There is currently no gold standard for presbyopia correction; however, we have entered a new era of laser procedures that correct accommodative loss in a minimally invasive way. One such method that has received a lot of recent attention is IntraCOR, an intrastromal presbyopia treatment in which there is no flap or lenticule creation. Photodisruption with the Technolas femtosecond laser (Technolas Perfect Vision, Munich, Germany) creates changes inside the stroma, altering its biomechanical properties and reshaping the cornea itself, but not necessarily its thickness.

Luis Antonio Ruiz, MD, of Bogota, Colombia, performed the first IntraCOR treatment in October 2007 and presented his results at the 2008 Royal Hawaiian Eye Meeting the following January.1 During initial treatments, the anterior and posterior surfaces of the cornea remained intact, and the epithelium and Bowman’s layer were not disturbed. Dr. Ruiz found that this noninvasive procedure avoided many of the problems associated with laser procedures that open the cornea to ablate the stroma.

Since Dr. Ruiz’s original experience with IntraCOR, other surgeons have transitioned to intrastromal correction from more invasive means of laser ablations for presbyopia. I started performing IntraCOR at the Istanbul Surgery Hospital in February 2008 and have since treated 302 presbyopic eyes with emmetropia or mild hyperopia, 14 post-LASIK eyes, and 20 pseudophakic presbyopic eyes. (Editor’s note: According to the company, combining IntraCOR with other corneal refraction options is currently under evaluation.) I have created my own treatment nomogram depending on the patient’s refraction, keratometry values, corneal thickness, scotopic pupil size, and anterior chamber depth.

As I see it, the advantages of IntraCOR include its ease of delivery, quick procedure time (20–25 seconds), and fast visual recovery. During the procedure, stromal cells are initially converted into gas bubbles, which then disappear postoperatively after a few hours (Figure 1).

**Clinical Results**

We have followed 114 patients with mild hyperopia or emmetropia for a mean of 9.4 ±4.1 months (range, 1–20 months) after presbyopic correction with IntraCOR. The Snellen chart (decimal) was used for distance visual acuity (VA); for near VA, the Jaeger chart...
was used. Of 180 eyes treated in these 114 patients, most achieved significant improvement in near UCVA, with mean reading ability improved from J 12.4 to J 2.1 and stable over the course of follow-up (Figure 2).

IntraCOR is also capable of correcting approximately 0.50 D of distance refractive error. The mean postoperative spherical equivalent was 0.59 ±0.39 D (range, -0.12 to 2.00 D). Mean distance UCVA improved from 0.72 ±0.24 to 0.82 ±0.17 (Table 1).

Unlike other presbyopia treatments, IntraCOR does not affect distance BCVA. In this series, mean distance BCVA decreased from 0.99 ±0.38 to 0.94 ±0.09. In early cases, five eyes lost 1 line of BCVA (2.8%) and five eyes lost 2 lines due to late-onset haze. We initially applied only steroids and artificial tears postoperatively; now, we also apply mitomycin-C preoperatively and prescribe cyclosporine drops postoperatively. After changing the protocol, we have not observed any loss of BCVA or recorded any patient complaints of night halos.

**POST-LASIK INTRACOR**

We have performed IntraCOR in 13 patients who previously underwent LASIK. In our experience, the procedure works well in some but not all eyes in this category. For instance, we observed a high myopic shift on previously myopic eyes; however, results improved in previously hyperopic eyes. Additionally, flap thickness seems to affect visual results. Measuring flap thickness with optical coherence tomography (OCT) is an important component of planning IntraCOR in post-LASIK eyes. Gains in near UCVA were not as good in post-LASIK as in virgin eyes in our study (Table 2).

**PSEUDOPHAKIC APPLICATION**

IntraCOR is effective in pseudophakic eyes. We observed a significant increase in near vision and no difference in distance BCVA and UCVA (Table 3) in the 20 eyes enrolled in this group.

**SUMMARY**

IntraCOR is less invasive than other presbyopic laser techniques such as monovision LASIK, conductive keratoplasty, or presby-LASIK. In our series, patients’ dis-
A significant improvement in near UCVA, slight improvement in distance UCVA, and stable BCVA were noted at 12-month follow-up in 21 patients who underwent presbyopic correction with IntraCOR (Technolas Perfect Vision GmbH, Munich, Germany). Results were promising, with minimal side effects, said Mark Tomalla, MD, during his presentation at the European Society of Cataract and Refractive Surgeons’ Winter Meeting in Budapest, Hungary.

All patients had mild hyperopic presbyopia, with preoperative sphere and cylinder ranging from 0.46 to 0.61 D and -0.23 to 0.25 D, respectively. Patients returned for follow-up at 1 day, 1 week, 1 month, 3 months, 6 months, and 12 months. All patients (mean age 53.8 ± 6.2 years) were available for 3-month follow-up; 19 were available at 6 months and 20 at 12 months. On average, patients gained 4.8 lines of near UCVA (logMAR). Although one patient lost 2 lines at 12 months, the majority (60%) gained up to 3 lines of distance BCVA. Distance UCVA remained the same or improved in 75% of patients, and less than 20% lost 2 lines due to a slight myopic shift after IntraCOR. Distance UCVA showed a trend of slight improvement after 12 months.

Dr. Tomalla and colleagues at the Clinic Niederrhein in Duisburg, Germany, used Scheimpflug corneal topography to study the true net refractive power change. The total difference in postoperative minus preoperative refractive power was approximately 2.00 D in the central cornea (Figure 1).