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HOS HOSPITAL DE OLHOS DE SERGIPE

Corneal Biomechanical Using Dynamic Ultra High Speed Photography and Tomography Scheimpflug Camera to Distinguish Normal to Keratoconus

**Allan Luz MD; Bernardo Lopes MD;
Isaac Ramos MD; Bruno Valbon MD;
Fernando Faria Correia MD; Renato Ambrósio Jr. PhD**

Dr. Ambrósio is consultant for Oculus Optikgeräte GmbH (Wetzlar, Germany)
Others authors have no financial interest in the subject matter of this poster

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Introduction

EDITORIAL

Screening for Ectasia Risk: What Are We Screening For and How Should We Screen For It?

Renato Ambrósio, Jr., MD, PhD; J. Bradley Randleman, MD

The challenge we have is to identify susceptibililty for developing biomechanical failure

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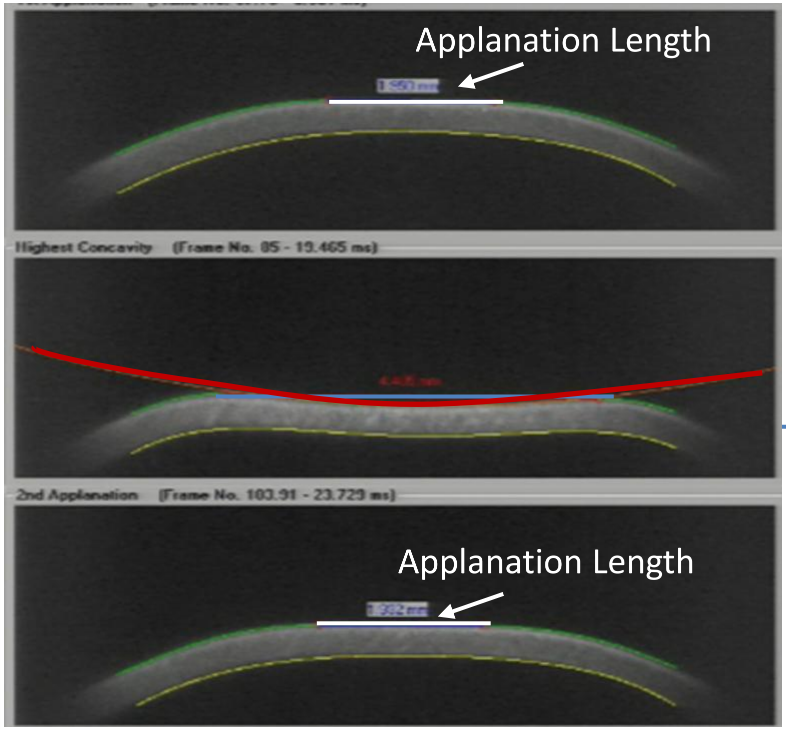
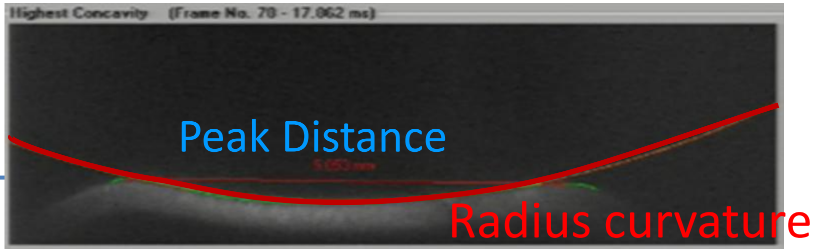
HOS Hospital de Olhos de Sergipe

Parameter Definitions

First Applanation



Highest Concavity



Second Applanation

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Corneal Deformation Parameters

