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# IOL Matters

## Materials technology provides essential tools for modern cataract surgery




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# Letters from the Editors

Dear Friends

This issue of *EyeWorld Asia-Pacific* concerns itself with intraocular biomaterials and viscoelastic devices. Arguably, these two innovations in addition to phacoemulsification are responsible for the revolutionary changes in cataract surgery over the last few decades. Those ophthalmologists who began their careers when intraocular lenses were in their infancy and viscoelastic materials were not available will recall how dramatically cataract surgery changed due to these innovations.

The first intraocular lenses were manufactured from polymethylmethacrylate (PMMA). PMMA was associated with severe endothelial damage that occurred with contact between the lens implant and endothelium during implantation. This phenomenon was one of the stimuli for the development of new intraocular lens materials, and viscoelastic devices that protect the endothelium and maintain space during lens insertion and other surgical maneuvers.

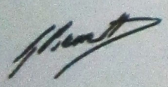
The introduction of foldable intraocular lens materials with phaco has allowed us to perform surgery through incisions as small as 1.8 mm, eliminating the need for sutures, reducing astigmatism and improving wound security. Today we have several materials available for the manufacture of intraocular lenses. As discussed in the roundtable in this issue, there remain issues with currently available IOL biomaterials. I do believe that there will continue to be improvements in terms of the biocompatibility, long-term clarity and physical properties of these materials.

Similarly, for several years following the introduction of the first viscoelastic for human intraocular surgery by Balazs in 1979, Healon was the only product available. Today there are several alternatives with different formulations.

Terms such as cohesive, dispersive, viscoadaptive, viscocohesive and more recently viscodispersive have been used to describe the performance of different products in relation to endothelial cell protection, space maintenance, clarity, retention during lens removal and ease of removal at the end of the procedure. To some extent these terms are artificial and there is a considerable overlap between the different categories. Although there is a desire for one product that would possess all the ideal characteristics, it may be more realistic to consider separate agents for different phases of the procedure.

Regardless of one's personal preferences, it is indeed gratifying to have so many choices available with respect to lens materials and viscoelastics. I hope that the articles on both topics will be helpful to surgeons so that they are better able to make choices that suit their particular technique and patients. It is certainly worthwhile to reflect on the efforts of individuals and industry, which have resulted in improved lenses and viscoelastic materials, allowing the outstanding results available with modern cataract surgery.

Warmest regards



**Associate Professor Graham Barrett, MD**
President, APACRS
Chief Medical Editor, *EyeWorld Asia-Pacific*

Dear Friends

It is a pleasure as always to welcome everyone to the latest edition of the *EyeWorld Asia-Pacific*. This issue covers the APACRS annual meeting held in conjunction with the 24th Annual Meeting of the Japanese Society of Cataract & Refractive Surgery (JSCRS). A summary of the 2009 APACRS Lim Lecture—a clinical update on intraoperative floppy iris syndrome (IFIS) and its management—is included in this issue. The cover feature for this issue is "Ophthalmic viscosurgical devices and IOL biomaterials—the search for the perfect IOL biomaterial." This issue also highlights the role of femtosecond laser in DSEK and advances in mechanical microkeratomes, and covers the therapeutic and diagnostic advances in dry eye, targeting the inflammatory pathogenesis of dry eye. Concluding this issue is a friendly exchange of views across the globe between members of the APACRS and ASCRS in a joint session called "Counterpoint", designed to examine opposing views on key issues in cataract and refractive surgery.

IOL biomaterials have evolved considerably from PMMA lenses to current generation biomaterials including silicone and acrylic lenses. Developing an understanding of the clarity, long-term biocompatibility and optical performance of each lens biomaterial is essential in the quest for the perfect IOL biomaterial.

Recent advances in microkeratome technology, particularly disposable-head microkeratome technology, seem to have decreased the incidence of flap complications to a level almost comparable with the results of femtosecond laser; however, the femtosecond laser has become the procedure of choice for laser refractive surgery.

Since lamellar cutting and various vertical cutting is possible, the femtosecond laser can be used in DSEK. However, the definitive role of the femtosecond laser for posterior lamellar disc preparation has yet to be established.

Pseudophakic endophthalmitis is of particular concern in the Asia-Pacific, where high volume cataract surgery is practiced. It is important to have a high index of suspicion for postoperative infection if the inflammation is more severe than expected. Recent advances in vitreo-retinal surgery have made it possible to perform sutureless vitrectomy with AC maintainer through a two-port pars plana approach. This approach avoids suprachoroidal entry when it is difficult to visualize the vitreous base due to thick exudates and membranes, and prevents hypotony. Meanwhile, AC wash, bag wash and IOL wash are done simultaneously.

It is well recognized that inflammatory mechanisms are involved in the pathophysiology of dry eye. It has been proposed that targeting specific molecules in the generation or immune expression of dry eye can inhibit the disease and create new therapeutic modalities.

I hope the discussion of varied ophthalmic situations in this issue will be interesting and informative for everyone.

*Varıyarkkonru ivate ikaimar rellam*
*Kuriyetirpai nira tutaittu.*

To give to the needy alone is charity;
All the rest is investment for a return.

– Thirukkural, Chapter 23 Charity – kural 221

With warm regards

**Dr. S. Natarajan**
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