ORTOKOREKCJA W KRÓTKOWZROCZNOŚCI U DZIECI

EWA OLESZCZYŃSKA-PROST

CENTRUM OKULISTYKI DZIECIĘCEJ WARSZAWA

www.okulistykadziecieca.pl

VI Konferencja -Edukacja Podyplomowa Okulisty pt. Krótkowzroczność. Jaskra.
Lidzbark Warmiński 26-27. 10. 2012.

ORTOKOREKCJA JEST

ODWRACALNĄ METODĄ

KOREKCJI KRÓTKOWZROCZNOŚCI

DZIECKO

POLEGA NA NOCNYM NOSZENIU WYSOKOGAZOPRZEPUSZCZALNYCH SOCZEWEK KONTAKTOWYCH O ODWROTNEJ 4-KRZYWIZNOWEJ GEOMETRII

PROCES DOBIERANIA ORTOSOCZEWEK

DOBÓR PACJENTÓW

- BADANIA OKULISTYCZNE

KWALIFIKUJĄCE DO ORTOSOCZEWEK

- OCENA KLINICZNA

KWALIFIKACJA PACJENTÓW

-DZIECI I DOROŚLI

-WADA WZROKU OD -1.O DO -5,5

-ASTYGMATYZM DO -1,5

-KERATOMETRIA 40,0 - 46,0 D (PROMIEŃ KRZYWIZNY ROG. 8,4-7,3)

-DZIECI Z POSTĘPUJĄCĄ MYOPIĄ

-OSOBY PROWADZĄCE AKTYWNY TRYB ŻYCIA (SPORT)

-OSOBY PRACUJĄCE W ZADYMIONYCH LUB KLIMATYZOWANYCH POMIESZCZENIACH

-WZGLĘDY ZAWODOWE

(NURKOWIE, PILOCI, ŻOŁNIERZE, PRACA NA WYSOKOŚCI)

-PACJENCI BEZ CHORÓB OCZU I POWIEK

(DYSTROFIA ROGÓWKI, STOŻEK ROGÓWKI, BLEPHAROCONJ. CHRONICA)

-OSOBY ROZUMIEJĄCE, ZE METODA WYMAGA REGULARNEGO STOSOWANIA SOCZEWEK KAŻDEJ NOCY


Strefa Krzywizny Bazowej
Strefa Krzywizny Odwrotnej
Strefa Peryferyczna
Strefa Podniesienia Krawędzi

CECHY ORTOSOCZEWEK

-- WYSOKOGAZOPRZEPUSZCZALNOŚĆ MATERIAŁU (BOSTON XO)

