

57-Re-treatment one year after photorefractive keratectomy (PRK) for myopia

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After performing your first several PRKs, the question inevitably arises: “When should I retreat, and what results can I expect from re-treatment?”

To help answer this question, Maria L. Gomez, MD, of Moorefield’s Eye Hospital, in London, England, looked at 35 retreated PRK patients. These results, entitled “Re-treatment one year after photorefractive keratectomy (PRK) for myopia,” were presented at the AAO meeting in San Francisco. Co-authors on this study were Julian D. Stevens, MD, Linda A. Ficker, MBBS, David S. Gartry, FRCOphth, and Philip D. Rosen, FRCOphth, all also of London, England.

The authors looked at 35 patients who had an original PRK for between -1.5D to -15D of myopia. All retreatments were performed at least 1 year after the original treatment. All patients were originally treated on the Model B VisX laser. All retreatments were performed using the Model C VisX laser, which is the VisX model currently approved for use in the U.S.

The retreatments represented 2% of initial PRK patients. Retreatment indications included regression and undercorrection of the spherical component, or uncorrected visual acuity (UCVA) of 20/50 or worse. All patients completed at least 12 months follow-up.

All patients were placed on a standard steroid and antibiotic drop regimen post-PRK. All medications were stopped by one month postop.

Patients were those that had initial PRK for low to moderate myopia. Mean spherical error one year after retreatment was -0.8D, with a range of +3.0 to -5.5D. Scalar analysis showed a reduction in mean astigmatism by 33% after retreatment. Vector analysis showed a mean surgically-induced astigmatism of 1.1D.

Safety was assessed by analyzing loss of best spectacle corrected visual acuity (BSCVA) at 12 months. After the original PRK, 8% of patients had lost 2 or more lines of BSCVA, whereas only 6% of patients after retreatment had a loss of 2 or more lines of BSCVA. Therefore, retreatment did not cause any further decline in BSCVA in these patients.

There was a statistically significant improvement in uncorrected visual acuity (UCVA) after retreatment in all subgroups.

The authors also discussed the results of their early analysis of two different techniques used to perform the retreatment PRK. They called these two techniques “non-smoothing” (i.e., standard PRK), and “smoothing” PRK. There was no attempt to randomize patients between these two techniques.

The “smoothing” technique, developed by Dr. Julian Stevens, consisted of soaking the cornea with normal saline solution, waiting 30 seconds for stromal hydration, after which a 5 um PTK was applied in short bursts. This procedure is supposed to draw fluid up out of the hydrated cornea, which is hypothetically superior to external fluid application in smoothing the ablated surface. Electron photomicrographs of porcine corneas treated with this technique demonstrate the smoother surface using the smoothing process.

For the smoothing group, 81% of the intended refraction by retreatment was achieved, compared to 48% in the non-smoothing group, a difference that was significantly significant. Also, no patients in the smoothing group lost 2 or more lines of BSCVA, compared to 8% of patients in the non-smoothing group. UCVA was better, and haze less, in the smoothing vs. the nonsmoothing group.

The authors concluded that while retreatment of PRK improved the refractive results, there remained two major problems: the scatter of refractive results, and the loss of BSCVA, which was often associated with haze. Both of these parameters were improved in the smoothing vs. the nonsmoothing groups, leading Dr. Gomez to conclude that the smoothing technique may be especially useful in PRK retreatments.

This paper was discussed by Dr. Stephen Trokel, MD, of New York City. Dr. Trokel began by addressing why retreatment outcomes seem to always be more difficult and associated with more complications than original PRKs. He suggested that the retreatment population is a more diverse group to begin with, so will necessarily have a larger postoperative “scatter” of results than a group of native myopic eyes.

One problem in analyzing postoperative results of retreatments, according to Dr. Trokel, is that in eyes with loss of BSCVA, it is difficult to obtain accurate refractions. Moreover, epithelial thickness varies after PRK, perhaps a function also of the varying methods used to remove the epithelium during the surgery.

“Smoother is better,” according to Dr. Trokel, both in original PRKs and in retreatments. The re-emergence of laser in refractive surgery, according to Dr. Trokel, is actually a blessing in disguise. It brings the surgeon back into the picture, and brings refractive surgery away from the “point and shoot” model that seemed to have been emerging a few years ago.