XII CONGRESSO NAZIONALE REFR@CTIVE.ONLINE - XI CONGRESSO NAZIONALE SICSSO

Refr@ctive.on-line

S.I.C.S.S.O.
Società Italiana Cellule Staminali e Superficie Oculare

# 2nd Joint International Congress

# REFR@CTIVE.ONLINE & SICSSO

## ERGIFE PALACE HOTEL, ROME - JUNE 28TH/30TH, 2012

# FINAL PROGRAM

TRADUZIONE SIMULTANEA
INGLESE ⇆ ITALIANO

SPONSORED BY

ASIA CORNEA SOCIETY

ESCRS European Society of Cornea & Ocular Surface Disease Specialists

ISRS International Society of Refractive Surgery

THE CORNEA SOCIETY

# 2nd JOINT
# INTERNATIONAL CONGRESS
## Refr@ctive.online and SICSSO

www.ROLANDSICSSO.org

XII CONGRESSO NAZIONALE REFRACTIVE ONLINE
XI CONGRESSO NAZIONALE SICSSO

**ROME, ITALY**
June 28–30, 2012

# ATTENDING SPEAKERS

Elena Albé, Italy
Giovanni Alessio, Italy
Camilla Alovisi, Italy
Emma Amasio Bartoli, Italy
Anas A. Anbari, Syria
Romolo Appolloni, Italy
Rossella Appolloni, Italy
Pasquale Aragona, Italy
Amhed Assaf, Egypt
Mariarosa Astori, Italy
Marco Azzolini, Italy
Corrado Balacco Gabrieli, Italy
Alessandra Balestrazzi, Italy
Emilio Balestrazzi, Italy
Cinzia Batisti, Italy
Guido Battarra, Italy
Michael Belin, USA
Roberto Bellucci, Italy
Gian Luca Biletta, Italy
Bernardo Billi, Italy
Stefano Bonini, Italy
Paolo Bonci, Italy
Paolo Brusini, Italy
Luca Buzzonetti, Italy
Carlo Cagini, Italy
Roberta Calienno, Italy
Antonio Calossi, Italy
Fabrizio Camesasca, Italy
Marino Campanelli, Italy
Aldo Caporossi, Italy
Piera Capra, Italy
Giancarlo Caprioglio, Italy
Roberto Carnevali, Italy
Ciro Caruso, Italy
Giampiero Cattaneo, Italy
Luciano Cerulli, Italy
Luca Cesari, Italy
Xiangjun Chen, Norway
Antonio Ciardella, Italy
Giovanni Citroni, Italy
Pietro Colosi, Italy
Denise de Freitas, Brasil
Antonio Del Prete, Italy
Daniele Di Clemente, Italy
Klaus Ditzen, Germany
Paul Dougherty, USA
Pietro Ducoli, Italy
Dan Epstein, Switzerland
Marco Fantozzi, Italy
Romina Fasciani, Italy
Paolo Fogagnolo, Italy
Matteo Forlini, Italy
Michele Fortunato, Italy
Alessandro Franchini, Italy
Severino Fruscella, Italy
Giovanna Gabbriellini, Italy
Caterina Gagliano, Italy
Alessandro Galan, Italy
Tamer O Gamaly , Oman
Vito Gasparri, Italy
Damien Gatinel, France
Sinan Goker, Turkey
Massimo Gualdi, Italy
Claudia Guarracino, Italy
Josè Guell, Spain
Farhad Hafezi, Swiss
Deanine Halliman, USA
Filippo Incarbone, Italy
Choun-KI Joo, Korea
