Corneal Cross-Linking Halting the Progression of Ectasia After Refractive Surgery

FI Camesasca MD,
P Vinciguerra MD,
S Trazza

I have no financial interest to disclose

ISTITUTO CLINICO HUMANITAS

CLINICA OCULISTICA
Istituto Clinico Humanitas
Rozzano, Milan, Italy
Chairman: Paolo Vinciguerra, MD

Cross-Linking and Ectasia After Refractive Surgery

- Patients that underwent refractive surgery
- After looking for a permanent solution for an unpleasant situation, such as high myopia…
- …find themselves with an even worst life quality !
- Instability and an apparently endless progression of bad visual acuity, heading towards PK…
- Often these patients come to our office when CXL is not anymore possible, due to extreme corneal thinning
- Astonished and diffident patients …

fabrizio@camesasca.com

Materials And Methods

- Ectasia progression documented in the last 6 months by:
- differential topography
- Scheimpflug optical pachimetry
- Minimal corneal thickness: 300 µm
- Treatment possible with corneal expansion
- **MEAN CCT: 412 microns**
- Follow-up: 1 - 12 - 24 - 36

Materials And Methods

33 eyes with ectasia after refractive surgery

- 3 prk
- 30 lasik

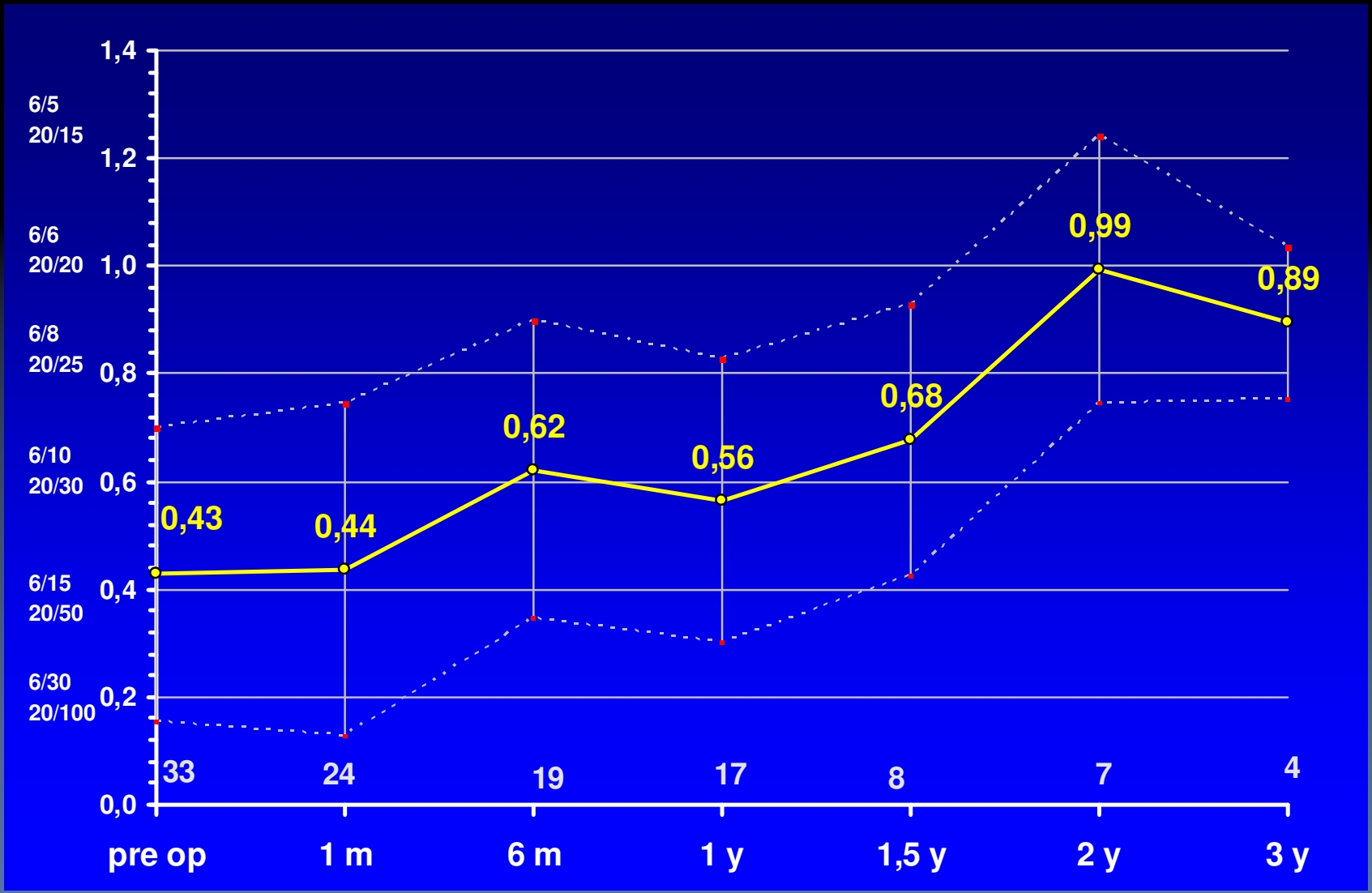
Mean age 42.2 years (range: 17 to 60)