-- 4 - KRZYWIZNOWA GEOMETRIA SOCZEWEK

Z ODWROTNĄ STREFĄ KRZYWIZNY

+ STREFA OPTYCZNA 6,0-8,0 mm

+ STREFA ODWROTNEJ KRZYWIZNY 0,6-1,0 mm

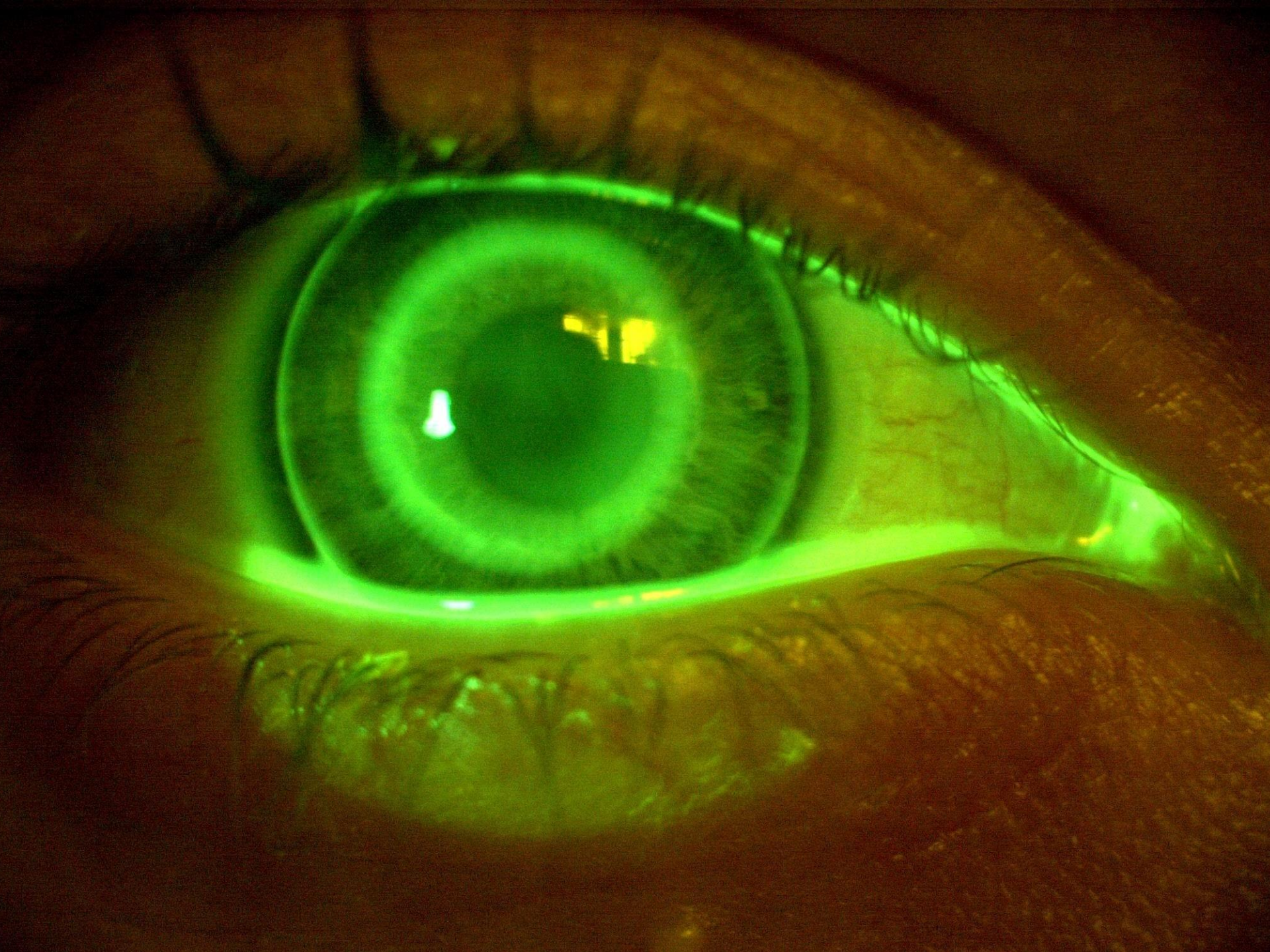
+ STREFA PERYFERYCZNA 0,6-1,5 mm

+ STREFA UNIESIENIA KRAWĘDZI 0,07mm

-- ŚREDNICA SOCZEWKI 9,5-12,5mm

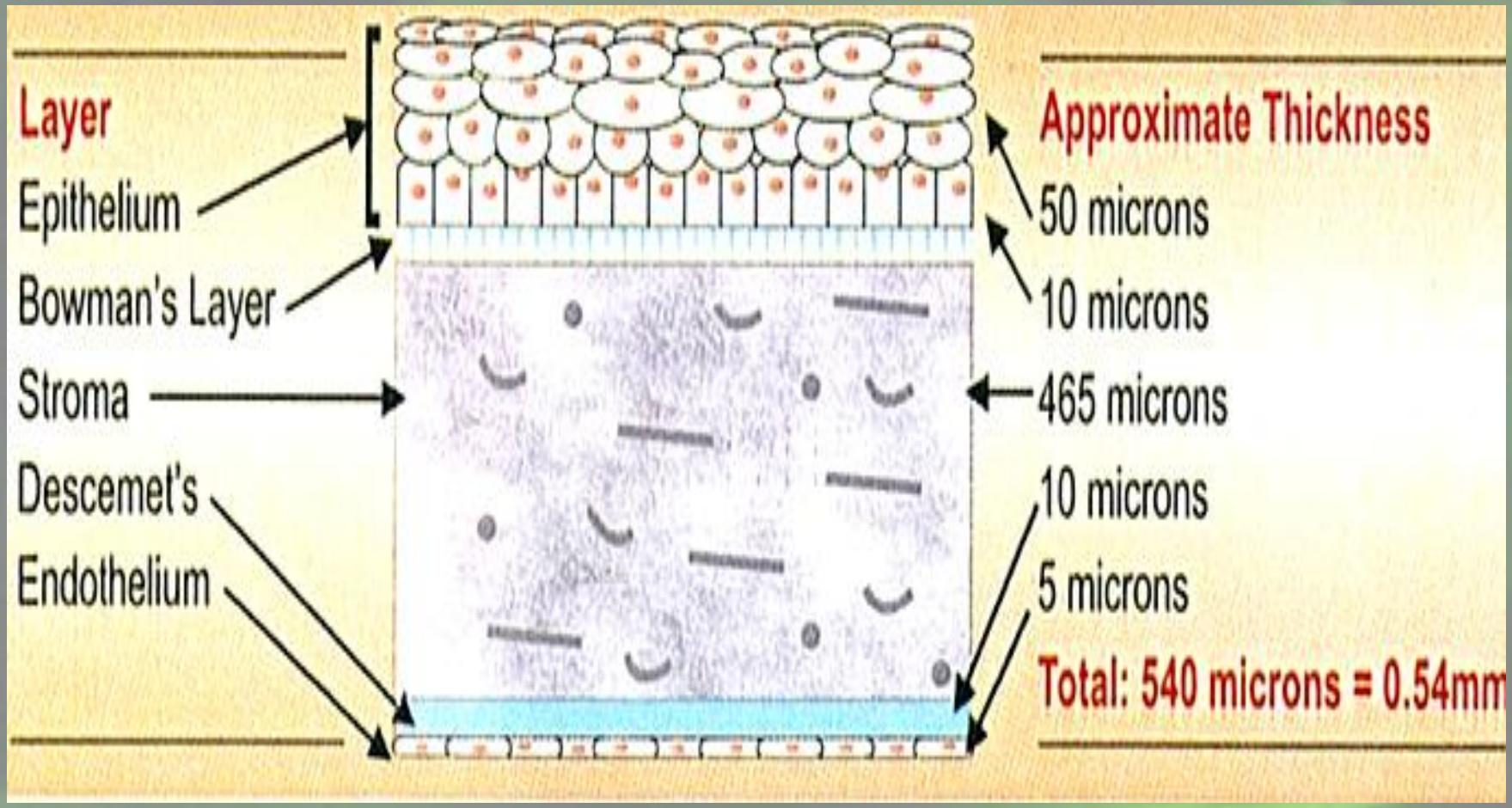
-- GRUBOŚĆ CENTRALNA 0,2 -0,25mm

-- KRZYWIZNA BAZOWA = MAPA ROGÓWKI



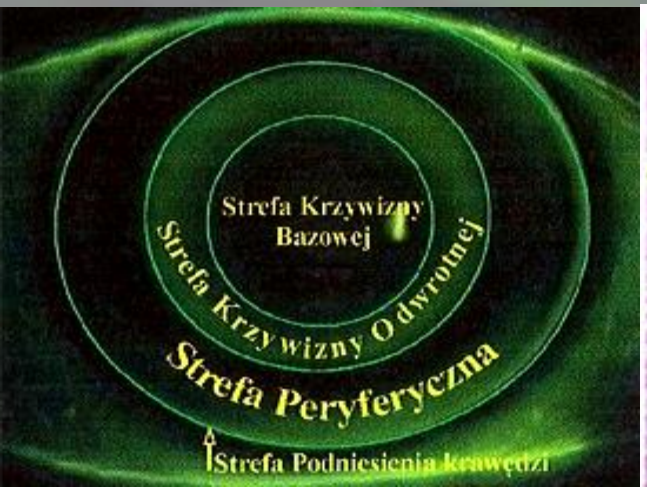
WARSTWY ROGÓWKI

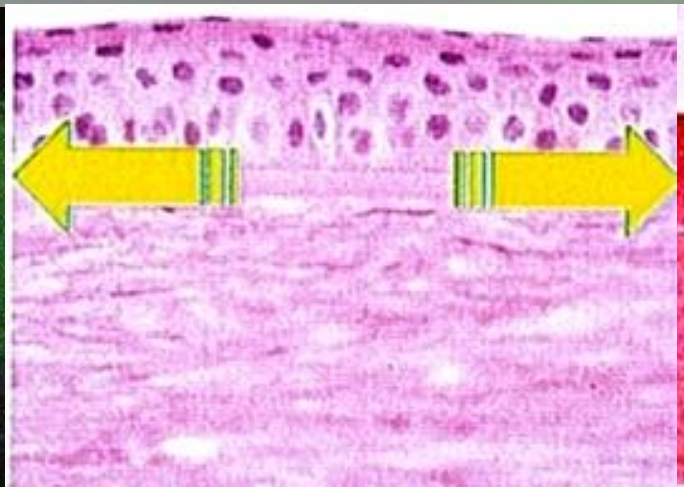
KOREKCJA MYOPII -1,0 DO -5,5 DSPH

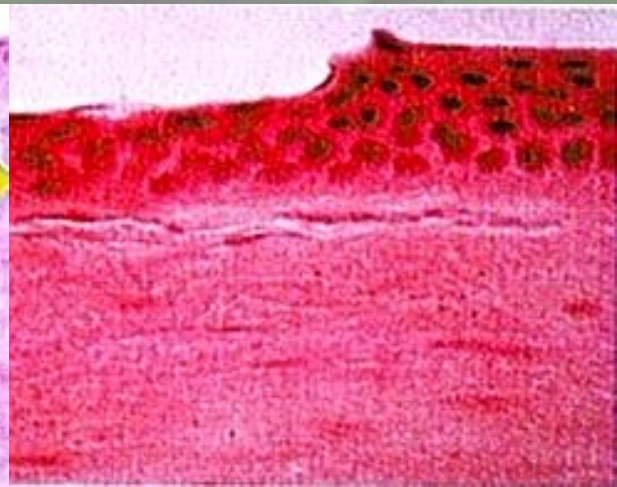


H I P O T E Z Y

-ZMIANY GRUBOŚCI CENTRALNEJ ROGÓWKI
-OBRZĘK ROGÓWKI PARACENTRALNIE > CENTRALNIE
(PRZEMODELOWANIE POWIERZCHNI ROG - STREFA K.ODWROTNEJ)
-ZMIANY PROMIENI KRZYWIZNY ROGÓWKI
(ABERACJE OPTYCZNE - KRZYWA ZERNIKEGO, MAPA ROGÓWKI)
- BRAK ZMIAN KRZYWIZNY TYLNEJ ROGÓWKI
-ZMIANY W GRUBOŚCI FILMU ŁZOWEGO
UCISK SOCZEWKI W CENTRUM POWODUJE
< GRUBOŚCI
< SIŁY ŁAMIĄCEJ
-ROZDZIELANIE I ZMIANA KSZTAŁTU POWIERZCHNI ROGOWKI
WARSTW FILMU ŁZOWEGO I KOMÓREK NABLONKA

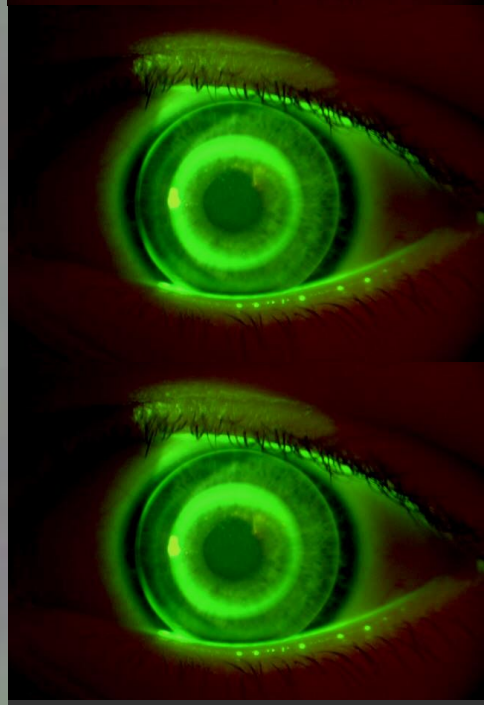


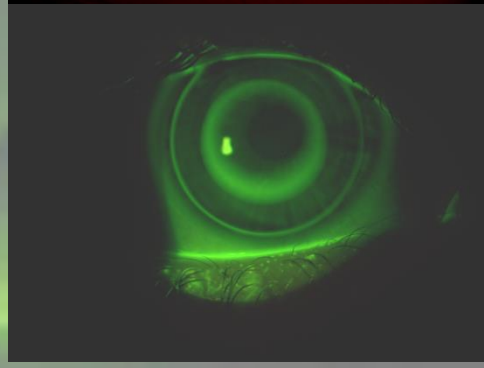




BADANIA OKULISTYCZNE

- BADANIE OSTROŚCI WZROKU SC I CC (d d , d b)
- REFRAKCJA + KERATOMETRIA
--TOPOGRAFIA ROGÓWKI – MAPA ROGÓWKI
- ŚREDNICA ŹRENICY
- ANALIZA FILMU ŁZOWEGO
    *TEST SCHIRMERA
    *BUT
    *OCENA WARSTW FILMU ŁZOWEGO
- BIOMIKROSKOPIA
- OFTALMOSKOPIA
- BIOMETRIA GAŁKI
- PACHYMETRIA
- CIŚNIENIE WEWNĄTRZGAŁKOWE
--MIKROSKOPIA LUSTRZANA - ENDOTELIUM
- OBRAZ FLUORESCEINOWY






Speedy-K

OCENA ORTOSOCZEWKI

*CENTRACJA NA ROGÓWCE

POŁOŻENIE CENTRALNE

DECENTRACJA = ASTYGMATYZM

*RUCHOMOŚĆ

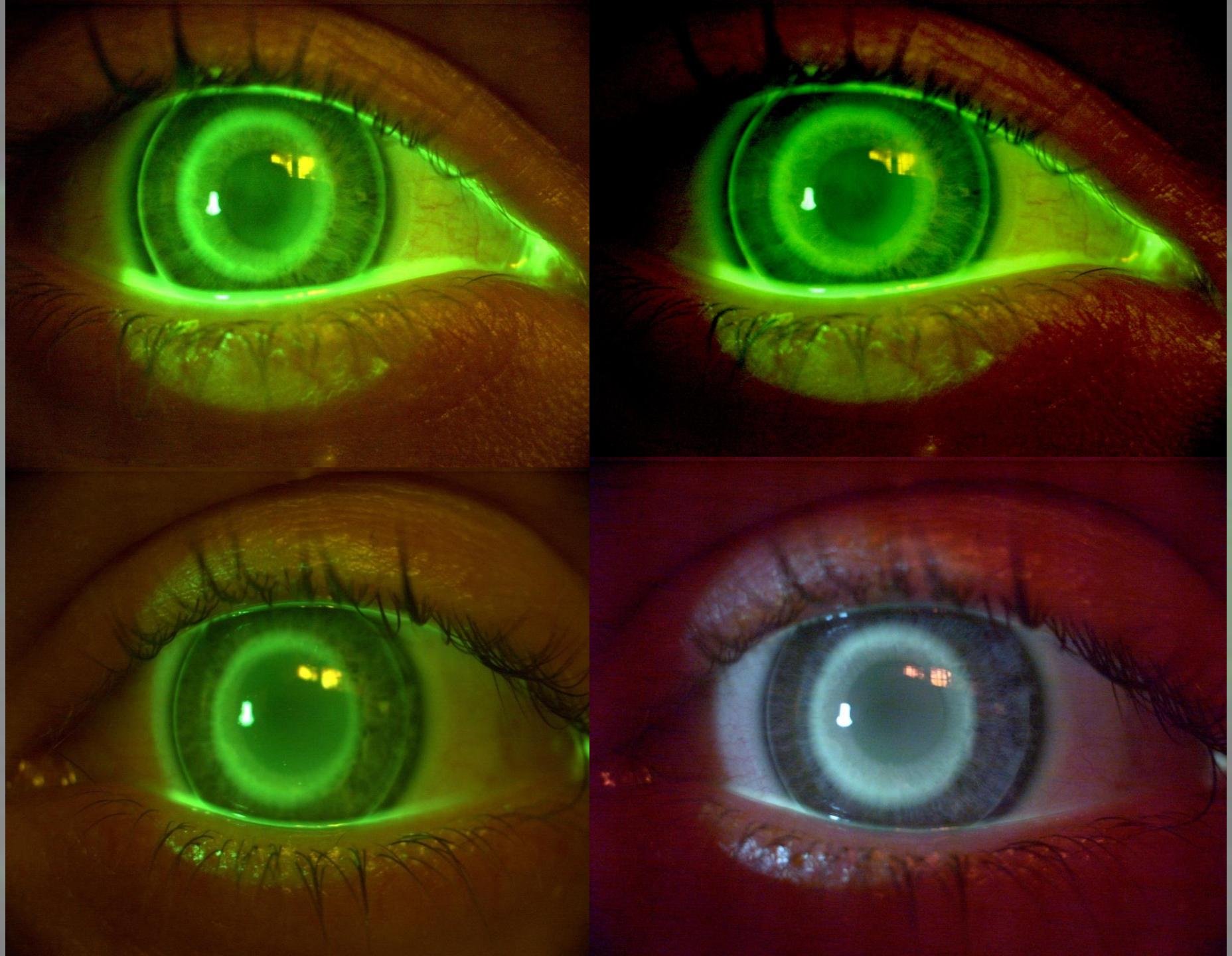
PRZY MRUGANIU 1-2 MM PRZESUNIĘCIA

BRAK RUCHU = SOCZEWKA BARDZIEJ PŁASKA

*OBRAZ FLUORESCEINOWY

OBRAZ „BULL EYE”

OCENA PRZY POMOCY BIOMIKROSKOPU Z NIEBIESKIM ŚWIATŁEM I ŻÓŁTYM FILTREM (WRATTEN-KODAK)




A
A

MATERIAŁ

LICZBA OSÓB: 186 (372 oczu)

