

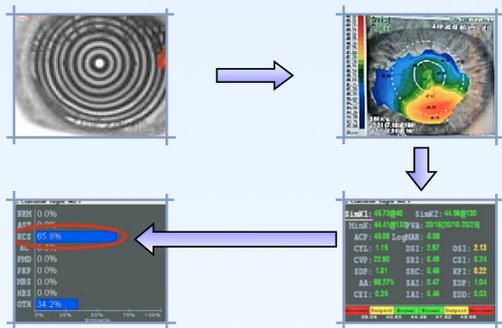
PHOTOREFRACTIVE KERATECTOMY IN PATIENTS WITH SUSPECTED KERATOCONUS : FIVE YEAR FOLLOW-UP

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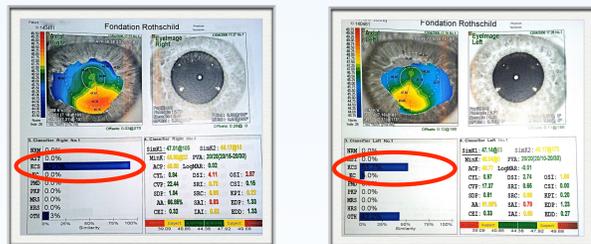
PURPOSE & DESIGN

To assess long-range outcomes of photorefractive keratectomy (PRK), using functional and topographic criteria, in myopic eyes with suspected keratoconus. Long-term (mean: 4.7 year) follow-up retrospective, interventional case series.

The study included 62 eyes of 42 patients classified as keratoconus suspects (KCS) or keratoconus (KC) by the corneal navigator of the OPD-Scan II (Nidek, Gamagori, Japan).



CORNEAL NAVIGATOR ALGORITHM (Nidek- OPD Scan II)



OPD Scan II of one of our keratoconus suspect patients, with major inferior steepening on curvature map and KCS scores of 92.7% on the right eye and 51.7% on the left eye.

METHODS

PRK treated patients 2004 - 2006 @ FOR

Classified KCS or KC > 0 by NCN OPD Scan II

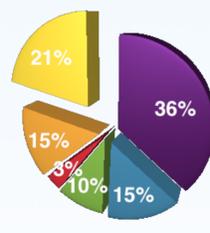
Evaluation 2011



RETROSPECTIVE STUDY

These patients have been treated with myopic PRK between 2004 and 2007 at the Rothschild Foundation, Paris, France, using the Nidek EC5000 excimer laser. The main outcome measures were refractive stability, mean corneal keratometry, mean central pachymetry, mean thinnest point value, and the occurrence of postoperative complications as corneal ectasia.

- ASBT
- SRAX
- Oblique astigmatism
- Against the rule
- Others
- Regular astigmatism



Simplistic subgroups of preoperative OPD Scan curvature shape

RESULTS

Parameters	Total					
Quantitative variable	N	Average	Dev.	p25	Median	p75
age (years)	62	34.57	15.11	30.72	34.87	43.2
Preoperative sphere (D)	62	-3.48	3.14	-5	-3	-1.75
Preoperative cylinder (D)	62	-0.97	0.92	-1.5	-0.75	0
Preoperative axis (% of eyes)	62					
with the rule (0°-30° or 150°-180°)		72.6%				
oblique (30°-60° or 120°-150°)		12.9%				
against the rule (60°-120°)		14.5%				
Preoperative BCVA (logMAR)	62	0,01	0,03	0	0	0
Preoperative keratometry (mm)	62	7,38	0,28	7,19	7,38	7,51
KCS score (%)	62	27,84	26,36	0	23	49
KC score (%)	62	33,13	42,15	0	0	88
Preoperative central pachymetry (CP) (μ)	56	529,43	32,87	515	537,5	545
Preoperative Thinnest Point (TP) (μ)	56	522,14	34,65	509	526	538,5
Preop pachymetry delta (CP-TP) (μ)	56	7,29	13,78	6	8	11
Time of follow-up (years)	47	4,76	1,44	3,87	4,79	5,81
Postoperative UCVA (logMAR)	41	0,06	0,26	0	0	0,046
Postoperative sphere (D)	30	-0,28	1,29	-0,25	0	0,25
Postoperative cylinder (D)	30	-0,52	0,42	-0,75	-0,5	-0,25
Postoperative central pachymetry (CP) (μ)	21	470,52	52,55	475	488	498
Postoperative thinnest point (TP) (μ)	21	461,52	56,42	462	481	492
Postoperative keratometry (mm)	23	7,86	0,38	7,5	7,79	8,2
Qualitative variable	n	%				
glasses	0	46	93,9 %			
(yes)	1	3	6,1 %			

