

REFR@CTIVE.ON-LINE & SICSSO

XIII Congresso Nazionale Refr@ctive.on-line - XII Congresso Nazionale SICSSO

Siena, Italy, 27-29 June 2013



FINAL PROGRAM and ABSTRACTS

3rd JOINT INTERNATIONAL CONGRESS

CONGRESS CHAIRMEN

Vincenzo Sarnicola, MD - Paolo Vinciguerra, MD



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AIM Group International – AIM Congress
Via G. Ripamonti, 129 - 20149 Milan (Italy)
Tel.: +39 02 56601.1 – Fax: +39 02 70048578
e-mail: congress@rolandsicssso2013.org



GENERAL INFORMATION

Congress venue

University of Siena, “DIDACTIC CENTER OF S. MARIA LE SCOTTE GENERAL HOSPITAL”
Strada Le Scotte, 4 - Siena, Italy



How to reach the venue by car

- From the north, A1 highway:
 - Firenze Certosa exit
 - Firenze-Siena highway
 - Siena Nord exit (then follow signs for “policlinico”)
- From the south, A1 highway:
 - Valdichiana exit
 - Bettolle-Siena highway
 - Siena Est exit (then follow signs for “policlinico”)

Free parking is available, either with parking disk or without time limits, along the street. There is also a partially covered parking garage (indicated on the road signs as “Policlinico 1”). **Parking fees:**

- 1 hour: 60 cents
- 2 hours: Euro 1,20
- 3 hours: Euro 1,80

The daily rate (Euro 2,00) goes into effect from the fourth hour.

The venue can also be reached by bus: lines 17, 10, 77, 003.

Useful numbers

Siena Radio Taxi - Ph.: 0577 49222

Ambulance - Dial 118

Police - Dial 113

Organizing Secretariat

The Organizing Secretariat will be available as follows:

| | |
|---------|------------|
| 27 June | 7.00-19.00 |
| 28 June | 7.30-19.00 |
| 29 June | 8.00-12.30 |

Badge

All participants must wear their personal badge in order to access to the congress areas and sessions:

| | |
|---------------|-------------|
| Faculty | red |
| Participants | transparent |
| Company staff | green |

Official language

The official language is English. Simultaneous translation English/Italian will be provided in the Main Auditorium.

Food & beverage

Lunches and coffee breaks are not included in the registration fees. A bar will be available at the venue. It is possible to buy and pre-pay lunches for 27 and 28 June. The cost is Euro 25,00 each (VAT included). Contact the Organizing Secretariat (congressreg@rolandsicssso2013.org) or register online through the website (www.rolandsicssso.org).

Certificate of attendance

A Certificate of attendance will be sent to all registered participants by e-mail at the end of the congress.

Exhibition

Sponsors will be happy to meet the congress participants at their stands.

CME credits (only for Italian participants)

Non è previsto l'accreditamento residenziale. Tutti i partecipanti avranno però il diritto di accedere a un programma di formazione a distanza (FAD) rivolto ai medici chirurghi che garantirà la possibilità di acquisire crediti formativi ECM. Il provider, Fabiano Gruppo Editoriale, sarà a disposizione per fornire le credenziali di accesso e informazioni dettagliate.

Insurance

Delegates are advised to take out travel insurance to cover medical expenses, accidents, loss, etc.. The Organizers will not accept any liability for the damage, theft or loss of any Participant's property in any circumstances.

Electricity

The voltage for electrical devices is 220v AC. 50 Hz. Plugs have two or three round pins. Foreign voltage might require an adapter.



INFORMATION FOR THE SPEAKERS

All Speakers are expected to prepare a PowerPoint presentation (2003, 2007 or 2010). Your presentation should be saved on a CD of USB memory stick and brought to the Slide Center either the day before your session or – if not applicable – at least 2 hours before the beginning of your session. Presentations will be uploaded from the Slide Center to the respective Session Room.

It is not allowed to use your own laptop for your presentation.

General guidelines:

- locate your session hall in due time
- find yourself in the Room assigned for presentation at least 10 minutes before the beginning of your session
- respect the timing allowed to the session and to each presentation

Detailed guidelines:

To have all scientific contributions thoroughly presented in the allocated time, we strongly recommend to follow the instructions below. This will assure that either speakers and audience will be happy with the exchange possible during the conference.

- Each presentation has been allocated a specific time slot: the chairpersons of your session will be very strict, and will not let you speak more than the time allowed
- Prepare a number of slides to be presented easily and clearly in the available time
- Do not fill your slides with too many figures and words
- Avoid any general introduction and focus on your topic
- Do not include live links to the Internet. If you wish to show web pages use screen shots within your Power Point presentation
- Room set-up is theatre style. All rooms are equipped with a lectern, microphone, projector, screen, laser pointer and computer (operating system Windows)
- Congress meeting rooms are equipped with the most common video formats: MPG (MPEG), WMV, AVI. Speakers using different video formats should bring the relevant codec installation package with them
- It is not possible to show simultaneously a PowerPoint presentation and a video, as there is only 1 projector in each meeting room
- For MAC users: if the presentation or video has been made with MAC, speakers should go to the Slide Centre much in advance in order to make the necessary conversion. If this is not possible, Speakers can have their MAC connected in the meeting room, provided that they bring the right VGA adaptor

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Jorge L. Alió SPAIN
Moemen Alreefy BAHRAIN
Samuel Arba-Mosquera GERMANY
Luca Avoni ITALY
Shady Awwad LEBANON
Stefano Baiocchi ITALY
Lelio Baldeschi ITALY
Alessandra Balestrazzi ITALY
Angelo Balestrazzi ITALY
Emilio Balestrazzi ITALY
Cinzia Batisti ITALY
Andrea Bedei ITALY
Simone Beheregaray JAPAN
Michael W. Belin USA
Bernardo Billi ITALY
Silvia Brogelli ITALY
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Orsola Caporossi ITALY
Tomaso Caporossi ITALY
Glenn Carp UK
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Giuseppe Chisari ITALY
Giovanni Citroni ITALY
Igor Di Carlo ITALY
Pietro Ducoli ITALY
Marco Fantozzi ITALY
Romina Fasciani ITALY
Rajesh Fogla INDIA
Franco Giuseppe Foscari ITALY
Rossella Franceschini ITALY
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Paolo Frezzotti ITALY
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Stephen S. Lane USA
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CONGRESS PARTY

REFR@CTIVE.ON-LINE & SICSSO CONGRESS PARTY 2013 “Cena in contrada”

Friday, 28 June, h. 21:00
Giardini della Società Camporegio in San Domenico

Siena is divided in 17 districts, called “contrade”. You will be in Siena just during the warm-ups for the Palio on 2 July: each “contrada”, represented in the race by a horse, is getting prepared for the competition, showing its ancient symbols, traditions and colours and taking you back to the Middle Ages.



Eating, drinking and celebrating in the streets is a must: you will feel to be a guest of the “contradaioi”, having a great time with them.

A special event, a peculiar experience, in the wonderful setting of Contrada del Drago! You will admire one of the most beautiful view on Siena...

The participation costs Euro 49,00.

Reservation is possible within 20 June: download the form on-line, fill it out and send it to the Organizing Secretariat (by email to: Congressreg@rolandsicssso2013.org or by fax to the number +39 02 70048578). A confirmation email will follow, with details for the payment of the ticket (which will be direct to the Contrada del Drago).

Attention!

Uncomplete forms will not be processed.

Only 350 seats available.

The receipt or the invoice will be sent by the Contrada del Drago, within 30 days after the dinner.



WET LABs

A room will be dedicated to the following Wet Labs (maximum 10 participants for each session):

THURSDAY, 27 JUNE

9.00-10.00 DALK Teacher: William Barry Lee (language: English)

10.00-11.00 DSAEK Teacher: Edward J. Holland (language: English)

15.00-16.00 DALK Teacher: Vincenzo Sarnicola (language: Italian)

16.00-17.00 DSAEK Teacher: Vincenzo Maurino (language: English)

FRIDAY, 28 JUNE

15.00-16.00 DALK Teacher: Giorgio Marchini (language: Italian)

16.00-17.00 DSAEK Teacher: Rajesh Fogla (language: English)

- No simultaneous translation is provided
- The participation is not included in the congress fee and costs Euro 121,00 (VAT 21% included)
- Those wishing to reserve a seat must be registered to the congress
- Reservation can be requested online or by email to the Organizing Secretariat (congressreg@rolandsicssso2013.org), specifying date and time of the Wet Lab. Confirmation of participation will be sent only if the payment is received.

PAYMENT

By Credit Card. All major credit cards are accepted (VISA, Eurocard/Master Card).

TERMS, CONDITIONS AND CANCELLATION POLICY

- The original invoice will be sent by e-mail
- Notification of cancellation must be sent in writing to the Organizing Secretariat
- No refunds will be made for cancellations received after 15 April
- All approved refunds will be processed and issued 60 days after the Congress.



THURSDAY, 27 JUNE

Main Auditorium - Italian <> English translation

8.20-8.30

OPENING REMARKS

8.30-9.40

OCULAR SURFACE: OVERVIEW

President of the Session: *Lelio Baldeschi, Italy*

Ennio Polito, Italy

Malocclusion syndrome and ocular surface pathology

Doris Hadjistilianou, Italy

Ocular surface tumors: new treatment approach

Fausto Trivella, Italy

Lacrimal disfunction: modern approach

Flavio Mantelli, Italy

Dry eye and blepharitis: epidemiological study and clinical management

Jonathan Rubenstein, USA

KLAL techniques

Rajesh Fogla, India

Boston Keratoprosthesis for oculare surface disease

Panel Disussion: *Giuseppe Valentini, Marco Puccioni, Maurizio Santella, Rossella Franceschini (Italy)*

9.40-10.40

FEMTOSECOND CATARACT

Presidents of the Session: *Aldo Caporossi, Italy - Vincenzo Orfeo, Italy*

Jorge Aliò, Spain

Femtosecond microincisional (MICS) cataract surgery

Jack T. Holladay, USA

Cataract: femtosecond Vs. traditional: “improving the spheroequivalent and astigmatic outcomes with femtosecond laser cataract surgery”

Stephen S. Lane, USA

The femtosecond laser in cataract surgery

Vincenzo Maurino, United Kingdom

Initial experience with the catalyst femtosecond laser cataract system

Leonardo Mastropasqua, Italy

Lensar femtocataract: initial experience

Panel Discussion: *Andrea Romani, Franco Passani, Paolo Frezzotti, Pietro Ducoli (Italy)*

10.40-11.00

BREAK

11.00-12.00

FEMTOCORNEA

President of the Session: *Choun-Ki Joo, South Korea*

George Waring IV, USA

Lecture: Small aperture corneal inlays for the surgical treatment of presbyopia

Leonardo Mastropasqua, Italy

Lecture: Corneal cellular and neural changes after ReLex “all femto” refractive surgery for myopia compared with FSL-LASIK

Guy Sallet, Belgium

Flap-customisation and handling with FS 200

Walter Sekundo, Germany

Refractive lenticule extraction will replace LASIK in the mid-term

Jorge Aliò, Spain

How successful are ICR in keratoconus surgery: an analysis based on visual outcomes

Panel Discussion: *Emilio Pedrotti, Luca Menabuoni, Marco Fantozzi (Italy); Vincenzo Maurino, United Kingdom*

12.00-12.50

TRANSITIONING TO DSEK: THE BASIC (THE CORNEA SOCIETY)

President of the Session: *Vincenzo Sarnicola, Italy*

William Barry Lee, USA

Patient selection and pre-operative evaluation

Michael W. Belin, USA

Instrumentation and insertion technique

Edward J. Holland, USA

Post-operative complications

Panel discussion: *Vincenzo Maurino, United Kingdom; Rajesh Fogla, India; Leonardo Mastropasqua, Italy*

12.50-14.20

SOOFT LUNCH COURSE: QUOTIDIA CONTACT LENSES. AN INNOVATIVE APPROACH TO IMPROVE THE PATIENT COMFORT



PRE-REGISTRATION IS REQUIRED

Alberto Montericcio, Italy

Chemical and physical characteristics and advantages

Matteo Piovella, Italy

Therapeutic applications

Antonio Mocellin, Italy

Use of new contact lenses in refractive surgery. Case reports

Domenico Lacerenza, Italy

Application and advantages of scleral contact lens in cataract and vitrectomy surgery. Case reports



14.20-15.30

EXCIMER LASER: CUSTOM ABLATION

President of the Session: *Leonardo Mastropasqua, Italy*

Paolo Vinciguerra, Italy

Why always and only custom? Present targets of custom ablation

Samuel Arba-Mosquera, Germany

Centration strategies during refractive surgery

Paolo Vinciguerra, Italy

Centration: clinical results

Jerry Tan, Singapore

The ultimate custom LASIK: from flap to zap

Samuel Arba-Mosquera, Germany

Tissue-saving customized treatments for refractive surgery

Guy Sallet, Belgium

Wavelight Refractive Suite: optimizing refractive results for my patients

Panel Discussion: *Shady Awwad, Lebanon; Jack T. Holladay, USA;*

Alessandro Mularoni, Italy; Severino Santoro, Italy; Walter Sekundo, Germany

15.30-16.15

KERATOCONUS LECTURES

President of the Session: *Paolo Vinciguerra, Italy*

Michael W. Belin, USA

Evolution of the Belin/Ambrosio Enhanced Ectasia Display: new parameters improve screening

Cynthia Roberts, USA

CLMX: a new index in the evaluation and monitoring of keratoconus

Aldo Caporossi, Italy

Cross-linking: the Siena experience

Giorgio Marchini, Italy

Long term results in DALK, PK and cross-linking: an overview of literature

Panel Discussion: *Rajesh Fogla, India; Vincenzo Sarnicola, Italy;*

Edward J. Holland, USA

16.15-16.25

MEACO INSTITUTIONAL PRESENTATION

By Salah Mahjoub

Secretary General of the Middle East Africa Cataract and Refractive Surgery Society (MEACRS)

16.25-17.05

UPDATE ON ADVANCED DIAGNOSTIC INSTRUMENTS

President of the Session: *Nicola Rosa, Italy*

Stephen S. Lane, USA

Intraoperative wavefront aberrometry - is it ready for prime time?

Paolo Vinciguerra, Italy

The determination of visual acuity with aberrometry and point spread functions

Paolo Vinciguerra, Italy

The biomechanical diagnosis of keratoconus

Riccardo Vinciguerra, Italy

Biomechanical changes after cross-linking

Panel Discussion: *Giuseppe Valentini, Edoardo Motolese, Bernardo Billi (Italy)*

17.05-19.05

INNOVATIONS (No translation service)

17.05-18.15

ROOM 1: OCULAR SURFACE

Presidents of the Session: *Rita Mencucci and Luigi Marino, Italy*

Graziella Pellegrini, Italy

Lecture Updating on regenerative medicine of ocular surface

Rossen Hazarbassanov, Brazil

Osmoprotection and lipid containing lubricants for management of dry eye disease and post refractive surgery patients

Federico Solignani, Italy

A pilot double-masked randomized clinical trial to study the effect of the topical application of Omega-3 in patients with dry eye syndrome

Jerry Tan, Singapore

New modalities in the treatment of dry eye

Caterina Gagliano, Italy

Experimental evidence on topical use of aminoacids in dry eye sindrome

Romina Fasciani, Italy

Ocular mucous membrane pemphigoid after Lyell Syndrome: occasional finding or predisposing event?

Giorgio Marchini, Italy

Autologous cultured limbal stem cells graft: comparison between biopsy depth and cells growth

Paolo Marangoni, Italy

Tobacco smoke exposure and macula disease

Jonathan Rubenstein, USA

Corneal reconstruction after trauma

18.15-19.05

ROOM 1: DIAGNOSTIC INSTRUMENTS

Presidents of the Session: *Alberto Montericcio and Maurizio Vanni, Italy*

Antonio Tarantello, Italy

Measurement of the internal diameters of the anterior chamber with and without accomodation

Marco Fantozzi, Italy

Morphological study of cornea by in vivo confocal microscopy and optical coherence tomography after refractive bifocal inlay implantation



Emilia Cantera, Italy
Keratometric values in a young healthy population

Luca Avoni, Italy
Effectiveness and safety of the regularization surgery of corneal thickness

Romina Fasciani, Italy
In vivo corneal confocal microscopy morphological comparison between different LK procedures for keratoconus

Luigi Mosca, Italy
In vivo pachymetry and morphological evaluation with CS4 corneal confocal microscopy after endothelial keratoplasty

Glenn Carp, United Kingdom
Artemis keratoconus screening based on epithelial thickness profiles and patterns

17.05-18.05

ROOM 2: CATARACT SURGERY AND PK

President of the Session: *Giuseppe Greco, Italy*

William Barry Lee, USA
Corneal considerations in cataract surgery

Antonino Scalisi, Italy
A case of Descemet's membrane detachment (DMD) after phacoemulsification cataract surgery

Simone Beheregaray, Japan
Forward light scattering induced by sub-surface nano glistening: influence on visual function

Luca Menabuoni, Italy
The anvil profile in laser assisted penetrating keratoplasty

Carlo Cagini, Italy
Outcomes of mushroom keratoplasty with femtolaser in patients with central leukoma

Luigi Mosca, Italy
Femtosecond laser-assisted arcuate keratotomies to correct post-penetrating keratoplasty astigmatism: a 24-month follow-up

Francesco Aiello, Italy
Cataract surgery in extreme hyperopia: operative and refractive outcomes

Roberta Calienno, Italy
Scanning electron microscopy evaluation of capsulorhexis performed by means of femtosecond laser-assisted cataract surgery

18.05-19.05

ROOM 2: KERATOKONUS

Presidents of the Session: *Mario Nubile and Mario Fruschelli, Italy*

Jorge Aliò, Spain
Refractive surgery in keratoconus: toric IOL or PRK?