WIEK: 5-18 lat

WADA WZROKU: -1,5 do - 5,5 D sph

-0,25 do -1,5 D cyl

OCENA ORTOKOREKCJI

1. OSTROŚCI WZROKU

2. ZMIAN SIŁY ŁAMIĄCEJ ROGÓWKI

3. POSTĘPU KRÓTKOWZROCZNOŚCI

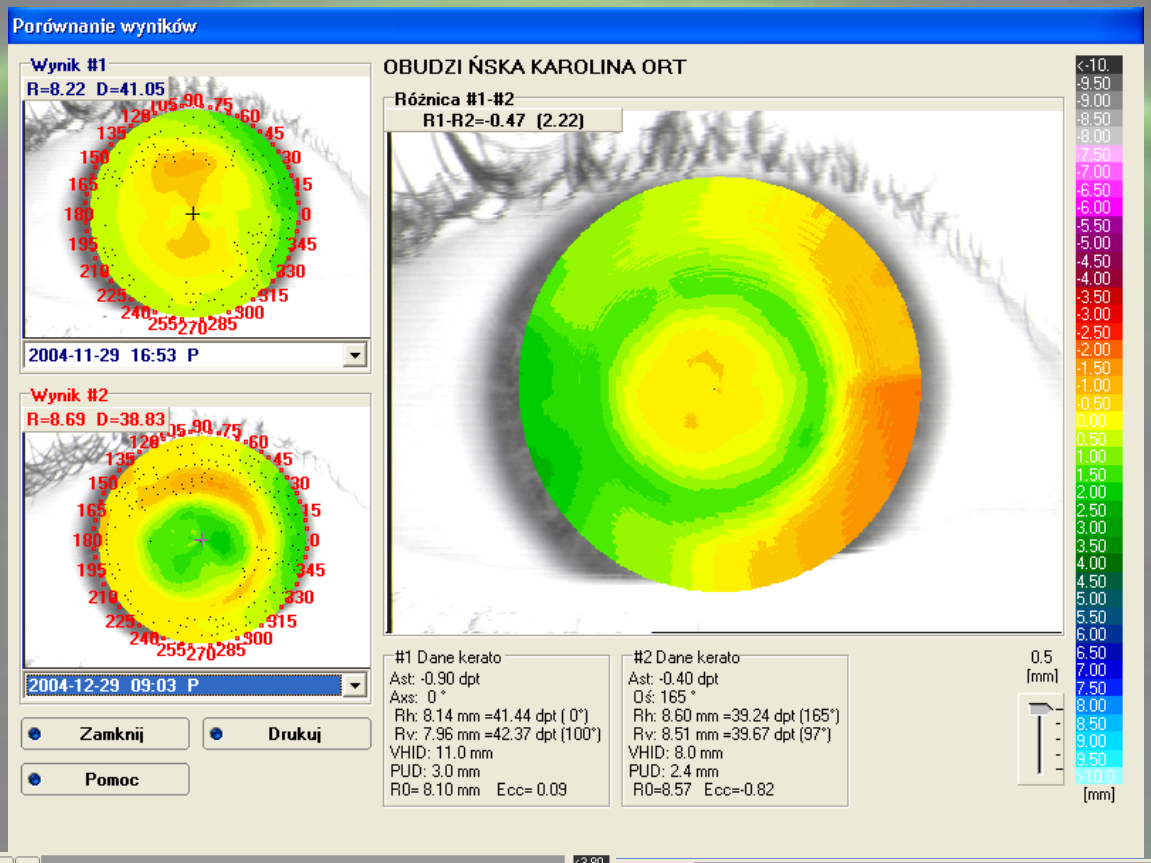
PODCZAS STOSOWANIA ORTOSOCZEWEK PRZEZ OKRES 2 - 6 LAT U DZIECI

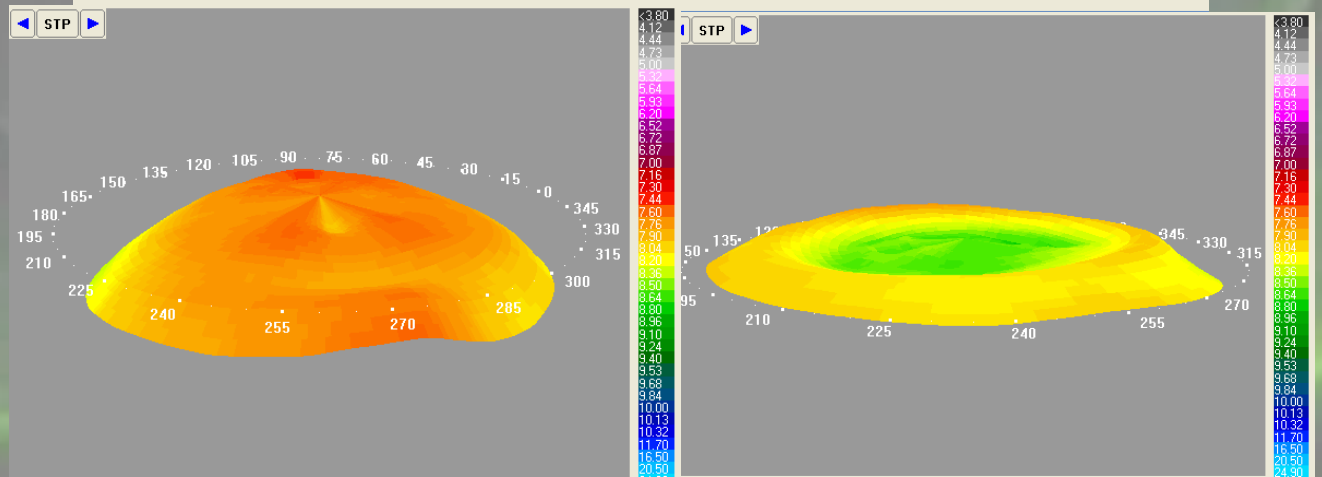
WYNIKI

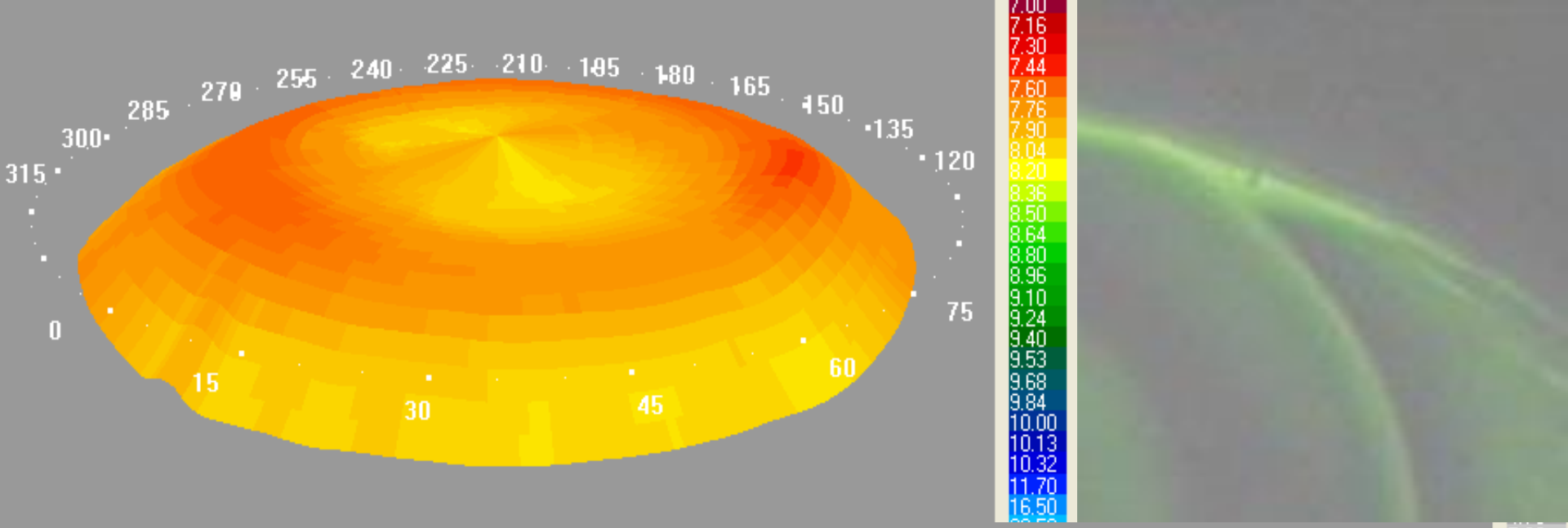
OSTROŚĆ WZROKU DO DALI
0,9 - 1,0
UZYSKANO U WSZYSTKICH PACJENTÓW

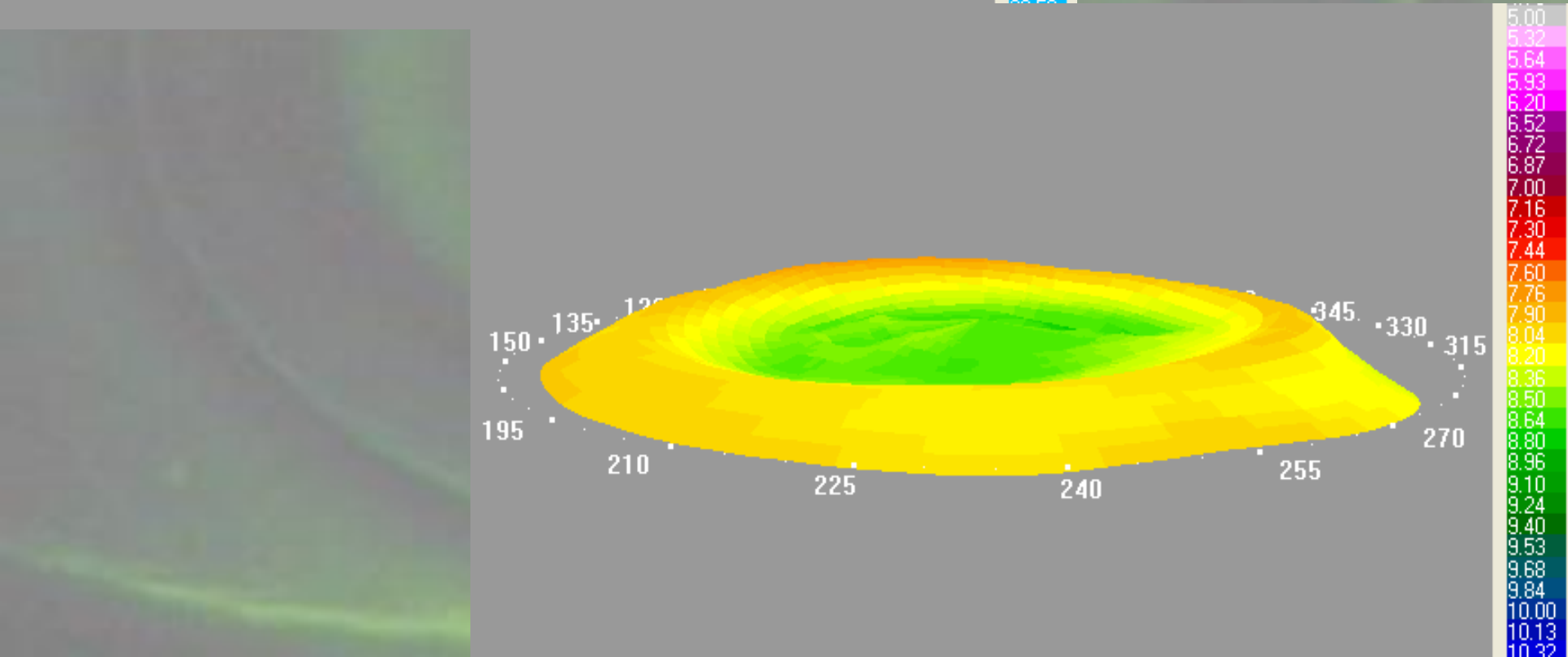
bez korekcji
przez cały dzień

TOPOGRAFIA ROGÓWKI






240
225
210
195
180
165
150
135
120
105
90
75
60
45
30
15
0
315
300
285
270
255
7.00
7.16
7.30
7.44
7.60
7.76
7.90
8.04
8.20
8.36
8.50
8.64
8.80
8.96
9.10
9.24
9.40
9.53
9.68
9.84
10.00
10.13
10.32
11.70
16.50


