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study

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LASIK with ESIRIS and ORK-CAM – Clinical Results

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Introduction

Perfect results – in combination with an ingenious aspheric algorithm of the SCHWIND-CAM software module ORK-CAM, the para-Gaussian spot of the **ESIRIS** excimer laser from SCHWIND eye-tech-solutions provides a very smooth surface simultaneously with an extremely accurate reproduction of ablation volumes for successful treatments.
The Online Coherence Pachymetry "**OCP**", together with the high-speed active eye-tracker working at 330 Hz, completes the state of the art technology.

Investment with spectrum

In combination with the diagnostic devices the ESIRIS can be used for multiple applications – aberration-free ablation as well as corneal and ocular wavefront treatments.

Fig. 1

Methods

- All LASIK procedures have been performed with the ESIRIS.
- All evaluated eyes were healthy and untreated
- All flaps were created with the Carriazo Pendular (superior hinge)
- The optical zone was either 6.0 mm, 6.5 mm or 7.0 mm.
- Pre-op refraction
  SEQ: - 1.00 D to - 11.00 D
  Sphere: - 0.25 D to - 10.00 D
  Cylinder: up to - 3.00 D
- All data from the 183 eyes had been analyzed for a period of 6 months.

Fig. 2

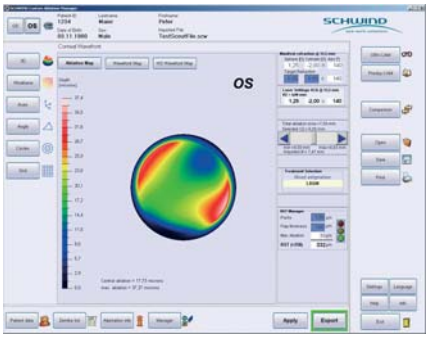

Fig. 3

Fig. 4

Results

A scattergram is the best way to show the predictability of the refractive outcome. Figures 5a, b display attempted refraction [D] vs. achieved refraction [D] for every single eye.

LASIK with ESIRIS & ORK-CAM – Clinical Results

Scatter: Laser Settings SEQ vs. Achieved Change

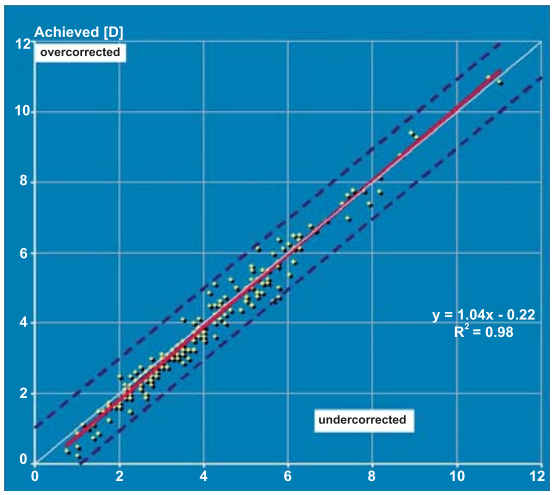

Fig. 5a: Laser Settings SEQ [D] vs. Achieved Change [D] in 183 eyes.

Scatter: Laser Setting CYL vs. SIRC

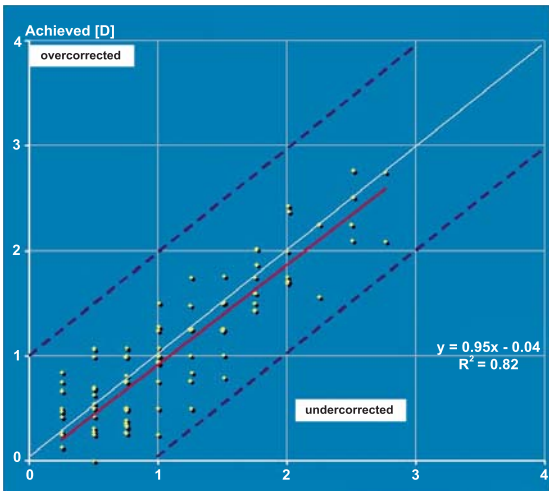

Fig. 5b: Laser Setting CYL [D] vs. Surgically Induced Refractive Cylinder [D] in 148 eyes.

In Fig. 5a and 5b the narrow scatter between the laser settings and the achieved SEQ (Spherical EQuivalent) cylinder, respectively, is obvious.

Refractive outcome – Percentage within Attempted

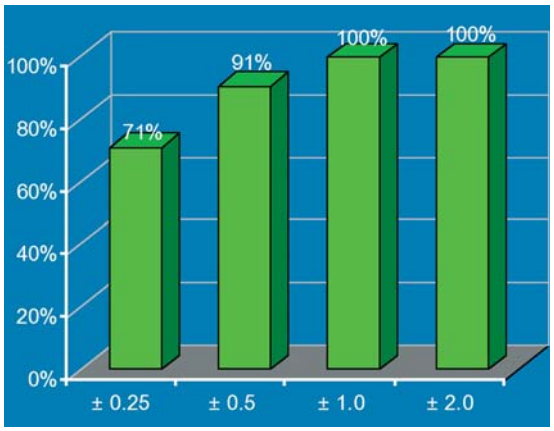

Fig. 6: The bar graph for the Refractive Outcome depicts the most impressive number with 71 % in the range of ±0.25 D.

