Thomas Kohnen

PRK vs LASIK: an evolving debate

Roibeard O'hEineachain
in Barcelona

THE renaissance of surface ablations in recent years, together with the development of new technologies for flap creation in LASIK and the use of wound-healing modulators in PRK, have added further complexity to the debate between proponents of surface and stromal ablations. Two presenters at the 12th Winter Refractive meeting of the ESCRS took opposing views on the topic but maintained that both approaches have their respective advantages.

Timo Tervo MD opened the debate by arguing in favour of surface ablation as the generally preferable modality in corneal refractive surgery. He noted that while LASIK causes less pain and provides faster visual rehabilitation, PRK has fewer complications, entails less risk of dry eye and induces less change in the cornea's biomechanics.

"PRK is less expensive than LASIK and the complications that occur with PRK are less serious and easier to treat than those occurring with LASIK. In addition PRK is easier to perform, it's difficult to get it wrong, and late enhancement is a simple procedure, said Dr Tervo, Helsinki University Eye Hospital, Helsinki, Finland.

He added that the advantages of LASIK compared to PRK may not be as important to patients as is commonly supposed. Regarding the slower visual recovery after PRK, he pointed out that most individuals see 10/20 or better on day five after trans-epithelial PRK. In addition, the haze that occurs after PRK is almost invariably insignificant, and while pain is greater after PRK, it only lasts a few days at most and is generally not too severe, he said.

Flap-related complications

Moreover, the flap-creation aspect of LASIK means that the procedure is inherently more risky than surface ablations. He noted that in a comparative study involving around 700 eyes, the total complication rate was six per cent for LASIK, compared to only 1.7 per cent for trans-epithelial PRK and 2.9 per cent for conventional PRK *(Ghadhfan et al, JCRS 2007, 33: 2041-2048*).

Among LASIK-treated eyes in the study, intraoperative flap complications such as buttonholes, partial flaps, and free caps, accounted for half of the complications. A further 0.9 per cent of eyes had postoperative flap complications requiring surgical intervention, such as DLK or interface debris.

Another flap-related complication in the study was dry eye syndrome, which in 1.3 per cent of LASIK-treated eyes was severe enough to require implantation of punctal plugs. In contrast, punctal plugs were not necessary in any eyes in the surface ablation groups. The greater severing of and slower re-growth of corneal nerves after LASIK, which several studies have demonstrated, is the most likely cause of the procedure's higher incidence of dry eye, he noted.

LASIK also undermines corneal mechanics to a greater extent than does PRK. The procedure therefore poses a greater risk of ectasia. He pointed out that a survey of the incidence of ectasia following corneal refractive procedures showed that LASIK accounted for 96 per cent of cases while PRK accounted for only four per cent *(Randleman et al. Ophthalmology 2008, 115: 37-50)*.

LASIK, particularly wavefront LASIK, is also contraindicated in eyes that have epithelial irregularities. Such procedures may result in irregular stromal ablations, Dr Tervo pointed out.

Dr Tervo noted that postoperative regression over 10 years' follow-up appears to be similar after myopic PRK and LASIK, as shown by a series of studies by Jorge Alio MD and his associates in the January 2008 issue of the American Journal of Ophthalmology. The studies also showed that the amount of regression correlated with the amount of correction attempted.

Eyes that underwent PRK to correct up to -6.0 D of myopia had a mean regression rate of -0.01 D per year, while eyes that underwent PRK to correct more than 6.0 D had a regression rate of -1.13 D per year, Dr Tervo noted. Similarly, eyes that underwent LASIK for up to -10.0 D of myopia the regression rate was -0.12 D per year, while among eyes that underwent LASIK for more than -10.0 D of LASIK correction the regression rate was -0.25 D per year, he added.

In summary, Dr Tervo maintained that PRK is the preferred option for lower amounts of correction, eyes with surface irregularities, those with thin corneas and patients predisposed to trauma such as athletes. LASIK, he acknowledged, is the preferred option for higher corrections and high astigmatism.