150
135
195
210
225
240
255
270
285
300
315
330
345
5.00
5.32
5.64
5.93
6.20
6.52
6.72
6.87
7.00
7.16
7.30
7.44
7.60
7.76
7.90
8.04
8.20
8.36
8.50
8.64
8.80
8.96
9.10
9.24
9.40
9.53
9.68
9.84
10.00
10.13

Przegląd wyników

Pacjent
GRZEJSZCZAK-ORT
AGNIESZKA

Widok
TAN EDT CMP ID
SAG 3D HGH IMG
ZER FOU INF
Źrenica / tęczówka
Dane keratometryczne
Mapa numeryczna

Lista badań

Oko	Data	Czas
L	2005-10-24	19:26
R	2005-10-24	19:24
L	2005-10-24	16:07
R	2005-10-24	16:07

Usuń

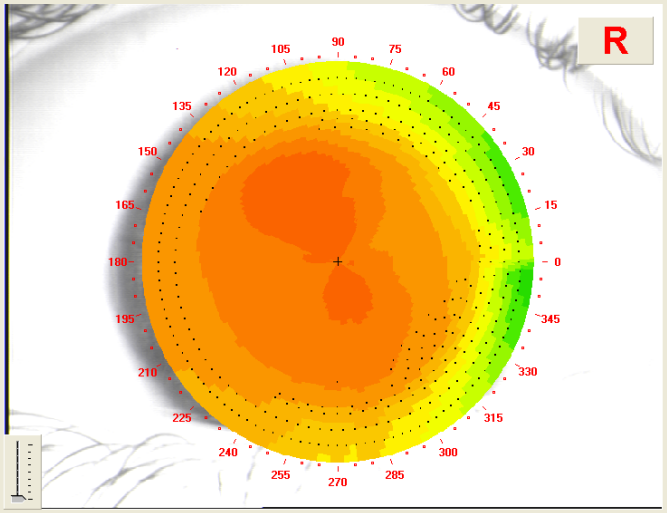
Eksport Import

Lens fitting

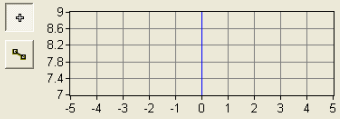
Drukuj

Zamknij

Pomoc



Centralne dane keratometryczne
Ast: -0.85 D @ 15°
Rh: 7.66 mm =44.06 D (15°)
Rv: 7.51 mm =44.92 D (109°)
VHID: 10.1 mm
PUD: 4.8 mm
R0: 7.52 mm Ecc: 0.66



[mm] ABS

Przegląd wyników

Pacjent
GRZEJSZCZAK-ORT
AGNIESZKA

Widok
TAN EDT CMP ID
SAG 3D HGH IMG
ZER FOU INF
Źrenica / tęczówka
Dane keratometryczne
Mapa numeryczna

Lista badań

Oko	Data	Czas
L	2006-05-10	18:08
R	2006-05-10	18:08
L	2006-01-16	18:15
R	2006-01-16	18:15

Usuń

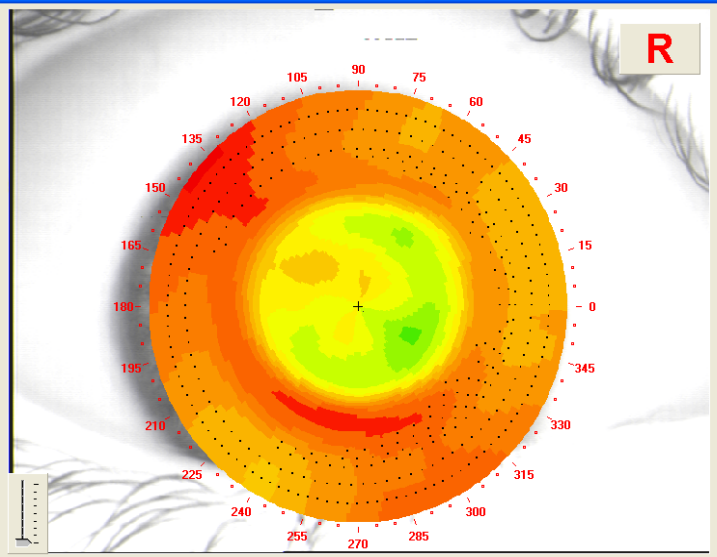
Eksport Import

Lens fitting

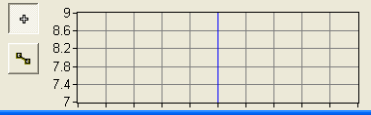
Drukuj

Zamknij

Pomoc



Centralne dane keratometryczne
Ast: -0.35 D @ 15°
Rh: 8.23 mm =40.99 D (15°)
Rv: 8.16 mm =41.37 D (110°)
VHID: 10.3 mm
PUD: 5.9 mm
R0: 8.13 mm Ecc: 0.72



[mm] ABS

ików

CZAK-ORT
KA

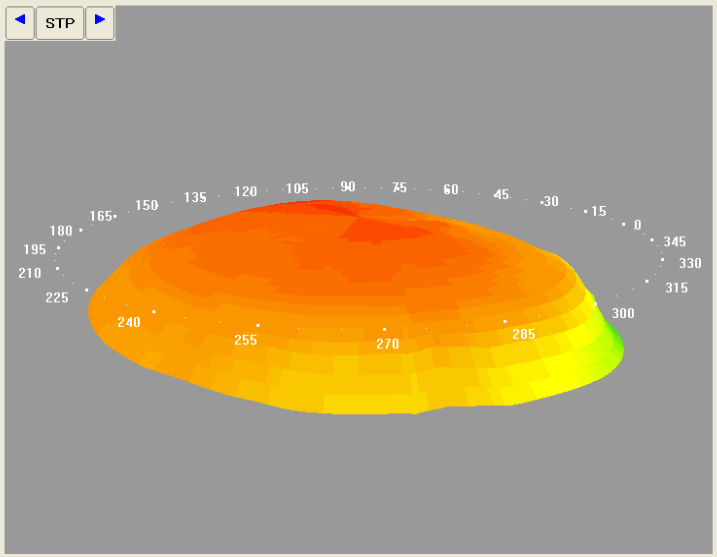
EDT CMP ID
3D HGH IMG
ER FOU INF
/ tęczówka
eratometryczne
umeryczna

Data	Czas
005-10-24	19:26
005-10-24	19:24
005-10-24	16:07
005-10-24	16:07

Import

Lens fitting

STP



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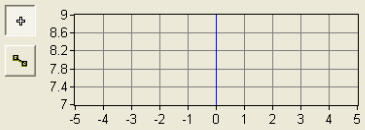
Rh: 7.66 mm =44.06 D (15°)
Rv: 7.51 mm =44.92 D (109°)
VHID: 10.1 mm
PUD: 4.8 mm
R0: 7.52 mm Ecc: 0.66



[mm] ABS

Przegląd wyników

Pacjent
GRZEJSZCZAK-ORT
AGNIESZKA

Widok
TAN EDT CMP ID
SAG 3D HGH IMG
ZER FOU INF
Źrenica / tęczówka
Dane keratometryczne
Mapa numeryczna

Lista badań

Oko	Data	Czas
L	2006-01-16	18:15
R	2006-01-16	18:15
L	2005-12-14	17:17
R	2005-12-14	17:17

Usuń

Eksport Import

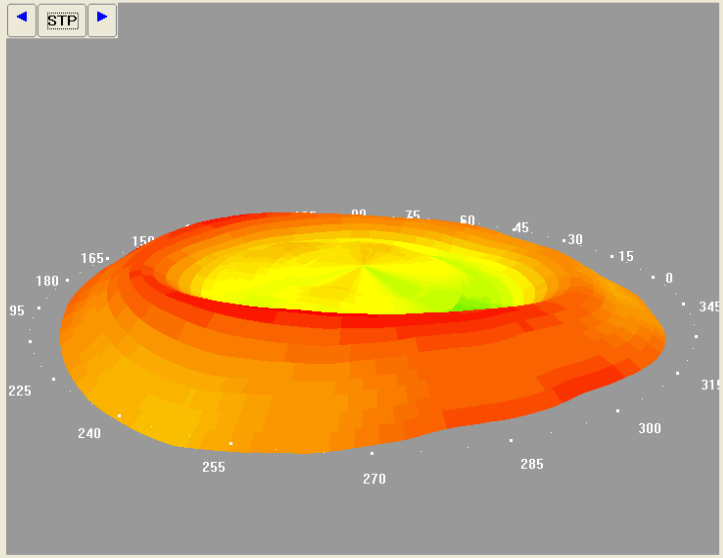
Lens fitting

Drukuj

Zamknij

Pomoc

STP



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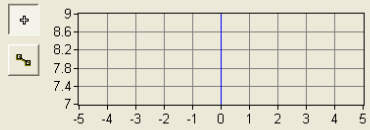
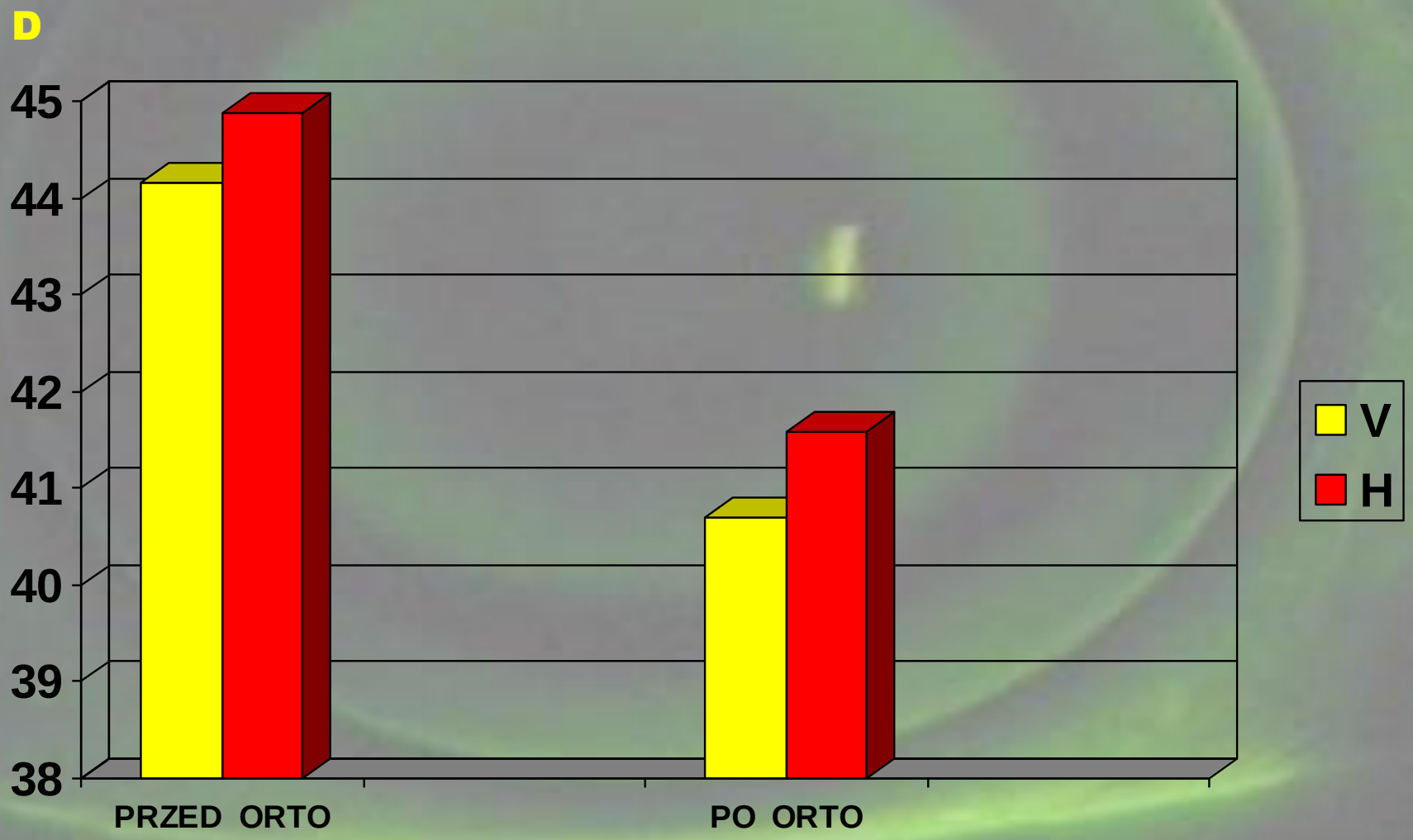
Rv: 8.16 mm =41.37 D (110°)
VHID: 10.3 mm
PUD: 5.9 mm
R0: 8.13 mm Ecc: 0.72