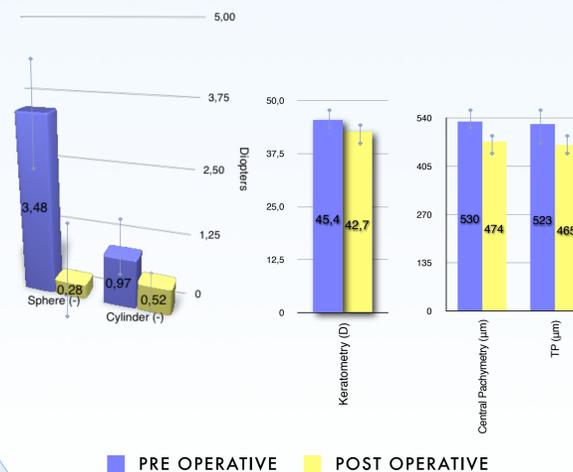
Patient population at baseline consisted of 62 eyes of 42 patients. The mean age was 34.6 +/- 15.1 years and the mean spherical equivalent (SE) was -3.96 +/- 3.05 Diopters (D) (mean sphere - 3.48 +/- 3.14 D, mean cylinder -0.97 +/- 0.92 D). The mean central pachymetry was 529.4 +/- 32.8 μm (mean thinnest point 522.1 +/- 33.6 μm) and the mean simulated keratoconus suspect (KCS) or keratoconus (KC) was positive in all 62 eyes and exceeded a 50% similarity score in 30 eyes (48.4 %).

MEAN FOLLOW-UP WAS 4.8 ± 1.4 YEARS

The mean magnitude of the SE was -0.53 +/- 1.35 diopters over the follow-up period, with a mean postoperative keratometry of 42.9 +/- 2.4 D.

Only 2 patients had to wear glasses again because of significant myopic regression.

NO CASE OF CORNEAL ECTASIA HAS BEEN REPORTED OVER THE STUDY PERIOD.

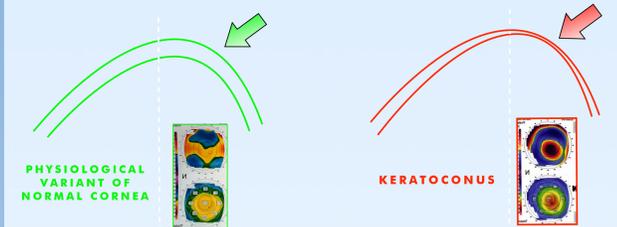


DISCUSSION

Corneas with topographic suspicion of keratoconus and believed to have subclinical keratoconus = absolute contraindication for Lasik surgery.

What about PRK ?

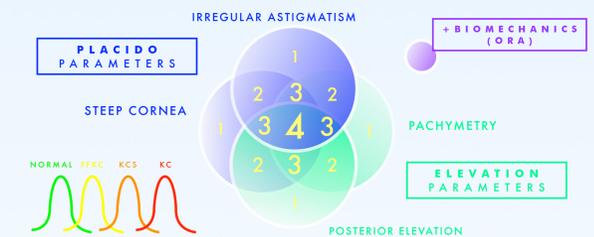
- Sensitivity & specificity of subclinical keratoconus detection based Placido topography is not 100% -> some of the included corneas may correspond to false positives, being only physiological variants of normal corneas.



Either way, no case of ectasia was reported in the study, and PRK did not lead to a progression or acceleration of KCS.

- Nidek Corneal Navigator -> based on anterior corneal curvature (without pachymetry profile or elevation parameters) -> every very steep cornea, especially with oblique or irregular astigmatism, will be in most cases classified as KCS by NCN !

Combining tomographic & pachymetric maps with the usual Placido topographic index may improve the sensitivity & specificity to detect corneas at risk for refractive surgery, while visco-elasticity measurements with the Ocular Response Analyzer (ORA) provides additional information in the screening of subclinical keratoconus.



- Could the inflammation induced by PRK halt the progression of ectasia and play the part of a "localised cross-linking" in corneas at risk ? Is the combination of CxL + PRK to treat non-progressive keratoconus relevant ?

- Results were restricted to a 5 year study period

CONCLUSION

Photorefractive keratectomy in eyes with suspected keratoconus based on Placido Neural Network may be safe and effective for myopia and astigmatism in carefully selected patients, with improvement of the visual function extended with refractive and corneal stability. However, treatment indications remain to discuss on a case-by-case basis as limitations may exist regarding steeper and thinner corneas.