- Sex: female 32,1%, male 67,9%
- LE 53,6%, RE 46,4%

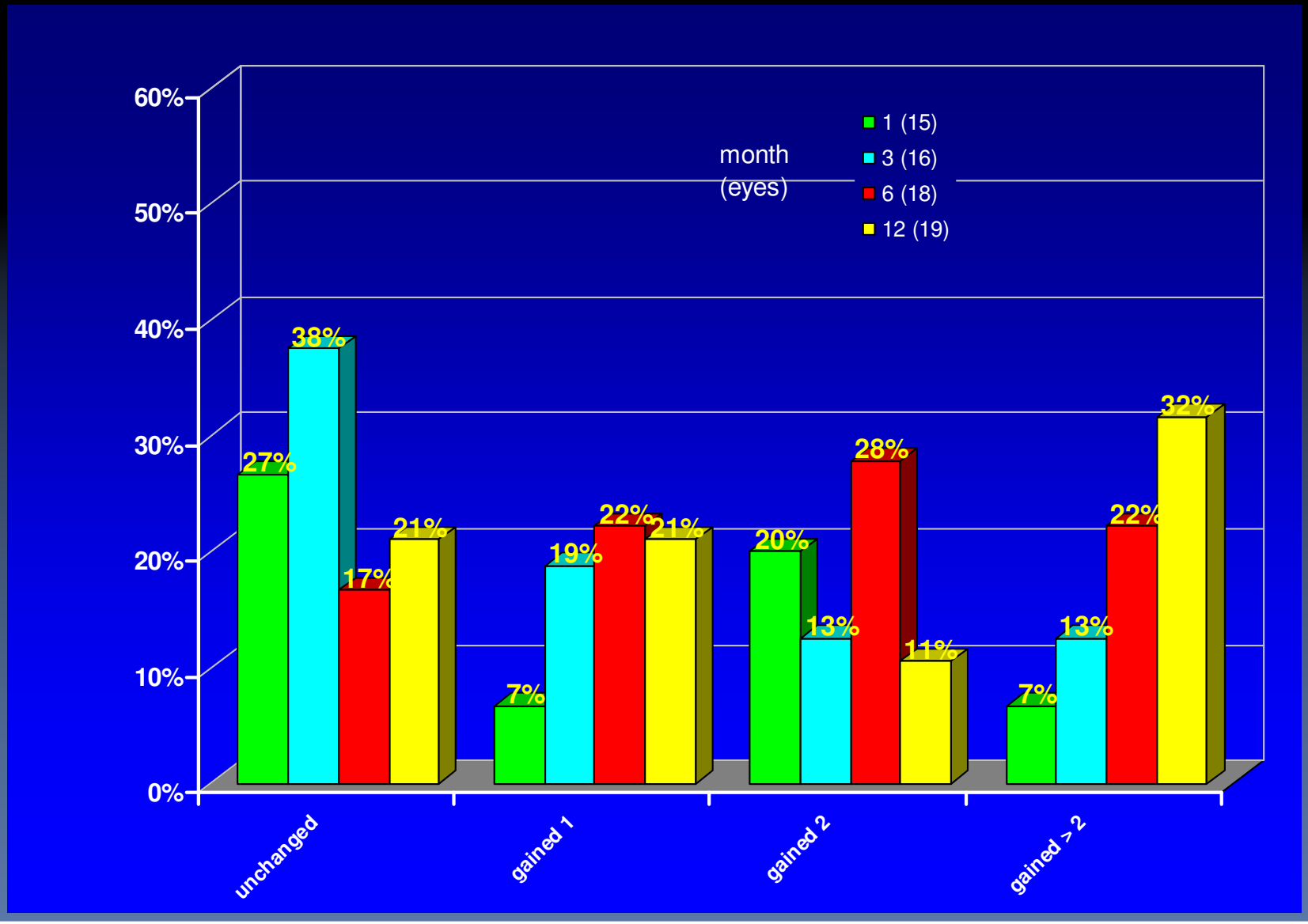
- pre SR equiv: mean -4,14 D ± 5,56 D (from -18,50 to 5,50)
- pre SR sph: mean -2,78 D ± 5,10 D (from -16,00 to 6,00)
- pre SR cyl: mean -2,72 D ± 2,06 D (from -8,75 to 0,00)

