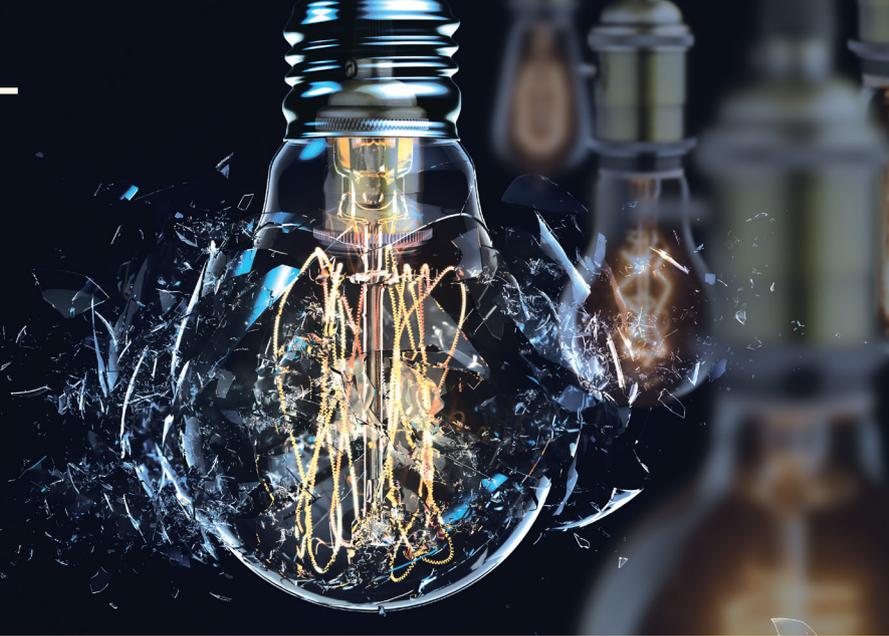


BRIGHT IDEAS



When I was invited as the guest medical editor for this special edition of *CRST Europe* dedicated to the future of CXL, I decided that I wanted to address topics that were debated in Zurich, Switzerland this past December, at the 2016 International CXL Experts' Meeting.

This scientific meeting has always been provocative in terms of finding consensus among key opinion leaders and in challenging and substantiating (or not) the claims of industry. The probable reason for this is that the meeting attracts many, if not all, of the key opinion leaders in the field of crosslinking. Because the meeting is relatively small and does not have parallel sessions, all of these experts are in one room, discussing the same topic.

With this in mind, I hope that the articles on the following pages can emulate the lively debates I enjoyed at the experts' meeting, covering many facets of CXL applications and research. Specifically, guest authors in this cover focus address the continuing debate regarding the efficacy of epithelium-on (epi-on) versus epithelium-off (epi-off) procedures. Ongoing research addressing the barriers preventing epi-on from being as effective as standard Dresden protocol CXL is promising, yet there are no published clinical data suggesting that any change is on the horizon. The biggest risk of the CXL procedure is postoperative infection, and we all want a solution that eliminates the removal of the epithelium. However, sacrificing the efficacy of the procedure is not the way to overcome this risk, especially in young people. There are exceptions, but, in general, I personally do not believe an epi-on procedure should be performed as a standard of care. Others disagree, and, in this special article series, that rationale is explored as well.

Add-on treatments and procedures to improve visual outcomes in treated keratoconus patients will be increasingly used in the near future. As all corneal specialists who treat keratoconus know, there are two sequential hurdles to overcome: (1) medical (ie, disease progression) and (2) visual rehabilitation. Once the patient has been safely treated with CXL, the second hurdle must be addressed.

On a personal level, I am enthusiastic about recent findings from my research group showing efficacy in CXL treatment of extremely thin corneas. This is done by individually adapting the overall UV-A

light fluence based on the thickness of the cornea after abrasion and riboflavin instillation. We have treated 26 eyes so far with corneal thicknesses between 215 and 390 μm . No endothelial decompensation was observed, and we aimed at a demarcation line 70 to 80 μm away from the endothelium. In other words, we may now be able to maximize the crosslinking effect, even in extremely thin corneas. Whether or not the additional crosslinks created will be able to arrest keratoconus progression in such thin corneas remains to be seen.

In summary, I believe that, in the future, CXL will become simpler and easier to administer. Additionally, more countries will adopt this procedure into their reimbursed health care systems, making the profit per case for physicians substantially lower than it is now. Therefore, unless the price of consumables becomes lower, there will be little resistance from corneal specialists when industry starts targeting general ophthalmologists as its future customer base.

I also personally hope that research on the use of CXL for the treatment of corneal infection, dubbed *photoactivated chromophore for keratitis* (PACK-CXL),¹ will gain more momentum. I strongly believe that this treatment method has the potential to make a major impact in the treatment of infectious keratitis. ■

1. Hafezi F, Randleman J. PACK-CXL: Defining CXL for Infectious Keratitis. *J Refract Surg*. 2014;30:438-439.



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