Vikentia Katsanevaki, Greece
Omid Kermani, Germany
Terry Kim, USA
Michael C Knorz, Germany
Antonio Laborante, Italy
Peter Laibson, USA
Alessandro Lambiase, Italy
Manuela Lanzini, Italy
Marco Lazzarotto, Italy
Barry Lee, USA
Andrea Leonardi, Italy
Guido Lesnoni, Italy
Stefano Lippera, Italy
Antonio Longo, Italy
Holger Lubatschowski, Germany
Saverio Luccarelli, Italy
Giulio Maione, Italy
Francoise Malecaze, France
Edward E Manche, USA
Giorgio Marchini, Italy
Leonardo Mastropasqua, Italy
Rodolfo Mastropasqua, Italy
Vincenzo Maurino, UK
Jodhbir Mehta, Singapore
Rita Mencucci, Italy
Bertram Meyer, Dubai
Shahzad I. Mian, USA
Antonio Mocellin, Italy
Alberto Montericcio, Italy
Franco Montrone, Italy
Alessandro Morico, Italy
Simonetta Morselli, Italy
Luigi Mosca, Italy
Alessandro Mularoni, Italy
Zoltan Nagy, Hungary
Marco Nardi, Italy
Piergiorgio Neri, Italy
Mario Novara, Italy
Mario Nubile, Italy
Vincenzo Orfeo, Italy
Luigi Pacente, Italy
Iacopo Paladini, Italy
Franco Passani, Italy
Mattia Passilongo, Italy
Stello Pecoraro, Italy
Emilio Pedrotti, Italy
Graziella Pellegrini, Italy
Giuseppe Perone, Italy
Vincenzo Petitti, Italy
Augusto Pocobelli, Italy
Romolo Protti, Italy
Paolo Rama,Italy
Vincenzo Ramovecchi, Italy
J. Bradley Randleman, USA
Emilio Rapizzi, Italy
Federico Regine, Italy
Sven Reisdorf, Germany
Cynthia Roberts, USA
Maurizio Rolando, Italy
Ferdinando Romano, Italy
Pietro Rosetta, Italy
Scipione Rossi, Italy
Anna Maria Roszkowska, Italy
Alain Saad, France
Giacomo Sanfelici, Italy
Enrica Sarnicola, Italy
Vincenzo Sarnicola, Italy
Claudio Savaresi, Italy
Domenico Schiano Lomoriello, Italy
Silvia Schumacher, Switzerland
Giuseppe Sciuto, Italy
Vincenzo Scorcia, Italy
Sebastiano Serrao, Italy
Neda Shamie, USA
Shigeto Shimmura, Japan
Leopoldo Spadea, Italy
Franco Spedale, Italy
Attilio Francesco Speciani, Italy
Edoardo Stagni, Italy
Mario Stirpe, Italy
Aleksandar Stojanovic, Norway
Donald Tan, Singapore
Giorgio Tassinari, Italy
Daniele Tognetto, Italy
Patricia Toro Ibañez, Italy
Achille Tortori, Italy
Silvia Trazza, Italy
Pasquale Troiano, Italy
Salvatore Troisi, Italy
Ray Jui-Fang Tsai, Taiwan
Elmer Tu, USA
Pasquale Vadalà, Italy
Davide Venzano, Italy
Carlo Maria Villani, Italy
Edoardo Villani, Italy
Paolo Vinciguerra, Italy
Riccardo Vinciguerra, Italy
Mark Wilkins, UK
Jayne Weiss, USA

