CUSTOM SURGICAL SOLUTIONS IN EXTREME CASES, USING THE FEMTOLASIK AND VISIAN ICL LENS

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ABSTRACT:
PRESENTATION OF A CASE OF A PATIENT WHO HAS TWO EXTREME REFRACTIVE ERRORS, WHICH HAVE NECESSITATED TWO DIFFERENT SURGICAL INTERVENTIONS FOR EACH EYE, THUS PREVENTING THE POSTOPERATORY COMPLICATIONS AS ECTASIA. THE 29-YEAR-OLD PATIENT HAD BEEN DIAGNOSED WITH COMPOSED MIOPIC ASTIGMATISM, AND USING THEIR OWN CORRECTION HAD A VISUAL ACUITY OF 0.8. AS A RESULT OF THE TWO DIFFERENT SURGERIES, SHE HAS MANAGED TO HAVE A BETTER VISUAL ACUITY, WITHOUT ANY CORRECTION.

KEY WORDS: FEMTO LASIK, EXCIMER LASER, VISIAN ICL, MIOPIC ASTIGMATISM, REFRACTION, REFRACTIVE SURGERY

INTRODUCTION

The refractive errors mean deficit of the eye which manifests itself as a low visual acuity, which can be corrected in the vast majority of cases by dioptres (contact lenses, glasses). There are situations in which patients who suffer from these refractive errors, no longer wish to wear these dioptres, which resulted in an extremely fast-growing of extraocular or intra-ocular refractive surgeries.

The refractive errors are: miopia, hipermetropia and astigmatism. Worldwide, it is estimated that these affect about 2 billion people.

Numerous studies have shown that most patients who ask for refractive surgery are wearers of contact lenses. (9)

Techniques of refractive surgery currently available are:

- Photorefractive keratectomy (PRK)
- Laser epithelial keratectomy (LASEK)
- Laser in situ keratomileusis (LASIK)
- Intracorneal ring segment (ICRS)
- Corneal inlay lenses (CIL)
- Phakic intraocular lenses (phakic IOL)
- Clear lens extraction (CLE)

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- Presbyopic surgery

Of all the techniques listed, the most commonly used procedure is undoubtedly the LASIK, in recent years even a derivation of it, namely FemtoLASIK. The latter is used to create the corneal flap with a femtosecond laser, unlike the initial technique which uses a microkeratom. The new technique has numerous advantages, studies showing that it is a safe, predictable and efficient technique. (2,3,8)

We need a thorough knowledge of these techniques to be able to provide our patients the best surgical solutions, because each technique has his indications, counter-indications and limits.

In the case of miopias and even small and medium-sized astigmatism, the results are similar between PRK and LASIK techniques (6), but in the case of extreme miopy and astigmatism, the surgical technique should be chosen extremely well to prevent possible complications during or postoperatory, or outstanding refractive errors.

CASE REPORT:

We present the case of a 29-year-old patient, who addressed our clinic in order to establish a therapeutic solution for diopter removal.

Following comprehensive eye examination she was diagnosed with compound myopic astigmatism (RE: -7.5 Dsf x - cyl 3.5 ^5˚, LE - 11 Dsf x - 3.5 cyl ^170 ˚). The best corrected visual acuity was 0.8 in the case of both eyes. Intraocular pressure was 15 mmHg in both eyes. The slit lamp examination of the anterior pole and of the fundus has not detected any pathological change, the appearance being within age and refraction error. Local and general clinical examination did not reveal any pathology that would be relatively counterindicated (significant cataracts, patients with obsessive personality, diabetus, autoimmune diseases etc.) or absolute (keratoconus, herpes virus infection of the cornea, corneal dystrophy deep, grossly amblyopic eye, corneal melt, unstable refraction) a refractive surgery procedure. (7)

Corneal topographies were normal and pachimetry values of the two eyes were 542 microns for the right eye and 540 microns for the left eye.