[mm] ABS

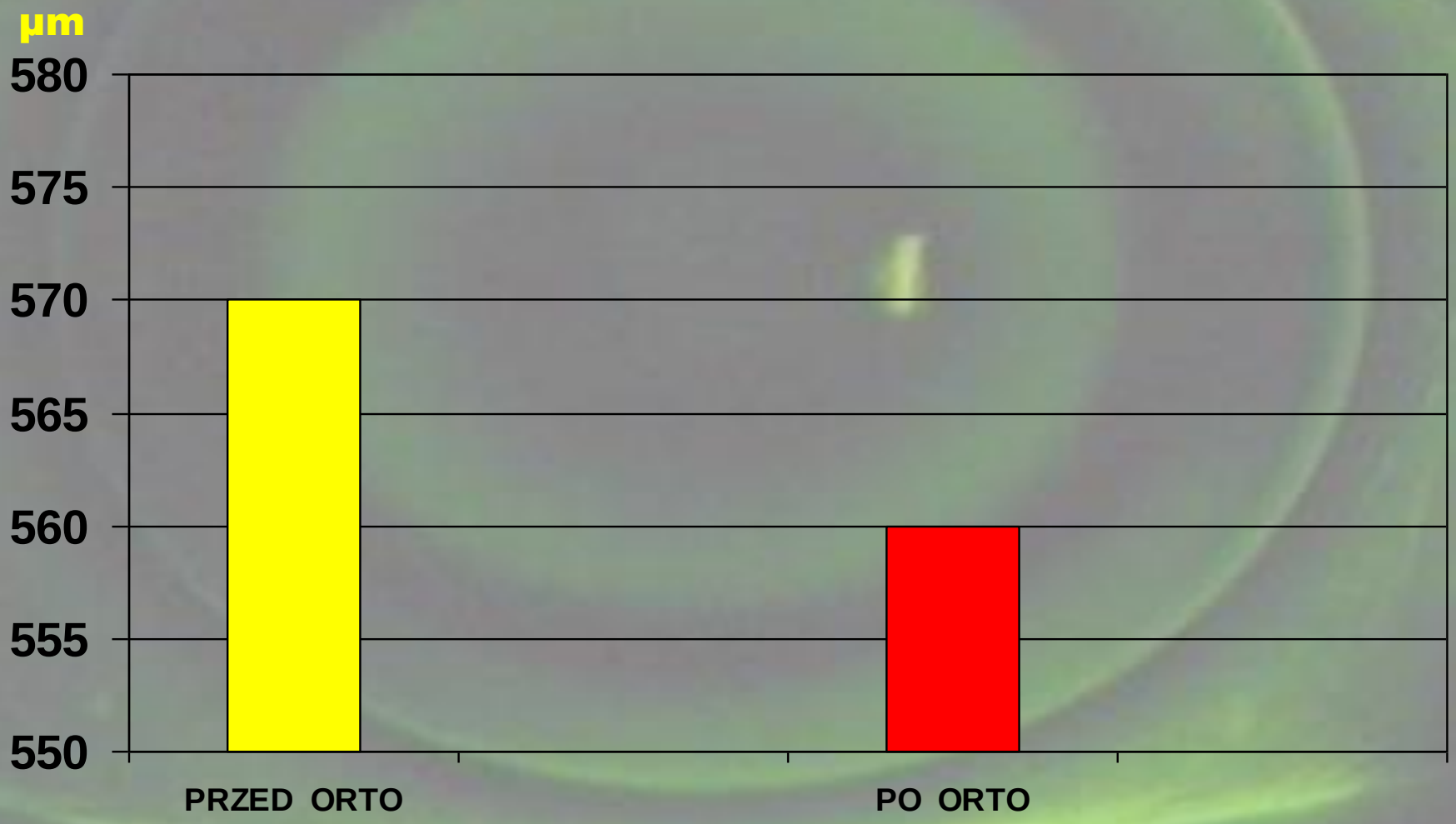
WYNIKI

SIŁA ŁAMIĄCA ROGÓWKI --TOPOGRAFIA



WYNIKI

PACHYMETRIA



* COON 1984
* SWARBRICK 1998, 2001 - 11,0 µm ± 5,9
* NICHOLS 2000 (Orbscan) - 12,0 µm ± 11
* LUI & EDWARDS 2000 - 16,0 µm ± 8
* NGUYEN 2002 (Orbscan) - 14,7 µm
* GARNER & GAMBLE 2004 - 14,2 µm

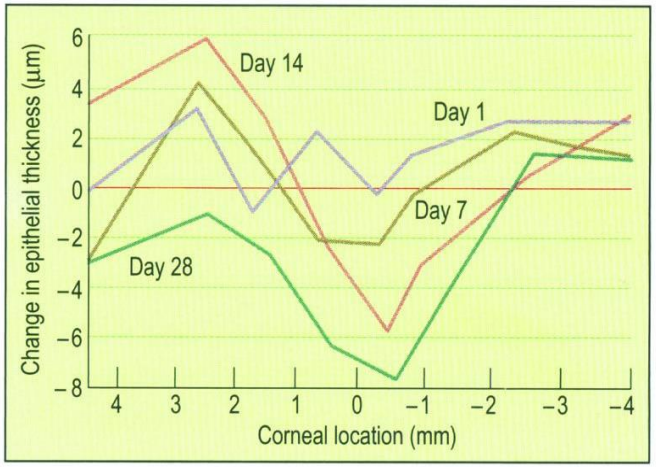


Figure 3.6 Changes in epithelial thickness following orthokeratology. Reproduced with permission from Swarbrick et al (1998) © The American Academy of Optometry.

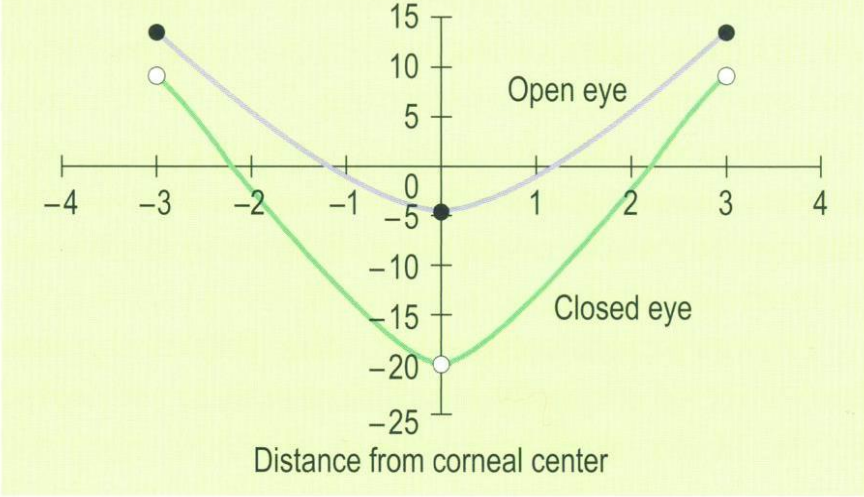
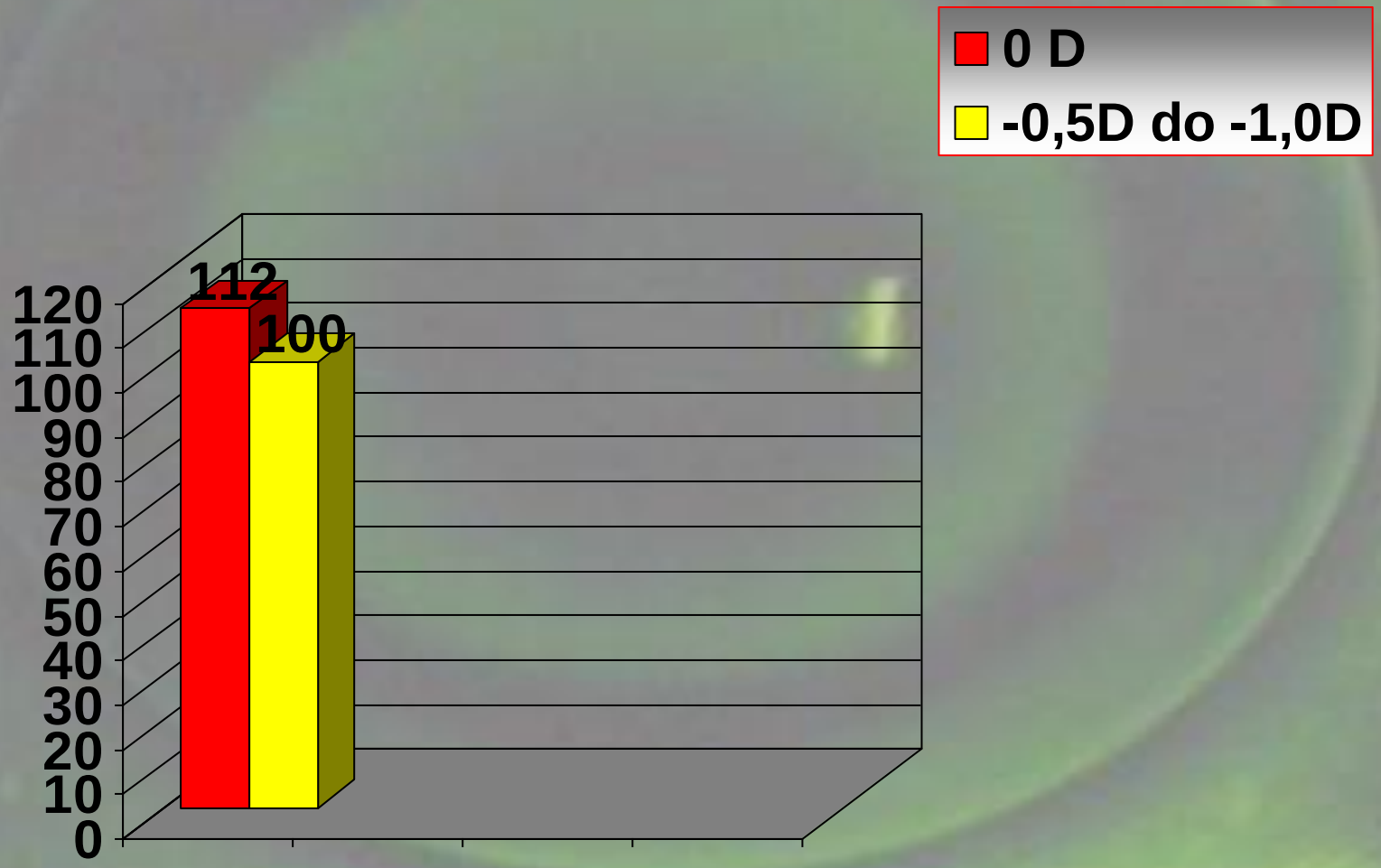