Vincenzo Maurino, United Kingdom
Femtosecond laser assisted mushroom keratoplasty for severe keratoconus

Mohamed Shafik, Egypt
Keratoconus forme frusta: a new concept

Salah Mahjoub, Tunisia
Manual versus femtosecond laser DALK in keratoconus

Salah Mahjoub, Tunisia
Toric Artisan for keratoconus: 5 years outcome

Caterina Gagliano, Italy
Effects of trans-epithelial cross-linking on corneal innervation and corneal sensitivity in patients with keratoconus

Romina Fasciani, Italy
Morphostructural evaluation with in vivo corneal confocal microscopy after femto-alk and femto DALK in keratoconus

Stefano Baiocchi, Italy
Comparative ultrastructural analysis in epi-on and epi-off CXL corneas

17.05-18.00

ROOM 3: REFRACTIVE

Presidents of the Session: *Luca Buzzonetti and Franco Giuseppe Foscari, Italy*

Krishna Prasad, India
To compare the outcomes of transepithelial PRK and LASEK

Salah Mahjoub, Tunisia
80 versus 100 microns femto LASIK flap

Samuel Arba-Mosquera, Germany
Cyclotorsional errors during refractive surgery

Giovanni Citroni, Italy
Outcomes, critical, and retreatments of multifocal presbyopia correction by excimer laser: multicenter international study with 36 month experience

Felice Menicacci, Italy
Correction of secondary ametropia post penetrating keratoplasty and deep anterior lamellar keratoplasty

Samuel Arba-Mosquera, Germany
Wavefront customized ablation strategies in refractive surgery

Michael Mrochen, Switzerland
Optical ray tracing for cataract and refractive surgery

Shady Awwad, Lebanon
Single-step trans-epithelial PRK: theoretical refractive implications and risks, clinical results and potential applications



18.00-19.05

ROOM 3: IOLS

Presidents of the Session: *José Güell, Spain and Augusto Morocutti, Italy*

Andrea Romani, Italy

Lecture: Anisometropic defects correction in phakic patient

Walter Sekundo

Results of centration comparing ReLEx and Femtolasik

Fabrizio Camesasca, Italy

Subjective and objective refraction after monofocal toric IOL implantation and alignment with an empirical method

Tomaso Caporossi, Italy

Optical and functional performance of phakic angle-supported intraocular lens for the correction of high myopia in 2-year follow-up study

Claudio Savaresi, Italy

A new surgical approach for macular degeneration in pathological myopia

Rodolfo Mastropasqua, Italy

Valutation of functional results after implantation of two different multifocal IOLs

Gianluca Martone, Italy

Visual and aberrometric outcomes in eyes with an angle-supported phakic intraocular lens and photorefractive keratectomy

Ivan Marchesoni, Italy

Cataract surgery with customized IOL implantation for astigmatism and spherical aberration treatment

Graziella Parisi, Italy

Functional results after bilateral implantation of multifocal IOLs with different power (+3.0 D, +2.50 D) in both eyes

FRIDAY, 28 JUNE

Main Auditorium - Italian < > English translation

08.30-10.00

ADVANCED IOLS: CLINICAL RESULTS, SELECTION AND MANAGEMENT OF COMPLICATIONS

President of the Session: *Vincenzo Orfeo, Italy*

Fabrizio Camesasca

Indication criteria and preoperative patient evaluation

Jorge Aliò, Spain

Modern multifocal IOL: analysis of outcomes based on defocus curves

Vincenzo Maurino, United Kingdom

Moorfields IOL study group: outcomes of a large prospective randomised controlled trial comparing two different diffractive multifocal IOLs (Restor Vs AcriLisa)

Kjell Gunnar Gundersen, Norway

A new opportunity in presbiopic pseudophakic treatment: Restor +2,50 add

Jack T. Holladay, USA

Exact forward and backward IOL power calculations for toric IOLs

Stephen S. Lane, USA

Technology for proper positioning of a toric IOL

Paolo Vinciguerra, Italy

Instruments and technology for preoperative, intraoperative and postoperative management

Kjell Gunnar Gundersen, Norway

Toric IOLs: a guide to implantation

Panel Discussion: *Alessandro Franchini, Luca Menabuoni, Felice Menicacci, Silvio Zuccarini, Riccardo Sciacca (Italy), Jonathan Rubenstein, USA*

10.00-10.30

MEDAL LECTURE 1

Jack T. Holladay, USA

The perfect IOL power calculation and no significant ocular aberrations

10.30-11.00

BREAK

11.00-12.00

TRANSITION TO DALK (EU CORNEA SOCIETY)

Presidents of the Session: *José Güell, Spain - Leonardo Mastropasqua, Italy*

Edward J. Holland, USA

Why DALK, standard technique and long term survival

Paolo Vinciguerra, Italy

DALK: learning curve



José Güell, Spain
DALK visco.bubble transition

Vincenzo Sarnicola, Italy
DALK out of limits

Rajesh Fogla, India
DALK on extreme ectasia

Panel Discussion: *Andrea Bedei, Aldo Caporossi, Antonio Leccisotti (Italy); William Barry Lee, USA*

12.00-13.10

EXCIMER LASER: CLINICAL RESULTS

President of the Session: *Stephen S. Lane, USA*

Glenn Carp, United Kingdom
Impact of the epithelium in irregular astigmatism

Jerry Tan, Singapore
LASIK for ultra-high myopic powers (-8.00 to -18.00) with corneal wavefront-guided treatments

Jorge Aliò, Spain
Corneal aberration following LASIK for high myopia and hyperopia (>-10 D and +5 D)

Samuel Arba-Mosquera, Germany
The effective optical zone

Edward Manche, USA
A comparison of corneal sensation following LASIK using femtosecond lasers

Samuel Arba-Mosquera, Germany
TransPRK vs LASEK vs LASIK excimer laser ablation

Farhad Hafezi, Switzerland
Excimer laser ablation depth in cross-linked corneas

Panel Discussion: *Scipione Rossi, Vincenzo Mittica, Edoardo Stagni (Italy)*

13.10-14.40

SOFT LUNCH COURSE: IONTOPHORESIS. THE DEFINITIVE CXL

Presidents of the Session: *Paolo Vinciguerra and Luigi Marino, Italy*



PRE-REGISTRATION IS REQUIRED

Pietro Rosetta, Italy
Principles of iontophoresis

Rita Mencucci, Italy
Histological results

Leonardo Mastropasqua, Italy
Confocal microscopy results

Riccardo Vinciguerra, Italy
Preliminary results

Paolo Vinciguerra, Italy
Clinical results - Milano

Leonardo Mastropasqua, Italy
Clinical results – Chieti-Pescara

Luca Gualdi
Iontophoresis-CXL: a personal experience

14.40-15.40

KERATOCONUS: CASE DISCUSSION

President of the Session: *Vincenzo Sarnicola, Italy*
Faculty: *Orsola Caporossi, Italy; Michael W. Belin, USA; Alessandro Mularoni, Italy; Paolo Vinciguerra, Italy*
Panel Discussion: *Aldo Caporossi, Italy; Michel Belin, USA; Paolo Vinciguerra, Italy*

15.40-16.10

MEDAL LECTURE 2

Edward J. Holland, USA
The Evolution of Lamellar Keratoplasty

16.10-17.10

CROSS-LINKING

President of the Session: *Emilio Balestrazzi, Italy*

Michael Mrochen, Switzerland
High intensity CXL

Farhad Hafezi, Switzerland
High-fluence CXL: laboratory results and clinical outcomes

Emanuela Filomena Legrottaglie, Italy
OCT and demarcation line

Cynthia Roberts, USA
Corneal deformation characteristics and IOP assessment

Farhad Hafezi, Switzerland
Increasing the antimicrobial efficacy of CXL in the treatment of infectious keratitis

Pietro Rosetta, Italy
Cross-linking for the treatment of corneal infections

Paolo Vinciguerra, Italy
Riboflavin solutions: one size fits all? Thin corneas and solutions, keys for treatment

Panel Discussion: *Leopoldo Spadea, Antonio Scialdone, Emilia Cantera (Italy)*

17.10-19.00

INNOVATION (No translation service)

17.10-17.45

ROOM 1: FEMTOCORNEA

President of the Session: *Vincenzo Maurino, United Kingdom*

Felice Menicacci, Italy
Correction of refractive defects with femtoLASIK – sbk: stability, efficacy and safety



Giulia Cartocci, Italy

Mushroom femtosecond assisted vs mechanical trephine penetrating keratoplasty in keratoconus patients: postoperative astigmatism and HO aberrations

Choun-Ki Joo, South Korea

Effect of hinge location on dry eye symptoms and high order aberrations following femtosecond laser assisted LASIK

Luca Menabuoni, Italy

Improving Boston Type-I keratoprosthesis procedure: “one touch” femtosecond-assisted preparation and centration of donor carrier tissue

Moemen Alreefy, Bahrain

Flex surgery in Bahrain

17.45-19.00

ROOM 1: CROSS-LINKING

President of the Session: *Aldo Caporossi, Italy*

Emanuela Filomena Legrottaglie, Italy

Lecture: Proper management of post-operative therapy in cross-linking and reduction of adverse events

Miguel Rechichi, Italy

Epithelial disruption cross-linking for keratoconus: two-year results

Leopoldo Spadea, Italy

Transepithelial corneal collagen cross-linking in ultrathin keratoconic corneas

Shady Awwad, Lebanon

Sequential corneal thickness evaluation after UV collagen cross-linking as evaluated by corneal OCT, ultrasound pachymetry, and Scheimpflug imaging

Rita Mencucci, Italy

Combining iontophoresis and corneal collagen cross-linking: a basic science study on human corneas

Erika Savio, Italy

Differences between 3 kinds of riboflavin solution, how to use them and what changes in corneal stroma

Cosimo Mazzotta, Italy

Accelerated cross-linking for progressive keratoconus: morphological evaluation by confocal and AC OCT corneal analysis

Caterina Gagliano, Italy

Corneal trans-epithelial cross-linking versus contact lens use

Anna Lucia Paradiso, Italy

Accelerated CXL: preliminary results

17.10-19.00

ROOM 2: DALK-DSAEK

Presidents of the Session: *Andrea Bedei, Italy – Jonathan Rubenstein, USA*

Tarek Katamish, Egypt

Management of double anterior chamber: strange mechanics

Enrica Sarnicola, Italy

Herpetic keratitis and DALK surgery

Angelo Balestrazzi, Italy

Tips and tricks for success full lamellar surgery

Tarek Katamish, Egypt

Different types of big bubbles during DALK

Enrica Sarnicola, Italy

Deep anterior lamellar keratoplasty in acanthamoeba infection

Patricia Toro Ibañez, Italy

Massive destruction of the stroma. DALK out of limits

Chiara Millacci, Italy

DALK for keratoglobus: management of disparity between donor-recipient

Patricia Toro Ibañez, Italy

Long-term graft survival in deep anterior lamellar keratoplasty

Angelo Balestrazzi, Italy

Long-term results of personal modified technique of deep anterior lamellar keratoplasty

José Güell, Spain

DMEK and very low rebubbling rate

Luca Menabuoni, Italy

The optimized laser assisted endothelial keratoplasty

Davide Venzano, Italy

Learning curve in descemet membrane endothelial keratoplasty

Pietro Rosetta, Italy

Extensive descemet membrane detachment post radial keratotomy

Federico Marcoli, Italy

DSAEK for the treatment of long-standing pseudophakic bullous keratopathy with corneal neovascularization

Mattia Passilongo, Italy

Evaluation of functional and refractive results depending on graft morphology in DSEK

Marco Ruggeri, USA

Intraoperative evaluation of DSAEK and DALK with portable supine optical coherence tomography

17.10-19.00

ROOM 3: MISCELLANEOUS

Presidents of the Session: *Claudio Marconcini and Gerardo Santoni, Italy*

Chiara Millacci, Italy

Aminiotic membrane transplantation in trabeculectomy



Gianluca Martone, Italy

An in vivo confocal microscopy analysis of the effects of topical antiglaucoma therapy on corneal innervation and morphology

Paolo Frezzotti, Italy

Efficacy, safety, and improved tollerability of preservative-free timolol 0,1% gel formulation compared with prior a BAK-preserved therapy

Stephen S. Lane, USA

Update on the intraocular miniaturized telescope (IMT)

Angelo Balestrazzi, Italy

Study of the anti-edema activity of an ophthalmic hyperosmotic solution based on lactobionic acid and sodium chloride for eyes suffering postsurgical corneal edema for endothelial decompensation

Salvatore Troisi, Italy

Topical treatment of traumatic recurrent corneal erosions with platelet-rich plasma (PRP): preliminary results

Igor Di Carlo, Italy

Efficacy of a new hyperosmolar solution in reduction of corneal edema after cataract surgery

Cinzia Batisti, Italy

Further experience in the use of hypotonic and isotonic solution of Vit. B2 in the treatment of patients with keratoconus

Maria Eugenia Latronico, Italy

Management of conjunctival melanoma examined by in vivo confocal microscopy and anterior segment optical coherence tomography

Alessandra Balestrazzi, Italy

Resolution of a case of corneal involvement in CIN

Andrea Leonardi, Italy

Preservative-free topic quinolone for preoperative prophylaxis

Silvia Brogelli, Italy

Ocular surface in blepharospasm treated by periodical injections of botulinum neurotoxins

Emilia Ghelardi, Italy

Antimicrobial activity of a new preservative for multidose ophthalmic solutions

Sara Pezzotta, Italy

Disposable sterile gauze in the reduction of the microbial flora of the periocular area of the newborn

Rita Mencucci, Italy

Corneal wound healing: the possible role of the Coenzyme Q10

SATURDAY 29 JUNE

Main Auditorium - Italian < > English translation

8.30-9.15

GRAFT VS HOST SYMPOSIUM

President of the Session: *Giorgio Tassinari, Italy*

Giuseppe Marotta, Italy

Graft vs Host: systemic framing

Edward J. Holland, USA

Graft vs Host: ocular symptomatology

Vincenzo Sarnicola, Italy

Graft vs Host: therapy

Panel Discussion: *José Güell, Spain; Alberto Montericcio, Italy; Edoardo Motolese, Italy*

9.15-10.30

CUSTOM RETREATMENT AND PHOTOTHERAPEUTIC ABLATION

President of the Session: *Aldo Caporossi, Italy*

Paolo Vinciguerra, Italy

SCTK I

Paolo Vinciguerra, Italy

SCTK II: myth-buster

Cynthia Roberts, USA

Biomechanics and residual stromal bed

Jerry Tan, Singapore

Trans-PRK corneal wavefront-guided treatments for complicated refractive surgery enhancements

Glenn Carp, United Kingdom

Artemis-guided transepithelial PTK

Jerry Tan, Singapore

Corneal wavefront-guided treatments for complicated LASIK enhancements

Panel Discussion: *Glenn Carp, United Kingdom; Cynthia Roberts, USA; Jerry Tan, Singapore; Paolo Vinciguerra, Italy*



10.30-11.30

CASE DISCUSSION: DIFFICULT DIAGNOSIS

Faculty: Edward J. Holland, USA; Josè Güell, Spain

Moderator: Vincenzo Maurino, United Kingdom

11.30-12.30

CORNEAL INFECTIONS: FROM CLINIC TO DIAGNOSIS

President of the Session: Vincenzo Sarnicola, Italy

Mario Nubile, Italy

Diagnosis

Rita Mencucci, Italy

Medical approach

Vincenzo Sarnicola, Italy

Surgical approach

Panel Discussion: *Leonardo Mastropasqua, Alberto Montericcio, Eduardo Motolese, Claudio Traversi (Italy); Rajesh Fogla, India*

ABSTRACTS

3rd JOINT INTERNATIONAL CONGRESS

REFR@CTIVE.ON-LINE & SICSSO

XIII Congresso Nazionale Refr@ctive.on-line - XII Congresso Nazionale SICSSO



FRANCESCO AIELLO

CATARACT SURGERY IN EXTREME HYPEROPIA: OPERATIVE AND REFRACTIVE OUTCOMES

Authors: **F. Aiello**^{1,2}, **G. Carifi**¹, **F. Safa**¹, **V. Maurino**¹

¹ Cornea, Refractive & Cataract Department, Moorfields Eye Hospital, London, United Kingdom, ² Ophthalmologic Unit, University of Rome Tor Vergata, Rome, Italy

PURPOSE: Cataract surgery in the small eye is challenging and poses a unique set of intra and post-operative complications. Refractive outcome is also more unpredictable with no standard accepted biometry formula. There is limited data on the success of cataract surgery in extreme hyperopia. We evaluated the type and frequency of intra and post-operative complications of phacoemulsification surgery with intraocular lens (IOL) implant in eyes requiring IOL over 35.0 dioptres. We evaluated as well the accuracy of biometric formula used.

SETTING: Moorfield's Eye Hospital, London, UK.

METHODS: Patients undergoing cataract surgery at Moorfields Eye Hospital and St. Ann's hospital from 2003-2010 with intraocular lens implants of 35 dioptres or above were identified from theatre records. Demographic data, biometry data, type and strength of intra-ocular lens (IOL), type and frequency of intra and post-operative complications, best-corrected visual acuity pre and post-op were noted.

RESULTS: 200 A total of 45 eyes of 33 patients were identified with an average follow-up of 15.9 months. Mean age was 63.5 16.7 years (range: 22-93). Mean IOL power was +36.91 D (range + 35 - + 54 D). Axial length mean was 19.53 1.09. Forty-one eyes (91.1%) used Hoffer Q, 1 eye (2.2%) used SRK/T and 3 eyes (6.6%) used Holladay 2 formula for IOL calculation. Common ocular co-morbidities included glaucoma with narrow angle, oculocutaneous albinism, amblyopia, diabetic retinopathy, retinitis pigmentosa and squint. Iris trauma, occurred in 1 eye (2.2 %), was the only intra-operative complications recorded, with 44 eyes (97.8%) having none. Post-operative complications included iritis in 1 eye (2.2%), sub-retinal fluid in 1 eye (2.2%) and exudative retinal detachment in 1 eye (2.2%). Forty-two eyes (93.4%) had no complications. In 21 eyes (46,6%) the different between planned and achieved postoperative refraction was within 1 dioptre.

CONCLUSIONS: This represents the largest series to date of operative data for cataract surgery in extreme hyperopia needing IOLs over 35.0 dioptres. Intra-operative (2.2%) and post-operative (6.6%) complication rates are significantly less than described previously with relatively minor complications. Hoffer Q was found to be the most accurate biometric formula. Cataract surgery is safe and successful in this extreme range of hyperopia however further studies on biometric formulae are required to optimise refractive outcome.

MOEMEN AL-REEFY

FLEX SURGERY IN BAHRAIN

Author: **M. Al-Reefy**

Department of Head & Neck, King Hamad University Hospital, Busaiteen, Bahrain

PURPOSE: To study the new refractive procedure of FLEX in Kingdom of Bahrain and to be compared with standard conventional Lasik procedure which has been in practice for the last 20 years.

METHOD: Prospective study of 20 patients (n=40 eyes) who had refractive lenticular extraction for myopia and astigmatism in Kingdom of Bahrain during 2012. Comprehensive preoperative refractive work out including refraction, corneal topography, pentacam study, tear films study and thorough preoperative discussion of the nature of surgery and anticipated results to the patient. Detailed explanation of the surgical procedure of Intracorneal Lenticular Extraction by Femtosecond Visumax Ziess Machine.

Post-operative monitoring of visual acuity, refraction, corneal topography and patient satisfaction. Comparison of post-operative results of Flex Operation with standard conventional Lasik operation carried out by the same surgeon MEL 80 Eximer Laser by Ziess. Results Visual Acuity has in 100% of cases to 20/20 within the first week after surgery. patient satisfaction was achieved in 98% in respect to no pain during procedure with fast recovery within 24hours after flex procedure with no significance complication reported within 6 months follow up.

CONCLUSION: reveals Flex (Femtosecond Lenticular Extraction) has more refractive predictability, safety and patient satisfaction. All patients had ReLEx surgery said they recommend this procedure for others. ReLEx is a new bright era in refractive surgery.

LUCA AVONI

EFFECTIVENESS AND SAFETY OF THE REGULARIZATION SURGERY OF THE CORNEA THICKNESS

Author: **L. Avoni**

Eye Bank of Emilia Romagna, Bologna, Italy

PURPOSE: The objectives of this study are evaluated utilizing the effectiveness endpoints. The primary is an adequate postoperative cornea thickness (550 microns in a diameter of 8 mm), the secondary endpoints are the thickness of the following corneal lenticles: 1. a stromal lenticle with a constant pachymetry of 400 microns; 2. an endothelium lenticle with a constant pachymetry of 150 microns. In addition for the safety were evaluated the reduction of endothelial cells density and any adverse events/ complications occurred.