Corvis ST - clinical parameters	Means
Intraocular pressure	Is the NCT measurement based on the 1st applanation
1st A-time	Is the time from starting until the first applanation
Highest Concavity-time	Time from starting until highest concavity is reached
2nd A-time	Time from starting until the second applanation
1st A length	Cord length of the first applanation
2nd A length	Cord length of the second applanation
Deformation amplitude	Maximum amplitude at the apex (highest concavity)
Wing-Dist	Distance of the two "knee's" at highest concavity (HC)
Curvature radius HC	Central concave curvature at HC
Curvature radius normal	Initial central convex curvature
Maximun velocity (in) - Vin	Corneal speed during the first applanation moment
Maximum velocity (out) - Vout	Corneal speed during the second applanation moment

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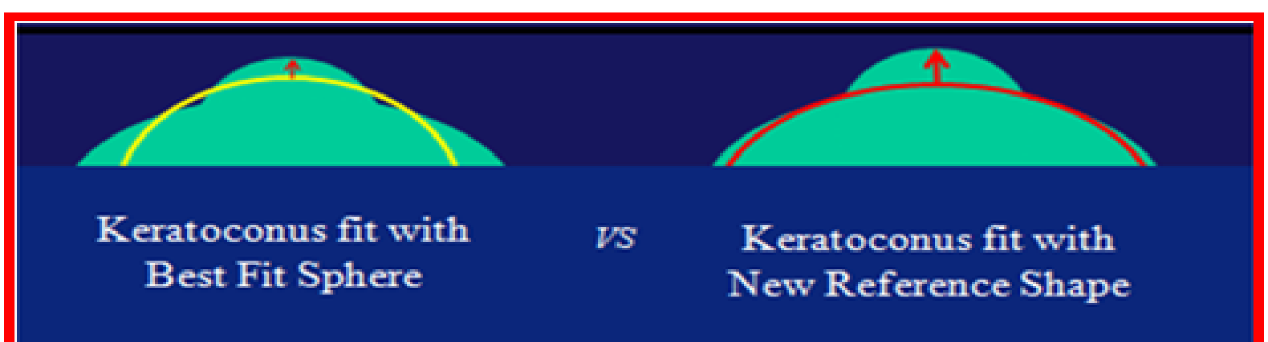
Corneal Tomography

ORIGINAL ARTICLE

Novel Pachymetric Parameters Based on Corneal Tomography for Diagnosing Keratoconus

Renato Ambrósio, Jr, MD, PhD; Ana Laura C. Caiado, MD; Frederico P. Guerra, MD; Ricardo Louzada, MD; Abhijit Sinha Roy, PhD; Allan Luz, MD; William J. Dupps, MD, PhD; Michael W. Belin, MD, FACS



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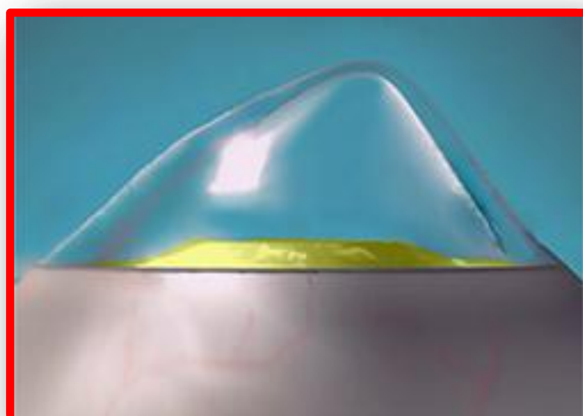
Purpose

To test the ability of Tomography and Corneal Biomechanical metrics to distinguish normal from ectatic cases



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Methods

A New Method for Grading the Severity of Keratoconus

The Keratoconus Severity Score (KSS)

Timothy T. McMahon, OD, Loretta Szczotka-Flynn, OD, MS,† Joseph T. Barr, OD, MS,‡ Robert J. Anderson, PhD,§ Mary E. Slaughter,¶ Jonathan H. Lass, MD†, Sudha K. Iyengar, PhD¶ and the CLEK Study Group*