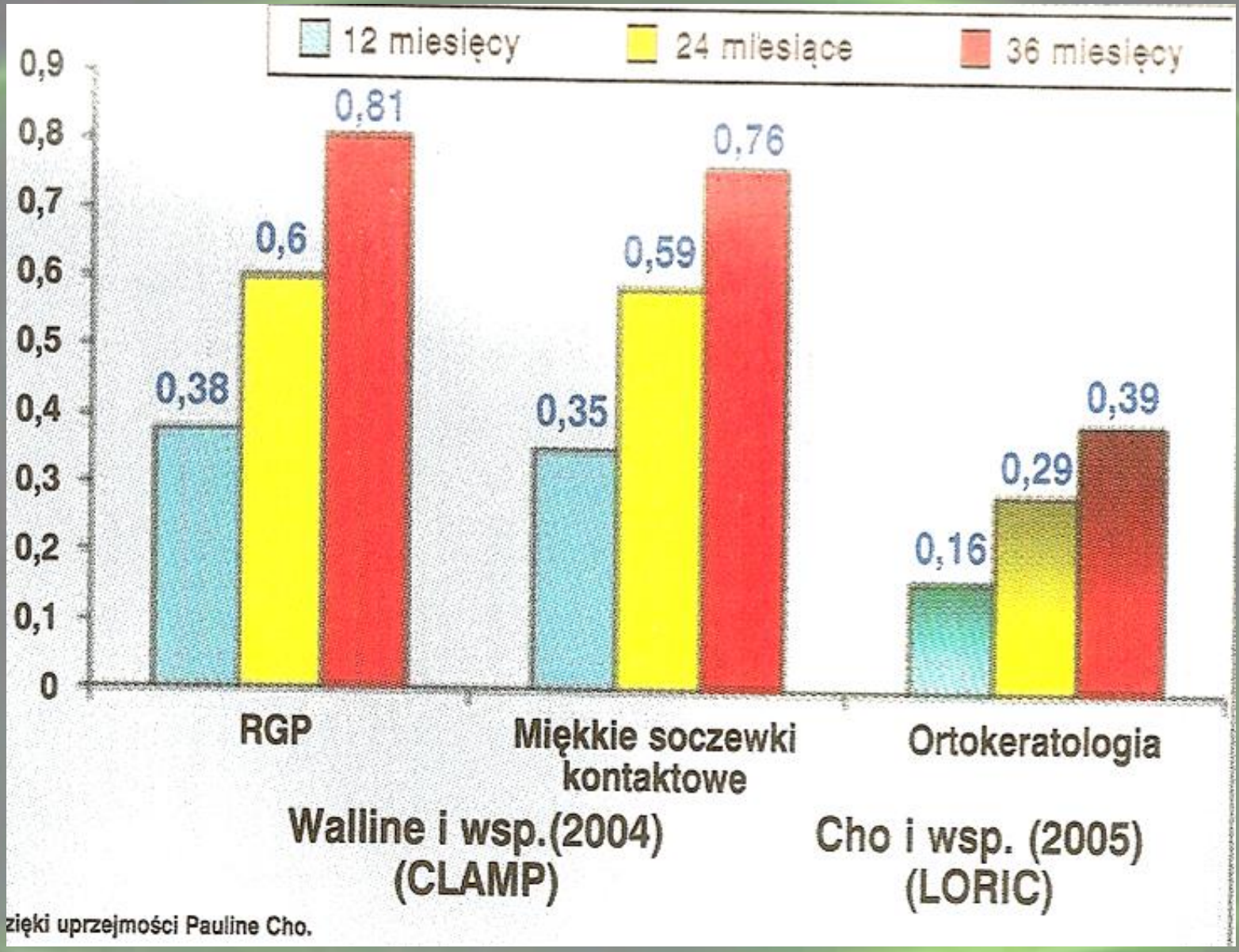
Figure 7.23 The difference in corneal thickness change (shown on the *y*-axis) between daily-wear and overnight-wear orthokeratology. Courtesy of Helen Swarbrick and Ahmed Alharbi.

CORNEAL CHANGES AND WAVEFRONT ANALYSIS AFTER ORTHOKERATOLOGY FITTING TEST

STILLITANO J,CHALITA M; AM JOURNAL OF OPHTHALMOL,2007;378-386

POSTĘP KRÓTKOWZROCZNOŚCI





zięki uprzejmości Pauline Cho.

0 86

40

-1,5 (2r)
-1,5
-5,0 (5,5r)

-3,0 (2,5)
-3
-4,0 (3)
-4,5

-4,5 (2,5)
-4,5
-2,5 (1)
-3,0
-5,0 (2,5)
5
-1,5 (4)
-1,5
-2,5 (1)
-3,0
-1,5 (2)
-1,5
-1,5 (2)
-1,5
-3,0 (4)
-1,0 (1)
-4,0 (2,5)
-3,5
-1,5 (0,5)
-1,5
-3,0 (1)
-3,5
-4,5 (3)
-4,5 (2,5)
-1,5
-5,0 (1)
-5,0
-5,0 (4,5)
-5,0
-4,5 (3)
-4,5
-2,0 (1)

46

-2,5
-2,5 (1)
-4,5 (7)
-4,5
-2,0
-2,0 (1)
-4,0 (2)
-3,5
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-1,5 (3)
-4,5 (2)
-4,5
-3,0 (5)

-0,5 87

31

-3
-3 (5,5r)
-5 (2,5r)
-5
-1,5 (1r)
-5,0 (5,5r)
-5,0
-2,5 (2r)
-2,5
-5,0 (5,5r)
-5,0 (5r)
-1,5 (1,5)
-1,5
-2,5 (2)
-2,5
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-4,0 (2)
-1,5
-4,5 (3)
-4,0 (4,5)
-1,5
-3,5 (4)
-3,5 (5)
-3,0
-1,5 (3)

-1,0

32

-1,5 (1,5r)
-1,5
-3,0 (1,5r)
-3,0
-4,5 (5r)
-3,0 (4)
-1,0 (4)
-1,5 (2,5)
-1,5
-2,5 (5)
-2,5
-4,0 (1)
-3,0 (2)
-1,0
-3,5 (3)
-3,5
-1,5 (2)
-1,5
-4,0 (3)
-3,5 (2)
-3,5
-3,5 (1)
-3,5
-2,0 (6)
-5,5 (0,5)
-5,5
-3,5 (4)
-4,5 (2,5)
-4,5
-4,0 (2)
-4,0
-4,0 (2)

-1,5 → -2,5

24

-1,5 (4r)
-1,5
-5,0 (5r)
-5,0
-2,5 (6r)
-2,5
-3,0 (4)
-1 (4)
-4,5 (1)
-3,5
-1,5 (5)
-2,0
-4,0 (2)
-4,0
-3,5 (2)
-3,0
-1,5 (2)
-1,5
-2,5 (6)
-1,5 (7)
-2,5
-1,5 (1,5)
-1,5
-3,5 (2)
-

