The Expanding Spectrum of Refractive Surgery

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In my first editorial as Editor-in-Chief of the Journal of Refractive Surgery, I discussed the fusion of “corneal” and “intraocular” procedures under the widening umbrella of “refractive surgery.” Nothing illustrates that concept better than this month’s issue of the Journal, with articles encompassing nearly every available anterior-segment approach now considered refractive surgery. Among the diverse topics presented herein, the safety and efficacy of femtosecond cataract surgery, the advanced analysis of subclinical ectatic corneal disease, and the evolution of corneal collagen cross-linking (CXL) techniques provide essential information for all ophthalmologists.

Perhaps the hottest topic in ophthalmology currently is femtosecond laser-assisted cataract surgery. A prime concern about new technologies is that “hype” may speak louder than facts; therefore, surgeons need hard data from which to make educated decisions about this new technology. In this issue, Miháltz and colleagues report potential visual aberration benefits for femtosecond laser cataract surgery. Although standard visual acuity outcomes did not differ between femtosecond or manual capsulotomy groups, more subtle markers of visual quality, including internal aberrations, Strehl ratios, and modulation transfer functions favored the femtosecond laser group. Members of the same research group also reported favorable outcomes regarding macular thickness in the early postoperative period, suggesting that the suction ring utilized for femtosecond laser cataract surgery has minimal adverse effect on the retina. With femtosecond laser cataract surgery still in its infancy, more studies are essential to evaluate the technique, benefits, and potential complications.

Improved identification of subclinical ectatic corneal disease in refractive surgery candidates remains of utmost importance. Wei and colleagues compared eyes with unilateral keratoconus to normal eyes and found that only irregularity indices with Orbscan II (Bausch & Lomb) technology demonstrated differences between groups, emphasizing the challenge of identifying such eyes when no definitive topographic abnormalities exist. Ambrósio and colleagues evaluated regional pachymetric indices generated from the Pentacam (Oculus Optikgeräte GmbH) and found a variety of these parameters can distinguish between keratoconic and normal eyes. The utility of this technique to identify subclinical keratoconus remains undetermined.

The efficacy of CXL is no longer in question; however, the optimal technique for riboflavin administration to maximize efficacy and safety, minimize discomfort, and reduce the potential for complications that accompany prolonged epithelial healing, continues to drive research toward better ways to apply the drug. Alió and colleagues evaluated keratoconic eyes implanted with intrastromal ring segments undergoing subsequent CXL and found no significant difference in outcomes when riboflavin was applied with the standard epithelial removal technique or through infusion of the drug into ring segment channels. This study may identify an alternative approach to drug delivery for CXL.

Many other outstanding articles are contained in this issue of JRS, which report improved accuracy and precision of modern mechanical microkeratomes and improved safety of phakic intraocular lenses (IOLs), as well as novel approaches to IOL implantation in eyes without capsular support. I believe our colleagues will find these articles thought-provoking and of clinical relevance, even if they do not yet consider themselves “refractive surgeons.”

REFERENCES


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