

Using a Laser to Create Intrastromal Arcuate Incisions

Correcting astigmatism with the iFS.

BY STEVEN C. SCHALLHORN, MD

In April of this year, the iFS Advanced Femtosecond Laser (Abbott Medical Optics Inc.) received FDA clearance for use in the creation of arcuate incisions in corneal surgery, including cataract surgery. Where I practice, my colleagues and I use the laser for this purpose and perform the technique intrastromally, without breaking the epithelium.



EARLY EXPERIENCE

By applying femtosecond laser energy with computerized control, the surgeon has vastly greater control over the arcuate incisions—a huge benefit compared with manual techniques. The level of precision with the laser is much higher, and of course, it is not possible to manually perform arcuate incisions intrastromally without going through the epithelium. Early concerns about using a laser incision were that it would not have as much effect as a traditional arcuate incision, that the ability to titrate the results might be limited, and the results would not be as predictable. In my experience, this has not been the case. Laser-created arcuate incisions can achieve the desired astigmatic correction, and the results are titratable. These incisions can effectively reduce low to moderate levels of astigmatism. In early analysis, the refractive result appears to be stable through 3 months of follow-up.

Although the work is preliminary, we have treated more than 100 patients. The iFS appears to be most beneficial for the correction of low to moderate cylinder (0.50-2.50 D). Analysis for nomogram refinement is underway to further improve results. Based on these first treatments, however, the surgery appears to be safe and effective.

ADVANTAGES

A femtosecond laser offers a significant advantage for ophthalmic surgery in terms of its precision and accuracy. Specifically, the incision's placement, optical diameter, arc angle, incision bevel, and depth are performed with a level of control that surgeons have not been able to accomplish with a blade. In intrastromal surgery, there is no need to break the epithelium, which minimizes the chance of infection. Moreover, the procedure itself is very comfortable for the patient. In addition, it appears that outcomes are less variable compared with manual arcuate incisions.

The technique will evolve and undoubtedly improve as we learn more about the procedure and how the laser system's parameters affect the results.

CONCLUSION

One advantage of creating an arcuate incision with the femtosecond laser that penetrates through the epithelium is that the refractive effect can be increased postoperatively by manually opening the incision. This approach introduces variability, however, and the refractive result may be unpredictable. Although our experience is still limited, at this point I prefer an intrastromal incision. Preliminary results show it to be safe and effective, and the laser technology is only going to get better. ■

Captain (Ret.) Steven C. Schallhorn, MD, is in private practice in San Diego and is chief medical director of Optical Express. He is a consultant to Abbott Medical Optics Inc. Dr. Schallhorn may be reached at scschallhorn@yahoo.com.