# GENERAL INFORMATION

## VENUE
The Congress will be held on June 28-30, 2012
All sessions will take place at:
**Ergife Palace Hotel**
Via Aurelia, 619 - 00165 Rome, Italy
Tel. +39 06 66441

## CHAIRMEN
**Vincenzo Sarnicola, MD**
**Paolo Vinciguerra, MD**

## SCIENTIFIC SECRETARIAT
**Fabrizio Camesasca, MD**
Istituto Clinico Humanitas, Milan - Italy
Email: *info@rolandsicsso.org*
**Patricia Toro Ibañez, MD**
Ospedale della Misericordia, Grosseto - Italy
Email: *info@rolandsicsso.org*

## ORGANIZING SECRETARIAT
**Refr@ctive.online and S.I.C.S.S.O.**
Tel: +39 334 1302292 / Fax: +39 06 99367548
Email: info@rolandsicsso.org
Web: www.rolandsicsso.org

## OFFICIAL LANGUAGE
The official language of the Congress is English.
Italian <-> English simultaneous translation will be available **only** on the MAIN ROOM.
Check this symbol:
No translation is available in other rooms.

## WEATHER
In late June the weather conditions in Italy are usually hot and sunny. Expected temperatures range from 20°C to 30°C.

## REGISTRATION DESK / SLIDE CENTER
All participants will receive their Congress pack at the registration desk.
The registration desk will be open the following hours:

| | |
|---|---|
| Thursday, 28th June | 07.00 – 19.15 |
| Friday, 29th June | 07.30 – 19.15 |
| Saturday, 30th June | 07.30 – 13.00 |

Speaker Ready room will observe the same time

## EXHIBITION
A trade exhibition will run parallel to the Congress.
The exhibition will be open the following hours:

| | |
|---|---|
| Thursday, 28th June | 08.30 – 19.00 |
| Friday, 29th June | 08.30 – 19.00 |
| Saturday, 30th June | 08.30 – 13.00 |

## ECM (ITALIAN DOCTORS ONLY)
Il congresso è accreditato per la **MAIN ROOM** i giorni 28, 29 e 30 giugno 2012 per le seguenti figure professionali:***Oftalmologo, Ortottista/ Assistente di oftalmologia, Infermerie.***
**11 CREDITI FORMATIVI ASSEGNATI**

MODALITA' PER L'OTTENIMENTO DEI CREDITI
- Partecipazione effettiva all'intera durata dell'evento (presenza 100%, come da rilevazione elettronica dei badge nella MAIN ROOM)
- Compilazione delle schede di valutazione
- Compilazione dei test di apprendimento
- Restituzione del fascicolo con le risposte alla Segreteria, completo di tutti i dati anagrafici richiesti e di firma.

Verificare nel programma il simbolo: E.C.M.

## ONLINE REGISTRATION
Online registration for the ROLANDSICSSO Congress, wetlabs and free Breakfast with the experts are now available at: www.rolandsicsso.org

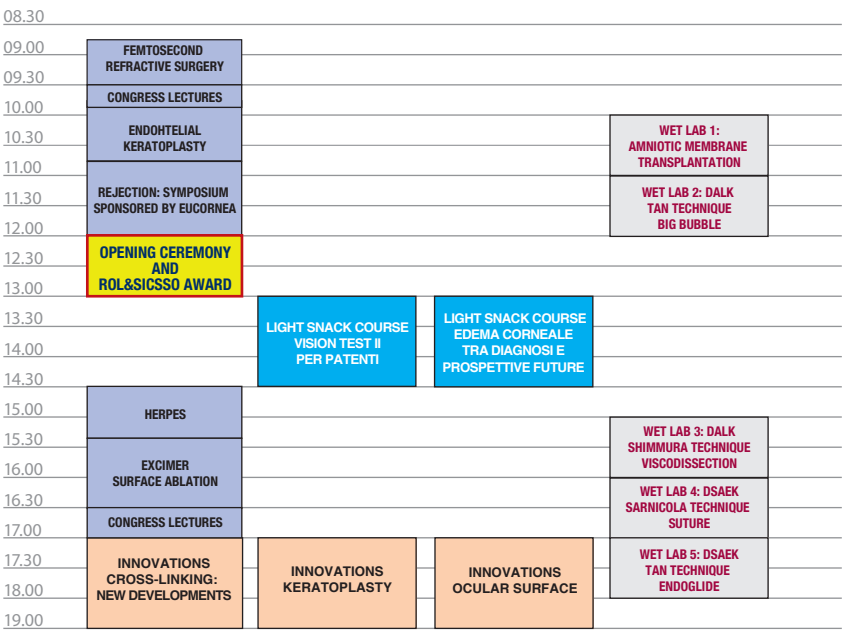
## INSTRUCTIONS FOR PRESENTERS AND SPEAKER READY ROOM
Consult the technical information on page 16 of the program.

## CONGRESS DINNERS
Congress Dinner 29th Dress Code:
Informal Dinner, comfortable dress suggested.
Tickets for Dinner and Show at 49,00 each.
Pick up from the Hotel at 20.00