Change in BSCVA – Percentage 'SAFETY'

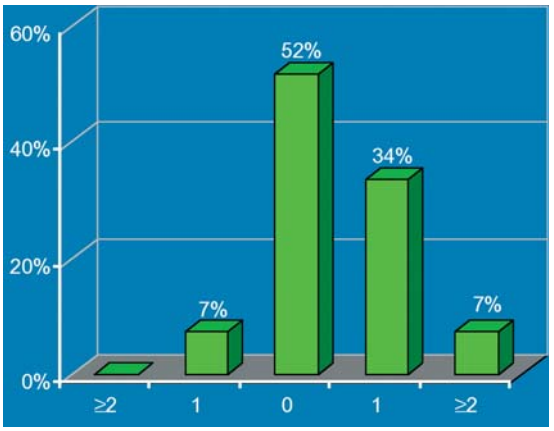

Fig. 7: Safety is described by the change in Best Spectacle Corrected Visual Acuity from the number of Snellen lines which changed from pre-op to post-op.

41 % of the patients gained 1 or more Snellen lines. No patient lost more than one Snellen line.

preOP BSCVA vs. postOP UCVA – Percentage

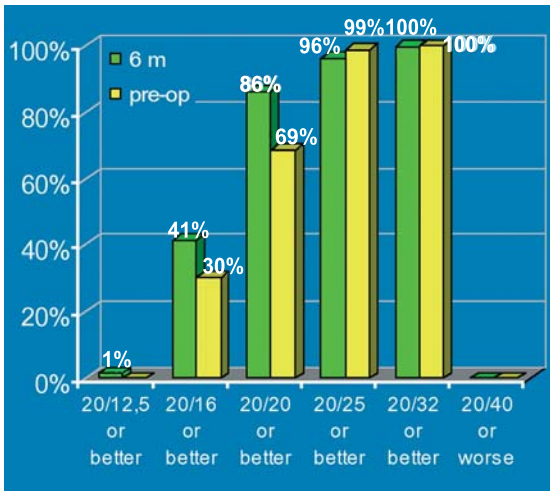

Fig.8: Change in pre-op BSCVA and post-op UCVA. In summary a significant change towards an improved Visual Acuity is clearly obvious.

preOP vs. postOP HOA (at 6 mm zone)

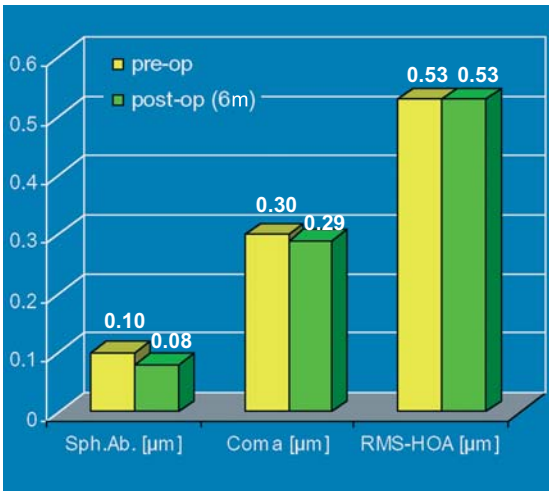

Fig.9: Change in Higher Order Aberrations (HOA). No increase of spherical Aberrations nor in Coma nor in the general RMS-HOA. The aberrations had been preserved -> no induction!

Looking solely at patients with a preoperative BCVA of ≥ 20/20 we noticed that 96 % achieved a 20/20 or better UCVA and 98 % achieved a 20/20 or better BCVA!

Contrast Sensitivity Photopic

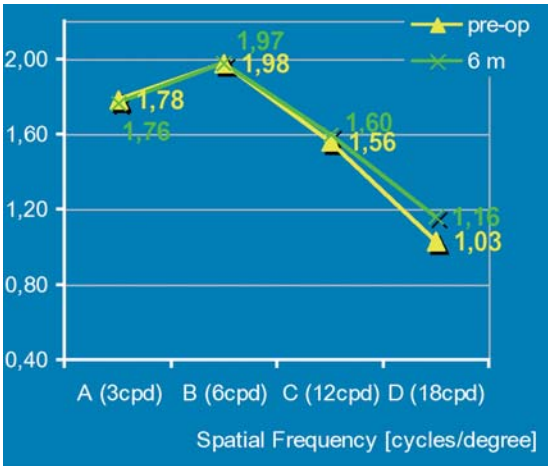

Fig.10a: The contrast sensitivity under photopic light conditions shows a post-op improvement that becomes more significant the higher the spatial resolution.

