



Edward E. Manche

Wavefront-guided PRK effective in treating highly aberrated eyes after keratorefractive surgery

Devon Schuyler
in Las Vegas

WAVEFRONT-guided PRK is an effective treatment for highly aberrated eyes following previous keratorefractive surgery, according to Edward E. Manche MD, associate professor of ophthalmology, Stanford University School of Medicine in California.

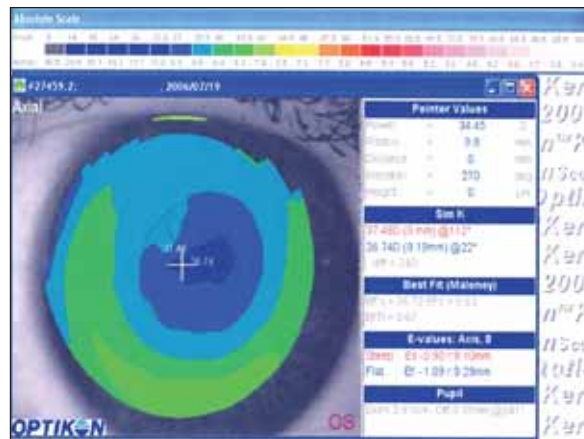
"This procedure provided excellent uncorrected and best spectacle-corrected visual acuity, excellent safety and good predictability," said Dr. Manche, speaking at the annual AAO meeting.

Dr. Manche presented his findings from a retrospective analysis of 25 eyes in 21 patients. All eyes had previously undergone keratorefractive surgery; 14 had undergone LASIK surgery, nine had undergone radial keratotomy surgery, and two had undergone PRK surgery. All of the patients had highly aberrated eyes, and suffered from a variety of visual complaints.

"There were a variety of underlying reasons for the aberrations, ranging from non-uniform ablations to decentration," said Dr. Manche.

Dr. Manche performed the surgery in all 21 patients. He began by imaging the corneal surface with the VISX WaveScan aberrometer, which provided a customised nomogram for performing wavefront-guided PRK surgery. He also applied 0.02 per cent topical mitomycin C for 10 seconds during surgery.

The procedure appeared to be effective at correcting refractive error. The average sphere before surgery was -1.56 D; this was reduced to -0.15 D six months after surgery. The spherical equivalent improved from -0.97 D to +0.01 D, and the mean cylinder improved from +1.18 D to +0.35 D. Stability



Courtesy of Edward E. Manche MD

also appeared to be good after the first few months.

"There was a fairly significant hyperopic overshoot in the first several weeks, especially in the subset of eyes that had previous LASIK," Dr. Manche said. However, this overshoot gradually corrected itself over the next six months.

Dr. Manche said that the efficacy was "quite good", with 100 per cent of eyes seeing 20/40 or better, 61 per cent seeing 20/20 or better, and 31 per cent seeing 20/16 or better six months after surgery. There was no sub-epithelial haze seen at any time interval.

"However, there was a delayed recovery of vision in these patients – in both uncorrected and best-corrected vision – so patients need to be advised ahead of time that it's going to take a fair amount of time to achieve their endpoint."

Predictability also was excellent. All of the eyes were within 1 D of emmetropia and 83 per cent of eyes were within 0.5 D by six months after the procedure.

There was essentially no change in total higher order aberrations, although there was a trend towards improvement in coma. Trefoil and spherical aberrations remained essentially unchanged, Dr. Manche said.

The safety of the procedure was excellent. Although 10 per cent of patients lost one or more lines of BSCVA at one month, 23 per cent had gained one or more lines of BSCVA at six months. No intraoperative or postoperative

complications occurred, and all eyes re-epithelialised within seven days.

A case study

Dr. Manche also presented a case study of a 49-year-old patient to illustrate the use of decentred LASIK re-treatment. The patient had undergone LASIK surgery five years earlier for myopia, and had poor quality of vision, ghosting, night vision problems, and a thin residual stromal bed. Although Dr. Manche said that the surgery had been "well done", with no striae of the flap and minimal refractive error, the patient had a superiorly decentrated ablation in both eyes and significant higher order aberrations.

The treatment plan involved removing nearly 40 microns of tissue to correct the centration, although there was only 1 D of myopia to correct. Dr. Manche emphasised the need to take extreme care in this procedure, which consumes an enormous amount of tissue, even for a small refractive error.

Dr. Manche reported that six months after the procedure, the higher order RMS had improved from 1.01 to 0.71 microns, coma had improved from 0.79 to 0.32 microns, and trefoil had improved from 0.32 to 0.15 microns. There was a small increase in spherical aberration, from 0.48 to 0.55 microns.

The result was a complete resolution of ghosting, with improvement in UCVA and BSCVA, excellent centration of central topographic flattening, and significant reduction in higher order RMS values, especially coma.

"I think it is a good study, although small, demonstrating the ability of wavefront-guided PRK to address refractive error and visual complaints after refractive surgery," said Helen K. Wu MD, one of the session panellists, in an interview with *EuroTimes*. She pointed out that the study highlights some important clinical points, such as the "rather generous" removal of tissue for even small corrections, as well as the prolonged recovery time. She said that the initial tendency toward hyperopic over-correction is an important point as well.

Dr. Wu, who is an assistant professor of ophthalmology at Tufts University School of Medicine in Boston, Massachusetts, said that this is a "very useful technique" in the appropriate patient. She did recommend that mitomycin C administration and surface ablation should be approached with caution in eyes with severe surface disease, such as severe dry eye.

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