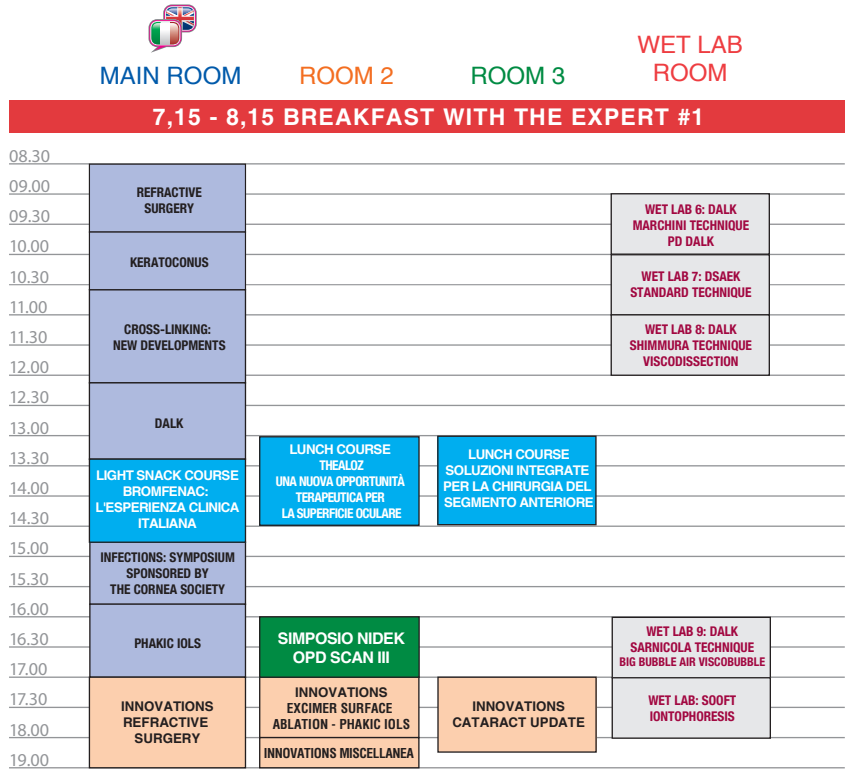
## CONGRESS LUNCHES
Breakfast vouchers are available at the secretariat's desk at a special price of Euro 25.00 (VAT included).

## CHANGES
La Segreteria Scientifica si riserva il diritto di apportare al programma tutte le variazioni ritenute necessarie per ragioni tecniche e/o scientifiche.