LASIK better and improving

Thomas Kohnen MD argued in favour of LASIK as the generally preferred option, pointing to the procedure's more rapid visual rehabilitation and wound healing and the superior outcomes of re-treatment.

He emphasised that when considering LASIK it is important to remember that it is an evolving procedure. Notably, the advent of femtosecond lasers has enhanced the predictability of flap creation and provides improved flap architecture. As a result of such advances, the refractive procedure of choice may become a thin-flap, sub-Bowman procedure that is a virtual hybrid of the two techniques, said Dr Kohnen, Johann Wolfgang Goethe University, Frankfurt, Germany.

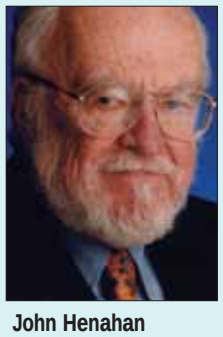
Regarding re-treatment, Dr Kohnen said that while it may be difficult to lift a LASIK flap after several years, most re-treatments are carried out within eight to 12 weeks after the initial procedure. Moreover, the outcomes produced by LASIK re-treatments appear to be better than those of PRK re-treatments.

He cited a study involving 157 eyes of 108 patients in which LASIK re-treatment either improved BCVA or maintained it within one line of the pre-revision level in 97.5 per cent of eyes. (Lyle, JCRS 2000; 26:650-659.) By comparison, in another study involving 93 eyes of 56 patients undergoing PRK re-treatment, 11.7 per cent of eyes had a late regression associated with corneal haze and loss of BSCVA following PRK re-treatment after previous PRK *(Haw et al, JCRS 2000; 26:660-667)*, he pointed out.

He noted however, that long-term results with PRK re-treatment may improve with the increased use of wound healing modulators such as mitomycin-C. Dr Kohnen added that he agreed with Dr Tervo regarding PRK's continued usefulness for some indications, such as thin corneas and topographical irregularities. However, he noted that at present LASIK accounts for 95 per cent of his refractive corneal ablation procedures, but PRK only accounts for five per cent.

"I think that for now we will live with both procedures but in the future maybe the sub-Bowman's treatment will be the best option for all," he added.

timo.tervo@hus.fi
kohnen@em.uni-frankfurt.de



John Henahan

The John Henahan Prize

EuroTimes is delighted to announce the launch of the John Henahan Prize, which will be awarded annually to a young ophthalmologist.

John Henahan was the visionary editor and guiding light of *EuroTimes* from 1996 to 2001 and his work has inspired a generation of young doctors and journalists, many of whom continue to work for *EuroTimes*.

Ophthalmologists who are members of the ESCRS and who are under 40 years of age are eligible to appy for the prize.

Entrants are invited to write a 1,000-word article on "Why I became an ophthalmologist". The article should give a brief introduction into why the individual ophthalmologist decided on his or her career path and should include reference to his or her early education, including mentors and role models (where appropriate). The article should also look at issues and controversies in ophthalmology, including changing demographics and evidence-based medicine. The closing date for entries is Friday 1 August, 2008.

A distinguished panel of ophthalmologists and medical journalists including Emanuel Rosen, FRCS, Jose Güell, MD, Sean Henahan, editor, *EuroTimes* and Paul McGinn, editor, *EuroTimes* will judge the entries.

The winning entrant will receive a prize of €1,000 which will be awarded at the XXVI ESCRS Congress in Berlin, 2008 in September. We will publish the winning entry in the October edition of *EuroTimes*.

To apply please email your article to Colin Kerr, executive editor, *EuroTimes* at colin.kerr@escrs.org. Your email should also include your full name, home address and phone number, your date of birth and ESCRS membership number.

Entries received after 1 August will not be considered. The decision of the judges is final and no correspondence will be considered once they have announced their decision.