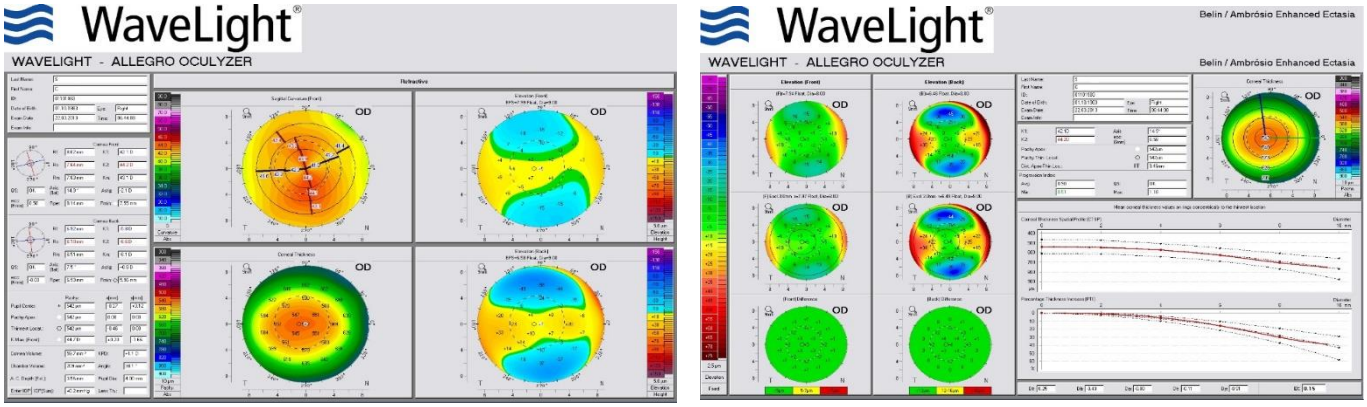

Fig 1.Right eye topographies (normal appearance)

Residual stromal thickness after removal of the right eye refraction (-7,5 Dsf x - 3,5 cyl ^5˚), calculated using the firmware excimer laser was 297 microns, which led us to recommend the Femto LASIK technique in this case. The flap was created by using the FS200 femtosecond laser with a diameter of 9 mm and a thickness of 120 microns. At three months after surgery, using an anterior pole OCT we have measured the thicknesses of the stroma and the flap which have been 298, i.e. 120 microns.

The much larger value of the refractive error of the left eye (-11 Dsf x - 3,5 cyl ^170 °) made the therapeutic solution adopted in this eye to be an implantation of a phakic IOL- Visian ICL toric type.

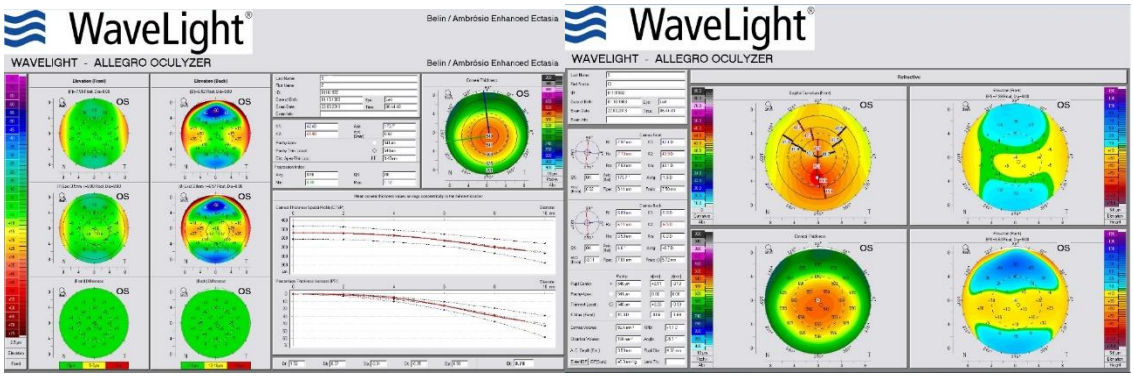

Fig 2.Left eye topographies (normal appearance)

Fig 3.Visian ICL phakic lens Implantation

Surgical interventions have been carried out at an interval of 3 weeks, both going without incidents.

The patient has been re-evaluated from an ophthalmological point of view (UCVA, BCVA, and manifest refraction) at one day, a week, a month and three months after surgery. The postoperative visual acuity at 3 months was 0.9 without correction for both eyes.

DISCUTIONS:

The particularity of the case is the high value of the two refractive errors, and surgical approach by two different techniques, appropriate to each eye. Carrying out a FemtoLASIK technique would have required a fairly deep ablation, resulting in a residual corneal stroma below 300 microns. Numerous studies have shown an increase in the number of postoperative complications of corneal ectasia type after surgery, after which the residual stroma is below 300 microns. (1)

A major advantage in the presented case was the creation of the flap in the right eye using the femtosecond laser, because it needed a more accurate thickness to keep the residual stroma as close as possible to the 300 microns. Studies have shown that standard deviation of flap thickness made with the microketatom is about 22-16 microns (4,5,10), compared with those made with the laser where standard deviation is about 10-14 microns.

The physicians availability to implant the artisan phakic IOL- Visian ICL in the case of the left eye, made it possible to resolve the case in a very efficient manner, because the lack of this surgical solution would have made the patient to have a post LASIK residual

refractive error of about 2-3 D. So we believe that this case has been resolved in a manner that led to the satisfaction of both patient and surgeons.

Although there are ophthalmologists who consider surgeries performed in refractive surgery with an aesthetic purpose, for this type of patients suffering from extreme refractive defects, their life changes radically after glasses independence.

We believe that the enormous technical progress of the refractive surgery solutions is a major advantage for patients wanting an independence from glasses and contact lenses too, but also for the ophthalmologists involved, providing fast, efficient and safe solutions.

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