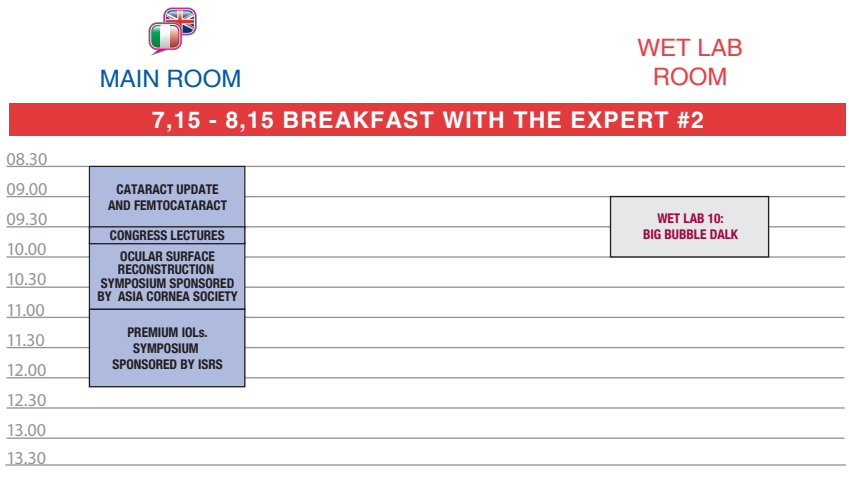
## 28 THURSDAY




## 29 FRIDAY




## 30 SATURDAY



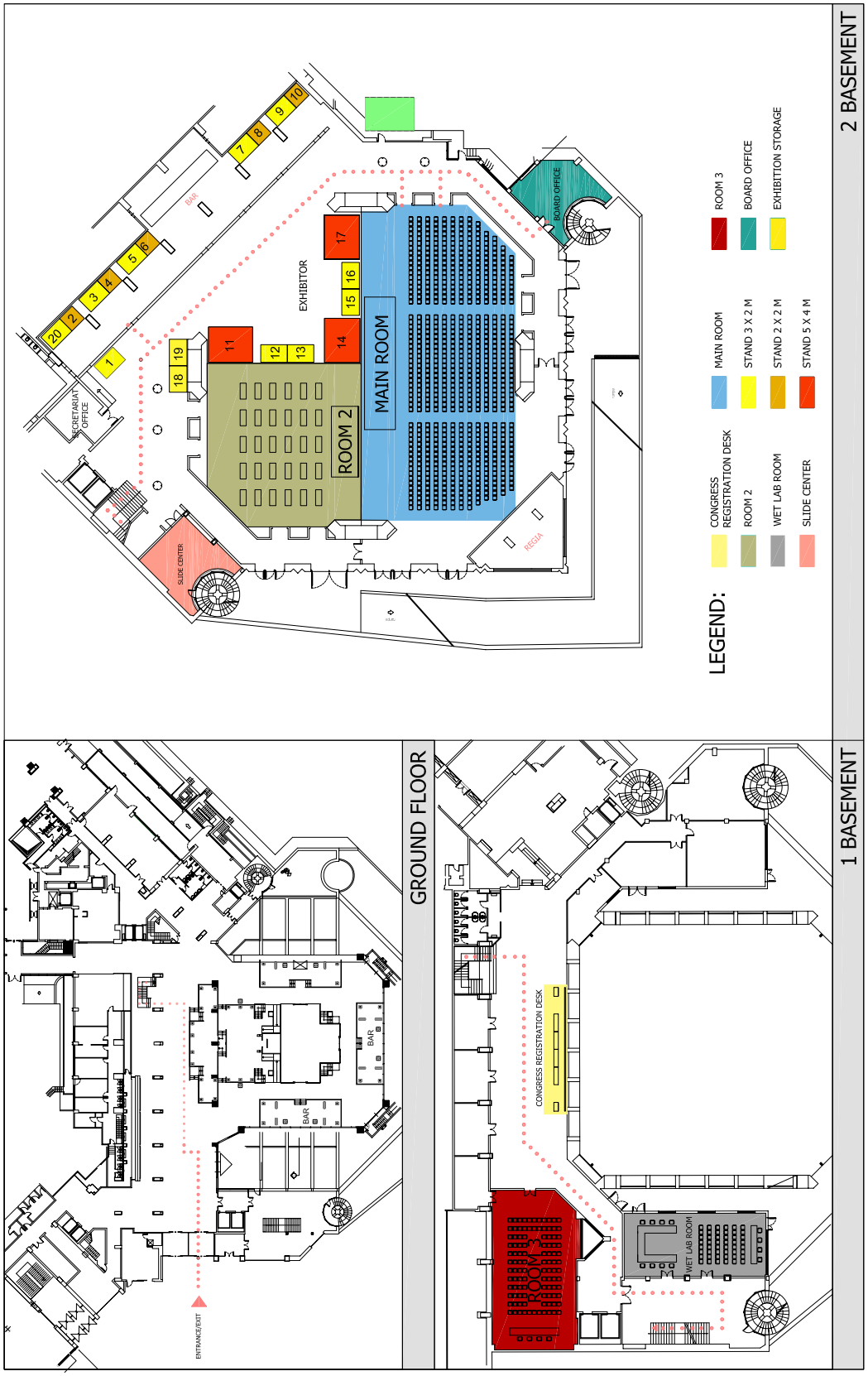

Key:

- MAIN SESSION
- LUNCH COURSES
- INNOVATIONS
- WET LAB
- SYMPOSIA
- BREAKFAST WITH THE EXPERT

# SPONSORS & EXHIBITORS LIST
# EXHIBIT AREA

| SPECIAL THANKS TO: | BOOTH N. |
|---|---|
| ALCON | 16 |
| ALFA INTES | 12 |
| ALLERGAN OPHTALMOLOGY | 13 |
| ALLERGOPHARMA | |
| AMO / ABBOTT | |
| BAUSCH & LOMB | 11 |
| BIOOS ITALIA | 03/05/07 |
| CIO | 20 |
| EUPHARMED | 15 |
| EYELAB | 01 |
| FARMIGEA | |
| LEICA MICROSYSTEMS | 02 |
| MEDIVIS | |
| NEW TECH | 21 |
| NIDEK | 14 |
| SIFI PHARMA | |
| SOLEKO | |
| SOOFT ITALIA | 03/05/07 |
| THEA FARMA | 17 |
| TOP CON | 09 |
| ZEISS | 18 |

| AND: | |
|---|---|
| ESASO | 04 |
| EUCORNEA | 06 |
| FGE EDITORE | 08 |
| OVI LENS | 22 |
| SIR OFTALMICA | 10 |
| ISRS | 23 |