METHODS: The pre-operative process of cornea evaluation were performed according to the normal procedures of the Corneas Bank of E. R.. The optical pachymetry were performed with Precisio topographer. In the operative phase the corneas were regularization with excimer laser IRES to have the constant thickness equal to the 550 microns and after they were cut with the microkeratotomy to obtain two lenticles: endothelium lenticle (thickness 150 microns) and stromal (thickness 150- 400 microns). **RESULTS:** The optical pachymetry performed immediately after corneal regularization, executed with the IRES excimer laser showed that the average value of 550 ± 25 microns thickness was achieved.

ENDOTHELIAL LENTICULE: The optical pachymetry performed immediately after the cut procedure showed that the average value of 150 ± 50 microns thickness was achieved. In addition at the optical pachymetry, the histological analysis, performed at the Hospital Maggiore provided a further confirmation that the above results were achieved.

CONCLUSIONS: The operative procedure of regularization of the cornea thickness with excimer laser supports reasonable assurance of effectiveness and safety as per the above end points.

STEFANO BAIOCCHI

COMPARATIVE ULTRA-STRUCTURAL ANALYSIS BETWEEN NORMAL, UNTREATED KERATOCONIC CORNEAS, EPI-OFF AND EPI-ON CROSS-LINKED CORNEAS

Authors: **S. Baiocchi, C. Mazzotta, A. Caporossi**

University of Siena, Department of Medical and Surgical Sciences and Neurosciences, Siena, Italy

PURPOSE: Assessing Ultra-structural differences between normal, keratoconic and cross-linked corneas.

METHODS: 5 keratoconic corneas were obtained from PK and DALK patients, 5 keratoconic corneas suitable for PK and DALK were previously treated with epi-off CXL one month before the PK or DALK operation and other 5 Keratoconic corneas were treated with Epi-on CXL at same time. 5 control group normal corneas were obtained from eye-bank donor specimens. Optical microscopy was performed (20 x to 320 x magnification) after Carnovsky solution preservation and Trypan blue staining. TEM was performed after Osmium tetra-oxide staining in ultrathin sections (7.500 x to 90.000 x magnification) . Analysis comprised fibers organization, lamellar and inter-fibrils spatial distribution. Fibrillar inter-spaces and distances were calculated by a dedicated software.

RESULTS: optical microscopy (OM) showed significant difference in fibers orientation and inter-fibrils distance between normal and KC untreated corneas in the whole stroma. Epi-off cross-linked corneas demonstrated significant differences in fibrils orientation compared with untreated KC corneas only in the anterior 300 µm of stroma. Epi-on crosslinked corneas demonstrated differences in fibrils orientation and inter-spaces confined in the anterior 100 µm from epithelial surface. Transmission electron microscopy (TEM) showed significant differences between normal and KC untreated corneas in all corneal layers except for endothelium, consisting in epithelial alterations, fibrils orientation and spatial distribution, inter-fibrils distances and keratocytes population and vitality. Main differences were detected beyond 200 µm of stromal depth. Epi-off cross-linked corneas showed improved spatial distribution and inter-fibrils distance in the anterior-mid stroma until 300 µm of depth, almost resembling interspatial distribution and fibrils orientation of normal corneas. Epi-On cross-linked samples showed the same but inhomogeneous improvements limited to the anterior stroma until 80 µm of depth from epithelial surface. Fibrils disorganization and altered interspatial distribution was maintained after Epi-On cross-linking beyond 80 µm similar to untreated KC corneas.

CONCLUSIONS: Ultra-structural comparative analysis demonstrated significant differences involving all corneal layers between normal and KC corneas. Main differences were detected in the mid-deep stroma beyond 200 µm of depth (in the so called weak cornea) consisting in augmented inter-fibrils distance and spatial disorganization in interlacing lamellae. In all Cross-linked corneas fibrils organization and interspaces were improved, almost resembling normal corneas but with significant differences in stromal depth (300 µm in Epi-Off vs 80 µm in Epi-On). These findings suggested a better keratoconus stabilization and more long term stable visual improvements after Epi-Off CXL treatment.

ALESSANDRA BALESTRAZZI

STUDY OF THE ANTI-EDEMA ACTIVITY OF AN OPHTHALMIC HYPEROSMOTIC SOLUTION BASED ON LACTOBIONIC ACID AND SODIUM CHLORIDE FOR EYES SUFFERING POSTSURGICAL CORNEAL EDEMA FOR ENDOTHELIAL DECOMPENSATION

Author: **A. Balestrazzi**

Ophthalmic Hospital, Rome, Italy

PURPOSE: To describe the anti-edema activity of an hyperosmotic solution of lactobionic acid and sodium chloride for eyes suffering postsurgical corneal edema.

SETTING: Ophthalmic Hospital Piazzale Degli Eroi 3 Rome, Italy.

METHODS: From February to April 2013 we used the solution of Lactobionic acid and sodium chloride in 20 eyes with postsurgical edema after DALK, DSEK, PK, iLASIK, cross linking or phacoemulsification. In more severe cases we used another anti-edema solution in combination.

RESULTS: The solution is very well tolerated, we just had a case of burning.

CONCLUSIONS: The solution is useful in all postsurgical corneal edema, it has an interesting synergistic effect with other anti-edema in particularly severe cases (better compliance, fewer instillations, better protection of the ocular surface).

ALESSANDRA BALESTRAZZI

RESOLUTION OF A CASE OF CORNEAL INVOLVEMENT IN CIN

Authors: **A. Balestrazzi, P. Michieletto, F. Di Porto, B. Kropp**

Ophthalmic Hospital, Rome, Italy

PURPOSE: To describe a case of surgical resolution of corneal involvement in CIN (Conjunctival Intraepithelial Neoplasia).

METHODS: A man of 80 years old was referred to our department in December 2011 for irritation and redness with diminution of vision in his left eye for the past 6 months. He was previously submitted to surgical excision of a conjunctival neoformation and PTK for corneal superficial opacification. We put the patient on topical MMC 0.02% 4 times daily in 7 day for four cycles without benefits. Then we have done a alcohol epitheliectomy and intraoperative mitomycin-C (0.02%) for two minutes with a partial reduction of corneal opacities. So we have decided to do a conjunctival peritomy and a excision of the minimal conjunctival involvement. Excision biopsy of the lesion was done using a non-touch technique. The excised fragment was sent for histopathological examination. After alcohol epitheliectomy, cryotherapy was applied to the margins of the remaining bulbar conjunctiva by the double freeze-thaw technique. The conjunctiva was closed with 8/0 vicryl suture. A bandage contact lens was applied. At every postoperative check up we have done digital photos with slit lamp.

RESULTS: Post-operatively cornea was clear and remain clear after 12 months of follow up.

CONCLUSIONS: In this case of corneal involvement of CIN (Conjunctival Intraepithelial Neoplasia), the best treatment was alcohol epitheliectomy, excision biopsy with adjunctive cryotherapy.



ANGELO BALESTRAZZI

TIPS AND TRICKS FOR SUCCESS FULL LAMELLAR SURGERY

Authors: **A. Balestrazzi, C. Simi, V. Corbo, A. Caporossi**

University of Siena, Department of Medical and Surgical Sciences and Neurosciences, Siena, Italy

PURPOSE: The aim of the presentation is to underline some steps of posterior lamellar techniques.

METHODS: Some modified steps to the standard DSAEK and combined phacoemulsification/DSAEK techniques are presented.

RESULTS: the use of instruments such as Caporossi's forceps and a correct planning of the incision sites make possible to improve the surgical repeatability and the clinical results of this kind of surgery.

CONCLUSIONS: in our case series the presented modifications led to a complications reduction and an improvement of the results.

ANGELO BALESTRAZZI

LONG-TERM RESULTS OF PERSONAL MODIFIED TECHNIQUE OF DEEP ANTERIOR LAMELLAR KERATOPLASTY

Authors: **A. Balestrazzi, G. Cartocci, M.E. Latronico, G. Martone, A. Caporossi**

University of Siena, Department of Medical and Surgical Sciences and Neurosciences, Siena, Italy

PURPOSE: To compare the long-term results of a personal modified technique of big-bubble deep lamellar keratoplasty (DLK) with the big-bubble literature results.

METHODS: 15 patients with refractive keratoconus underwent a big-bubble modified technique in the last 12 months. The technique includes some surgical different steps:

- The first one is the air injection in anterior chamber before the bubble intracorneal injection;
- The second one is represented by the application of viscoelastic device on the roof before to cut the anterior lamella;
- The third one is the staining of the bubble to carry out the "BRAVE CUT" with trypan blue.

RESULTS: Preoperative best corrected visual acuity (BCVA) was 0.14 ± 0.33 and after 12 months the BCVA improved to 0.76 ± 0.39 . Mean SE improved from -8.17 ± 3.90 to -1.90 ± 3.60 at 12 months. Mean topographic astigmatism improved from -7.1 ± 3.7 to -2.17 ± 1.7 at 12 months. Moreover there was not any intraoperative and postoperative complications using this technique.

CONCLUSIONS: This modified DLK big-bubble technique may be sure and predictable and can lead to significant surgical advantages to achieve a deep dissection with baring Descemet membrane.

SIMONE BEHEREGARAY

FORWARD LIGHT SCATTERING INDUCED BY SUB-SURFACE NANO GLISTENING: INFLUENCE ON VISUAL FUNCTION

Authors: **S. Beheregaray¹, T. Yamamoto², T. Hiraoka¹, T. Oshika¹**

¹ University of Tsukuba, Tsukuba, Japan, ² Ushiku Aiwa General Hospital, Ushiku, Japan

PURPOSE: To measure the forward light scattering (FLS) in eyes with AcrySof® intraocular lens (IOLs) presenting sub-surface nano glistening (SSNG), and evaluate the impact of FLS on the visual function.

METHODS: Forty-three eyes from 34 individuals presenting SSNG were studied. Forward light scattering was evaluated by a double-pass image method with OQAS II (Optical Quality Analysis System, Visiometrics), and quantified by OSI (Optical Scatter Index). Contrast sensitivity was assessed by OPTEC 6500 (Stereo Optical), and the area under log contrast sensitivity function (AULCSF) was calculated. Backward light scattering (BLS) of IOLs was evaluated using the Scheimpflug system EAS-1000 (Nidek). Correlations among OSI, age, time after surgery, visual function, IOL power, and BLS were analyzed.

RESULTS: Patients' age was 69.6 ± 7.3 (mean \pm SD) years, period after surgery was 6.5 ± 2.7 years, OSI was 2.3 ± 1.2 . Uncorrected visual acuity (UCVA) logMAR was 0.34 ± 0.35 , and best corrected visual acuity (BCVA) logMAR was -0.06 ± 0.07 . Photopic AULCSF was 1.58 ± 0.32 without glare, and 1.60 ± 0.37 with glare; mesopic AULCSF was 1.22 ± 0.39 without glare, and 1.01 ± 0.43 with glare. According to simple correlation test, OSI correlated with BCVA and contrast sensitivity ($p < 0.05$). Multivariate analysis showed OSI was the only relevant variable to BCVA and contrast sensitivity with glare ($p < 0.05$). Also, OSI and age correlated with contrast sensitivity without glare ($p < 0.05$), however OSI was more significant.

CONCLUSIONS: SSNG did not deteriorate BCVA, but increased forward light scattering which appeared to affect both visual acuity and contrast sensitivity.

SILVIA BROGELLI

OCULAR SURFACE IN BLEPHAROSPASM TREATED BY PERIODICAL INJECTIONS OF BOTULINUM NEUROTOXINS

Authors: **S. Brogelli, S. Esente**

Centro Oculistico, Firenze, Italy

Blepharospasm is a focal dystonia whose peripheral trigger sensory stimulation is in the surface of the eye and the motor component is in the complex of muscles of lids and periorbital region. The approved pharmacologic treatment is local injection of Botulinum Neurotoxins. We have treated 994 patients affected by blepharospasm since 1986 to 2012. We have retrospectively reviewed all the pieces of information we had about their ocular surface in order to build a documented theory about the complex relationships between ocular surface and the anomalous motor control of lids in blepharospasm patients chronically treated by periodical local injections of botulinum toxin. Primary infectious keratitis was considered an exclusion criterium to treatment by botulinum toxin so it was absent in our cases. Primary dry eye was found in a minority of cases. Secondary dry eye symptoms were common because of the excess of eyelid opening induced by the injections of neurotoxins. The cooperation between several medical specialties is mandatory in blepharospasm patients: neurologists, maxillofacial and plastic surgeons are accustomed to make botulinum injections in blepharospasm and they have good results but they cannot visit the surface of the eye by slit lamp and this unique ophthalmological approach should be emphasized in order to avoid the local complications of the treatment and to reduce the dosage of administered neurotoxins by simply taking care of the ocular surface which is the beginning of the reflex arch of normal as well as pathological blinking.

CARLO CAGINI

OUTCOMES OF MUSHROOM KERATOPLASTY WITH FEMTOLASER IN PATIENTS WITH CENTRAL LEUKOMA

Authors: **C. Cagini, F. Riccitelli, F. Piccinelli,**

A. Bartolini, M. Messina, A. Cerquaglia, S. Manes

Department of Ophthalmology, University of Perugia, Perugia, Italy

PURPOSE: To evaluate the outcomes of femtolasar assisted mushroom keratoplasty for the treatment of central full-thickness corneal scars.

METHODS: Mushroom keratoplasty was performed in five cases of central full-thickness corneal scars resulting from various origin (post traumatic, keratoconus and corneal dystrophy). Complete ophthalmic evaluation was performed preoperatively and postoperatively at 1, 3, 6 and 12 months.

The donor graft consisted of a large anterior stromal lamella of 9.0 mm in diameter performed by femtosecond laser and a small posterior button of 6.0 mm in diameter including deep stroma and endothelium performed by microkeratome. Only the anterior lamella was sutured with nylon 10.0.

RESULTS: There was only one case of posterior flap's temporary dislocation (resolved by injecting an air bubble). In all cases at the last follow up the graft was clear and well positioned. In all cases a very smooth and clear interface was obtained. In all cases the resulting best spectacle-corrected visual acuity was better than 4/10 (one of these better than 7/10). In all cases visual recovery was limited by the underlying ocular diseases (glaucoma, amblyopia). At the last follow up the average astigmatism was 4.2 diopters, the average endothelial cell density was 1576 cells/mm² and the average central corneal thickness was 455 μ m.

CONCLUSION: Mushroom keratoplasty combines the visual and refractive advantages of reduced surface distortion and fast healing of the large anterior lamellar graft with the advantages of reduced risk of immunologic rejection and improved graft survival due to the preservation of healthy recipient endothelium.

ROBERTA CALIENNO

CANNING ELECTRON MICROSCOPY EVALUATION OF CAPSULORHEXIS PERFORMED BY MEANS OF FEMTOSECOND LASER-ASSISTED CATARACT SURGERY

Authors: **L. Mastropasqua¹, R. Calienno¹, L. Vecchiarino¹, E. D'Ugo¹, A. Mastropasqua², P.A. Mattei¹, C. De Nicola¹, L. Toto¹**

Ophthalmology Clinic, University G. D'Annunzio, Chieti-Pescara, Italy, ² Ophthalmology Clinic, Campus Biomedico, Rome, Italy

PURPOSE: To evaluate capsulorhexis cut quality obtained during femtosecond laser-assisted cataract surgery (FCSL) at different energy settings and to evaluate if differences exist with that obtainable with a standard manual technique, using scanning electron microscopy (SEM).

METHODS: Sixty capsulorhexises obtained by means of conventional manual technique and by means of FCSL with different laser energy settings were divided into five groups: group 1 (12 rhexis) obtained with manual technique and groups 2 to 5 (each with 12 rhexis) obtained with FCSL at 7, 13.5, 14 and 15microjoules, respectively. All samples were evaluated by means of SEM to compare the thickness along the rhexis edge and overall irregularity of the cut surface.

RESULTS: Rhexes obtained with FCSL at all energy settings had perfectly circular with negligible deformation. Groups 1 and 2 showed a significantly higher and lower thickness, respectively, of the rhexis edge compared to the other three groups. There was also a statistically significant correlation between the degree of irregularity and increasing energy.

CONCLUSIONS: In conclusion, the use of FCSL in cataract surgery resulted in a better rhexis geometry and circularity while maintaining a similar degree of irregularity of the cut surface when lower energy settings were used.

FABRIZIO CAMESASCA

SUBJECTIVE AND OBJECTIVE REFRACTION AFTER MONOFOCAL TORIC IOL IMPLANTATION AND ALIGNMENT WITH AN EMPIRICAL METHOD

Authors: **F.I. Camesasca, M. Vitali, P. Vinciguerra**

Humanitas Clinical and Research Center, Rozzano (MI), Italy

PURPOSE: We evaluated subjective and objective refraction, and topographic astigmatism (TA) before and after implantation of a toric aspheric monofocal IOL, aligned with an empirical method based on the limbal vessels pattern.

SETTINGS: Istituto Clinico Humanitas - Rozzano - Milan, Italy.

MATERIALS: Thirty-six eyes of 20 cataract patients (mean age 64.35 ± 16.59) received a toric aspheric monofocal IOL (Zeiss AT Torbi 409 MP). Preoperatively, reference limbal vessels positioned in correspondance of the alignment axis recommended by the specific website software (Zeiss Z Calc) were photographed. IOL axis orientation was performed aligning the axis with these reference limbal vessels, and checking the software recommended angle, as well as the preoperative corneal topography astigmatism. Subjective refraction and TA were measured before and nine months after surgery. In-the-bag IOL orientation was determined by anterior segment photography and examination of the above mentioned reference vessels.

RESULTS: Mean preoperative subjective refraction was $-2.29 \text{ D} \pm 3.63 \text{ D sph with } -2.19 \text{ D} \pm 0.55 \text{ D cyl at } 64.44^\circ \pm 72.73^\circ$. Mean TA was -1.79 ± 0.39 at $118.88^\circ \pm 73.82^\circ$. Mean SIA was -0.20 D . Postoperatively (9 ± 4 months), mean subjective refraction was $-0.41 \text{ D} \pm 0.79 \text{ D sph with } -0.25 \text{ D} \pm 0.44 \text{ D cyl at } 93.33^\circ \pm 45.09^\circ$. Mean BSCVA and UCVA were -0.06 LogMar and -0.02 LogMar , respectively. Mean TA was $-1.87 \text{ D} \pm 0.40 \text{ D at } 134.25^\circ \pm 63.90^\circ$. Mean IOL axial orientation was at $90.83^\circ \pm 38.40^\circ$.

CONCLUSIONS: Patients receiving monofocal toric IOLs aligned through an empirical method reached optimal visual acuity. Mean TA was not influenced by SIA, and final refraction showed highly satisfactory correction of spherical and astigmatic defect.

