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EDITORIAL

Where are we in laser corneal refractive surgery

Dónde estamos en cirugía refractiva corneal con láser

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Since the revolutionary incorporation of the excimer laser in corneal refractive surgery back in 1980s,¹ the understanding of both corneal biomechanics and the qualitative and quantitative evaluation of the eye as an optical system, have become an obsession for both ophthalmologists and optometrists as well as for other related scientists. In fact, the closed interaction between these groups of professionals turned out for the first time in modern medicine, a daily clinical standard since then.

Initially photorefractive keratectomy (PRK) and soon after, mostly, laser assisted in situ keratomileusis (LASIK), the “precise” heir of lamellar refractive techniques, were considered as techniques able to correct any degree of ametropia. Quality of vision deterioration on the higher corrections, industry driven quality and design improvements in intraocular materials and the description of secondary ectasia² allowed, at that time, refractive surgeons to reconsider the use of phakic intraocular lenses (p-IOL’s), in fact one of the earliest ever used refractive procedures, abandoned because of the initial frequency and severity of associated complications.^{3,4}

Along the first decade of the 21st century we had the opportunity to observe significant improvements in the field of refractive surgery: better excimer ablation pro-

files, higher repetition rates, very effective eye trackers, advanced surface ablation techniques with a very low rate of common initial complications such as refractive regression and haze, femtosecond microkeratomes increasing the quality and safety of lamellar surgery as well as multiple advances in the evaluation tools such as wavefront sensors, double pass instruments, topographers, or instruments to measure the biomechanical properties of the cornea, between others.

At the same time, the first mid and long term control studies with all these new refractive strategies started to be published and, apparently for a period of time, it looked like the clinical and refractive indications and contraindications of each procedure (PRK, LASIK and pIOL’s) were established.

Although this is still basically true, taking a look to the most recent developments, I would say that we are inside a long running continuous process of refinement, being perhaps the most obvious examples the multiple corneal collagen crosslinking techniques (CXL) including those with a precise refractive correction goal and the intrastromal flapless refractive techniques (Small Incision Lenticule Extraction, SMILE) using only the femtosecond laser, with two main conceptual advantages: to avoid those limitations related with the excimer laser (use of gases, temperature, humidity restrictions, etc.) and, most important, the biomechanical and biological (dry-eye) superiority over LASIK because of the small superficial opening.⁵

All of us who have had the chance to enjoy and suffer these 25 years of refractive revolution, are aware of

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the importance of such an interprofessional relationship I pointed out in the beginning of this editorial and we must stress our young colleagues to understand its need and to continue and perhaps, to strength it. Some of the articles of this issue highlights such a compromise, reporting the results of investigations of interest for both ophthalmologists and optometrists for achieving a better understanding of the effects of different refractive surgery techniques, such as photorefractive keratectomy (PRK),⁶ wavefront-guided laser refractive surgery,⁷ laser in situ keratomileusis (LASIK),⁸ or corneal collagen cross-linking (CXL).⁹

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