Advances in excimer laser technology and improved intraoperative and postoperative therapies make surface ablation a viable alternative for those patients where other refractive laser procedures are contraindicated, Francesco Carones MD told delegates attending the World Ophthalmology Congress. “Improvements in recent years have helped to overcome some of the known disadvantages of surface ablation techniques including pain, slow recovery and wound healing-related issues such as haze and regression. We have seen advances in laser technology, ablation profiles, surgical techniques and intraoperative and postoperative therapy that are helping to overcome these issues,” he said.

Dr Carones, medical director of the Carones Ophthalmology Centre in Milan, Italy, said that there are several key factors to bear in mind in order to achieve optimal results in surface ablation procedures. “One of the most important issues for me is the amount of tissue removed because this is directly correlated to the wound healing process which leads to haze and regression. We also need to be careful in terms of ensuring adequate residual stromal bed thickness, because even with PRK it is possible to see cases of ectasia,” he said.

Safe limits
Dr Carones said that the safe limits for tissue removal depend upon whether the surgeon is using antimetabolites or not. “If we limit our ablations to 80 to 100 microns without using metabolites, we can be on the safe side and be able to correct myopia up to -6 D or -7 D, astigmatism between 2.0 to 2.5 D and hyperopia up to +2.5 D. If we use antimetabolites like mitomycin C we may extend the amount of tissue removed up to 150 microns in a safe manner and bring our limits for correcting myopia up to -10 D, astigmatism up to 4.0 D as well as hyperopia up to +4 D,” he said.

Dr Carones advised leaving a minimum residual stromal bed thickness of at least 300 microns after the ablation to stay within safe limits. “Corneal curvature is important because we do not want to flatten or steepen the cornea too much in order not to induce quality of vision problems and perhaps also tear film and epithelial irregularity which may lead to scarring in some cases,” he said.

Very good outcomes were reported in a 2008 study of 20 eyes of 10 patients with compromised corneas or a family history of keratoconus who were treated with simultaneous PRK and collagen crosslinking. “The precision of the procedure was not affected by the simultaneous crosslinking procedure at the time of the surgery and there was no loss in best corrected visual acuity for any of the patients,” he said.

Dr Carones also stressed the importance of targeting final corneal curvature that respects the safety limits. “Corneal curvature is important because we do not want to flatten or steepen the cornea too much in order not to induce quality of vision problems and perhaps also tear film and epithelial irregularity which may lead to scarring in some cases,” he said.

Finally, Dr Carones emphasised the importance of respecting safety limits in terms of effective optical zone and patients’ scotopic pupil size to avoid any potential issues of haloes and night vision problems.

These patients are often recommended for surface ablation because of the higher risk of corneal ectasia associated with LASIK procedures. He noted that a 2008 study of 20 eyes of 10 patients with compromised corneas or a family history of keratoconus who were treated with simultaneous PRK and collagen crosslinking resulted in very good outcomes with 36 months’ follow-up. “The precision of the procedure was not affected by the simultaneous crosslinking procedure at the time of the surgery and there was no loss in best corrected visual acuity for any of the patients,” he said.

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