POWIKŁANIA

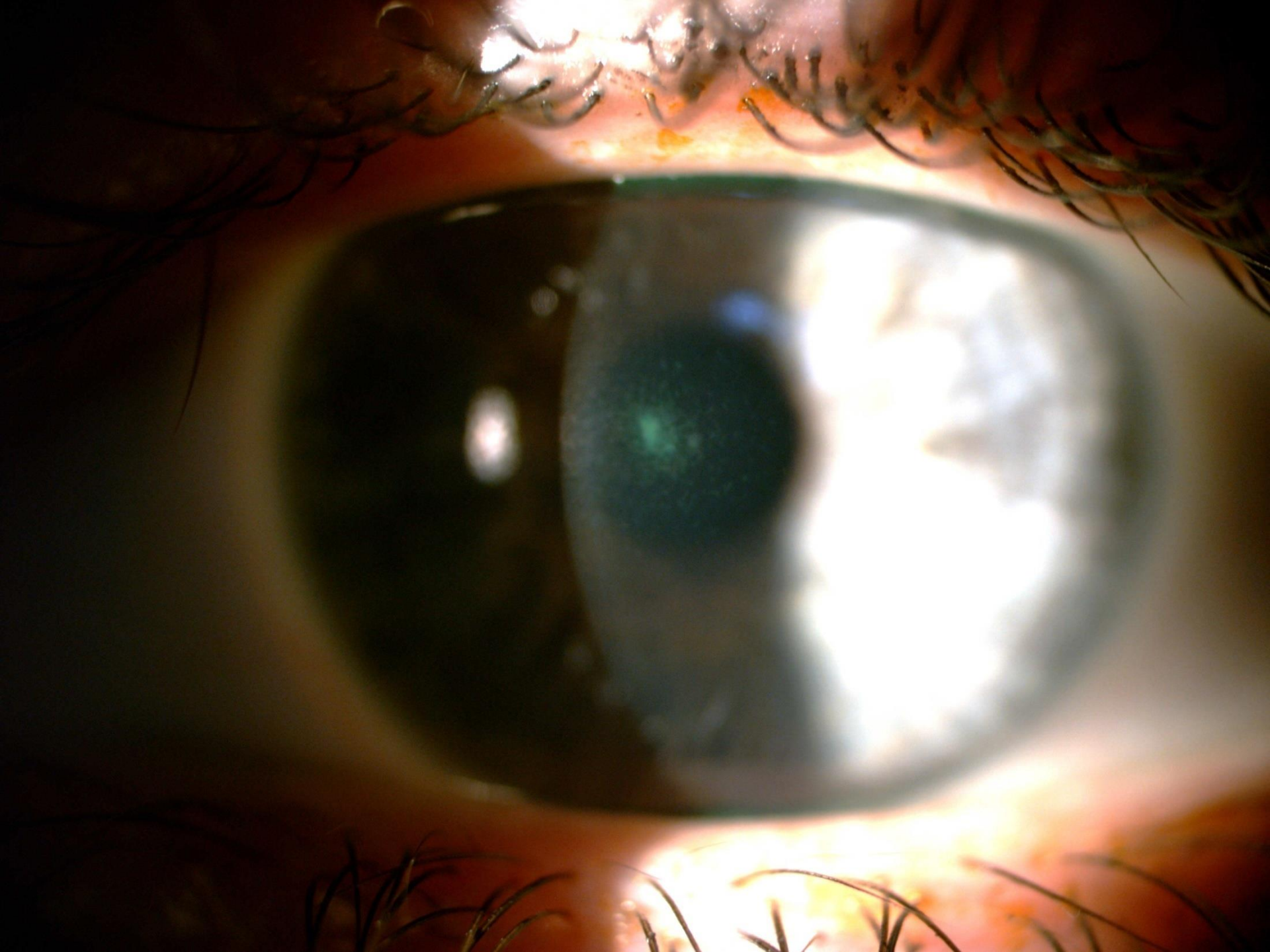
KERATITIS PUNCTATA

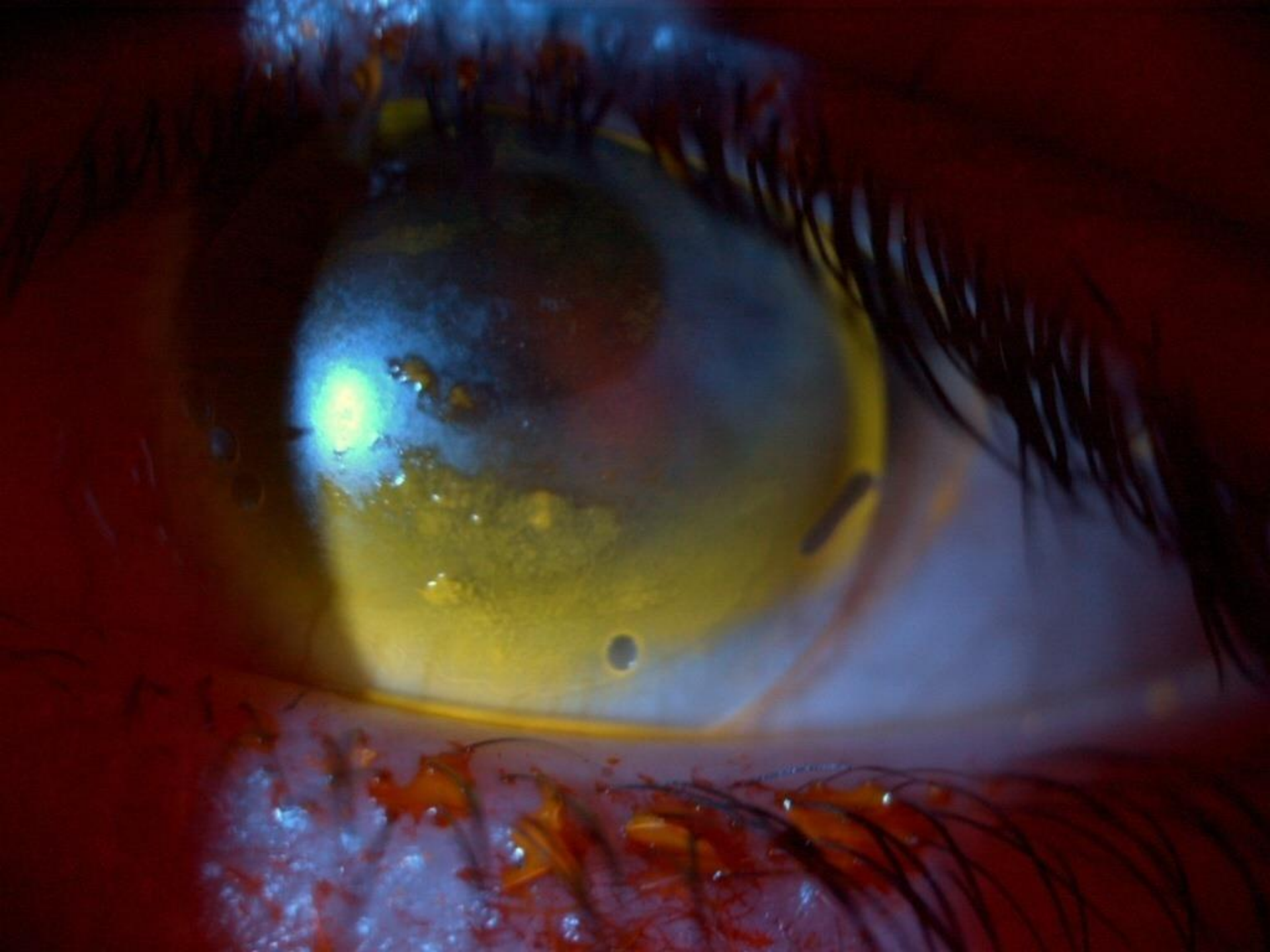
OSADY MUCYNOWO-BIAŁKOWE

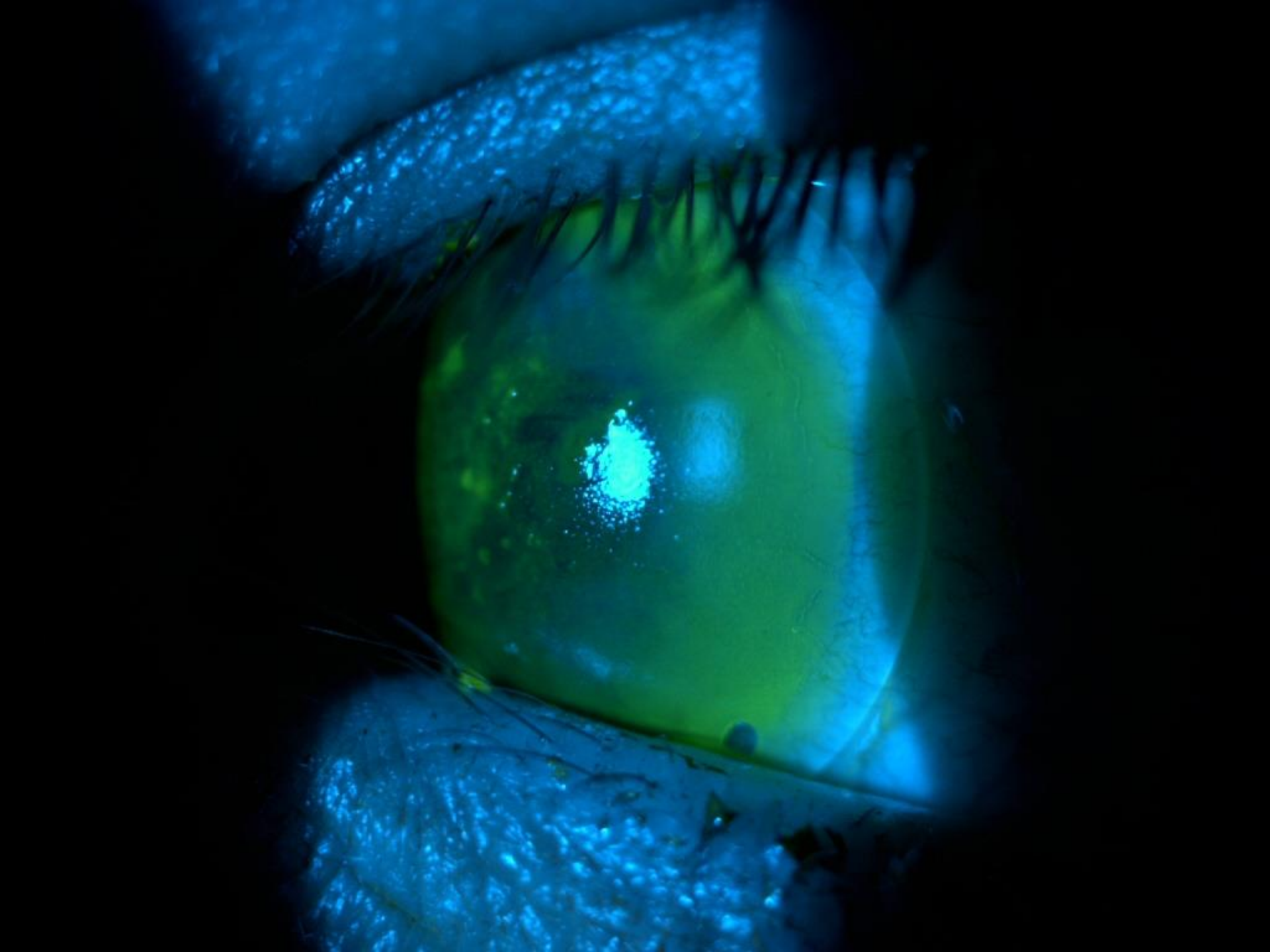
OWRZODZENIE ROGÓWKI

ASTYGMATYZM

ENDOTHELIUM - BEZ ZMIAN







Przegląd wyników

Pacjent
SIDORSKA-ORTO
MARTA

Widok
TAN EDT CMP ID
SAG 3D HGH IMG
ZER FOU INF

Źrenica / tęczówka
Dane keratometryczne
Mapa numeryczna

Lista badań

Oko	Data	Czas
L	2006-09-25	18:23
R	2006-09-25	18:23
L	2006-09-25	10:08
R	2006-09-25	10:08

Usuń

Eksport Import

Lens fitting

Drukuj

Zamknij

Pomoc

L

Centralne dane keratometryczne
Ast: -0.85 D @ 15°
Rh: 7.82 mm =43.15 D (15°)
Rv: 7.67 mm =44.02 D (92°)
VHID: 11.1 mm
PUD: 3.8 mm
R0: 7.73 mm Ecc: 0.44

[mm] ABS

Przegląd wyników

Pacjent
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Oko	Data	Czas
L	2006-12-11	10:23
R	2006-12-11	10:23
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R	2006-09-25	18:23

Usuń

Eksport Import

Lens fitting

Drukuj

Zamknij

Pomoc

L

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Ast: -0.45 D @ 15°
Rh: 8.13 mm =41.51 D (15°)
Rv: 8.04 mm =41.98 D (94°)
VHID: 10.9 mm
PUD: 3.9 mm
R0: 8.02 mm Ecc: 0.57

[mm] ABS

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Zamknij

Pomoc

STP

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[mm] ABS

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MARTA

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[mm] ABS

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OVERNIGHT ORTOKERATOLOGY

- A ONE YEAR CONFOCAL MICROSCOPY STUDY

Szaflik J P, Oleszczyńska-Prost E, Ambroziak A, Udziela M, Szaflik J:

XXXI World Ophthalmology Congress, Hongkong, 28.06.-02.07.2008

Purpose: To identify and analyze potential changes in microstructure of the cornea in patients using night orthokeratology lenses.

Method: 40 patients aged 10-37, (mean 13 years) were enrolled in the study. Confocal microscopy of the cornea was performed before starting orthokeratology correction and after one year of wearing of CKR (Controlled Kerato-Reformation) lenses (Optivision, Houston, USA). The corneal microstructure was analysed, this special attention given to the stroma. The basal epithelial cells, anterior keratocytes and endothelium cells density counts were performed before and after 1 year of using the lenses.

Results: 32 patiewnts were assessed. No morphological changes were found in the confocal microscopy of the cornea of the examined patients. No statistically significant changes were found in the density of evaluated cell populations.

Conclusion: Our results seem to confirm the postulated epithelial mechanism of corneal reshaping by orthokeratology lenses. We did not observed any negative influence of one-year long night wear of orthokeratology lenses on the cornea as evaluated by confocal microscopy. Further studies are needed to determine the long-term effect of overnight orthokeratology on the corrnea.