# THURSDAY, 28TH JUNE

E.C.M. MAIN ROOM

08.20 OPENING REMARKS
Paolo Vinciguerra - Vincenzo Sarnicola

## FEMTOSECOND REFRACTIVE SURGERY

**08.40 - 09.40 Chairman: C. Balacco Gabrieli**

08.40 Current and future trends of refractive surgery with femtosecond laser
HOLGER LUBATSCHOWSKI

08.50 Femtosecond laser refractive lenticule extraction for myopia: morphology and results
LEONARDO MASTROPASQUA

09.00 Femtosecond laser–assisted presbyopia surgery on the crystalline lens – Update
OMID KERMANI

PANEL DISCUSSION: S. Goker, L. Mosca, S. Schumacher, G. Perone, D. Tan

## CONGRESS LECTURE

09.30 Food–related inflammation and keratitis
ATTILIO FRANCESCO SPECIANI

## ENDOTHELIAL KERATOPLASTY

**09.40 - 10.45 Chairmen: V. Maurino, V. Sarnicola**

09.40 EK: different techniques
BARRY LEE

09.50 Donor preparation: different techniques
NEDA SHAMIE

10.00 Donor insertion: different techniques
DONALD TAN

10.10 Complications
VINCENZO MAURINO

10.20 Results
JOSÉ GUELL

PANEL DISCUSSION: A. Balestrazzi, F. Montrone, A. Pocobelli, E. Rapizzi

## REJECTION: SYMPOSIUM SPONSORED BY EUCORNEA

**10.45 - 12.00 Chairman: P. Vinciguerra**

10.45 Physiopathology of rejection and a new surgical strategies
JOSÉ GUELL

10.55 Clinical signs
VINCENZO SARNICOLA - PATRICIA TORO

11.05 Pharmacology and therapy
LEONARDO MASTROPASQUA - MARIO NUBILE

11.15 Clinical presentation and therapeutical options after rejection in penetrating, anterior and posterior lamellar keratoplasty.
ALDO CAPOROSSI

PANEL DISCUSSION: G. Caprioglio

**12.00 - 13.00**

## OFFICIAL WELCOME AND ROL&SICSSO MEDAL AWARD

**REPRESENTATIVES OF**

ASIA CORNEA SOCIETY • THE CORNEA SOCIETY • EUCORNEA • ISRS • REFR@CTIVE.ON–LINE • S.I.C.S.S.O.

OFFICIAL INTRODUCTION: M. STIRPE
ROL&SICSSO MEDAL AWARD RECIPIENT: J. GUELL, C. ROBERTS, D. TAN

# THURSDAY, 28TH JUNE

## MAIN ROOM

### HERPES

**14.30 - 15.15 Chairmen: S. Bonini, G. Marchini**

14.30 Overview of HSV
PETER LAIBSON

14.40 Physiopathology and therapy
PIERGIORGIO NERI

14.50 Herpes scar and keratoplasty
VINCENZO SARNICOLA - PATRICIA TORO

**PANEL DISCUSSION: Rs. Appolloni, D.G. Halliman, M. Nubile, P. Vadalà, C.M. Villani**

### EXCIMER SURFACE ABLATION

**15.15 - 16.20 Chairman: G. Alessio**

15.15 How to select and follow refractive surgery patients with the Scheimpflug camera topo–tomographer
MICHAEL BELIN

15.25 Why is it so difficult to correct astigmatism
DAN EPSTEIN

15.35 Gradient and regression
CYNTHIA ROBERTS

15.45 The reparative process
SEBASTIANO SERRAO

15.55 Custom Ablation and Gradient
PAOLO VINCIGUERRA

**PANEL DISCUSSION: P. Bonci, V. Katsanevaki, O. Kermani, A. Montericcio**

### CONGRESS LECTURES

**16.20 - 17.00 Chairman: L. Cerulli**
**MODERATORS: V. Gasparri, V. Petitti**

16.20 Genetics in Ophthalmology – first steps in clinical practice
ANTONIO CIARDELLA

16.30 Antibiotics in 2012: evaluating the landscape for effective treatment of ocular infections
DEANINE HALLIMAN

16.40 The evolution of keratoplasty
EMILIO BALESTRAZZI

16.50 The International Committe for Classification (IC3D) of Corneal Dystrophies
JAYNE WEISS

# THURSDAY, 28TH JUNE / 17.00 - 19.00

## INNOVATIONS - MAIN ROOM

### CROSS-LINKING: NEW DEVELOPMENTS

**MODERATORS: A. Caporossi, P. Vinciguerra**

17.00 Results of surface ablation in patients with forme fruste keratoconus: 5 years of follow–up
ALAIN SAAD - DAMIEN GATINEL

