Refractive surgeons review surface ablation pros, cons, and alternate solutions

**“After LASEK and epi-LASIK, the epithelial cells still release cytokines, but there is an uncoupling between those mediators and the signals coming from the stromal keratocytes”**

John Marshall MD

Although LASIK quickly rose to become the predominant method for laser vision correction after it was introduced, various factors subsequently fueled a resurgence of interest in surface ablation techniques, and these procedures have regained popularity particularly among European refractive surgeons.

At a refractive surgery subspecialty meeting held during the annual meeting of the American Academy of Ophthalmology, leading ophthalmic surgeons debated the pros and cons of surface ablation.

Michael C. Knorz MD, professor of ophthalmology, University of Heidelberg, Germany undertook the task of discussing the cons of surface ablation. Nonetheless, he emphasised that it remains a great tool that belongs in the refractive surgeon’s armamentarium. However, its use should be limited to certain patients, said Dr. Knorz.

“Typical indications are patients with thin corneas, epithelial basal membrane dystrophies, or asymmetric corneal topography,” he noted.

The disadvantages of surface ablation are underlined by comparing it to LASIK, as surface ablation is associated with more postoperative discomfort, a slower visual recovery, and worse efficacy and safety outcomes. Any previous advantage of surface ablation for minimising induced higher order aberrations has also been eliminated with use of a femtosecond laser for flap creation, said Dr. Knorz.

He cited a prospective study conducted by Daniel Durrie MD and Stephen Slade MD that compared wavefront-guided thin-flap LASIK (SBK with a femtosecond laser-created 100 micron, 8.5mm flap) and advanced surface ablation in fellow eyes of patients with thin corneas,“Typical indications are patients with thin corneas, epithelial basal membrane dystrophies, or asymmetric corneal topography,” he noted.

He added that conceptually, LASIK could be a better procedure if the epithelial cells are killed when the flap is lifted and then replaced so that the tissue serves purely as a biological bandage.

By avoiding epithelial damage, LASIK mitigated the postoperative problems of haze and pain associated with surface ablation procedures. However, studies from Dr. Marshall and his colleagues raised concern about its effect on corneal biomechanical stability. Recognising that the traditional LASIK flap cut through the cornea in its weakest areas both in terms of depth and eccentricity, studies were undertaken using sophisticated measurement techniques to investigate the effects of various flap features on corneal biomechanics.

Results from that research indicated benefits of thinner, narrower, and planar flaps. With the opportunity for reliable creation of such flaps using the femtosecond laser, the idea of SBK was born.

Findings from the study from Drs. Durrie and Slade along with other emerging data are suggesting that SBK may fulfill its promise of providing the biomechanical stability of PRK without its pain and haze. Larger and longer-term experience is needed to better define the efficacy and safety profile of SBK, according to Dr. Marshall.

Dr. Marshall suggested that biomechanical stability after SBK might be further increased by changing the edge angle of the flap so that it is more oblique. Surface ablation procedures may also be further improved using a technique Dr. Marshall termed “pharmacologically modulated PRK” where novel modalities are used to control the wound healing process responsible for haze and pain.

If you are an ophthalmologist, this is the podcast you should be listening to on www.escrs.org

We will discuss the big issues in cataract and refractive surgery with our panel of experts. And if you have any suggestions as to who should be on EuroTimes Podcasts, please let us know.