Less pain, more gain with advanced surface ablation

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in Paris

New techniques for advanced surface ablation (ASA) offer patients a faster recovery of best-corrected visual acuity, less pain and less chance of haze formation compared to treatment with conventional PRK, according to Sven Lee MD, Nürnberg, Germany. Sven Lee MD, of Nürnberg, Germany, presented the clinical results of a cohort study regarding this new approach to excimer-laser-surface ablation for myopia during the XXII Congress of the ESCRS.

According to Dr Lee, this new approach to surface ablation, using the MEL 80 laser (Carl Zeiss Meditec) showed significant advantages compared with conventional PRK.

We see a faster recovery of BCVA, a faster recovery of low contrast and glare vision, less pain and faster re-epithelialisation time, and, crucially, less haze formation after one year."

“By observing our limit, the outcome of surface ablation with the spot scanning laser will be much safer and steadier,” he said.

Advantages of advanced surface ablation

Dr Lee explained that there are several key differences between advanced surface ablation and PRK.

“Advanced surface ablation uses a modified pattern-of-laser-shots to reduce thermal effects on the cornea, different postoperative treatment methods and new cooling techniques on the cornea, all of which help to improve recovery rates and reduce patient discomfort,” he said.

The ASA procedure is performed under topical anaesthesia and the epithelium is removed using an Amoil epithelial scrubber that has been moisturised with one or two drops of balanced salt solution at room temperature. Afterwards an epithelial spatula is used to clean any debris from the stromal surface. The stroma is then ablated using a special distribution pattern of laser shots to minimise the thermal effects on the cornea.

Dr Lee stressed the importance of keeping the treatment time as short as possible, since the longer the procedure the greater the risk of corneal dehydration and of developing subsequent haze complications. He also advised the use of the optional cone from Carl Zeiss Meditec which ensures that during the ablation the plume is not sucked away directly above the surface of the cornea but only inside the cone, thereby further reducing dehydration of the cornea.

After ablation the corneal treatment zone should be cooled with -8°C BSS applied two to four times onto the corneal surface for 10 seconds each time. The solution is then sucked away by a sponge after each cooling procedure.

Dr Lee emphasised the importance of applying a metallic ring or funnel to the treatment zone before cooling so as to avoid the possibility of chilled BSS coming into contact with the conjunctiva and causing pain to the patient. Once the cooling is finished, Dr Lee applies one drop of a non-steroidal anti-inflammatory drug such as Voltaren (Ciba Vision) and a bandage contact lens is then fitted to protect the eye.

Dr Lee noted that post-operatively all patients should be treated with Ofloxacin 0.3% eye drops, four times a day until complete re-epithelialisation.

Therapeutic ointment should be avoided during the period, he said. After removing the contact lens, fluorometholone eye drops 0.1% are instilled three times a day for one month and then tapered by one drop every month over the next three months.

Surface ablation has its limits

In a separate presentation, Dr Lee said that his team had also tried to establish the limit for successful and safe myopic surface ablation using the MEL 70 laser (Carl Zeiss Meditec).

The study, conducted between 1997 and 2003, looked at 446 eyes of 317 patients treated with the MEL 70 laser. Follow-up was conducted after 1 and 4 weeks, as well as 6, 12, 24 and 36 months. The mean preoperative spherical equivalent was -5.71 D ±2.48, ranging from -0.25 D to -13.25 D and astigmatism from -0.25 D to -6.50 D. For the PRK group, mean spherical equivalent was -5.59 D, with myopia ranging from -0.75 D to -13.25 D and astigmatism from -0.25 D to -6.50 D.

Dr Lee pointed out that after one year, predictability, safety, and stability were better in the ASA treated group. Mean postoperative pain, haze formation, and re-epithelialisation time in this group were also better. There were no differences in terms of efficacy.

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Dr Lee’s team found the statistically analysed limit for safe and predictable surface ablation was between -8.75 D and -9.0 D. Afterwards, all patients above -9.0 D were categorised as group A and all patients below -8.75 D as group B.

The results for stability, safety, predictability and efficacy were significantly better in the groups below the -8.75 D threshold, noted Dr Lee, and the difference was still evident after three years.