17.06 Comparative stress–strain measurements of human corneas after transepithelial UV–A induced cross–linking: Impregnation with iontophoresis, different riboflavin solutions and irradiance power
RICCARDO VINCIGUERRA

17.12 New accelerated corneal cross–linking with beam optimization
SILVIA SCHUMACHER - MICHAEL MROCHEN

17.18 Corneal cross–linking as a treatment for keratoconus: Four–year morphological and clinical outcomes with respect to patient age
RICCARDO VINCIGUERRA

17.24 A curious complication after corneal cross–linking in an adult patient with progressive keratoconus
ELENA ALBÈ

17.30 Corneal regularisation for refractive purposes associated to CXL after LK in keratoconus
LEOPOLDO SPADEA

17.36 Transepithelial corneal cross–linking in children: 18 months follow up.
LUCA BUZZONETTI

17.42 Visual acuity after corneal collagen cross–linking in progressive keratoconus
ALESSANDRA BALESTRAZZI

17.48 Long term results of association ICRs and CXL TE in keratoconic patients
ALESSANDRO MULARONI

17.54 Trans–epithelial cross–linking with riboflavin solution: two–year clinical results
LUIGI PACENTE

18.00 Transepithelial and traditional collagen cross–linking: clinical and morphological results, follow up at 12 months.
MANUELA LANZINI

18.06 Transepithelial cross–linking (CXL TE): our experience
ANTONIO LABORANTE

18.12 Transepithelial cross–linking with 0.5% hypotonic riboflavin
ALEKSANDAR STOJANOVIC

18.18 One year of application ipo–isotonic riboflavin in thin corneas: experience of single istitution, Siena
CINZIA BATISTI

18.24 UV–A rays absorption in human corneas before and after trans–epithelial riboflavin application: an experimental study
CIRO CARUSO

## THURSDAY, 28TH JUNE

## LIGHT SNACK COURSES

**13.00 - 14.30 - ROOM 2 - COURSE IN ITALIAN ONLY**

### LIGHT SNACK COURSE: VISION TEST II PER PATENTI

MAX 150 Persone - Pass presso stand: OVI Lens

**ISTRUTTORI: ALBERTO MONTERICCIO, ANTONIO MOCELLIN, PASQUALE TROIANO, MARIO NOVARA**

1. Cosa dice la legge
   ANTONIO MOCELLIN
2. Come fare gli esami
   PASQUALE TROIANO
3. I Visori
   ALBERTO MONTERICCIO
4. Il Vision Test II
   MARIO NOVARA

Viene presa in esame la nuova legge riguardo la certificazione per l'idonietà alla guida e descritti gli esami necessari per ottenere una corretta certificazione. Il programma prevede la presentazione dello strumento con prova pratica.

**13.00 - 14.30 - ROOM 3 - COURSE IN ITALIAN ONLY**

### LIGHT SNACK COURSE: EDEMA CORNEALE TRA DIAGNOSI E PROSPETTIVE FUTURE

MAX 100 Persone - Pass presso stand: SOOFT

1. Edema Corneale: Eziopatogenesi e Terapia.
   Perché è importante effettuare una corretta diagnosi differenziale? Quando trattare?
   ELENA ALBE'
2. Chirurgia oftalmica ed edema corneale
   PIETRO ROSETTA
3. Nuove prospettive terapeutiche: il ruolo dell'acido lactobionico
   LUCA CESARI

**ACCESS TO THE LUNCH COURSES AND THE SYMPOSIA ARE BY INVITATION ONLY OF THE ORGANIZING COMPANIES.
ACCESS PASSES ARE AVAILABLE AT THE RELEVANT STAND.
L'ACCESSO AI LIGHT SNACK COURSES E AI SIMPOSI E' SOLO SU INVITO DELLE AZIENDE ORGANIZZATRICI.
IL PASS DI ACCESSO PUÒ ESSERE RITIRATO PRESSO IL RELATIVO STAND.**

