

Advanced Tope-guided/Oculink PRK and CXL Beneficial for the Visual Outcome in Patients with Keratoconus, Corneal Ecstasia and Thin Corneas

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ABSTRACT

Aim: To stop the keratoconus or the progression of the corneal thinning, to reduce the irregular astigmatism and improve BCVA. 6 year study and follow up of the first patients usually every 2-3 patients every month, almost 120 patients in 6 year.

Methods: PRK using Wave light excimer EX 500 nm and CXL UV 300 nm. To these procedures, we added a combined treatment referring to Oculink or topography guided to ameliorate the cornea irregularities-also using Vibex Rapid which is with a twice diffusion rate than the standard riboflavin.

Election of the candidates: Not all the patients with keratoconus can succeed to topography guided PRK+CXL +oculink/topography guided+Vibex rapid – the most probable are Kc1, Kc1-Kc2, kc2 with k1-K2 not too high.

Conclusion: Topography guided PRK+CXL is the most adequate method of stopping and improving the vision in patient with keratoconus, and in irregular astigmatism, or thin corneas topography guided is a safer method for not having complications in time, the goal of treatment is to flatten the steepest part of the cornea and to steepen the flattest area of the cornea.

Keywords: Keratoconus; Irregular astigmatism; Thin corneas topography; Photo-therapeutic keratectomy; Corneal collagen

CASE STUDY

Purpose

Stop the keratoconus, 'Halt' the corneal thinning, reduce the irregular astigmatism and improve.

UCVA methods

6 years study and long period of follow up of the first patients- usually every 2-3 patients with KC every month almost 120 patients in 6 yrs. Tope- guided/oculink PRK performed with excimer Ex 500 and CXL with CCL 365 and Riboflavin used in approx. all the cases was Vibex Rapid-which is with the twice diffusion rate than the standard riboflavin.

Election of the candidates

Not all the patients can succeed this treatment the most probable are the early stages Kc 1, Kc 1-2, some of the cases with Kc 2 with not very high keratometry readings. The ablation should be maximum admitted conform the keratometry readings

Advanced topography guided/Oculink is generally limited to 50 µm maximum tissue removal – for a residual stromal depth at least 300 µm – guided by a corneal map. The map is created by multiple high-resolution computer images. This allows imaging of difficult corneas, even those with extreme cones or keratometry greater than 55D.

Treatment algorithms are then developed to flatten or steepen specific meridians as needed based on a best fit sphere. Another point is Zernike values: it calculates for each Zernike polynomial a coefficient which describes the contribution of that polynomial

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to the height data. The relative contribution of the Zernike polynomial (tilt, astigmatism, focus, coma, spherical ablation) is displayed in numerical values. C4 and C12 should be equal otherwise the treatment is not computed available. Abnormal values will appear in red; in Kc for example the coma will be often increased.

DISCUSSION

From 120 patients included in the study 75 were with Kc 1-2, 25 with Kc 1, 20 of them with irregular astigmatism and thin cornea who were not good candidates for Lasik/Femto Lasik (Figure 1). 54 from 75 with Kc 1-2 improve the vision with more

than 3 lines, 8 of them improve with 1 line, 9 of them had a corneal haze island, and only 2 cases were not satisfied for their postop UCVA and continued with RGP, these were with Kc 2 and with keratometry reading up to 53D (Figure 2).

Cases with irregular astigmatism and Kc 1 VA were 20/20 in their majority. In 6 years study from 100 cases with Kc only 2 of them continued with rigid contact lenses but no progression of KC only that it was not obtained the max UCVA expected.

The others progression was stable. The cases with irregular astigmatism and thin corneas had a max UCVA and very satisfied of the quality of the vision [1-11].

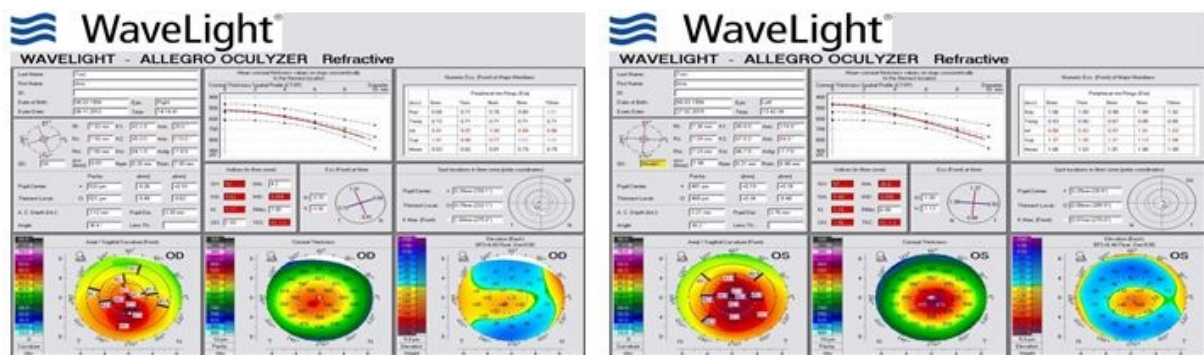


Figure 1: Keratometry readings before/6 years after treatment.

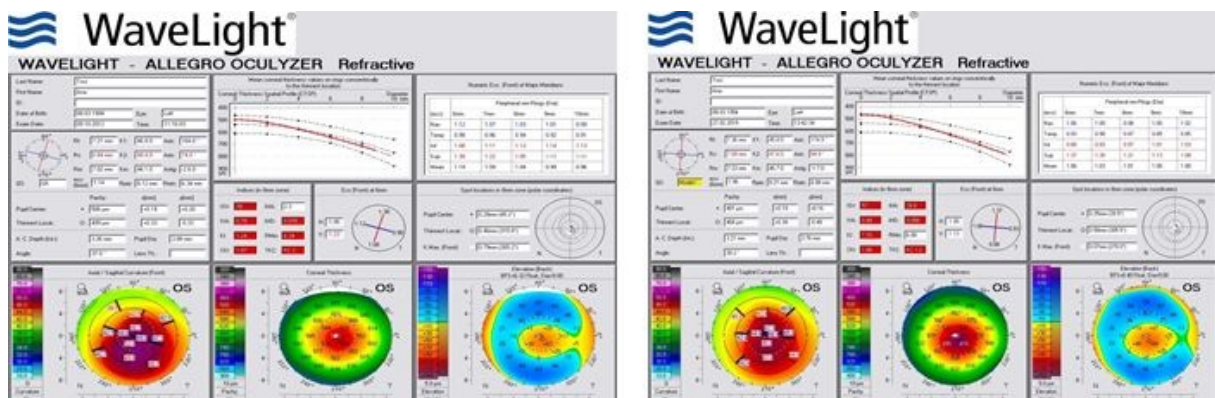


Figure 2: Before/6 years after treatment.

CONCLUSION

Advanced Tope-guided (oculink) PRK+CXL+Vibex R is the most adequate method of stopping and improving the vision in patients with keratoconus, and in patients with irregular astigmatism, or thin corneas which are not good candidates for Lasik or Femto Lasik.

Tope-guided/oculink treatment in addition is a safer method for not having tardive complications. The goal of treatment is to flatten the steepest part of the cornea and to steepen the flattest part of it the target of this procedure- is not fully correction but visual improvement and 'halting' the progression.

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