- post SR equiv: mean -2,30 D ± 3,75 D (from -13,50 to 2,50)
- post SR sph: mean -1,11 D ± 3,62 D (from -12,00 to 3,50)

BSCVA over Time



Change in BSCVA – Percentage "SAFETY"



Achieved Correction SEQ over time - "STABILITY"

OPD CORNEAL NAVIGATOR

KLYCE INDEXES

	PRE	POST 6 m	POST 12 m	POST 24 m
ACP	44,67	44,83	43,74	38,09
CYL	6,51	2,28	2,82	2,6
CVP	117,42	61.51	84	**71,25**
SDP	5,59	2,78	3,7	**3,11**
AA%	84,99	77,02	83.24	**78,94**
CEI	0,17	0,24	0,08	**0,22**
LogMAR	0,17	0,13	0,17	**0,125**
DSI	9,51	7,62	9,57	**6,06**
SRI	1,42	1,18	1,31	**1,19**
SRC	1,28	1,19	1.26	**1,2**
SAI	2,16	1,95	2,16	**1,5**
IAI	0,59	0,58	0,59	**0,58**
OSI	7,75	6,17	7,86	**5,22**
CSI	0,57	0,49	0,37	**0,99**
KCI	0,40	0,30	0,5	**0,23**
KPI	0,33	2,61	0,32	**0,28**
EDP	3,02	2,61	3,27	**2,9**
EDD	12,40	8,90	10,95	**7,04**

