

# I UNDERWENT CXL TO TREAT MY KERATOCONUS



What I learned from the experience.

BY JAMES C. LODEN, MD

I was diagnosed with keratoconus right after my first year of medical school, when I was about 23 years old. I had noticed that my astigmatism had changed significantly, but at that time I was not yet an ophthalmologist, so I didn't fully understand it. I just noticed that I wasn't getting as good vision as I used to with my toric contact lenses or spectacles, particularly in my right eye. My dad, who was an eye surgeon, saw these signs and thought that I might have keratoconus. He sent me to a cornea specialist, Tom Woods, MD, in Memphis, Tennessee, who diagnosed keratoconus.

There was no corneal topography in 1988. We didn't have the Orbscan (Bausch + Lomb), Galilei (Ziemer Ophthalmic Systems), or Pentacam (Oculus Optikgeräte). The diagnostic tools available at that time were unsophisticated compared with current standards. Diagnosis of keratoconus was basically done by looking at the mires through a keratoscope. If those mires looked a little steep or irregular, keratoconus was diagnosed.

Dr. Woods told me that he thought I had keratoconus and that the main thing I should do is avoid rubbing my eyes. In hindsight, I think I developed keratoconus as a result of rubbing my eyes while studying in college and medical school. I would hold my eyes closed to memorize something, and I would put the thumb of one hand on one eye and a finger on the other as I

was sitting there trying to remember all of this information. Dr. Woods told me to stop putting pressure on my corneas. And I listened.

My keratoconus progressed slightly for a couple of years, but then it stabilized and didn't progress much at all. I was able to achieve really good vision just wearing regular gas permeable contact lenses. Not much in my life changed with the diagnosis, but it could have impeded my career if the keratoconus had progressed further—it probably would have eliminated cataract and refractive surgery from my career options.

## TIME FOR CXL

I was 52 years old when I underwent CXL, performed by my partner Terrence Doherty, MD, a fellowship-trained cornea surgeon. Dr. Doherty had been checking my corneas every year to make sure everything was looking the same. That year, he noticed subtle Vogt striae in my right cornea that had not been previously noted. Then, at an ASCRS meeting, I saw a presentation by Theo Seiler, MD, PhD, documenting progression of keratoconus in patients in their 60s and 70s.

Before that, the traditional school of thought was that, if a patient with keratoconus made it into the 40s and 50s, he or she would probably not see further progression. I then became worried that, despite 20 years of stability, I could hit a progressive phase again.

By this time, things had changed in our profession. We could monitor keratoconus progression with corneal topography, and we could perform CXL when necessary.

## UNUSUAL PROCEDURE DESIGN

Dr. Doherty and I, in consultation with William F. Wiley, MD, decided to use an epithelium-on (epi-on) CXL approach, not approved by the US FDA, because I did not want to undergo a full epithelium-off (epi-off) procedure. The big issue with performing epi-off CXL for mild keratoconus is the potential for a significant delay in visual recovery. Patients for whom I have performed epi-off CXL have experienced significant delays—from 3 weeks to 3 months, in rare instances—before full visual activity was restored.

I knew I couldn't take disability for 3 months; I could bankrupt my business doing that. After consulting multiple surgeons, therefore, I opted for a 20- $\mu$ m phototherapeutic keratectomy (PTK) to roughen up the epithelium, a 30-minute soak with riboflavin solution, and three 5-minute UV-light treatments with 5-minute soaks between each one.

The logic behind this procedure design is that, because oxygen is the rate-limiting factor in the CXL chemical reaction, we wanted to give the cornea time to recover and reoxygenate between UV-light treatments.

This was an unusual design for a CXL procedure, but it was important to me

that it be epi-on CXL, and I wanted to try to get just enough stabilization to make sure I wouldn't progress. There is no approved process in the United States for epi-on CXL, and I didn't have time to travel outside the United States to have it done, so I cooked up this protocol after consulting with Drs. Wiley and Doherty.

### THE EXPERIENCE

I felt absolutely nothing during the PTK portion of the procedure, when the excimer laser fired to remove the epithelium. There is a loud snap each time the laser fires, but there is no corresponding sensation whatsoever, and that should be the case if the cornea is well anesthetized.

One thing I noticed was that the part of my eye that became uncomfortable during the long riboflavin soaks was not the cornea, but rather the inner surface of my eyelid. As the alcaine or tetracaine

anesthetic wore off, I would start feeling the lid speculum on the inner surface of the lid. The cornea is easy to numb because it is so exposed, but getting those numbing drops up under the eyelids is more difficult. If our patients are going to feel a little discomfort during CXL, it will probably be under the lids.

If a patient notes discomfort even after you've generously numbed the cornea, consider attempting to place numbing drops on the inner surface of the lid instead of the cornea.

### RELATING TO PATIENTS

Any time an eye surgeon has an opportunity to undergo an ophthalmic procedure, he or she should seize the opportunity. If you're a great candidate for LASIK, why not have LASIK? It gives you a greater ability to relate to your patients.

My experience undergoing CXL for keratoconus has really helped me

in my interactions with my LASIK patients. Because I went under the excimer laser for PTK, I can explain what it feels like. I can say to them, "Well, I've had a procedure done. It's not exactly the same as LASIK, but I can tell you what it's like under the laser. You can see the red light, but the brightness isn't too bad. Every time the laser fires, you don't feel a thing. You may smell a little bit of odor, but that's it."

In the end, having gone through eye surgery myself gives me a better ability to relate to the patient. ■

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