Theo Seiler, MD, PhD

Professor Seiler presented the Charles D. Kelman lecture on his collagen crosslinking research at the American Society of Cataract and Refractive Surgery (ASCRS) meeting in April.

1. What is Professor Seiler's background?

Professor Seiler teaches general ophthalmology and is a specialist in corneal and refractive therapy, physiologic optics, ophthalmic lasers, and anterior segment surgery. Professor Seiler is credited as being the first physician to use an excimer laser on the human eye. He was born in Ravenburg, Germany, in 1949. He studied medicine, mathematics, and physics at the Universities of Heidelburg and Berlin. In 1976, Professor Seiler became a professor of physics at the Peter-Silbermann College in Berlin. Shortly after, he began his residency in the Department of Ophthalmology at the Free University of Berlin, where he rose to senior assistant and lecturer in 1985. He then became a Professor of Ophthalmology in 1990.

In 1993, Professor Seiler became Professor and Chairman of the Department of Ophthalmology at Technische Universität of Dresden, a unique interdisciplinary center that focuses on research and teaching.

Professor Seiler assumed his current position in 2000. He is the Professor and Chairman of the Department of Ophthalmology at the University of Zurich in Switzerland.

2. What was the inspiration for Professor Seiler's research on corneal crosslinking?

The concept of crosslinking is not new, Professor Seiler explained during his Innovators Lecture at the 2008 ASCRS Symposium on Cataract, IOL, and Refractive Surgery, in Chicago. People have used crosslinking to tan leather for more than 6,000 years, and dentists have taken advantage of the stiffening effect of UVA in plastic materials for more than 25 years, Professor Seiler said during his lecture. It was this process that gave Professor Seiler the idea to crosslink collagen in the cornea. He believed that the stiffness could counteract keratoconus.

Crosslinking preclinical studies began in 1993 and included laboratory work and animal trials, Professor Seiler said. It was during this time that the treatment parameters were identified. Several substances, including aldehyde sugars, chemical crosslinkers, and irradiation, were tested before the first patient was treated with riboflavin and UVA in 1998. Once the patient experienced no side effects, a pilot study was created to confirm the results.

3. What is the timeline of crosslinking from when the parameters were established to Professor Seiler's current research?

After optimal parameters were identified, a pilot study to confirm the clinical feasibility began in 1999. It took another 2 years, however, until patients were enrolled in multicenter prospective studies, Professor Seiler said. Those studies are still underway and have continued to help researchers improve upon the technology as well as identify a full list of indications for crosslinking, he added. "We are also now searching for rare complications and establishing contraindications as well as indications," he said during the lecture. To date, more than 400 corneas have been crosslinked in Dresden, where the procedure first began.

4. Are there any potential future applications?

Investigators are currently examining PRK in crosslinked eyes and the potential for scleral crosslinking. Additionally, several investigators have used crosslinking to slow the progression of keratectasia after LASIK. In a small study of 10 cases, keratectasia did not progress in any instance after crosslinking, Professor Seiler said. Additionally, no patients lost two or more lines of BCVA, and six patients had an improvement of two or more lines of BCVA, he said. In 30% of the patients, UCVA also improved by two or more lines.

The uses will most likely not stop there, Professor Seiler added. As with any new technology, one can expect others to add or expand upon it in their own way. "That is what will be done in the next few years," he said.

5. What other awards and honors has Professor Seiler received?

In addition to being honored this year by the ASCRS as the Charles D. Kelman Innovator's Lecturer, Professor Seiler received the Binkhorst award from the American Academy of Ophthalmology (AAO) in 1994; the Barraquer Award from the AAO in 1995; the Graefe Award from the Deutsche Ophthalmologische Gesellschaft in 1996; and the Honor Award from the AAO in 1997. ■