EMILIA CANTERA

KERATOMETRIC VALUES IN A YOUNG HEALTHY POPULATION

Authors: **E. Cantera, M. Cortes, S. Conflitti**

Opedale Israelitico, Rome, Italy

PURPOSE: to characterize corneal morphology and corneal optic quality in a population of normal adolescents and young adults.

METHODS: 600 eyes of 300 students (ages 10-20 years) were



examined with the Sirius corneal topographer, a combination of Scheimpflug camera and Placido disk. To study corneal morphology shape indices were used. In particular corneal asphericity, sim K, corneal meridians at 3,5,7 mm. Moreover we evaluated corneal pachimetry and corneal asymmetry, parameters used in clinical practice for keratoconus screening. In order to define corneal optic quality we studied corneal aberrations (astigmatism, spherical aberration, coma) at different pupil diameters.

For all above mentioned values normality limits were established. Right eyes and left eyes were analyzed separately in order to evaluate enantiomorphism.

RESULTS: corneas examined showed a prolate profile. Anterior mean sim K average was 7.751 (SD 0.81), anterior mean meridian average 3 mm was 7.79 (SD 0.86), posterior mean meridian average was 6.499 (SD 0.445); pachimetry mean was 547.59 microns. Six corneas showed a pattern compatible with early keratoconus.

CONCLUSIONS: corneas examined had a prolate profile, 1% probably had an early keratoconus.

TOMASO CAPOROSSI

OPTICAL AND FUNCTIONAL PERFORMANCE OF PHAKIC ANGLE-SUPPORTED INTRAOCULAR LENS FOR THE CORRECTION OF HIGH MYOPIA IN 2-YEAR FOLLOW-UP STUDY

Authors: **G. Martone, A. Tarantello, G. Cartocci, A. Balestrazzi, A. Caporossi**

University of Siena, Department of Medical and Surgical Sciences and Neurosciences, Siena, Italy

PURPOSE: To investigate the safety, the efficacy and stability of an angle-supported hydrophobic acrylic phakic intraocular lens (pIOL) for correction of moderate-to-high myopia in adults. Setting: Ophthalmology Department, University of Siena, Italy.

METHODS: 15 patients (22 eyes) with moderate-to-high myopia underwent implantation of an angle-supported pIOL. Best spectacle-corrected visual acuity (BSCVA), uncorrected distance visual acuity (UCVA), predictability and stability of mean manifest refraction spherical equivalent (MRSE), adverse events, central endothelial cell density, corneal and total ocular aberrations and rotation of the pIOL were measured at 1 and 2-year follow-up.

RESULTS: Mean postoperative UDVA was 0.83 and 0.8 and mean postoperative BSCVA was 0.97 and 0.95 at 1-year and 2-year, respectively. The mean MRSE was -0.29 and -0.09 D. The mean percentage change in central endothelial cell density was -3.45% and -4.18% 1 and 2 years after surgery. No adverse events were observed.

Wavefront measurements revealed a significant reduction in terms of high order aberrations between pre-operative and post-operative values. The analysis of the rotation showed a little variation (mean rotation of 5.4 and 5.2°) between postoperative 1 month and postoperative 1 and 2 year visits.

CONCLUSIONS: The angle-supported hydrophobic acrylic pIOL yielded excellent refractive correction and predictability with optimal safety. This study demonstrates significant support for a high stability of this pIOL.

GIULIA CARTOCCI

MUSHROOM FEMTOSECOND ASSISTED VS MECHANICAL TREPHINE PENETRATING KERATOPLASTY IN KERATOCONUS PATIENTS: POSTOPERATIVE ASTIGMATISM AND HO ABERRATIONS

Authors: **G. Cartocci, A. Balestrazzi, M.E. Latronico, G. Martone, V. Corbo, A. Caporossi**

University of Siena, Department of Medical and Surgical Sciences and Neurosciences, Siena, Italy,

PURPOSE: The aim of the study is to compare the visual and refractive outcomes of two different penetrating keratoplasty (PKP) techniques with a double running 16-bite antitorque suture in patients with keratoconus. METHODS: This non-randomised prospective study included a comparison of 10 keratoconus patients that underwent femtosecond laser-assisted keratoplasty (FLAK) with a mushroom incision configuration versus 10 patients that underwent conventional manual suction trephination PKP. All PKPs were closed with an identical 16-bite double running antitorque suture. The range of follow-up was between 3, 6 and 12 months. Preoperative and postoperative manifest refraction, uncorrected and best-spectacle corrected visual acuity (BSCVA), topographically determined astigmatism, corneal high-order ocular aberrations (HOAs), endothelial cell counts and complications were analysed.

RESULTS: At 12 months of follow-up, the mean UCVA and BSCVA were similar between the two groups with no significant differences. The mean spherical equivalent was also similar between the groups and was less than 3 dioptres. There was a statistically significant difference in topographic astigmatism between the groups. By 12 months, the corneal astigmatism was 3.88 diopters (D) in the FLAK and 4.4 D in the conventional PKP group. The total HOAs from both corneal surfaces were significantly lower in FLAK than in the other group ($p < 0.01$). Postoperative complications and mean endothelial cell loss were not different between the two groups. CONCLUSIONS: FLAK is a safe and stable procedure The FLAK mushroom incision with a double running 16-bite antitorque suture induces less postoperative topographic astigmatism HOAs compared with conventional manual trephination PKP.

GIOVANNI CITRONI

OUTCOMES, CRITICAL, AND RETREATMENTS OF MULTIFOCAL PRESBYOPIA CORRECTION BY EXCIMER LASER: MULTICENTER INTERNATIONAL STUDY WITH 36 MONTH EXPERIENCE

Author: **G. Citroni**

Studio Oculistico Giovanni Citroni, Darfo Boario Terme, Italy

PURPOSE: To investigate clinical outcomes, critical consideration, and retreatments of multifocal laser correction of presbyopia

METHODS: We are reporting the results with critical and retreatments of a prospective study on 142 ametropes and emmetropic presbyopic patients. Preoperatively routine eye examination includes distance vision and near vision, corneal thickness and wavefront measurements. Patients underwent multifocal PRK ablation with Presbytec Gauss Laser.

RESULT: The mean age of the patients was 54.5. Follow up was up to 36 months. Results revealed a stable uncorrected near

visual acuity with statically significant gain from mean J6 to J2. Preoperative uncorrected mean distance visual acuity was stable postoperatively. There was no loss of distance corrected visual acuity. Regression happened in 6% of cases. The results obtained were similar to those obtained with other presbyopia excimer laser correction.

CONCLUSIONS: Multifocal Presbytec System is an effective presbyopia laser correction, especially in ametropes patients and shows stable refractive outcomes with 94% patient satisfaction. It is mandatory a careful patients selection to provide a result of refraction success.

IGOR DI CARLO

EFFICACY OF A NEW HYPEROSMOLAR SOLUTION IN REDUCTION OF CORNEAL EDEMA AFTER CATARACT SURGERY

Author: **I. Di Carlo**

Policlinico San Luca, Torino, Italy

Even if transitory, a post-cataract surgery corneal oedema would be considered as an adverse condition also because it could have a negative psychological impact on the patient. In order to reduce this complication and improve the comfort of the patient, an hyperosmolar eye drop solution has been tested. Consequently, a double blind test has been performed considering aspects like inflammation, functional recovery and healing perceptions

MARCO FANTOZZI

MORPHOLOGICAL STUDY OF CORNEA BY IN VIVO CONFOCAL MICROSCOPY AND OPTICAL COHERENCE TOMOGRAPHY AFTER FLEXIVUE MICROLENS™ IMPLANTATION

Authors: **M. Fantozzi, A. Malandrini, A.M. Catanese,**

L. Menabuoni, C. Fantozzi, I. Lenzetti

Department of Ophthalmology, Misericordia e Dolce Hospital, Prato, Italy

PURPOSE: To investigate the healing of corneal wounds and the corneal structural features after Presbia Flexivue Microlens™ implantation using in vivo confocal microscopy (IVCM) and anterior segment optical coherence tomography (AS-OCT).

METHODS: The corneal inlay was inserted into a stromal pocket created in the non-dominant eyes of 52 emmetropic presbyopic patients using femtosecond laser. The mean follow up was 7,6 months. IVCM and AS-OCT examinations were performed preoperatively and at 1,6 and 12 months after surgery.

RESULTS: Under IVCM examination, epithelial layers maintained integrity. The stroma around the inlay showed intense cellular activity, edema, inflammation and deposition of degeneration material early in the postoperative period, but recovered normal regularity after 12 months. Endothelial cells appeared unchanged throughout the postoperative period. AS-OCT analysis showed regular planar shape of corneal pocket in all eyes. The mean value of side cut angles were $30.7^\circ \pm 0.5$. The mean difference between the measured and planned pocket depth was 9.77 finally. At 1 month, some hyperreflective areas beneath the inlay representing the femtolaser treated area and microfolds were observed. After 12

months, a regular anterior segment profile was described and the interface pocket reflectivity decreased over time. IVCM and AS-OCT 6 month after inlay removal showed clear corneas without alterations or signs of irregularity.

CONCLUSIONS: IVCM analysis demonstrated that the inlay elicited low-level wound healing response in its immediate vicinity. AS-OCT evaluation confirmed no alteration of the corneal structures and that the surgical procedure was repeatable.

ROMINA FASCIANI

OCULAR MUCOUS MEMBRANE PEMPHIGOID AFTER LYELL SYNDROME: OCCASIONAL FINDING OR PREDISPOSING EVENT?

Authors: **R. Fasciani, M.I. Giannico, A. Caristia,**

A. Agresta, S.A. Ambrogio, E. Balestrazzi

Ophthalmology Department, Catholic University of Sacro Cuore, Rome, Italy

PURPOSE: Ocular Mucous Membrane Pemphigoid (OMMP) is an autoimmune disease involving the eye, characterized by subepithelial detachment due to immunologic reaction against conjunctival basement membrane zone (BMZ) antigens. Lyell syndrome (LS) is a drug induced T cell-mediate cytotoxic reaction involving mucocutaneous areas. We present two cases of OMMP developed after LS. METHODS: Two male patients, 80 and 60 years old, suffered from persistent corneal ulcerations, corneal melting and inflammation after months of Lyell syndrome episode. Conjunctival biopsies were obtained to perform direct immunofluorescence (DIF) and histological analyses. Indirect immunofluorescence (IFI) and ELISA were also performed.

RESULTS: DIF analyses showed IgG and C3 deposits along the BMZ in a linear pattern; histology revealed the presence of eosinophils, neutrophils and mast cells with fibrin deposition in the derma for both patients; these data confirmed the clinical suspect of OMMP. IFI and ELISA were negative.

CONCLUSION: Chronic eye surface injury associated with LS could promote autoimmunization versus ocular epithelial BMZ antigens, playing a strategic role in the subsequent onset of OMMP. The occurrence of OMMP after Lyell syndrome could be an occasional finding or, on the other hand, Lyell syndrome could be an underestimated predisposing factor to develop OMMP.

ROMINA FASCIANI

IN VIVO CORNEAL CONFOCAL MICROSCOPY MORPHOLOGICAL COMPARISON BETWEEN DIFFERENT LK PROCEDURES FOR KERATOCONUS

Authors: **R. Fasciani¹, L. Spadea², L. Mosca¹, A. Caristia¹, G. Maione¹, S.A. Ambrogio¹, E. Balestrazzi¹**

¹ Ophthalmology Department, Catholic University of Sacro Cuore, Rome, Italy, ² Eye Clinic University of L'Aquila, Italy

PURPOSE: to evaluate in vivo confocal microscopic features seen in patients that underwent to Corneal Lamellar Ablation for transplantation (CLAT) and to Femtosecond Anterior Lamellar Keratoplasty (FALK).

METHODS: 53 patients, affected by mild to moderate keratoconus, were submitted to lamellar keratoplasty: 30 eyes of 30 patients to



CLAT (iVIS Technologies, Taranto, Italy) and 18 eyes to FALK (INTRALASE, Abbott, USA). All the patients were evaluated using CS4 confocal microscopy. Using 40x lens and Z-ring device of CS4, a morphological evaluation of interface and stromal and endothelial tissue trophism and a pachimetry study of ablation and residual bed thicknesses were performed at 2 months and 1 year after surgery.

RESULTS: No endothelial cell density difference was seen between CLAT and FALK procedures. The morphological features of lamella and donor-recipient interface were similar in both lamellar keratoplasty techniques with progressive improvement of keratocytes and corneal nerves density, reduction of inflammation stromal scattering and edema. Marked folds in the residual stromal bed were present in both procedures, but they were less evident in CLAT patients, especially after sutures removal, but they still remained in FALK. Probably, in FALK those folds were mainly due to lamellar graft compression of keratoconus, instead of CLAT patients where the folds depended on suture traction forces.

CONCLUSION: Confocal microscopy seems to be a useful procedure to investigate in vivo the results of keratoplasty surgery. The morphological analysis of the tissues permits a direct evaluation and comparison between the different keratoplasty techniques.

ROMINA FASCIANI

MORPHOSTRUCTURAL EVALUATION WITH IN VIVO CORNEAL CONFOCAL MICROSCOPY AFTER FEMTO-ALK AND FEMTO DALK IN KERATOCONUS

Authors: **R. Fasciani, L. Mosca, A. Caristia, A. Agresta, E. Balestrazzi**

Ophthalmology Department Catholic University of Sacro Cuore, Rome, Italy

PURPOSE: To explore and to correlate with visual results the ultrastructural alterations after 2 lamellar keratoplasty techniques.

METHODS: 27 eyes submitted to laser assisted lamellar keratoplasty for keratoconus (10 femtosecond assisted anterior lamellar Keratoplasty, Femto-ALK, and 17 femtosecond assisted deep anterior lamellar Keratoplasty, Femto-DALK) were examined with in vivo confocal microscopy (IVCM - CONFOSCAN 4). Endothelium, residual stromal bed, donor-recipient interface and donor lamella morphological features were evaluated. A grading for interface haze and thickness as well for density and orientation of dark striae was created.

RESULTS: No endothelial side effects were seen in all eyes. A progressive reduction of average level of light-scattering intensity and thickness of the donor-recipient interface was demonstrated, with best results in procedures that use excimer ablation (Femto-DALK). The amount of dark striae was inversely proportional to residual stromal bed thickness and symmetry. A progressive reduction of dark striae was observed during the follow-up, more evident after sutures removal.

CONCLUSION: In our study, the best interface quality was obtained in those lamellar procedures that used excimer laser smoothing due to a better interaction between recipient stromal bed and donor lamella with less scarring reaction and inflammation. The dark striae grading was related to surgery warp of keratoconus residual stromal bed. Lamellar procedures that reduced the thickness asymmetry of keratoconus obtained the best results due to less compression of residual stromal bed. In our results, the IVCM morphostructural evaluation seems to be useful to explain transplant's optical quality assessment in Femtosecond laser lamellar keratoplasty techniques.

CATERINA GAGLIANO

EXPERIMENTAL EVIDENCE ON TOPICAL USE OF AMINOACIDS IN DRY EYE SYNDROME

Author: **C. Gagliano**

Neurovisual Science Technology (NEST), Catania, Italy

Aminoacids are essential nutrients, as they constitute the main elements of which proteins and peptides are made of, thus building and regulating the whole metabolism of living organisms. They are required for the synthesis of collagen fibers, regulation of the wound healing, modulation of inflammation and regenerative process. Experimental and clinical evidences have been shown that aminoacids decreased risk of hyperplastic reaction through decreased EGF expression. Moreover an increased expression of TGFb, suggesting decreased keratocytes proliferation and increased motility of epithelial cells. Dry eye syndrome is accompanied by alterations of ocular surface epithelia and increased production of inflammatory cytokines in the tear film. Treatment of rabbits' eyes with saline alone or saline plus aminoacids (Leu, Gly, Pro, Lys) has shown a significant increase of tear production, and a decrease of MMP9 expression in the aminoacid treatment group after 3 days of treatment, suggesting that an improved trophism of the ocular surface may exert a positive effect on the whole lacrimal system. Consistently with these results, also clinical study on 20 patients affected by mild to moderate dry eye, has shown that treatment with saline alone or saline plus aminoacids (Leu, Gly, Pro, Lys) resulted at 1 and 3 months of treatment in a better response for some symptoms, such as burning, itching, dryness and tearing in the aminoacid-treated patients (p<0.001). Another clinical study has compared the response of patients affected by dysfunctional tear syndrome treated with either an artificial tear containing hyaluronic acid only or hyaluronic acid plus aminoacids (Leu, Gly, Pro, Lys). After 1 and 3 months of treatment, even though all patients showed improvements of signs and symptoms, those patients treated with aminoacids-containing eye drops had better corneal stain and less hyper-reflecting cells in the epithelial corneal layer as compared to those receiving hyaluronic acid alone (p<0.05). Recently, Wang and coll. discovered the effects of lacritin on the omeostasis of aminoacids in tears. Lacritin is a prosecretory mitogen in tears and, although a tear protein, it promotes basal tearing and lacrimal gland secretion. Certainly, more studies are required, both on experimental model systems and on human patients, to understand better the pharmacokinetics and the pharmacodynamics of topical aminoacids and their effects on different eye compartments, such as lacrimal glands, corneal epithelial surface and stroma. Some of these studies are already running in laboratories and clinical settings in Italy and abroad.

CATERINA GAGLIANO

EFFECTS OF TRANS-EPITHELIAL CROSS-LINKING ON CORNEAL INNERVATION AND CORNEAL SENSITIVITY IN PATIENTS WITH KERATOCONUS

Authors: **C. Gagliano¹, M. Anguzza², G. Napolitano¹, S. Stella², G. Scandurra², G. Parisi², T. Avitabile²**

¹ Neurovisual Science Technology (NEST), Catania, Italy,

² Catania University, Department of Ophthalmology, Catania, Italy

PURPOSE: To assess the effects of trans-epithelial cross-linking (TE-CXL) on corneal innervations and corneal sensitivity.

METHODS: Twenty-four patients with bilateral progressive keratoconus were enrolled in this prospective study. TE-CXL was performed in one eye and the other eye was left untreated

or continued to use contact lens. TE-CXL was performed by applying an enhanced riboflavin solution (Ricrolin TE®) on the intact corneal epithelium for 30 minutes before irradiation with ultraviolet A (370 nm at 3 mW/cm(2)) (UVA) for 30 minutes. We investigated changes in corneal sensitivity and nerve morphology as part of a comprehensive safety evaluation of this treatment. Confocal microscopic analysis with ConfoScan3 of corneal sub-basal nerve plexus and corneal sensitivity assessed with the Cochet-Bonnet esthesiometer were measured. Visual acuity, contrast sensitivity and tear function were also evaluated.

RESULTS: We found that corneal sensitivity in the center of the treated area was significantly (p<0.05) reduced 10 days after UVA with TE-CXL treatment compared with the corneal sensitivity of the control eye but gradually recovered to normal levels at 30 day. However, corneal sensitivity was not significantly different from control values at other measurement times. In parallel with these functional alterations, corneal nerve degeneration was visible in the treatment area 10 days after TE-CXL. After 1 month we observed a subsequent regeneration in the treatment area, simultaneously accompanied by the recovery of corneal sensitivity.