Overnight orthokeratology – a one year confocal microscopy study

Authors: Jacek P. Szaflik*, Ewa Oleszczyńska-Prost**, Monika Udziela*, Anna Maria Ambroziak*, Jerzy Szaflik*

* Department of Ophthalmology, Medical University of Warsaw, Poland
** Center for Paediatric Ophthalmology, Warsaw, Poland

Introduction

Orthokeratology is a clinical contact lens technique using contact lenses to correct refractive error by changing the shape of cornea. It utilizes RGP reverse geometry lenses for temporary correction of low to moderate myopia.

Due to the published studies (1,2) the refractive effect is achived by thinning the central epithelium, (1,2) thickening the midperipheral stroma was also found in one study. (2)

Due to Soni et al (3) spherical power, the spherical equivalent power, and the binocular uncorrected visual acuity make take up to two weeks to recover after lens discontinuation.

The use of in vivo white-light corneal confocal microscopy allows to examine corneal layers in high magnification and imaging of cells. This technique permits qualitative and quantitative assessments, as cell densities counts can be performed.

Confocal microscopy is also a sensitive indicator of mechanical stress in corneal stroma.

If cornea during the confocal microscopy examination is a subject to mechanical stress, dark stromal lines (striae) and possibly Descemet's membrane folds are being visualized. (4)

This phenomena can for instance effect from the sutures deforming the cornea after surgery (Fig. 1) or from applying excessive pressure

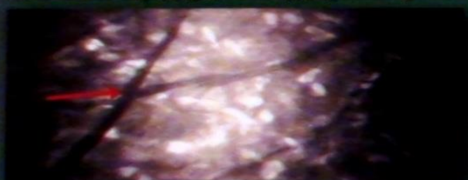

Fig. 1. Dark lines – striae: effect of stress and deforming the cornea by sutures after surgery (PK).

by the applanation of the laser scanning microscope (RCM HRT) microscope's front lens (or precisely, the protective cup covering the front lens) on the examined cornea by the time of examination (Fig. 2). In the second case this effect can be usually reduced or

Fig. 2. Effects of the excessive pressure applied to the cornea by directly applanating head of laser scanning confocal microscope (RCM HRTII) during examination A. Dark lines – striae B. Desemet's membrane folds.

eliminated by readjusting (lowering) the pressure applied by the microscope during examination of the cornea.

Purpose

To determine and analyze potential microstructural changes in cornea of patients using overnight orthokeratology.

Do Orto K lenses stress corneal stroma mechanically?

Material and methods

40 young subjects, aged 10-37 years (mean 13) were enrolled in the study.

All patients suffered from low or moderate myopia (-2.00 do -4.50 Dsph, mean -3.25 Dsph) and were fitted with night orthokeratology lenses CKR (Controlled Kerato-Reformation) (Optivision, Houston, USA) to reduce refractive error.

Confocal microscopy of the cornea (ConfoScan3, Nidek Technologies) with non-applanating front lens (Fig. 3) (thus non-inducing stromal striae itself by the time of the examination) was performed before starting the orthokeratology correction and after one year of overnight wearing of CKR (Controlled Kerato-Reformation) lenses (Optivision, Houston, USA). Corneal microstructure was analyzed, with special attention given to the stroma. The basal epithelial cells, anterior keratocytes and endothelium cells density counts were performed before and after one year of using the lenses.

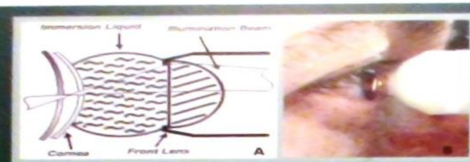

Fig. 3. ConfoScan3 (Nidek Technologies) confocal microscope – in this microscope front lens does not have any direct contact with the cornea and therefore may not induce any mechanical stress during examination.

Results

Results of cell densities counts of basal epithelium, anterior stroma and endothelium cells in the studied group are presented in Table 1.

32 patients were assesed again after one year of continuous use of night orthokeratology lenses.

In the examined corneas basal epithelial cells, Bowman's layer, anterior, medium and posterior stroma as well as endothelium and Descemet's membrane appeared normal in confocal microscopy imaging. (Fig 4-7)

Tab. 1. Cell densities in the studied group.

Basal epithelium cells/mm² (mean ± SD)	ROI(mean)	Anterior keratocytes cells/mm² (mean ± SD)	ROI(mean)	Endothelium cells/mm² (mean ± SD)	ROI (mean)
5760,33 ± 728,39	0,0498	887,35 ± 165,12	0,0704	2603,42 ± 299,47	0,06024

Tab. 2. Cell densities before and after 12 month of orto K use (for 32 evaluated patients).

	Basal epithelium (mean ± SD)	Anterior keratocytes (mean ± SD)	Endothelium (mean ± SD)
Confoscan 1	5982,91 ± 556,43	859,68 ± 149,56	2691,1 ± 290,47
Confoscan 2	5687,57 ± 764,75	934,81 ± 196,93	2694 ± 380,88
statistical significance	p = 0,085	p = 0,159	p = 0,986

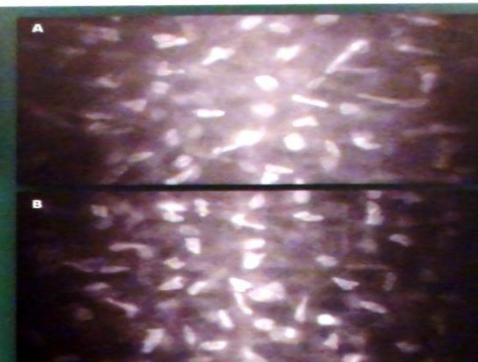

Fig. 6. Unchanged medium and posterior stroma in patient wearing night orthokeratology lenses.

Fig. 4. Normal appearence of basal epithelial cells layer in patient wearing night orthokeratology lenses.

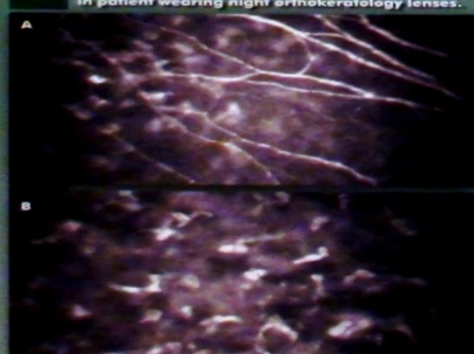

Fig. 5. Normal Bowman's layer and anterior stroma in patient wearing night orthokeratology lenses.

Fig. 7. Normal appearence of endothelium and Descemet's membrane in patient wearing night orthokeratology lenses.

Results of cell densities before and after 12 month of orto K use (for 32 evaluated patients) are presented in Table 2. No statistically significant differences in cell densities were found in nonparametric tests for two related samples (significance level 0.05).

Conclusions

We did not observe any negative influence of one-year long night wear of orthokeratology lenses on the examined cornea layers (basal epithelium, anterior stroma, endothelium) as evaluated by confocal microscopy. We did not notice any symptoms of mechanical stress in the corneal stroma of orthokeratology patients – our results seem to confirm the postulated epithelial mechanism of corneal reshaping by orthokeratology lenses. Further studies are needed to determine the long-term effect of overnight orthokeratology for the cornea.

References

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2. [illegible]
3. [illegible]
4. [illegible]

Reprint requests to: [illegible]

Piśmiennictwo

Safety of Overnight Orthokeratology for Myopia

A Report by the American Academy of Ophthalmology

Woodford S. Van Meter, MD, David C. Musch, PhD, MPH, Deborah S. Jacobs, MD,

Complications:100 cases **infectious keratitis result from gram+ & gram-- bacteria and *acanthamoeba***

Overnight orthokeratology for **slowing the progression of myopia in children also needs well-designed and properly conducted controlled trials to investigate efficacy.**

Ophthalmology 2008;115:2301–2313 © 2008 by the American Academy of Ophthalmology.

Safety and efficacy of overnight orthokeratology in myopic children

Renée Mika, O.D., Bruce Morgan, O.D., Michael Cron, O.D., Josh Lotoczky, O.D.,and John Pole, O.D., M.S.

Michigan College of Optometry, Ferris State University, Big Rapids, Michigan.

Abstract: **myopia with overnight orthokeratology is safe and efficacious in children and adolescents**.

Optometry 2007;78:225-231

Short-term Effects of Overnight Orthokeratology on Corneal Cell Morphology and Corneal Thickness

Nieto-Bona, Amelia PhD*; González-Mesa, Ana MSc†; Nieto-Bona, Ma Paz PhD‡; Villa-Collar, César MSc§; Lorente-Velázquez, Amalia PhD*

Results: **No significant changes in either endothelial cell or stromal cell density** were observed after 1 month of OK. **Superficial cells increased in height and width**, the width increase after 1 month being significant ($P < 0.01$). Epithelial thickness was significantly reduced in the central cornea and 2 mm around the center. Corneal pachymetry increased significantly in the band from 5 to 10 mm from the corneal apex ($P < 0.01$).

Cornea: June 2011 - Vol 30 - Is6. Clinical Science © 2011 Lippincott W & W, Inc.

Piśmiennictwo

ORTHO-K AND KIDS: MAXIMIZE THE BENEFITS, MINIMIZE THE RISK

While not risk free, orthokeratology allows dr. to offer new treatment options to our young patients.

By Jason Jedlicka, O.D.

CORNEA & CONTACT LENSES 1 MAY 2012

Using proper solutions and teaching proper technique

are crucial to minimizing tle risk of complications for children in orthokeratology lenses

ORTHOKERATOLOGY FOR SLOWING MYOPIC PROGRESSION:A RAMDOMISED CKT TRIAL

Pauline Cho, Sin-Wan Cheungch

Centre for Myopia Research, , School of Optometry,Hong Kong ,China

CONTACT LENS & ANTERIOR EYE34,SEPTEMBER 2011

OVERNIGHT ORTHOKERATOLOGY FOR MYOPIA CONTROL:SHORT-TERM EFFECTS ON AXIAL LENGTH AND REFRACTIVE ERROR

HelenA.Swabrick, Ahmed Alharbi, Edward Lum, Kathleen Watt

School of opthometry and Vision Science,Universitiy of New South Wales,Sydney.Australia

CONTACT LENS & ANTERIOR EYE34,SEPTEMBER 2011

FITTING CHILDREN WITH ORTHOK FOR MYOPIA CONTROL-THE PRO'S AND CON'S

Kate K.Johnson

Gerry &Johnson Optometrists, Brisbane,Australia

CONTACT LENS & ANTERIOR EYE34,SEPTEMBER 2011

WNIOSKI

ORTOKOREKCJA JEST

SKUTECZNĄ I BEZPIECZNĄ

NIEINWAZYJNĄ I ODWRACALNĄ

METODĄ KOREKCJI KRÓTKOWZROCZNOŚCI

DO -6,5 Dsph
DO -1,5 Dcyl

STOSOWANIE ORTOSOCZEWEK POWODUJE :

- CAŁODZIENNĄ OSTROŚĆ WZROKU DO DALI 0,8-1,0
- ODWRACALNE ZMIANY SIŁY ŁAMIĄCEJ ROGÓWKI
- ZMNIEJSZENIE POSTĘPU KRÓTKOWZROCZNOŚCI – 58%

ZMNIEJSZENIE POSTĘPU KRÓTKOWZROCZNOŚCI

ORTOKOREKCJA

+

LECZENIE NADMIERNEGO SKURCZU AKOMODACJI


DZIĘKUJĘ ZA UWAGĘ


DZIĘKUJĘ ZA UWAGĘ