Cornea • Volume 25, Number 7, August 2006

	Normal	Mild Keratoconus
Corneal Topography	Regular axial topography pattern	Axial topography consistent with keratoconus. Flat keratometry <51.00 D
Slit-lamp examination	Normal	Fleischer ring or Vogt striae
Visual Acuity	Spectacle correct acuity ≥55 letters at 4m on Log mar chart (with no other ocular pathology)	Reduce spectacle acuity (<55 letters at 4m Log mar chart) (with no other ocular pathology)

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Methods

Differences in the distributions among the groups were assessed using the mann Whitney test (non parametric test)

The ROC curve was used to identify cutoff points that maximized sensitivity and specificity in discriminating KC from normal

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Results

Normal Health ---------------------------------------271 single eyes

Mild Keratoconus (KC) ------------------------ 183 single eyes

	Age	**Kmax**	**CCT**
Control	31,8 ± 10,2	44,6 ± 1,4	542 ± 37,4
KC	30,8 ± 12	52,4 ± 4,9	481±40,4
P value	0,884	<0,0001	<0,0001

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Results

Most parameters obtained statistically significant differences between groups

	Control	KC	P value
A1 time	8,4 ± 0,5	7,4 ± 0,4	<0,0001
A1 length	2 ± 0,4	1,7 ± 0,5	<0,0001
HC radius	11,4 ± 2,6	8,6 ± 1,8	<0,0001
A2 time	23,7 ± 0,5	24,2 ± 0,6	<0,0001
A2 lentgh	2,3 ± 0,5	1,8 ± 0,4	<0,0001
ART Max	503,3 ± 84	202,8 ± 79	<0,0001
BAD D	0,4 ± 0,6	7,3 ± 4,1	<0,0001

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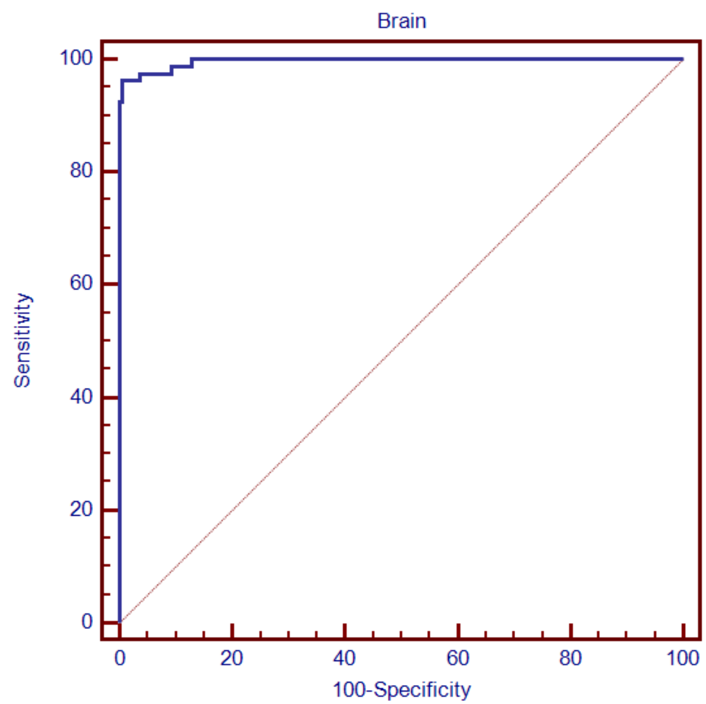
Results Discriminant Analysis



Sensibility 97,5%
Specificity 96,3%

Through an discriminant analysis we reached values over the area under the curve of 0,997

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Discussion

✓Deformation and Tomographic data effectively distinguishes normal and ectatic corneas

✓Due to the low specificity and sensitivity of the individual data Corvis, in this version, should not be used alone for the diagnosis of KC

✓Integration of Corneal ToMography and Deformation data has the potential to best screen for ectasia risk (susceptibility) of Refractive Surgery candidates