CONCLUSIONS: This study highlights the immediate effects of trans-epithelial collagen cross-linking on the corneal nerves and the simultaneous change of corneal sensitivity.

CATERINA GAGLIANO

CORNEAL TRANS-EPITHELIAL CROSS LINKING VERSUS CONTACT LENS USE

Authors: **C. Gagliano¹, M. Battaglia², M. Toro², R. Amato¹, E. Galvagno², P. Carlino², T. Avitabile²**

¹ Neurovisual Science Technology (NEST), Catania, Italy,

² Catania University, Department of Ophthalmology, Catania, Italy

PURPOSE: To compare the outcomes of trans-epithelial corneal cross-linking (TE-CXL) versus contact lenses use in the treatment of progressive keratoconus.

METHODS: This non randomized retrospective study comprised 15 patients with bilateral progressive keratoconus treated with TE-CXL in the worst eye and contact lens use in the other eye. TE-CXL was performed by applying an enhanced riboflavin solution (riboflavin 0.1%, dextrane T500 with trometamol [Tris-hydroxymethyl aminomethane] and EDTA [ethylenediaminetetraacetic] sodium salt) on the intact corneal epithelium for 30 minutes before irradiation with ultraviolet A (370 nm at 3 mW/cm(2)) for 30 minutes. Controlateral eye continued to use contact lens. Uncorrected and corrected visual acuity (UDVA, CDVA), refraction, corneal topography parameters were evaluated at baseline and at 3, 6 and 12 months.

RESULTS: At 12 month, UDVA and CDVA improved significantly in the TE-CXL treated eyes. In the eyes with CL, none of the study parameters showed a significant change from baseline. Only in the eyes treated with TE-CXL mean spherical equivalent decreased by 0.88 D, and mean cylindrical reduction was 1.25 D. In controlateral eyes (contact lens), there was a general trend toward worsening of these parameters. The differences between the two eyes were statistically significant (p<0.05). The thinnest detected in the TE-CXL eye had increased as compared to the controlateral eye: difference at 12 month 27.5+3.14 (p=0.04). No intraoperative or postoperative complications were observed in any of the patients treated with TE-CXL.

CONCLUSIONS: Trans-epithelial cross-linking appeared to be safe and effective in the treatment of progressive keratoconus.

EMILIA GHELARDI

ANTIMICROBIAL ACTIVITY OF A NEW PRESERVATIVE FOR MULTIDOSE OPHTHALMIC SOLUTIONS

Author: **E. Ghelardi**

Department of Translational Research and New Technologies in Medicine and Surgery, Univerity of Pisa, Italy

Ophthalmic preservatives are chemicals that are meant to prevent microbial spoilage of multiuse ophthalmic preparations. The glycine derivative, sodium hydroxymethyl glycinate (SHMG), is frequently used as a preservative for personal-care products and was placed on the list of permanently approved preservatives by the European Union at levels up to 0.5% without restrictions of use. Recently, multidose artificial tears containing the mixture of 0.002% SHMG and 0.1% EDTA as a novel preservative have been marketed in Italy. Since these solutions are claimed to have a mild impact on the ocular surface (they are not cytotoxic, irritant, or allergenic in rabbits' eyes), we set out to evaluate whether different concentrations of SHMG alone or in combination with EDTA could be an efficient preservative for different ophthalmic preparations.

In vitro susceptibility assays were performed against several gram-positive and gram-negative bacteria representative of the microbial flora of epithelial surfaces or colonizing the conjunctiva, as well as against Candida albicans and Aspergillus niger. Using different concentrations of SHMG alone or in combination with EDTA, the minimal inhibitory and microbicidal concentrations against these organisms were assessed. In addition, 8 brands of multidose eye drops containing 0.002% SHMG and 0.1% EDTA as preservative were tested for antimicrobial activity using the antimicrobial effectiveness test recommended by the international pharmacopoeias.

The minimal inhibitory and bactericidal/fungicidal concentration values of SHMG ranged from 0.0025% to 0.0125% for bacteria and from 0.125% to 0.50% for mold and yeast. Susceptibility testing demonstrated that the addition of EDTA substantially increased the SHMG activity against all bacterial and fungal strains. The preservative effectiveness test was applied to commercial eye drops. All the drop solutions met the criteria reported by the U.S. Pharmacopeia for parenteral and ophthalmic preparations. All products also satisfied the major acceptance criteria of the European Pharmacopeia with respect to the antifungal activity. As regard the antibacterial activity, the less-stringent criteria of the European Pharmacopeia were fulfilled.

The present study demonstrates the efficacy of a novel preservative for ophthalmic solutions (SHMG/EDTA) and its activity in protecting selected commercial artificial tears against microbial contamination.

ROSSEN HAZARBASSANOV

OSMOPROTECTION AND LIPID CONTAINING LUBRICANTS FOR MANAGEMENT OF DRY EYE DISEASE AND POST REFRACTIVE SURGERY PATIENTS

Authors: **R. Hazarbassanov, R.R. Loureiro, J.L. Covre, J. Barros, J.A.P. Gomes**

Department of Ophthalmology, Paulista Medical School, Federal University of Sao Paulo, Sao Paulo, Brazil

PURPOSE: To evaluate immunostaining patterns of inflammation after treatment with osmoprotective or lipid containing lubricant, in dry eye disease (DED) and post-refractive surgery patients.



METHODS: 48 patients were enrolled. Patients were submitted to the following tests for DED diagnose: Ocular Surface Disease Index (OSDI), visual acuity(VA), biomicroscopy, Schirmer 1, tear film osmolarity, break up time(BUT), fluorescein and lissamine green staining, impression cytology(IC) and immunocytochemistry(ICC) for an inflammation marker(HLA-DR) and L-carnitine, an osmoprotective component. Three groups were formed:(A)16 patients with evaporative DED (EDED), (B) patients submitted to either LASIK(16) or PRK(16). In each group,8 patients (16eyes) were treated with either Optive® or Endura®.Later, participants were randomized to receive QID for the 1st month and BID for the following 2 months of Optive® or Endura®(Allergan, Inc.,Irvine,California).

RESULTS: Pre-treatment and 3 month follow-up exams are completed for both groups.ICC of conjunctiva samples showed 42.86% positivity for HLA-DR staining on group A,20% for LASIK, and 30% for PRK, before treatment ($p=0.4896,\chi^2$ test). There was lower HLA-DR staining for EDED patients treated with Optive® and Endura® (28.11% and 35.6%,respectively). ICC for L-carnitine staining was 53.33% positive for A,22% for LASIK and 10% for PRK, before treatment ($p=0.041,\chi^2$ test). L-carnitine ICC staining post-treatment showed high positivity for Endura® in contrast to a lower staining for Optive®.

CONCLUSIONS: Conjunctival cells showed tendency of higher expression of inflammation marker HLA-DR on EDED patients, similarly for L-carnitine, which could be reduced after osmoprotective therapy. Those markers could be used to detect EDED in early stage and as prognostic tool for DED treatment.

JOO CHOUN-KI

EFFECT OF HINGE LOCATION ON DRY EYE SYMPTOMS AND HIGH ORDER ABERRATION FOLLOWING FEMTOSECOND LASER ASSISTED LASIK

Author: **C. Joo**

Seoul St. Mary's Hospital, Department of Ophthalmology, Seoul, South Korea

PURPOSE: To compare the differences of dry eye symptoms and high order aberration (HOA) the clinical results of wavefront guided LASIK when a corneal flap was created in either the temporal side or the superior side with femtosecond laser.

METHODS: A retrospective study was performed to compare corneal sensitivity by esthesiometer in 5 points, tear breakup time, anesthetized Schirmer test, UCVA, refraction and HOA preoperatively and at 1 week and 2 and 6 months postoperatively. The parameters were compared between temporal hinge group and superior hinge group was performed.

RESULTS: Forty eyes of 20 patient (13 women and 7 men) of the temporal hinge group and 40 eyes of 20 patient (12 women and 8 men) of superior hinge group who underwent LASIK for myopia or myopic astigmatism with femtosecond flaps were evaluated. No significant difference of corneal sensitivity, tear breakup time, anesthetized Schirmer test, UCVA, refraction(in terms of spherical equivalent) and HOA (in terms of RMS) was observed between the groups at 6 months postoperatively ($p = 0.45, 0.64, 0.48, 0.39$ and 0.38 respectively, Mann-Whitney U test).

CONCLUSIONS: Dry eye symptoms and HOA after femtosecond assisted, wavefront guided LASIK did not affected by the location of the hinge.

TAREK KATAMISH

MANAGEMENT OF DOUBLE ANTERIOR CHAMBER: STRANGE MECHANICS

Author: **T. Katamish**

Cairo University, Cairo, Egypt

PURPOSE: 1- Finding the cause of postoperative double A.C., in 3 cases of straightforward DALKS with no apparent intraoperative D.M. tears.

2- Explanation of failure of repeated air injection in A.C. to treat one of these cases.

SETTING: Ophthalmology Department, Cairo University, 2012, Egypt. the presentation will be supported by high quality videos which support my point of view.

METHODS & RESULTS: 1- Retrospective evaluation of 3 cases of double anterior chamber following straightforward DALKS with no apparent Descemet's membrane (D.M.) tears during surgery. Video of those cases revealed perfectly intact D.M. in all cases, but careful watching revealed escape of large air bubble in the anterior chamber during big bubble formation, which means that this air in anterior chamber has to be passed through tear in D.M., our own explanation is: these D.M. tears could be hidden in the peripheral part of D.M. concealed under the peripheral rim of the cornea or may be a small disinsertions of Shwalb's line due to forcible air injection. 2- During management of one of the previous cases with air injection in the anterior chamber, air escaped in the wrong direction to the interface between D.M. and stroma rather than the anterior chamber which have been corrected surgically by careful re-injection of air in anterior chamber with simultaneous removal of air in the interface.

CONCLUSIONS:1- Double anterior chamber following DALK may occur without apparent D.M. tears.

2- Careful placement of air in anterior chamber during management of double anterior chamber is very imp.

TAREK KATAMISH

DIFFERENT TYPES OF BIG BUBBLES DURING DALK

Author: **T. Katamish**

Cairo University, Cairo, Egypt

PURPOSE: Retrospective evaluation of different types of Big Bubbles during DALK in 100 cases. classification of bubbles depends on many factors: - progressive or explosive bubbles - Big bubbles after single, 2nd, 3rd or even 5th air injections - ordinary or inverted big bubbles - challenging cases of big bubbles.

SETTING: Ophthalmology Department - Cairo University, Egypt and Al-Nour Eye Hospital, Cairo Egypt.

METHODS:Deep Anterior Lamellar Keratoplasty (DALK) was done in 100 cases using the Big Bubble Technique using sharp needle in the early cases replaced later by blunt cannula.

RESULTS: - failure to obtain big bubble in 15% - progressive big bubble in 10% - explosive big bubble in 70% (40% single injection, 20% 2nd injection, 8% 3rd injection and 2% after 5th injection) - complicated mechanics in 4%- inverted big bubble in 1%.

CONCLUSIONS: Big Bubble formation during DALK takes different shapes depending on many factors during air injection.

MARIA EUGENIA LATRONICO

MANAGEMENT OF CONJUNCTIVAL MELANOMA EXAMINED BY IN VIVO CONFOCAL MICROSCOPY AND ANTERIOR SEGMENT OPTICAL COHERENCE TOMOGRAPHY

Authors: **M.E. Latronico, G. Cartocci, A. Balestrazzi, G. Martone, B. Colucci, A. Caporossi**

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PURPOSE: To describe the features of conjunctival melanoma by in vivo confocal microscopy (IVCM) and anterior segment optical coherence tomography (ASOCT).

METHODS: A 64-year-old female patient underwent excision high pigmented conjunctival lesion. 20 years before she underwent surgical excision for a primary acquired melanoses with atypia at the level of superior and inferior conjunctival fornix.

The histological examination confirmed the diagnosis of epithelioid conjunctival melanoma. The patient was examined by IVCM and ASOCT before and 1 and 6 months after the surgical excision of melanoma.

RESULTS: The preoperative morphological analysis of the confocal images demonstrated hyper-reflective cells, atypical large cells with large nuclei and prominent nucleoli, and surrounding inflammation cells. Many dendritic cells and multiple large vessels were observed. AS-OCT examination suffered from poor resolution with shadowing because the large pigmented lesion didn't allow to penetrate through the lesion into the eye.

CONCLUSIONS: IVCM and ASOCT may be a valuable new tools in the follow up of conjunctival pigmented tumors to provide new informations on conjunctival alterations

PAOLO MARANGONI

TOBACCO SMOKE EXPOSURE AND MACULA DISEASE

Author: **P. Marangoni**

Tobacco smoke represents one of the main risk factors for Macular Degeneration.

The aim of the paper is to highlight smoke toxicity on retina tissues and its peroxidation mechanism, analyzing some in vitro and in vivo clinical trials. Peroxidation can slash the potential activity of the plasmatic and macular antioxidant elements, which are primarily constituted by Lutein and Zeaxantin.

IVAN MARCHESONI

CATARACT SURGERY WITH CUSTOMIZED IOL IMPLANTATION FOR ASTIGMATISM AND SPHERICAL ABERRATION TREATMENT

Authors: **E. Pedrotti, R. Mastropasqua, M. Passilongo, G. Parisi, I. Marchesoni, G. Marchini**

Ophthalmology Unit, Department of Neurosciences, University of Verona, Verona, Italy

PURPOSE: To evaluate the effectiveness of Customized IOL implantation to treat astigmatism and spherical aberration in patients affected by keratoconus or previously surgically treated for refractive issues.

METHODS: Ten patients were enrolled, of whom a total of

sixteen eyes were examined. Ten eyes were affected by non-evolutive keratoconus, and six had already undergone laser refractive treatment. After filling a given form, the factory sent a IOL with customized spherical and toric power, and spherical aberration. Follow-up examinations were performed up to 6 months postoperatively and included visual acuity (near at 40 cm and distance), aberrometry, and contrast sensitivity.

RESULTS: Six months postoperatively, mean natural visual acuity was $0,63 \pm 0,21$, whereas visual acuity with correction was $0,89 \pm 0,32$ with a refractive error in Spherical equivalent, if compared to the preoperatively target of $-0,52 \pm 0,67$ D. Visual acuity near at 40 cm was $0,65 \pm 0,14$, and with correction it was $0,97 \pm 0,19$. Contrast sensitivity was found within normal range, whereas total spherical aberration was 0,01 micron.

CONCLUSIONS: These lenses proved to be effective for astigmatism and spherical aberration correction in previously surgically treated eyes, or affected by keratoconus, giving a good visual acuity and high visual quality.

GIORGIO MARCHINI

AUTOLOGOUS CULTURED LIMBAL STEM CELLS GRAFT: COMPARISON BETWEEN BIOPSY DEPTH AND CELLS GROWTH.

Authors: **G. Marchini¹, E. Pedrotti¹, R. Mastropasqua¹, M. Passilongo¹, G. Parisi¹, V. Barbaro², S. Ferrari², M. Bertolin², B. Ferrari², D. Ponzin²**

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PURPOSE: To evaluate the correlation between depth and position of limbal biopsy and cultured stem cells in terms of number of cell extracted from each biopsy and cell ability to grow and give rise to limbal epithelial grafts.

MATERIAL AND METHODS: 9eyes affected by severe limbal stem cell def (LSCD) were enrolled. LSCD patients showed a complete disappearance of the palisades of Vogt,360-degree conjunctivalisation, revealed after fluorescein staining, impression cytology specimens with no presence of corneal epithelial cells. The best limbal area was found by using cytokeratin expression analysed on impression cytology specimens. A limbal biopsy was performed at different depths.Primary corneal keratinocytes are isolated from the biopsy, plated onto lethally irradiated 3T3-J2 cells and cultured in keratinocyte growth medium, a Dulbecco's modified Eagle's medium and Ham's F12 media mixture (2:1). After 3 days, a medium containing 10 ng/ml EGF is added to the culture. Keratinocytes are trypsinized at subconfluency, counted and plated at clonal density onto a new feeder to evaluate proliferation efficiency and clonogenicity potential.

RESULTS: A limbal biopsy was performed at different depths (264-537 microns) and sent to the Cell Factory laboratories at 4°C for corneal stem cell isolation. The number of cells obtained from 9 limbal biopsies was between 9.500 and 66.500 cells. One to two weeks after isolation, cells were plated onto fibrin glue discs and let grown to confluence for 1 week before being transplanted.Location and depth of the biopsy are correlated with the percentage of deltaNalphanp63 which guarantees the presence of undifferentiated stem cells. The follow up was at 3-15-30 days and 3-6-12-18-24 months post-grafting.



CONCLUSION: No data are reported regarding the quality of the limbus biopsy specimen used to isolate the stem cells. Here, for the first time, a correlation between the size and depth of the biopsy in the limbus area and the quality of the cells extracted is given. We will demonstrate how standardized and precise surgical criteria, as well as appropriated cell culture methods, are essential in order to guarantee the achievement of adequate starting material, thus avoiding the risk to get unsuitable limbal stem cell samples and to have cultures of undifferentiated stem cells that allow long-term regeneration of the grafts transplanted.

FEDERICO MARCOLI

DSAEK FOR THE TREATMENT OF LONG-STANDING PSEUDOPHAKIC BULLOUS KERATOPATHY WITH CORNEAL NEOVASCULARIZATION

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PURPOSE: To treat pseudophakic bullous keratopathy associated with extensive neovascularization with DSAEK.
METHODS: A 64 year old man affected by bilateral Fuchs' dystrophy underwent cataract surgery in his right eye in March 2007, with complete visual recovery. One year later, March 2008, endothelial dysfunction occurred with corneal edema, pain and visual loss. Corneal surgery was proposed, but the patient needed to delay his surgery because family problems. Four years later, January 2012, because of visual worsening due to cataract in left eye, the patient required corneal surgery in his right eye. He had a story of repeated ocular inflammations treated with antibiotics eyedrops, long standing pseudophakic bullous keratopathy, heavy corneal haze, and neovascularization starting from both superior and inferior limbus extended through the visual axis. The visual acuity was 0,5/10. We performed a DSAEK without any specific treatment for neovascularization, except the topic use of tranexamic acid to reduce bleeding after epithelium removal.
RESULTS: One month after surgery corneal edema was completely resolved and corneal neovascularization significantly reduced, while moderate stromal haze persisted, and BCVA was 1/10. At the sixth month the BCVA raised 5/10, due to improvement of both corneal haze and neovascularization.
CONCLUSIONS: In this case of long-standing pseudophakic bullous keratopathy with significant corneal neovascularization DSAEK alone was effective in to restore corneal transparency, achieving quite complete corneal neovascularization regression, avoiding an high risk penetrating keratoplasty. In selected cases resolution of corneal edema by endothelial function repair not only restores corneal transparency but also allows regression of neovascularization.