Contrast Sensitivity Mesopic

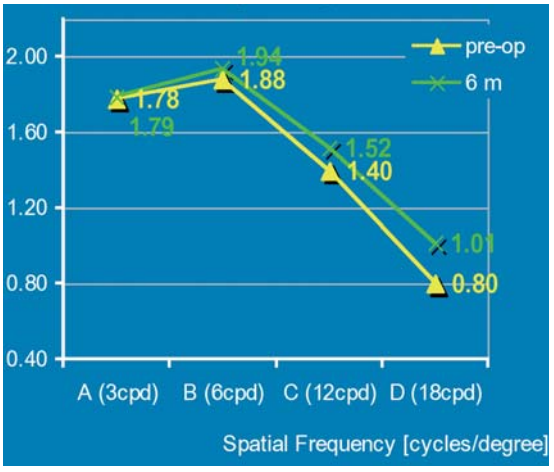

Fig.10b: The contrast sensitivity under mesopic light conditions shows a post-op improvement that becomes more significant the higher the spatial resolution.

As a tribute to the aspherical algorithm and the compensation of the bio-mechanical effects, the contrast sensitivity under various light conditions improved.

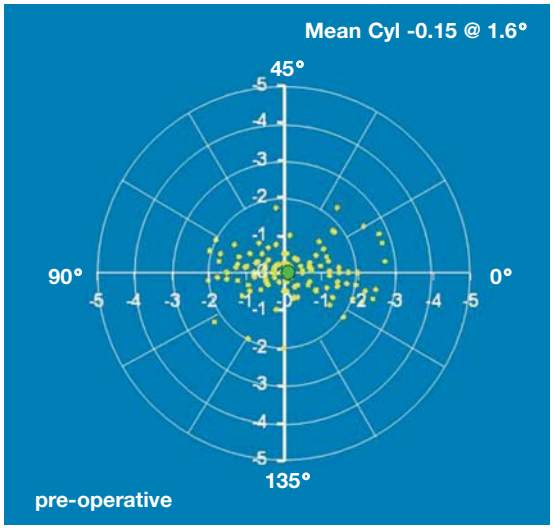

Fig. 11a: Pre-op double-angle scatter plot of the cylindrical component.

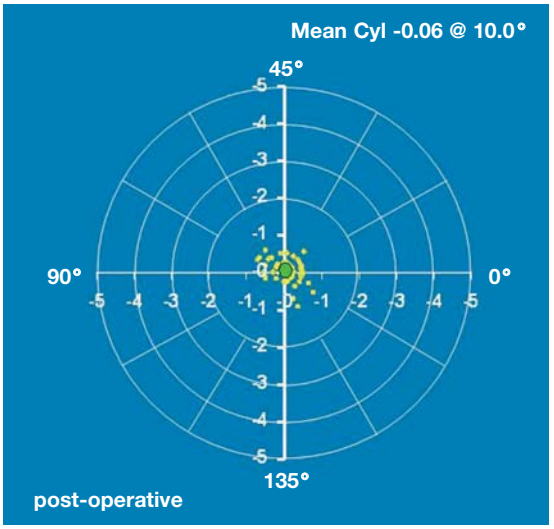

Fig 11b: Post-op double-angle scatter plot of the cylindrical component.

Figures 11a and 11b show the double-angle scatter plot of the cylindrical value with an extremely good post-op scatter and a mean value of -0.06 diopter.

Achieved Correction SEQ over Time 'STABILITY'

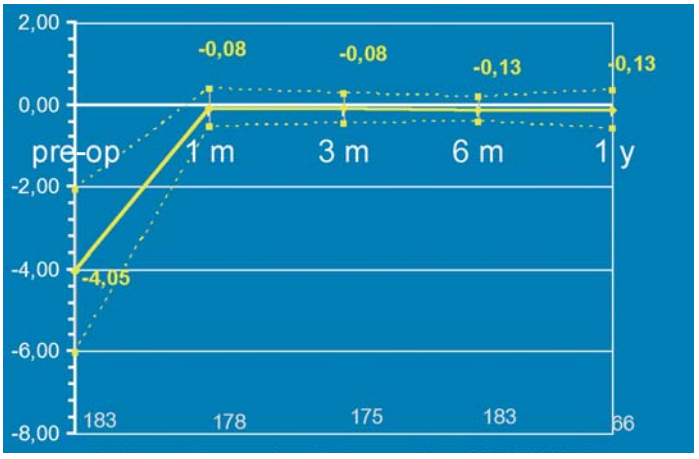

Fig. 12: Stability timeline of the spherical equivalent over a time period.

Values are shown for 1, 3, 6 months and the available data for 1 year follow-up are added. One year data have been available only for 66 eyes showing the highly successful rate. The overall re-treatment rate was less than 2%! Results may vary.

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