IMPROVED

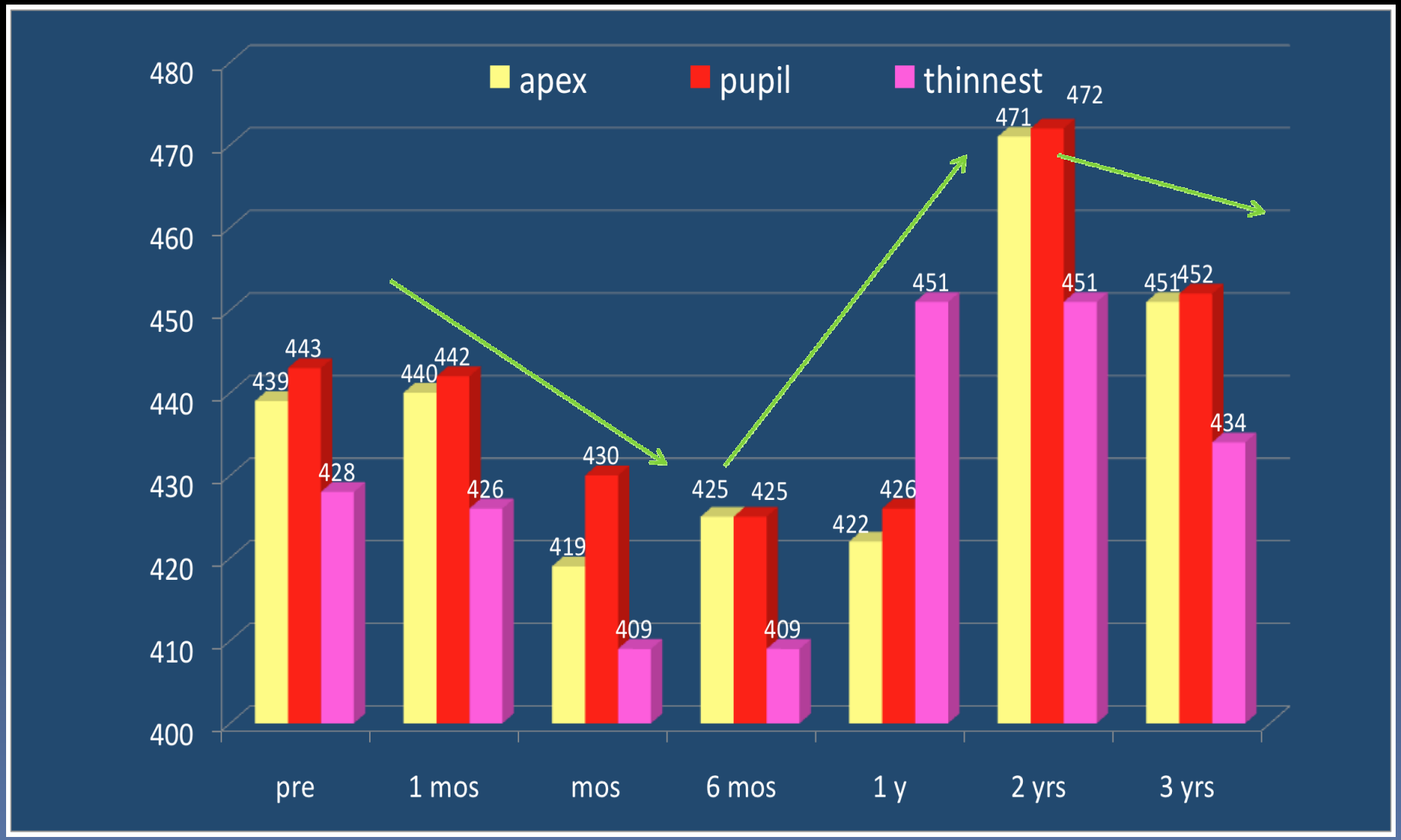
UNCHANGED

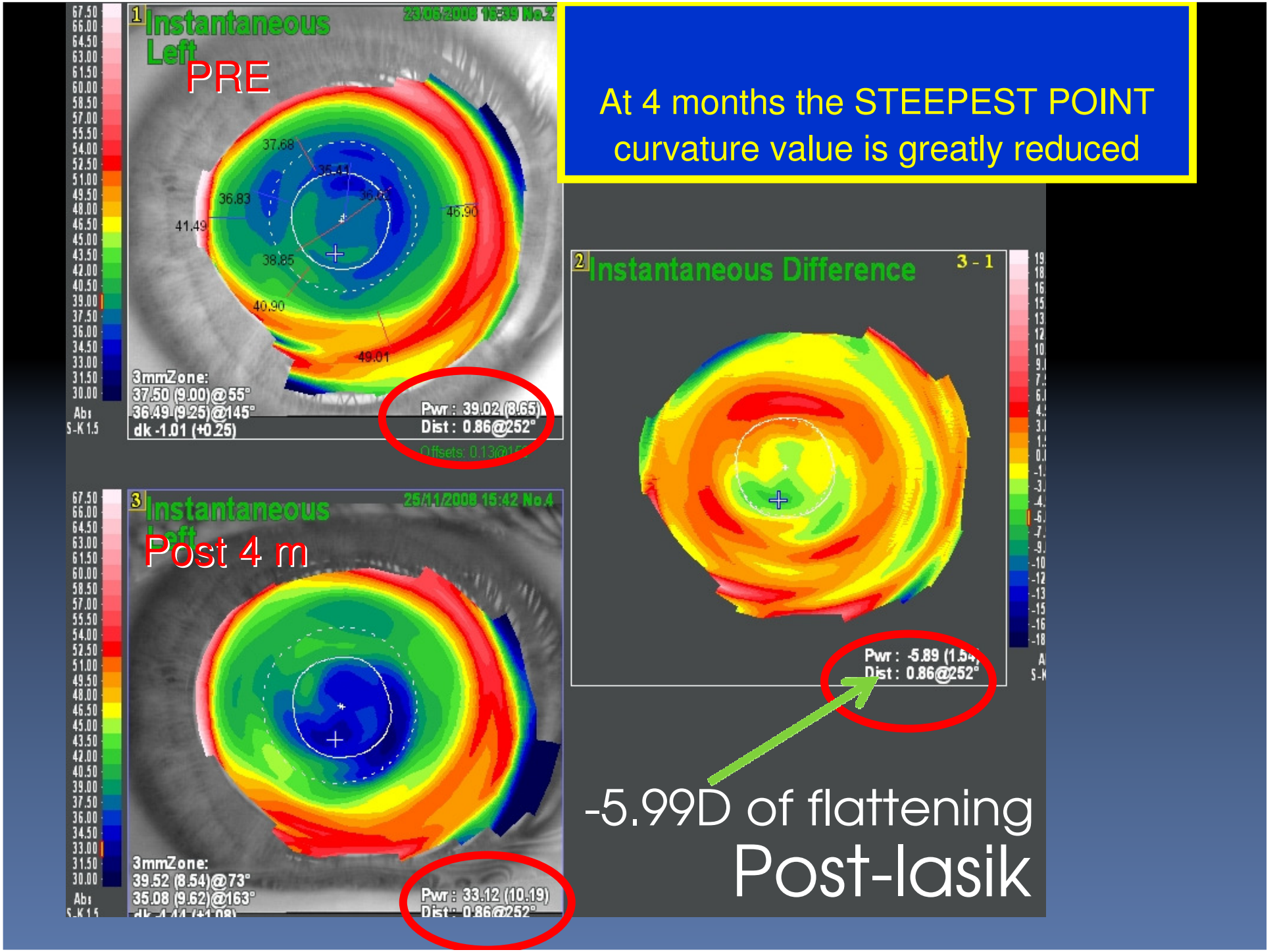
WORSENED

Ambrosio ‘s Indexes

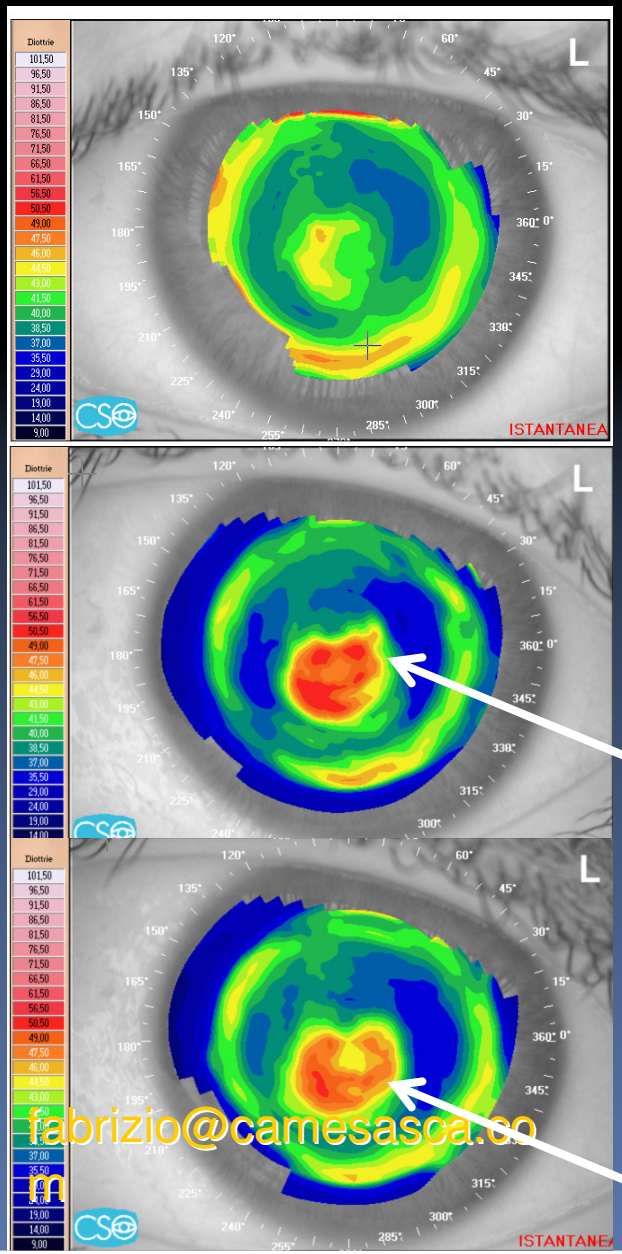
	isv	iva	ki	cki	iha	ihd	n
PRE XL	77	0,05	0,06	0,05	0,87	0,05	33
POST 1 M	56,15	1,23	1,25	1,16	22,.9	1,39	19
POST 3 M	109	1,43	1,33	1,09	5,17	1,36	14
POST 6 m	88	1,14	1,23	1,21	20,23	1,10	19
POST 1 Y	80,35	1,16	1,25	1,17	16,08	1,16	17
POST 2 Y	107	1,32	1,31	1,25	23,48	1,35	7
POST 3 Y	58,25	1	1,21	1,27	14,20	1,06	4