GIANLUCA MARTONE

AN IN VIVO CONFOCAL MICROSCOPY ANALYSIS OF EFFECTS OF TOPICAL ANTIGLAUCOMA THERAPY ON CORNEAL INNERVATION AND MORPHOLOGY
Authors: **G. Martone, S. Baiocchi, A. Balestrazzi, N. Romeo, A. Caporossi**
University of Siena, Department of Medical and Surgical Sciences and Neurosciences, Siena, Italy

PURPOSE: To evaluate the long-term effects of preservative-free and preservative-containing antiglaucoma eyedrops on the tear secretion and ocular surface.
METHODS: 120 patients with bilateral primary open angle glaucoma (POAG) or ocular hypertension (OH) divided into six groups according to type of topical hypotensive therapy and 20 healthy age-matched volunteers were studied. Corneal sensitivity, Schirmer test, lachrymal film break-up time, and In vivo Confocal Microscopy (IVCM) were performed in all patients.
RESULTS: A significant reduction was found between groups on topical preservative hypotensive therapy and the control group in all clinical parameters studied. The clinical scores were significantly lower in the preservative medication groups than in the preservative-free group.
At IVCM examination, the density of superficial epithelial cells was reduced in all glaucomatous patients, except for the preservative-free group, with respect to control subjects. On the contrary, the density of basal epithelial cells of glaucomatous preservative therapy groups was higher than control and preservative-free groups. Stromal keratocyte activation and the number of beads were higher in all glaucoma preservative groups. The number of sub-basal nerves was lower in all glaucoma groups than in the control group and tortuosity was significantly higher in glaucoma preservative group than preservative free-group and control groups.
CONCLUSIONS: Glaucomatous patients in particular with chronic preservative treatment show ocular surface alterations. The development of preservative-free antiglaucoma treatment may reduce damage to the ocular surface and improve the compliance and the adherence in the medical therapy.

GIANLUCA MARTONE

VISUAL AND ABERROMETRIC OUTCOMES IN EYES WITH AN ANGLE-SUPPORTED PHAKIC INTRAOCULAR LENS AND PHOTOREFRACTIVE KERATECTOMY
Authors: **G. Martone, P. Massimo, A. Tarantello, A. Balestrazzi, A. Caporossi**
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PURPOSE: To evaluate the postoperative changes in corneal and total high order aberrations (HOAs) induced by photorefractive keratectomy (PRK) after the implantation of an angle-supported phakic intraocular lens (pIOL).
METHODS: 8 eyes with high myopia and astigmatism had implantation of an angle-supported acrylic pIOL and photorefractive keratectomy 3 months after first surgery. Preoperative and postoperative corneal and total HOAs were measured using surface aberrometry (CSO Eye Top topographer, Italy) a Hartmann-Shack wavefront aberrometer (Zywave Bausch & Lomb, USA) at a fixed entrance pupil scan size of 5.0 mm under pharmacologic mydriasis.
RESULTS: The pIOL implantation induced fewer ocular and corneal HOAs and did not change significantly from pre- to postoperatively HOAs values, with exception of the mean total spherical aberration Z(4,0) inducing negative aberration. After PRK, mean postoperative total spherical aberration Z(4,0) and HOAs were increased.
CONCLUSION: Angle-supported phakic IOLs followed by PRK could offer good efficacy, predictability, and safety to manage large refractive myopic errors improving the quality of vision. Foldable pIOL implantation increased total HOAs and spherical aberration less than PRK.

RODOLFO MASTROPASQUA

VALUTATION OF FUNCTIONAL RESULTS AFTER IMPLANTATION OF TWO DIFFERENT MULTIFOCAL IOLS
Authors: **R. Mastropasqua, I. Marchesoni, G. Parisi, M. Passilongo, E. Pedrotti, G. Marchini**
Ophthalmology Unit, Department of Neurosciences, University of Verona, Verona, Italy

PURPOSE: To evaluate visual acuity and quality of vision after implantation of two aspheric multifocal IOLs (MIOLs) with different additional power (SV25T0 add+2.5 D, SN6AD1 add +3.0 D).
SETTING: Ophthalmology unit, department of Neurosciences, University of Verona, Verona Italy
METHODS: 20 pazienti (40 eyes) undergoing bilateral facoemulsification were divided into 2 groups of 10 (20 eyes). Each group was submitted to a post operatively follow-up of 6 months during which monocular corrected distance visual acuity (CDVA) at 4m, corrected near visual acuity (CNVA) at 40 cm, and corrected intermediate visual acuity at 50, 60 and 70 cm was determined. It were also evaluated contrast sensibility (CS) and high order aberrations (HOA).
RESULTS: there was no statistically significant difference in CDVA (p>0,01). The CNVA resulted better in the group implanted with the MIOL add +3.0 D. The MIOL add + 2.5 D was more effective in CIVA and in CS. HOA resulted lower in patients implanted with the MIOL add +2.5 D.
CONCLUSIONS: Both MIOL models provide a good distance vision. The MIOL add +3.0 D seems show better performances in near vision while the MIOL add +2.5 D seems provide a better intermediate vision.

COSIMO MAZZOTTA

ACCELERATED CROSS-LINKING FOR PROGRESSIVE KERATOCONUS: MORPHOLOGICAL EVALUATION BY CONFOCAL AND AC OCT CORNEAL ANALYSIS
Authors: **C. Mazzotta, S. Baiocchi, A.I. Paradiso, A. Caporossi**
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PURPOSE: To assess morphological corneal changes induced by Accelerated CXL (ACXL) in patients with progressive keratoconus by in vivo confocal analysis and AC OCT.
METHODS: 18 patients affected from progressive keratoconus, age between 13 and 27 years (mean 20 years) were enrolled. 5 patients undergoing trans-epithelial treatment with Paracel plus Vibex Xtra solution (Avedro, Waltham, MA) at 45 mW/cm2 UVA power for 2.40 minutes. 13 patients undergoing epithelium-off procedure: 4 eyes with Vibex solution at 30 mW/cm2 for 4 minutes, 5 eyes with Vibex solution at 12 mW/cm2 for 10 minutes and 4 eyes with Vibex rapid solution at 30 mW/cm2 for 4 minutes. Energy was delivered by KXL I UV-A source (Avedro Inc, Waltham, MA) soaking time was 4 minutes for Paracel plus 6 minutes for Vibe Xtra, 15 minutes for Vibex standard solution and 10 minutes for Vibex rapid. Morphological studies were conducted by in vivo HRT II scanning laser confocal microscopy (Heidelberg, Germany) Visante and Cirrus AC-OCT (Zeiss, Jena, Germany).
RESULTS: Penetration of ACXL treatment was detected at different depth depending on UV-A power and exposure time

settings. Superficial nerves and keratocytes apoptosis were rapidly followed by normal repopulation.
CONCLUSIONS: ACXL demonstrated the ability to induce a faster, safe and customized cross-linking of stromal collagen at different depth related to different UV-A power and exposure times. IThis new therapeutic strategy may represents the future for a Customized Corneal Collagen Cross-linking that could be performed according to patient's age, keratoconus stage and progression rate.

LUCA MENABUONI

THE ANVIL PROFILE IN LASER ASSISTED PENETRATING KERATOPLASTY
Authors: **L. Menabuoni**¹, **I. Lenzetti**¹, **A. Malandrini**¹, **A. Canovetti**¹, **F. Rossi**², **R. Pini**²
¹ U.O. Oculistica, Ospedale Misericordia e Dolce, Prato, Italy, ² Institute of Applied Physics, Italian National Research Council, Florence, Italy

PURPOSE: To describe and assess the use of a new anvil-like trephination pattern in penetrating keratoplasty (PK) assisted by laser technology.
METHODS: 30 eyes underwent anvil PK. An Intralase Femtosecond Laser 150 KHz (iFS150TM, Abbott Medical Optics -AMO, Santa Ana, CA, USA) was used to create anvil shaped penetrating cuts on both donor and recipient corneas. Diode laser (@810 nm, produced by ElEn spa, Calenzano - FI, Italy) welding procedure was performed in order to improve the healing process. All patients were evaluated for corrected distance visual acuity, pachimetry, topography and endothelial cell density.
RESULTS: All surgeries were successful and without any intraoperative complications. This profile enables a safe and easy to perform suturing procedure, with an immediate closure effect evidenced during surgery. The large interface between donor and recipient tissue supports the laser welding procedure. A 12 months follow up study showed that the anvil shaped flap provides a better visual acuity recovery and a reduction in the number of rejection.
CONCLUSIONS: Use of anvil trephination profile was effective and safe to perform PK. Short term visual results and refractive results are encouraging compared with those of conventional PK studies. Longer term follow-up and comparative studies are necessary to determine precisely advantages of this technique.

LUCA MENABUONI

IMPROVING BOSTON TYPE-I KERATOPROSTHESIS PROCEDURE: "ONE TOUCH" FEMTOSECOND-ASSISTED PREPARATION AND CENTRATION OF DONOR CARRIER TISSUE
Authors: **A. Malandrini**¹, **L. Menabuoni**¹, **A. Canovetti**¹, **F. Rossi**², **R. Pini**², **C. Lenzetti**¹, **I. Lenzetti**¹
¹ Department of Ophtalmology, Misericordia e Dolce Hospital, Prato, Italy, ² Institute of Applied Physics, Italian National Research Council, Firenze, Italy

PURPOSE: We describe a technique to avoid the decentration of the visual axis of the Boston type I keratoprosthesis (Kpro), performing two concentric trephinations with femtosecond laser.



METHODS: Two concentric side cuts were performed in a donor cornea, using the 150 kHz Intralase™ FS laser . Within the same applanation procedure, a 8.5 mm diameter anterior side cut was performed, followed by a concentric 3 mm diameter anterior side cut. **RESULTS:**The femtosecond laser assisted double trephination results in a donor cornea correctly prepared, and in an inner side precisely matched with the prosthesis. At the end of the surgery the KPro was correctly centered. The technique was replicated in five cases. **CONCLUSION:** The femtosecond laser enables a new safer and easier procedure to center the KPro in the donor cornea. In addition, the perfect regularity of the peripheral rim allows an easier suturing to the host, with better distribution of tension.

LUCA MENABUONI

THE OPTIMIZED LASER ASSISTED ENDOTHELIAL KERATOPLASTY

Authors: **L. Menabuoni**¹, **I. Lenzetti**¹, **A. Malandrini**¹, **A. Canovetti**¹, **F. Rossi**², **R. Pini**²

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PURPOSE: Postoperative evaluation of the optimized laser assisted endothelial keratoplasty (EK) outcomes. The donor cornea thickness is determined by OCT in the surgery room and a progressive reduction in thickness endothelial layer is used. **MATERIALS and METHODS:** Intraoperative OCT is performed in donor cornea to exactly determine its thickness. By the use of the femtosecond laser (iFS150TM, Abbott Medical Optics -AMO, Santa Ana, CA, USA) an endothelial flap of a predetermined thickness is trephined in the donor cornea, and the thickness is progressively reduced to a 70 micrometers thick flap. Manual stripping of the recipient eye is performed. The donor tissue is positioned in the correct final configuration by performing diode laser (@810 nm, produced by El.En. s.p.a., Calenzano –FI, Italy) welding procedure.

RESULTS: In a 12 months follow up study, it was evidenced that a correct thin flap enables a good functional recovery and a modest endothelial cells loss.

CONCLUSIONS: The use of the last generation technologies (intraoperative OCT, femtosecond laser for trephination, and diode laser for suturing) provides an improvement in EK and a rapid and better visual recovery.

RITA MENCUCCI

COMBINING IONTOPHORESIS AND CORNEAL COLLAGEN CROSSLINKING: A BASIC SCIENCE STUDY ON HUMAN CORNEAS

Authors: **R. Mencucci**, **I. Paladini**, **E. Favuzza**, **M. Marini**, **E. Sarchielli**, **B. Vannelli**
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PURPOSE: To evaluate whether different UV-A treatment intensities on human corneas (ex vivo) soaked through iontophoresis procedure performed with a new hypotonic solution of riboflavin + enhancer, determine different morphological and biochemical response on the

corneal tissue (epithelium, keratocytes, collagen and nerve fibers and endothelium).

METHODS: Fifteen human cadaver corneas were divided in 3 different groups according to methods of soaking and UV-A intensity used:

Group 1- four corneas, treated with the new riboflavin formulation using iontophoresis for 5 minutes and an irradiance power of 3 mW/cm2 for 30 minutes;

Group 2 - four corneas treated with the new riboflavin formulation using iontophoresis for 5 minutes and an irradiance power of 10 mW/cm2 for 9 minutes;

Group 3 - four corneas treated with the new riboflavin formulation using iontophoresis for 5 minutes without irradiance power; Group 4 – three untreated corneas utilized as control.

Samples were prepared for immunohistochemical and biomolecular analysis using different markers as beta catenin, connexin 43, CD34, vimentin/desmin, collagen I.

RESULTS: Group 3 didn't show modifications, the appearance was similar to the controls . Group 1 and Group 2 showed variable changes in the stroma, due to keratocytes apoptosis and in relationship with the intensity of the treatment. No corneas showed signs of fibrosis with a negative Desmin-Vimentin staining. No endothelial damage was evidenced in the treated groups, nor nerve fiber alterations.

CONCLUSION: iontophoresis can be considered a potential delivery tool for riboflavin penetration in the Istroma. Variable morphological changes are related to different intensity of energy.

RITA MENCUCCI

CORNEAL WOUND HEALING: THE POSSIBLE ROLE OF THE COENZYME Q10

Author: **R. Mencucci**
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Corneal wound healing is a complex dynamic process in which cells, extracellular matrix, tears and growth factors interact to restore tissue integrity while maintaining clarity and hydration. Many mechanisms are involved in the corneal wound healing process, including adhesion, migration and proliferation of corneal epithelial cells. These three phases are characterized by an intense metabolic cellular activity and need high energy. The aim of our work is to assess the possible role of coenzyme Q10 on the wound healing response in laboratory experiments and if it may be of help in controlling wound healing in corneas that have suffered epithelial damage or have undergone oxidative stress.

FELICE MENICACCI

CORRECTION OF SECONDARY AMETROPIA POST PENETRATING KERATOPLASTY AND DEEP ANTERIOR LAMELLAR KERATOPLASTY

Authors: **F. Menicacci**, **E. Berni**, **F.I. Menicacci**, **E. Sarnicola**
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PURPOSE: Astigmatism and myopic ametropia is still a severe problem in 8% to 20% of the eyes that cannot be corrected by spectacles or contacts lenses. The purpose of this paper is to evaluate the efficacy of femtolaser i-lasik for the correction of

secondary ametropia induced by previous corneal surgery (PKP and DALK) in cases with anisometropia.

METHODS: Patients with secondary ametropia (ametropia and difficult correction through contacts lens or spectacles) following PKP and DALK have undergone femtolaser I lasik. Procedure lasik has been performed using AMO's IntraLaser FS and for the refractive defect correction laser Bausch & Lomb 217 Zyoptix Z 100 Hz e laser VISX S4 –IR.

RESULTS: The results we achieved, document and confirm the validity of lasik for the correction of such post operative refractive errors. We obtained a clear improvement of both the anisometropia and visual acuity.

CONCLUSIONS : Refractive surgery can improve the final visual outcome of patients who have undergone successful corneal transplantation. Among different techniques used for residual refractive errors (astigmatism, myopic or hyperopia) we believe that femtoLasik, in selected cases, should be considered a valid technique to be used.

FELICE MENICACCI

CORRECTION OF REFRACTIVE DEFECTS WITH FEMTOLASIK – SBK : STABILITY, EFFICACY AND SAFETY

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PURPOSE: To evaluate the efficacy of femtolaser SBK for correction of all refractive defects : myopia., astigmatism and hyperopia.

METHODS: Patients with myopia, astigmatism, hyperopia underwent femtoLasik-SBK . The procedure femtoLasik has been performed with AMO's IntraLaser FS and refractive defect was treated using Bausch & Lomb 217 Zyoptix Z 100 Hz e laser VISX S4 –IR.

RESULTS: Our results document the reliability, the stability, the efficacy and the safety of the femtoLasik –SBK technique for the correction of these defects performing a 90 micron flap. This type of flap saves tissue and Bowman membrane, reduces the effect on the corneal stability, and reduces the “ dry eye syndrome” due to the involvement of nerve plexus stromal and subepithelial, and furthermore reduces the risk for corneal ectasia.

CONCLUSIONS: Among different techniques used for residual refractive defects the femtoLasik-SBK has been recognized a valid alternative to the PRK and the LasiK with microkeratome.

CHIARA MILLACCI

DALK FOR KERATOGLOBUS: MANAGEMENT OF DISPARITY BETWEEN DONOR-RECIPIENT

Authors: **C. Millacci**, **P. Toro**, **E. Sarnicola**, **C. Sarnicola**, **V. Sarnicola**
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PURPOSE:To report a predescemetec Deep Anterior Lamellar Keratoplasty (pdDALK) approach in keratoglobus managing donor-recipient curvature disparity.

METHODS:A layer by layer stromectomy to reach a pdDALK plane was performed in 3 eyes of 2 patients with extreme

keratoglobus. Average of preoperative corneal thickness was 220 microns. Diameter of trephination was 11mm. Disparity of curvature between donor-recipient was managed performing a full thickness circular cut of the recipient bed. Removed tissue was stored. Descemet and endothelium were pulled out from donor graft and the stored tissue (recipient's endothelium) was attached to the donor button using fibrin glue. Same size (11 mm) donor tissue was sutured with 18 Nylon 10-0 interrupted stitches. Air bubble in the anterior chamber was left at the end of the surgery.

RESULTS:Rupture of recipient bed occurred during surgery in one case. In all cases the recipient's endothelium glued to the donor button resulted attached at first day postoperative. In one eye after one week postop detachment of recipient's endothelium was recorded. A new air bubble into the anterior chamber was used to fix this complication. Cornea and ocular surface were stable until the last follow-up. No other problems of adherence between donor-recipient were recorded. 30% of endothelial cell loss was present at 6 months follow-up. **CONCLUSIONS:** Full thickness complete circular cut of the recipient bed seems to be a good approach to solve disparity of curvature problems between donor and recipient bed in DALK for keratoglobus.

CHIARA MILLACCI

AMNIOTIC MEMBRANE TRANSPLANTATION IN TRABECULECTOMY

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PURPOSE: To determinate the efficacy and safety of the use of amniotic membrane transplantation (AMT) in trabeculectomy in patients with previous failed filtering blebs.

METHODS: A consecutive series of 19 eyes from 18 patients with one or more failed trabeculectomy were enrolled in this study. Trabeculectomy with AMT under the scleral flap was performed and intraocular pressure (IOP), number of antiglaucoma medications, appearance of the filtering bleb and intra and postoperative complications were retrospectively analyzed for a period of 24 months. Success was defined as IOP <21 mmHg at the end of follow-up.

RESULTS: The median preoperative pressure was 29 mmHg (IQR=5 mmHg) on an average of 2.8 glaucoma medications (range 1-4). The median postoperative intraocular pressure at the end of follow up was 19 mmHg (IQR=2.5 mmHg) with an average of 0.15 medications. Complete success was seen in 19/19 (100%), one patient (5%) required postoperative antiglaucoma therapy to reach target pressure. After 24 months from surgery 18 of 19 (95%) AM filtering blebs were functioning well. No patients had severe intra or postoperative complications.

