hibxFs).

I am currently researching contact lens-assisted cross-linking, a new technique for treating thin corneas that are not amenable to conventional collagen cross-linking. My idea is to increase the thickness of riboflavin-containing matter in front of the cornea enough to decrease ultraviolet irradiance of the endothelium to safe limits. The therapy uses an ultraviolet-barrier-free, riboflavin-soaked contact lens and a precorneal and a precontact lens riboflavin film.

Another technique that I am developing is stab incision glaucoma surgery, which involves a single stab tunnel entry into the anterior chamber followed by purposeful compromise of the tunnel to achieve aqueous drainage. The advantages of this approach include no subconjunctival dissection, a single 2.8-mm conjunctival entry incision that leaves almost all of the tissue virgin, less scarring, and no "ring of steel." Multiple attempts can be executed if required.

Corneal surgery is one of my greatest passions. While performing Descemet membrane endothelial keratoplasties (DMEKs), I realized the need for better visualization and comprehension of graft dynamics. This led me to create endoilluminator-assisted DMEK (E-DMEK) for excellent visualization and three-dimensional depth perception of a DMEK graft. E-DMEK makes the procedure easier and faster and helps me to identify graft morphology, orientation, dynamics, and positioning. I am also conducting research on a corneal transplantation technique developed by Harminder Dua, MD, PhD, and Amar Agarwal, MS, FRCS, FRCOphth, called "pre-Descemet endothelial keratoplasty" (PDEK). PDEK involves the transplantation of Descemet membrane, the endothelium, and Dua's layer. Including Dua's layer with a DMEK graft provides resilience, simplifies graft preparation, and allows for use of younger donor corneas. E-PDEK as in E-DMEK makes surgery easier.

The greatest reward for a researcher is peer acceptance. I am gratified to see that many doctors in India, the United States, and other countries are now practicing my oculoplasty technique "supra-brow single-stab incision frontalis sling" surgery for better cosmesis.

I think a successful researcher needs a mentor for support and guidance. Amar Agarwal, MS, FRCS, FRCOphth, and Athiya Agarwal, MD, FRSH, have been inspiring role models and great mentors, and I want to thank them for always supporting me. I am fortunate to work in a premier tertiary care hospital renowned for its innovative culture. Research also needs immense familial support, and I thank God for my loving husband, my two patient and understanding children, and my wonderful parents, who instilled in me a need for accomplishment and a sense of pride in my work. ■

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