Pentacam pachimetry




1 Instantaneous
Left
PRE
37.68
36.83
41.49
38.85
40.90
49.01
46.90
3mmZone:
37.50 (9.00)@55°
36.49 (9.25)@145°
dk -1.01 (+0.25)
Pwr : 39.02 (8.65)
Dist : 0.86@252°
2 Instantaneous Difference 3 - 1
Pwr : -5.89 (1.54)
Dist : 0.86@252°
3 Instantaneous
Post 4 m
25/11/2008 15:42 No.4
3mmZone:
39.52 (8.54)@73°
35.08 (9.62)@163°
Pwr : 33.12 (10.19)
Dist : 0.86@252°
At 4 months the STEEPEST POINT curvature value is greatly reduced
-5.99D of flattening
Post-lasik

Cross-Linking and Ectasia After Refractive Surgery

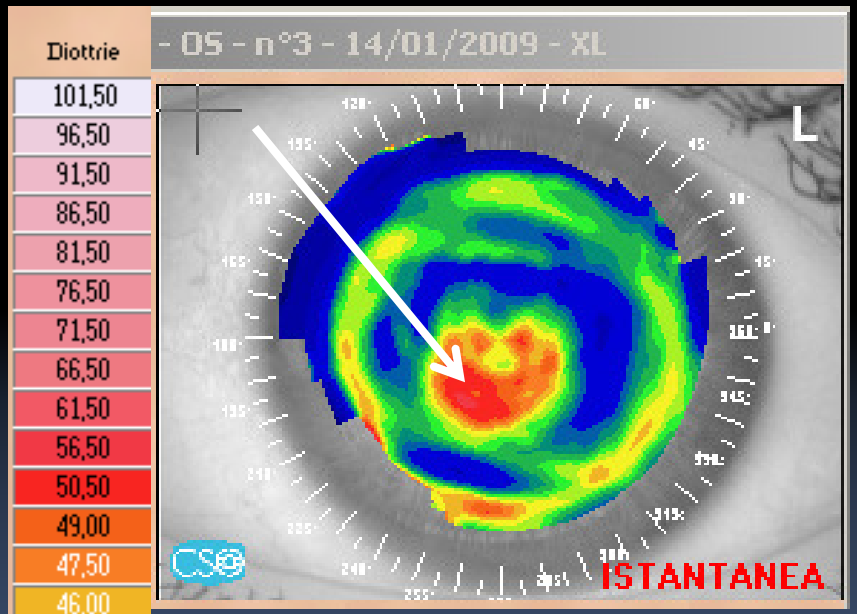


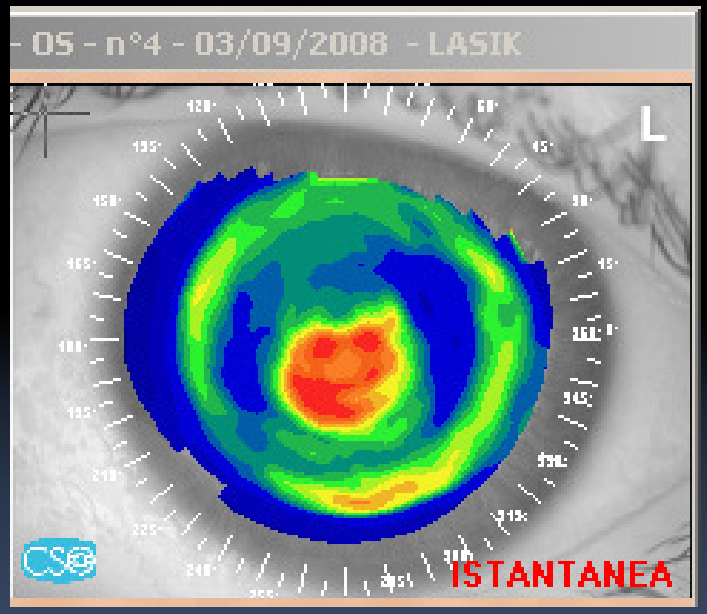
Case 13. LE, 04.03.2005, first examination, four years after LASIK for -4.00 –0.50 (125). BSCVA is 20/35 with -1.50 -3.25 (110).

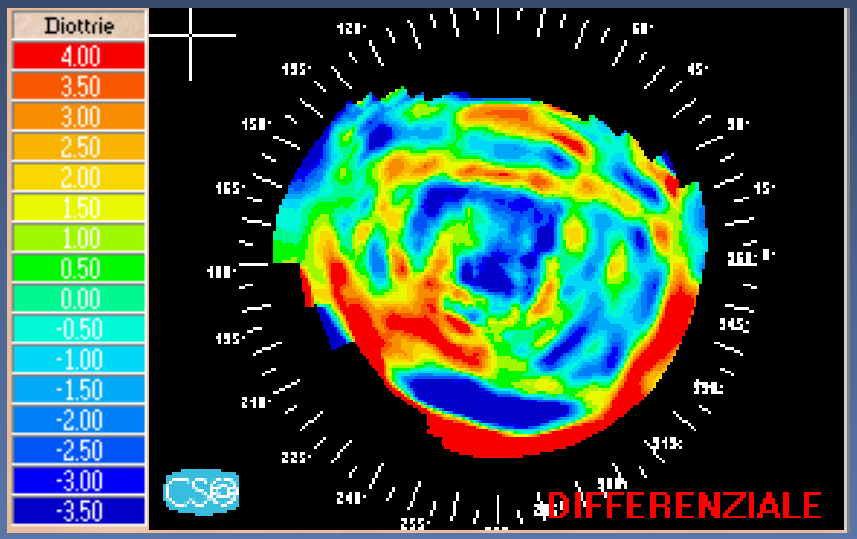
LE, 09.03.2008, immediately before cross-linking, BSCVA is 20/50 with -2.75 -6.00 (95). Note worsening of ectasia. Differential map showed a progression in ectasia of 4.15 D.

LE, 04.07.2009, 6 months after cross-linking, BSCVA is 20/30 with -2.50 -4.00 (105). Note central flattening.

LE, CXL 10.14.08: 3 mos post CXL







Note central flattening. Differential map shows that ectasia regressed of 3.27 D.

Conclusions 1

- Perform regular topo- and tomographic examinations using differential maps
- Always suspect that a LASIK patient may develop ectasia at some future point
- Perform CXL early, before cornea becomes too thin, with greatest refractive changes

fabrizio@camesasca.com

Conclusions 2

- No complications
- All patients display stability
- OZ apparently recentered
- Mild reduction of refractive error
- Improvement continues long after CXL
- Corneas thinner than 400 µ are still treatable

fabrizio@camesasca.com

Thank you for your attention !