CONCLUSION: Amniotic membrane transplantation (AMT) in trabeculectomy seems to be usefulness and safety to improve the surgical outcomes determining a low and prolonged postoperative intraocular pressure in patients with a high risk of surgical failure.



LUIGI MOSCA

IN VIVO PACHYMETRY AND MORPHOLOGICAL EVALUATION WITH CS4 CORNEAL CONFOCAL MICROSCOPY AFTER ENDOTHELIAL KERATOPLASTY

Authors: **L. Mosca, R. Fasciani, L. Mosca, L. Guccione,**

A. Agresta, M.E. Toro, A. Rosati, E. Balestrazzi

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PURPOSE: to evaluate in vivo confocal microscopic and pachymetry features seen in patients that underwent to DSAEK and to DSEK assisted with femtosecond (Femto-DSEK).

METHODS: 23 eyes of 20 patients submitted to 13 DSAEK and 10 Femto-DSEK were evaluated using CS4 confocal microscopy. Using 40x lens and Z-ring device of CS4, a morphological evaluation of interface and stromal and endothelial tissue trophism and a pachimetry study of ablation and residual bed thicknesses were performed at 1 month and 1 year after surgery.

RESULTS: No endothelial cell density difference was seen between DSAEK and Femto-DSEK procedures. At 1 month, oedema produced increase of set donor endothelial lamella and donor-recipient interface haze thickness, evident stromal folds and scattering with low keratocytes evidence in both techniques. These features progressively improved at 1 year of follow-up. In 4 cases (2 DSAEK and 2 FemtoDSEK), despite of a good endothelial density and of the reduction of stromal oedema, the persistence of an hyporeflective band above the endothelium and of an high hypereffectivity in the lamellar interface produced bad visual recovery.

CONCLUSIONS: Confocal microscopy seems to be a useful procedure to investigate in vivo the results of keratoplastic surgery. The morphological and pachimetry analysis of the tissues permits a direct evaluation and comparison between the different keratoplasty techniques.

LUIGI MOSCA

FEMTOSECOND LASER-ASSISTED ARCUATE KERATOTOMIES TO CORRECT POST-PENETRATING KERATOPLASTY ASTIGMATISM: A 24-MONTH FOLLOW-UP

Authors: **L.Mosca, L. Guccione, L. Mosca, M.E. Toro,**

A. Rosati, A. Agresta, R. Fasciani, E. Balestrazzi

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PURPOSE: To evaluate the efficacy of arcuate keratotomies (AKs) performed with femtosecond laser for the correction of high astigmatism after penetrating keratoplasty (PKP).

METHODS: 24 eyes of 20 patients (15 M, 5F; mean age: 49.7years \pm 15.5 SD) with high postPKP astigmatism underwent AK assisted by a 60 kHz femtosecond laser (IntraLase, AMO, Irvine, CA, USA). Mean preoperative refractive cylinder was 5.23 diopters, mean preoperative topographic cylinder was 8.78 D; mean UCVA was 0.13 and mean preoperative BSCVA was 0.58; mean preoperative refractive error in spherical equivalent was 2.92 D. Mean preoperative SAI index was 3.25 D.

RESULTS: after surgery, mean postoperative UCVA was 0.26 at six months, 0.27 at 12 months, 0.26 at 24months; mean postoperative BSCVA was 0.75 at six months, 0.67 at 12 months, 0.72 at 24 months. Mean postoperative SAI was 2.91 D at six months, 2.95 D at 12 months, 3.00 D at 24 months. Mean postoperative refractive cylinder was 2.48 D at six months, 1.95 D at 12months,

1.88 D at 24 months. Mean postoperative topographic cylinder was 5.02 D at six months, 6.06 D at 12 months, 5.34 D at 24 months. Postoperative MRSE was -1.86 D at six months, -1.88 D at 12 months, -2.16 D at 24 months.

CONCLUSIONS: The reduction of more than 50% of the preoperative topographic astigmatism showed the effectiveness of femtosecond laser-assisted AK to correct astigmatic errors after PKP. The better results in postoperative BSCVA was probably related to the slight reduction of SAI (reduction of 11%).

ANNA LUCIA PARADISO

ACCELERATED CXL: PRELIMINARY RESULTS

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PURPOSE: To assess the preliminary clinical results after accelerated cross-linking in patients with progressive keratoconus.

METHODS: 18 patients affected from progressive keratoconus, age between 13 and 27 years (mean 20 years) were enrolled. 5 patients undergoing trans-epithelial treatment with Paracel plus Vibex Xtra solution (Avedro, Waltham, MA) at 45 mW/cm² UVA power for 2.40 minutes. 13 patients undergoing epithelium-off procedure: 4 eyes with Vibex solution at 30 mW/cm² for 4 minutes, 5 eyes with Vibex solution at 12 mW/cm² for 10 minutes and 4 eyes with Vibex rapid solution at 30 mW/cm² for 4 minutes. Energy dose (7.2 J/cm.²) was delivered by KXL I UV A source (Avedro Inc, Waltham, MA) soaking time was 4 minutes for Paracel plus 6 minutes for Vibe Xtra, 20 minutes for Vibex standard solution and 10 minutes for Vibex rapid.

RESULTS: UCVA and BSCVA gained +1 \pm 0.5 Snellen lines at 6 months follow-up. No statistically significant variation in K readings and coma values were recorded. Optical pachymetry showed a decrease 6 months after cross-linking procedure not statistically significant.

CONCLUSION: Accelerated CXL showed an improvement of clinical and functional data although not statistically significant. The apparent reduction of the pachymetric value could be related to a compaction or corneal collagen.

GRAZIELLA PARISI

FUNCTIONAL RESULTS AFTER BILATERAL IMPLANTATION OF MULTIFOCAL IOLS WITH DIFFERENT POWER (+3.0 D, +2.50 D) IN BOTH EYES

Authors: **G. Parisi, E. Pedrotti, M. Passilongo,**

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PURPOSE: To evaluate the functional results after bilateral implantation of multifocal IOL with different power (+3.0 D, +2.50 D) in both eyes.

METHODS: 30 patients were enrolled, all affected by bilateral cataract and without other eye diseases. They were divided in three groups, each composed of 10 people. All patients underwent phacoemulsification and multifocal intraocular lens implantation

in both eyes. Group 1 received a +3,00 IOL, Group 2 received the same lens, but with a +2,50 D addition, whereas Group 3 received a combination of +3,0 D and +2,5 D in both eyes. 6 months postoperatively different parameter were evaluated: Visual acuity (UCVA), best corrected visual acuity (BCVA), uncorrected intermediate (UIVA), uncorrected near (UNVA), and best distance corrected near visual acuity (BDCNVA). Contrast sensitivity, reading speed, defocus curve, patient satisfaction and spectacle independence were also evaluated.

RESULTS: None differences were found in UCVA, BCVA among the three groups. Group 2 had the best UIVA. Contrast sensitivity was found to be better in groups 2 and 3, reading speed was found to be better in groups 1 and 3. Defocus curve with binocular vision showed that group 3 had a bigger visual range from all distances. **CONCLUSIONS:** Combining these type of IOL seems to provide a bigger visual range from all distances, assuring a good visual quality and spectacle independence.

MATTIA PASSILONGO

EVALUATION OF FUNCTIONAL AND REFRACTIVE RESULTS DEPENDING ON GRAFT MORPHOLOGY IN DSEK

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PURPOSE: To evaluate and compare functional and refractive results depending on graft morphology and thickness in patients treated with DSEK.

METHODS: 50 patients were enrolled, of whom a total of 80 eyes were examined. The graft was prepared with intrastromal dissection technique. Patients were examined 12 months postoperatively. Graft thickness was evaluated with AS-OCT (with an average of five scannings per eye), and Central Corneal Thickness (C) and Peripheral Corneal Thickness (T) were measured. Using these datas, the C/P Ratio was then calculated. Different parameters were evaluated: Best corrected visual acuity (BCVA), Total Aberrations, Spherical Equivalent (SE), and Hypermetropic Shift. All these parameters were afterward put in comparison, considering C/P Ratio and Graft thickness.

RESULTS: Patients were divided in three groups, considering C/P ratio (a cut-off of 130 micrometers was set) and graft thickness (using 0,8 as a cut-off). A positive correlation was found between hyperopic shift and central graft thickness. On the other hand a negative correlation was noticed between hyperopic shift and C/P ratio. A low BVCA was found in patients with high graft thickness. **CONCLUSION:** Hyperopic shift appears to depend more on posterior corneal curvature than on graft thickness. Thin grafts (<130 micrometers) seems to permit a better vision.

GRAZIELLA PELLEGRINI

REGENERATION OF SQUAMOUS EPITHELIA FROM STEM CELLS OF CULTURED DRAFTS

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PURPOSE: The only cultured cell types extensively used for tissue regeneration are the keratinocyte and the chondrocyte. Cultured autologous keratinocytes derived from the epidermis have been used for many years to produce grafts that generate an epidermis over a full-thickness wound, such as a third-degree burn. But there have been many failures of engraftment, and in the absence of criteria for the quality of the cultures, the causes of failure cannot be analyzed.

METHODS: It has become clear that the essential feature of the grafts is the presence of an adequate number of stem cells. This article describes the criteria for estimating that number. Advances in graft preparation, combining better preservation of stem cells with ease of application of the graft, are also described. These improvements have been applied to cultures of ocular limbal cells, which contain the keratinocyte stem cells of the corneal epithelium.

RESULTS: Cultures meeting the criteria of stem cell number have been grafted to 116 patients suffering from chemical destruction of the limbus. The procedure has been highly successful in the alleviation of suffering and the restoration of vision.

SARA PEZZOTTA

DISPOSABLE STERILE GAUZE IN THE REDUCTION OF THE MICROBIAL FLORA OF THE PERIOCLAR AREA OF THE NEWBORN

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At birth the skin of periorcular region is not fully formed, and the natural defense systems of the newborn are not yet fully developed. Therefore, the newborn is particularly exposed to inflammatory eyelid and conjunctival processes.

The growth of microbes and infections are made easier by the absence of skin acidity, by the low immune power of the skin and by the lack of the bacterial flora.

At birth is done as a preventive measure to all infants a prophylactic antibiotic eye drops and cleaning the eyelid skin precisely to prevent conjunctivitis transmitted during the passage of the cervical canal (gonococcus).

In case of conjunctival secretion during the first days of life is necessary to make a conjunctival swab, to rule out bacterial processes (Staphylococcus, E. Coli, Pseudomonas).

Due to the stagnation of tears, lacrimal stenosis may be due to frequent conjunctivitis or infection of the lacrimal outflow, resulting in aggression of germs that reside in the periorcular skin area or tear ducts

Therefore, a thorough cleansing of that district can reduce the frequency of ocular and periorcular inflammation. The daily cleaning of the eye with medicated gauze, preferably sterile, therefore, takes on a considerable preventive importance, thanks to its antimicrobial, decongestant and detergent action.

The extract of Echinacea is widely used for its anti-inflammatory and antibacterial properties between the natural substances suitable for the treatment of mild inflammation of eyes. Other natural active ingredients such as Bromelain and acid Beta-Glycyrrhetic have a bacteriostatic action that strengthens its emollient and anti-inflammatory properties and, in the presence of secretions located on the eyelashes, makes it particularly suitable for cleaning the children's eyes. These gauze, which contain



active ingredients with anti-inflammatory and antibacterial action for a complete and careful cleaning of the eyes and eyelids, are therefore particularly suitable for the prevention or resolution of minor irritations and inflammations of the periocular area.

In the presence of diseases or alterations, in combination with specific treatments, the proper use of adequate and systematic medicated sterile gauze to the periocular area or eyelid, causes a progressive reduction in both symptoms and signs of infection and inflammation, prevents new exacerbations and facilitates the use of other therapies or the application of any aids.

KRISHNA PRASAD

TO COMPARE THE OUTCOMES OF TRANSEPITHELIAL PRK AND LASEK

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PURPOSE: To evaluate the outcome of transepithelial PRK(TEPRK) in comparison with conventional surface ablation using alcohol to remove the epithelium (LASEK)

METHODS: 35 individuals who underwent LASEK in one eye and Transepithelial PRK were studied.Their symptoms after sugery,visual recovery and topography and regression was studied over a period of 6 months.All eyes underwent wavefront guided excimer laser treatment after an initial topography and preoperative assessment to rule out contraindications for the procedure.

RESULTS: 30 out of 35 of subjects reported more comfort in the eye undergoing TEPRK post operatively.The visual recovery was also significantly faster in the eye with TEPRK with 74%(26) of the subjects reaching a vision of 6/9 the very next day of surgery and 6/6(20/20) at 1 week.Two eyes among 35 were observed to have central small island like left over epithelium during laser ablation of epithelium which was followed by refractive correction in the usual manner.These eyes showed small islands on topography post surgery and were follwed up for 6 months,however there was no significant difference in quality of vision of these eyes in comparision to fellow eyes at end of 6 months.

CONCLUSIONS: Transepithelial PRK may be a promising treatment in surface ablation with more post operative comfort and faster visual rehabilitation when compared to LASEK.

MIGUEL RECHICHI

EPITHELIAL DISRUPTION CROSSLINKING FOR KERATOCONUS: TWO-YEAR RESULTS

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PURPOSE: To evaluate the efficacy of epithelial disruption collagen crosslinking (EDCXL) for progressive keratoconus using a corneal disruptor device to enhance corneal penetration of Riboflavin solution designed for a transepithelial technique.

METHODS: The most severely affected eye of 28 patients with

bilateral progressive keratoconus was treated. Follow-up was 24 months.A corneal disruptor was used to create pockmarks in the epithelium to facilitate deeper penetration of riboflavin solution normally used for transepithelial crosslinking.Fellow eye was considered a control.The corneal epithelium was punctured multiple times with the disruptor device followed by application of an enhanced riboflavin solution irradiation with UVA for 30 minutes.

RESULTS:The mean depth of the demarcation line centrally was 250.41 microns (SD 21,89 range 209-290).No complications were reported.Mean baseline UDVA and CDVA was 0.73±0.21 and 0.30±0.11.12 months mean UDVA and CDVA was 0.48±0.15 and 0.25±0.1 that was statistically significant.Mean spherical equivalent refraction showed a significant decrease of 0,96 D.Mean baseline apical keratometry (AK), apical gradient curvature, average pupillary power, inferior-superior index and cone area were 59.21 D, 8.91 D, 47.9 D, 11.49 and 10.32 mm2 respectively.At 24 months these values were 56.18 D, 7.32 D, 41.34 D, 9.65 and 7,75 mm2 respectively, a difference that was significant for all indices.

There were no significant changes in endothelial cell count following the procedure.No adverse effects were observed.

CONCLUSIONS: EDXCL is safe and effective in medium-term stabilization of keratoconus with observed improvement of topographic and refractive parameters.The procedure is well tolerated with rapid epithelialization and less patient discomfort.

PIETRO ROSETTA

EXTENSIVE DESCOMET MEMBRANE DETACHMENT POST RADIAL KERATOTOMY

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PURPOSE: To report a case of a late-onset large Descemet membrane (DM) detachment post radial keratotomy and its spontaneous resolution after topical hypertonic treatment.

METHODS: A 42 years old man with an history of bilateral radial keratotomy 20 years ago to correct high myopia and astigmatism was referred to our center for severe visual loss. Complete ophthalmologic examination including corneal topography, tomography and anterior segment OCT revealed a large DM detachment and corneal edema of the lower half of the cornea. Corneal pachymetry was 950 microns and visual acuity was count fingers (CF). Endothelial keratoplasty (DSAEK) was suggested. During the preoperative period hypertonic therapy was prescribed. Possible causes for this complication are discussed.

RESULTS: Preoperative controls showed a significant reduction of corneal edema which decreased to 600 microns. Anterior segment OCT showed a decrease of the DM detachment together with an improvement of visual acuity (20/63)and corneal transparency.

CONCLUSIONS: Radial keratotomy may rarely cause DM detachment and consequent severe corneal edema. Based on our experience, we suggest to consider hypertonic therapy before any invasive procedure as it could induce a resolution of the complication.

MARCO RUGGERI

INTRAOPERATIVE EVALUATION OF DSAEK AND DALK WITH PORTABLE SUPINE OPTICAL COHERENCE TOMOGRAPHY

Authors: **M. Ruggeri ¹, F. Cabot ², A.P. Canto ², C. De Freitas ¹, S.H. Yoo ^{1,2}, J.M. Parel ^{1,2}**

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PURPOSE: To intraoperatively evaluate DSAEK and DALK using portable intraoperative Spectral Domain Optical Coherence Tomography (SD-OCT)

METHODS: A portable SD-OCT system was built and used during DSAEK and DALK surgeries to image patients in supine position. The portable system combines a modified operating microscope stand and a commercial SD-OCT engine. The microscope stand was equipped with motorized stages to position the OCT scanner on the designated area of the cornea during surgery. The OCT system provides near 3 micrometers resolution in tissue and a surgical access of 60mm. During normal operation, a trained user controls the imaging software and tracks the targeted region of the cornea while a magnified OCT view of the surgical site is displayed to the surgeon on a monitor.

RESULTS: 4 DSAEK and 3 DALK surgeries were evaluated intraoperatively with OCT under an institutional review board (IRB) approved protocol. During DSAEK, the OCT aided the surgeon to ensure optimal adhesion of the donor endothelial lenticule to the host cornea. During DALK, the OCT aided the surgeon judging the depth reached by needle used for air injection with big-bubble technique and monitoring stromal dissection. The system enabled precise measurements of the central corneal thickness during surgery.

CONCLUSIONS: Intraoperative portable SD-OCT can be used to safely assist the surgeon in several steps of DSAEK and DALK and has the potential of improving graft attachment rates in DSAEK and improving stromal bed dissection as well as lowering the chance of complication as Descemet's membrane perforation in DALK.

ENRICA SARNICOLA

HERPETIC KERATITS AND DALK SURGERY

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PURPOSE: Update on the pathophysiology of herpetic keratitis and approach suitable for medical and surgical therapy in corneal stromal opacities after HSV infection.

METHODS: Review of anatomic and phisiopathologyc classification of Herpes corneal infection.

52 eyes of 52 patients underwent DALK surgery due to corneal scar after clinical diagnoses of herpes simplex virus keratitis. UCVA and BSCVA pre and postoperative, number

of recurrence and rate of rejection were analized. Pre and postoperative theprapeutic protocol were studied.

RESULTS: The mean preoperative uncorrected visual acuity (UCVA) was 20/70 (range 20/200-20/50). The postoperative visual results at 31 months follow-up were a mean UCVA of 20/40 (range 20/100 -20/30). We found 42 of 52 (80%) eyes with BSCVA of 20/30 or better; and 27 of 52 (52%) cases achieved 20/20 at the last visit follow-up. No episodes of rejection or graft failures were observed in this series. At the time of final examination, recurrence of herpetic keratitis was not observed in any of the patients who were all under long-term prophylactic therapy with acyclovir.

CONCLUSIONS: The successful use of DALK with the big-bubble technique to treat corneal opacification caused by stromal scars attributable to herpetic keratitis.With lamellar keratoplasty, immunological problems are reduced because the host endothelium is not replaced.The use of prophylactic antiviral therapy is effective in preventing recurrence of herpetic keratitis after corneal transplantation.

