

# 20 YEARS OF LASIK

## Celebrating LASIK surgery

### THE RIGHT DECISION

Preoperative evaluation of LASIK candidates has become much more accurate and effective than it was in the past

**Ioannis Pallikaris MD, PhD** is professor of ophthalmology, School of Medicine, University of Crete and founder and director of the Vardinoyannion Eye Institute of Crete. Considered the originator of LASIK, in 1989 Prof Pallikaris was the first to conduct animal trials with the technique. He has since remained at the forefront of research in refractive surgery, and counts among his mentors Theo Seiler MD and John Marshall PhD. Dr Pallikaris was also president of the ESCRS from 2006 to 2008.

**Q:** Much has changed since the early days of laser refractive surgery. Tell us a little about your early experiences. What were you thinking as you began your first LASIK surgery?

After my first studies in 1988 on corneal healing after excimer laser surface ablations (PRK), I was sure that we needed to go deeper with the ablation. However, because of the suturing problems and aberrations with in situ keratomileusis, I knew we needed a technique with a more viable and stable corneal button to cover the ablated stroma. From my experience in plastic surgery I was aware that for the viability and optimal healing of the detached tissue, it was best to preserve a connection, or bridge, with the intact healthy tissue. That is how I came up with the idea of the flap. The first animal studies in 1989 proved the viability and the healing course of the flap approach. The first clinical study in 1990 proved that the flap would not create an extreme astigmatic effect.

**Q:** What has changed in your practice over the years? For example, whom would you not treat now that you might have considered treating in the past? What range of correction do you consider safe?

We now know the limits of LASIK's ability to correct refractive error. Therefore, in

comparison with the early years of refractive surgery, we are generally more conservative and much more effective. The main factors that help us to decide if we should treat a patient with overall healthy eyes are the refractive error, corneal topography and corneal thickness.

**Q:** Has your relationship with patients changed as the technology has changed? How do you balance the promise of vision improvement versus the potential risks?

Today I have a much better understanding of the relationship between the subjective problems of the patient and the objective measurements obtained with the more sophisticated technology that is now available. For that reason, I feel much more secure in guiding the patient to the right decision with the right expectations.

**Q:** What is your current approach? Tell us about the pre-op work-up, which laser and keratome you use, etc.

Preoperatively, our patients go through a complete ophthalmic examination. That includes manifest and cycloplegic refraction, Placido-based corneal topography, Scheimpflug imaging and ultrasound pachymetry. We perform wavefront analysis with the iTrace in combination with topography. Regarding our surgical equipment, we use both the Allegretto 400 Wave Eye-Q and the Pulzar Z1. We create LASIK flaps in our practice with the iFS Advanced Femtosecond Laser. Although this device has very high accuracy, we always perform intraoperative pachymetry in LASIK procedures in case the flap is thicker than expected.

**Q:** What influence do you think these various technical improvements have had on LASIK-related complications? For example, are you better able to spot bad LASIK candidates (eg keratoconus patients)? Is



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the risk of ectasia less severe? Are you seeing fewer problems with post-op night vision haloes and glare?

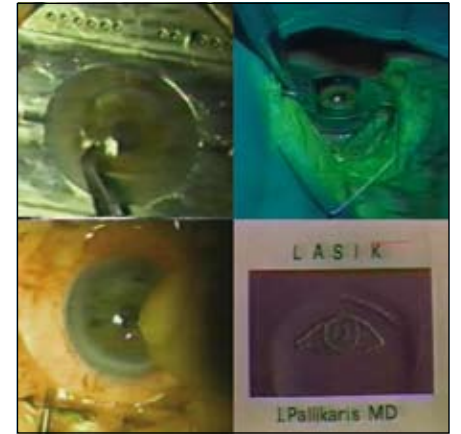
With the use of new technology, preoperative evaluation of LASIK candidates has become much more accurate and effective than it was in the past. We can now detect subclinical keratoconus with very sensitive examinations and this has minimised the ectasia risk.

**Q:** Looking ahead, what technology looks the most interesting to you? Is thin-flap, wavefront-guided all-laser LASIK setting the bar high for future improvements in technology?

Thin-flap LASIK will play an important role in the future of refractive surgery, since it increases safety and allows more patients to be treated. Wavefront-guided technology is a useful tool for the correction of aberrations that cause visual complaints, but for the moment it cannot yet provide the so-called "super-vision". On the other hand, vision free of aberrations is not our goal, since a normal small amount of higher order aberrations gives us a depth of focus that seems to be essential for normal vision.

**Q:** Does LASIK have a role, primary or adjunct, in the treatment of presbyopia? What about intrastromal ablation via all-femtosecond correction, INTRACOR ablation, etc?

In the treatment of presbyopia we must select the most appropriate method for each patient taking into consideration parameters such as profession, hobbies, age, refraction and any concomitant ocular



Stills from Ioannis Pallikaris' first LASIK procedure

pathologies. For young presbyopes with pre-existing refractive errors I perform monovision or multifocal laser, whereas for emmetropes I prefer to use corneal inlays because this technique is reversible, safer and minimally invasive. I prefer clear lens extraction in emmetropes 60 years or older or in ametropes more than 55 years. I avoid multifocality in patients with high mesopic expectation, whereas I do not perform monovision in patients with high stereoptic expectation.

The femtosecond laser is a very interesting tool for presbyopia. It can provide intrastromal ablations for flapless multifocal corneas and also enables the creation of optimal corneal pockets for the implantation of inlays. In the future, the use of femtosecond laser in crystalline lens surgery will probably play an important role in the correction of presbyopia.

**Q:** What would you imagine refractive surgery will be able to offer patients 10 years from now?

The next goal is surgical correction of presbyopia. In the future, exciting new technology will enable us to reshape or rejuvenate the normal human lens and also use more advanced IOL material that can be remodelled in situ. Regarding LASIK surgery, I believe that corneal remodelling techniques will be used for fine tuning of the optics of the eyes in order to achieve a custom induced aberrations optical system, based on patients' specific demands and expectations.

**Prof Pallikaris was interviewed by contributing editor of EuroTimes, Roibeard O'hEineachain**

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