ENRICA SARNICOLA

DEEP ANTERIOR LAMELLAR KERATOPLASTY IN ACANTHAMOEBA INFECTION

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PURPOSE: To report our experience with deep anterior lamellar keratoplasty (DALK) as surgical alternative to penetrating keratoplasty for the treatment of Acanthamoeba keratitis.

METHODS: Retrospective review of clinical reports of 12 eyes of 11 patients with previous infection of Acanthamoeba keratitis were treated in our department with DALK between 2007 and 2009. DALK procedure was performed as a surgical approach to restore corneal transparency after resolution of the acute phase of infection in 9 eyes and during the acute phase in 3 cases because of poor clinical response to intensive antiamoebic medical therapy.

Cannula Big-bubble technique was used to bare Descemet membrane. Postoperative status of the cornea (donor graft and recipient cornea), therapeutic protocol, recurrence of infection and corneal rejection were assessed.

RESULTS: Nine descemetic DALK, (dDALK) and 3 predescemetic DALK (pdDALK) were obtained. No ruptures of Descemet's membrane occurred during surgery. No conversion to penetrating keratoplasty are reported in this series. Postoperative therapeutic protocol with one antiamoebic was prescribed. No episode of rejection or recurrence of infection was detected in these patients through their last visit. No graft-host interface problems were recorded.

CONCLUSIONS: DALK is valid alternative and safe procedure to restore vision in cases with significant corneal scarring due to Acanthamoeba keratitis or in cases unresponsive to medical therapy and can be considered as the first choice of surgery in most eyes with healthy endothelium, with the advantages of less risk of intraocular entry of infectious organisms at the time of surgery and less entdothelial rejection and graft failure.



CLAUDIO SAVARESI

A NEW SURGICAL APPROACH FOR MACULAR DEGENERATION IN PATHOLOGICAL MYOPIA

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OBJECTIVE: To evaluate the efficacy in the treatment of macular degeneration in myopic patients after cataract surgery and the subsequent installation of the new miniaturized system type Galilean magnification double lens with ring containment to complete of the IOL implantation in the capsular bag.

MATERIALS And METHODS: 25 patients underwent the study of 42 eyes that underwent cataract surgery with macular degeneration and degenerative myopia with involvement of the macular area that has been implanted miniature magnifying system consists of two IOLs in PMMA and ring stabilizer.

RESULTS: Follow up was performed at a distance of 1day, 7 days, 30days, 60days and 180 days. The diagnostic tools included the anterior segment OCT and posterioe segment OCT and micro perimetry. Patients underwent implantation of the new magnifying system intraocular have improved all their visual capacity that depending on the initial visual deficit that is improved by 2 to 5 lines.

CONCLUSION: The new magnifying system has proved effective in improving the visual acuity of patients suffering from macular degeneration with pathological myopia. The size of the crystalline implanted in the capsular bag did not interfere with the anatomy of the capsular bag and showed no alterations attributable to fibrosis of the capsular bag . The visual recovery appeared considerable, especially in patients with residual vision more than 3 lines.

ERIKA SAVIO

DIFFERENCES BETWEEN 3 KINDS OF RIBOFLAVIN SOLUTION, HOW TO USE THEM AND WHAT CHANGES IN CORNEAL STROMA

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PURPOSE: To analyze the changes in corneal stroma after keratoconus' cross linking using a riboflavin solution for epi off technique, a riboflavin solution for epi on and a new hypo-osmolar solution for both technique.

METHODS: 45 patients (90 eyes) have been followed up for one year to study corneal stroma remolding after using hyper and hypo osmolar Riboflavin solution in corneal cross linking. Both technique, epi -on and epi -off,have been investigated. The irradiation time has been 30 minutes (6 steps) for each technique, with the same irradiation device. Patients have been undergone to Scheimpflug camera topography and pachimetry, aberrometry, OCT analysis of anterior segment, measurement of UCVA and BCVA just before treatment and after 1,3, 6,12 months.

RESULTS: Corneas treated with hypo-osmolar solution versus hyper-osmolar solution revealed a deeper gray line in the corneal stroma (OCT analysis) both in epi on and epi off technique .

The differences are more evident in epi on technique. Also differences between UCVA and BCVA at 6 and 12 months after

cross linking are better using hypo-osmolar solution (differences statistically significant).

CONCLUSIONS: Epithelium layer is a natural protection against UVA and inflammation but often is a shield versus riboflavin penetration. Choose the correct technique for each corneal thickness and for each kind of corneal pathology improves refractive results and keratoconus stabilization. A customized cross linking will be the future.

ANTONINO SCALISI

A CASE OF DESCOMET'S MEMBRANE DETACHMENT (DMD) AFTER PHACOEMULSIFICATION CATARACT SURGERY

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PURPOSE: To describe a case of a patient with non planar combined DMD secondary to phacoemulsification cataract surgery that was resolved using intracameral air injection assisted by intraoperative optical coherence tomography (OCT).

METHODS: A 81-year-old male patient presented DMD in his left eye two days after phacoemulsification cataract surgery with clear-corneal temporal incision. He had undergone an intracameral air injection three days after the first operation, which failed. For this reason a fluid drainage with simultaneous intracameral air injection was performed. Configuration of Descemet's membrane (DM) was delineated before and during treatment with the OCT system.

RESULTS: Three days after the last procedure, the DM was reattached to the corneal stroma and the cornea became clear without edema.

CONCLUSIONS: In this case, early intervention has been necessary and intraoperative OCT results as useful tool to evaluate the complete reattachment the DM to the corneal stroma.

FEDERICO SOLIGNANI

A PILOT DOUBLE-MASKED RANDOMIZED CLINICAL TRIAL TO STUDY THE EFFECT OF THE TOPICAL APPLICATION OF OMEGA-3 IN PATIENTS WITH DRY EYE SYNDROME

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PURPOSE: To study the effect of a new micro-emulsion containing Vitamin E and Omega-3 Fatty Acids in an aqueous stable eye drops on symptoms and ocular surface signs in patients with dry eye syndrome (DES)

METHODS: A total of 40 subjects with DES (confirmed by symptoms of dry eye and at least 2 of the following: Schirmer test < 8mm/5 min; break-up time <10 sec; Lissamine green staining >0= 3 according to NEI score system) were enrolled into this randomized, double-masked study to receive either the

micro-emulsion or carboxymethylcellulose b.i.d. for 4 weeks. The assessments included: OSDI questionnaire, Schirmer I test, corneal and conjunctival staining, tear break-up time (BUT), tear osmolarity, HLA-DR expression on conjunctival epithelial cells at 4 and 12 weeks.

RESULTS: After 4 weeks of therapy patients treated with the Vitamin E/Omega-3 Fatty Acids microemulsion showed a statistically significant improvement in OSDI score, BUT, corneal staining, tear osmolarity after 4 weeks, and HLA-DR expression decrease compared to baseline after 12 weeks. The group of patients treated with carboxymethylcellulose hypotonic eye drops did not show any statistical changes for the studied parameters. No changes were recorded in both groups for Schirmer test.

CONCLUSIONS: The new micro-emulsion containing Vitamin E/Omega-3 Fatty Acids has shown positive results in improving symptoms and signs of DES, probably due to the effect of Omega-3 fatty Acids metabolites, including resolvins and neuroprotectins having a well known anti-inflammatory activity. Further clinical trials are necessary to confirm these preliminary results and to study the effect on ocular surface inflammation.

LEOPOLDO SPADEA

TRANSEPITHELIAL CORNEAL COLLAGEN CROSS-LINKING IN ULTRATHIN KERATOCONIC CORNEAS

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To report the results of transepithelial corneal collagen cross-linking (CXL) with modified riboflavin and UVA irradiation in eight patients affected by keratoconus with a thinnest pachymetry value less than 400µm, not treatable by the standard technique with de-epithelialization.

Patients and methods: Sixteen patients affected by progressive keratoconus with thinnest pachymetry values ranging from 331 µm to 389 µm underwent transepithelial CXL in one eye using a riboflavin 0.1% solution in 15% Dextran T500 containing ethylenediamine tetra-acetic acid 0.01% and trometamol to enhance epithelial penetration. The patients underwent complete ophthalmological examination, including endothelial cell density measurements and computerized videokeratography, before CXL and at one day, one week, and one, 6, and 12 months thereafter.

Results: Epithelial healing was complete in all patients after one day of use of a soft bandage contact lens. No side effects or damage to the limbal region was observed during the follow-up period. All patients showed slightly improved uncorrected and spectacle-corrected visual acuity; keratometric astigmatism showed reductions (up to 5.3 D) and apical ectasia power decreased (Kmax values reduced up to 4.3 D). Endothelial cell density was unchanged.

Conclusion: Application of transepithelial CXL using riboflavin with substances added to enhance epithelial permeability was safe, seemed to be moderately effective in keratoconic eyes with ultrathin corneas, and applications of the procedure could be extended to patients with advanced keratoconus.

Keywords: keratoconus, pachymetry, topography, transepithelial corneal collagen cross-linking, thin cornea

ANTONIO TARANTELLO

MEASUREMENT OF THE INTERNAL DIAMETERS OF THE ANTERIOR CHAMBER WITH AND WITHOUT ACCOMODATION

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PURPOSE: To compare the internal diameters measurements of the anterior chamber (AC) and white to white (WTW) using different diagnostic technologies to evaluate the variation of the diameters in the nonaccommodated state and during subjective accommodation.

METHODS: The study comprised 50 eyes of 25 subjects between 20 and 50 years of age. All measurements were performed by the same operator. The horizontal (0 degree), vertical (90 degree) and oblique (45 and 135) diameters of the AC were measured in the unaccommodated state and after stimulating accommodation using AC OCT (Visante OCT, Zeiss, Germany), Orbscan Ilz (Bausch & Lomb, Rochester, NY), Pentacam Scheimpflug camera (Sirius; CSO, Italy) and partial coherence interferometry (IOL Master, Zeiss, Germany).

RESULTS: All devices demonstrated high repeatability and reproducibility. The comparison of the internal diameters of the AC showed important differences on different axes.

CONCLUSION: All the diagnostic technologies show good correlation and excellent reproducibility for evaluating the internal diameters of the AC. This study shows that all diameters are different both in the unaccommodated and accommodated state and confirms that the AC was an oval with a larger vertical axis.

PATRICIA TORO IBÁÑEZ

MASSIVE DESTRUCTION OF THE STROMA. DALK OUT OF LIMITS

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PURPOSE: To report a resolution of Descemet rupture, in one case with incongruence between donor-recipient, during DALK.

METHODS: Case Report: A 30 year old patient underwent DALK procedure because a big corneal stromal opacity after herpetic keratitis. An intraoperative paracentral Descemet rupture occurred during delamination of deep stroma, surgery continued with manual lamellar delamination. Air was left into the anterior chamber through the paracentesis and the patient was instructed to rest in the supine position until the control. Double chamber recurred after one week. Endothelial traction was evident, precluding the adherence from donor to recipient. We decided to cut the recipient's endothelium in order to ensure that the tissue join in a single plane and then air was left into the anterior chamber and patient in supine position. We follow the patient every two hour to avoid pupillary block.

RESULTS: During the immediate postoperative period we found complete adherence between recipient and donor and corneal transparency improved. No recurrence of double anterior chamber was found in follow-up period. POstoperative BSCVA of 20/40 was achived after 12 months follow-up



CONCLUSIONS: DALK is the procedure of choice in cases with stromal opacity where endothelium is healthy. Even though ruptures of Descemet membrane occur, it can be solved. It is important to follow carefully these patients in the postoperative period in order to diagnose these complications.

PATRICIA TORO IBAÑEZ

LONG-TERM GRAFT SURVIVAL IN DEEP ANTERIOR LAMELLAR KERATOPLASTY

Authors: **P. Toro, C. Sarnicola, E. Sarnicola, C. Millacci, V. Sarnicola**

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PURPOSE: To determine 10-year corneal graft survival rates in a large consecutive series of Deep Anterior Lamellar Keratoplasty (DALK).

METHODS: Retrospective, case series report DALK procedures performed between 2000 and 2009. Clinical results of graft survival were analyzed using the Kaplan-Meier survival method. Endothelial cell loss was analyzed with the Gaussian distribution and the Chi square methods. Follow-up time, graft survival rate and preoperative and postoperative endothelial cell density, incidence of Descemet membrane (DM) ruptures and technique to repair them were recorded.

RESULTS: Six hundred and sixty eyes of 502 patients met the entry criteria. The mean length of follow-up was 4.5 years (range 0.5-10). We report an average graft survival rate of 99.3% (range 98.5-100%); three eyes (0.45%) experienced graft failure and 1 eye (0.15%) developed late endothelial failure because of an intraoperative complication. Predominant indications for DALK in this series were Keratoconus (74%), post-herpetic keratitis scars (15%) and corneal stromal opacities of different etiology (11%). Endothelial cell loss from preoperative donor levels average was 11% (range 10-13%). Endothelial cell density was unchanged after the 6 months postoperative and the last follow-up visit. Incidence of DM ruptures was 9%. Since Needle and Cannula Big bubble technique were used no conversion to PK was recorded.

CONCLUSIONS: Deep Anterior Lamellar Keratoplasty is a successful form of transplantation in anterior-stromal corneal disorders with healthy endothelium with higher long-term graft survival rates and stable endothelial cell density after the first 6 months postoperative. DALK survival rate does not vary significantly over time.

SALVATORE TROISI

TOPICAL TREATMENT OF TRAUMATIC RECURRENT CORNEAL EROSIONS WITH PLATELET-RICH PLASMA (PRP): PRELIMINARY RESULTS

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PURPOSE: Recurrent erosions post-corneal-epithelial-trauma present a condition of difficult therapeutic management. The Authors report the clinical results after 14 weeks of PRP-eye-drop administration and successive follow-up of 12 months on patients non-responding to traditional treatment, compared with prolonged therapy with hyaluronic-acid-eye-drops.

METHODS: 16 post-traumatic recalcitrant-recurrent-corneal-erosion-affected eyes of 16 patients (average patient age 43 years) have been randomized in two groups.

8 patients have been treated with topical-PRP administration 5-times-a-day for 14 weeks (group-I); other 8 patients have been treated with hyaluronic-acid-eye-drops with the same posology (group-II). Before the treatment, and every two weeks, a clinical (biomicroscopy, fluo-test, BUT-test) and symptomatic (OSDI-modified) follow-up has been done; the same check has been done every 4-weeks in the following 12 months. Besides a check has been planned and done in the 12 hours following any recurrence of the acute symptomatology.

RESULTS: Group I: two cases of recurrent erosion during the hyaluronic acid treatment and three patients in the following 12 months; group II: only one case of corneal erosion at 16th day of therapy; no cases in the following 12 months. The BUT-test and OSDI score have shown a better result in the II group.

CONCLUSIONS: The topical PRP-treatment appears effective for prophylaxis of further episodes of recurrent-corneal-erosion and for the physiological restoration of corneal-epithelial-adhesion-complex, probably for the action of cytokines and growth-factors. Moreover the PRP-eye-drop has been more successful than the hyaluronic-acid in the stabilization of precorneal-lachrymal-film. We suggest further studies to clarify the process of action of the PRP-eye-drops and evaluate the indications.

DAVIDE VENZANO

LEARNING CURVE IN DESCemet MEMBRANE ENDOTHELIAL KERATOPLASTY

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PURPOSE: To evaluate the learning curve in Descemet Membrane Endothelial Keratoplasty (DMEK).

METHODS: We included 24 eyes with corneal endothelial disorders underwent DMEK surgery.

Outcomes were compared between the first 12 eyes (1G) and the seconds (2G).

13 eyes received phacoemulsification contemporary (5 in 1G and 8 in 2G).

RESULTS: BCVA before surgery was 0.15 (SD 0.18) in 1G was 0.70 (SD 0.37) in 2G 0.82 (SD 0.2) at 6 months follow-up (FU). Donor ECD-age was 1G=2650cells/mm²-65yrs (SD 267.7-10.7) and 2G=2810cells/mm²-64yrs (SD 119.7-8.3).

Graft diameters: 1G 8.07mm (SD 0.58) and 2G=8.77mm (SD 0.21). The endothelial cells density (ECD) in 1G was 814 cells/mm² (SD 254,31) in 2G 1330 cells/mm² (SD 495,19) at 6 mo FU.

In 1G 2 cases graft detachment needed a rebubbling.

The not working grafts were 8 (33.33%) equally divided in two groups and retreated with DMEK two of these (8.33%) underwent penetrating keratoplasty.

CONCLUSIONS: The functional results of the two groups of treated eyes do not demonstrate significant differences while significant was the difference in endothelial cells density that could not be demonstrated by the difference in graft diameter only. DMEK has a short learning curve because in only 10 treatments was a great improvement of anatomic results while the functional outcomes were gained since first treatments.

RICCARDO VINCIGUERRA

COMPARISON OF BIOMECHANICAL AND TOMOGRAPHIC DATA IN SUBCLINICAL KERATOCONUS

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PURPOSE: To evaluate the tomographic and biomechanical corneal changes in subclinical keratoconus (KC).

METHODS: Five patients with very asymmetric KC were retrospectively compared with fellow eyes without tomographic evidences of KC. Tomographic and biomechanical data were respectively obtained with Pentacam and Corvis ST (Oculus Optikgeräte GmbH, Wetzlar, Germany).

The eyes without tomographic evidences of KC were also compared with five healthy subjects pachymetry- and intraocular pressure (IOP)-matched.

From Pentacam analysis we considered: minimal pachymetry, single and total deviation values (Dv) from Belin-Ambrosio Enhanced Ectasia Display (BAD), and all topometric indexes obtained in the topometric map.

From Corvis ST analysis we considered: time (t1-2), length (l1-2) and velocity (v1-2) of first and second applanation, time (tC), peak distance (pC), radius (rC) and deformation amplitude (dC) of highest concavity, IOP and pachymetry.

RESULTS: Comparison between KC and the fellow eyes revealed a significant difference in single and total Dv evaluated (p<0.05) except for Dv of average pachymetric progression index and deviation of minimum thickness. Similarly topometric values showed a significant difference (p<0.05) between KC and fellow eyes in selected indexes.

Corvis ST analysis indicated non significant difference between KC and fellow eyes (p>0.05) in all parameters, showing that fellow eyes had the same pathological biomechanical behavior of the eyes with manifest disease, whereas tomographic analysis didn't show any significant pathological changes.

Comparison between KC patients' "healthy" eyes and control group showed only scattered significant difference in topometric indexes and in tomographic data in BAD Dv; however the overall total Dv difference was not significant. Conversely biomechanical data revealed significant differences in t1-2(p<0.01), v1(p=0.002), tC(p<0.001), rC(p<0.001), and dC(p<0.001) between KC patients and control group.

CONCLUSIONS: Biomechanical analysis with Corvis ST is able to show significant difference between normal eyes subclinical KC when normal tomographic data show normality or only small abnormalities. In conclusion Corvis ST could be a valid aid in the screening for the risk of ectasia in refractive surgery patients and for early diagnosis of KC.



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