## THURSDAY, 28TH JUNE / 17.00 - 19.00 — INNOVATIONS - *ROOM 2*

### KERATOPLASTY

**MODERATORS: A. Montericcio, D. Tan**

17.00 Long–term results of deep anterior lamellar keratoplasty (DALK) by the visco–bubble technique
SHIGETO SHIMMURA

17.06 Femtosecond laser–assisted mushroom configuration penetrating keratoplasty and deep anterior lamellar keratoplasty in advanced keratoconus
VINCENZO MAURINO

17.12 DALK: why are we falling behind?
NEDA SHAMIE

17.18 The small bubble, a new technique for deep anterior lamellar keratoplasty
STEFANO LIPPERA

17.24 Postoperative corneal higher order aberrations after penetrating keratoplasty, deep anterior lamellar keratoplasty (DALK), and automated lamellar therapeutic keratoplasty (ALTK) for keratoconus
PAOLO BRUSINI

17.30 DALK, indications and methods
PAOLO BONCI

17.36 Intraoperative optical coherence tomography for evaluation of lamellar and penetrating keratoplasties
GIUSEPPE SCIUTO

17.42 Mushroom PK with excimer laser
PAOLO BONCI

17.48 Pre–descemetic and descemetic DALK. an in vivo confocal microscopy study
DOMENICO SCHIANO LOMORIELLO

17.54 Conservation of arclength in keratoconus: bending or bulging?
CYNTHIA ROBERTS

18.00 Anterior Segment OCT Application in Corneal Surgery
VINCENZO SCORCIA

18.06 Outcomes of mushroom keratoplasty with femtolaser in patients with central leukoma
CARLO CAGINI

18.12 DALK, our experience
ACHILLE TORTORI

18.18 DMEK: hype or here to stay?
NEDA SHAMIE

18.24 Visual acuity and endothelial cell density after descemet membrane endothelial keratoplasty: 6 to 36 months follow–up
DAVIDE VENZANO

18.30 Monitoring of endothelial cell density during simulation of DSAEK phases in vitro using THIN–C deswelling medium and two different glides for endothelium insertion. Experimental research and clinical data.
AUGUSTO POCOBELLI

18.36 DSAEK: personal tecnique
VINCENZO RAMOVECCHI

18.42 Combination of DSAEK technique and IOL removal from the anterior chamber and repositioning with iris fixation IOL
GIAN LUCA BILETTA

18.48 Long–term graft survival in Deep Anterior Lamellar Keratoplasty
PATRICIA TORO - ENRICA SARNICOLA - VINCENZO SARNICOLA

18.54 Effect of lamellar graft thickness on the anatomical and functional outcomes in DSEK patients
RODOLFO MASTROPASQUA

19.00 DALK/PK in patients with HSV–related corneal scarring
RODOLFO MASTROPASQUA

## THURSDAY, 28TH JUNE / 17.00 - 19.00 — INNOVATIONS - *ROOM 3*

### OCULAR SURFACE

**MODERATORS: J. Guell, L. Mastropasqua**

17.00 In vivo confocal microscopy with histological correlations in the diagnosis of limbal stem cell deficiency
MARIO NUBILE

17.06 Role of lipid based compounds on dysfunctional tear syndrome associated with computer use
CATERINA GAGLIANO

17.12 S100 expression in normal and pathological sclerocorneal limbus
ROBERTA CALIENNO

17.18 Surgery of pterygium
ALBERTO MONTERICCIO

17.24 Alterations of epithelial stem cell marker patterns in human diabetic corneas and effects of c–met gene therapy
GRAZIELLA PELLEGRINI

17.30 Heating wet chamber goggles (Blephasteam®) in meibomian gland dysfunction unresponsive to warm compress treatment
EDOARDO VILLANI

17.36 PROSE: prosthetic replacement of the ocular surface
NEDA SHAMIE

17.42 Inflammatory mediators in tears: what are the solutions?
CATERINA GAGLIANO

17.48 The use of Rituximab in refractory inflammatory external eye disease
MARK WILKINS

17.54 The eyelid margin in dry eye: an in vivo confocal study
EDOARDO VILLANI

18.00 Amniotic membrane application associated with perforating keratoplasty: long term results
FRANCO PASSANI

18.06 Novel noncontact meibography with anterior segment optical coherence tomography: HS Meibography
CHOUN-KI JOO

18.12 Plateled lysate in ocular GVHD
MARIAROSA ASTORI

18.18 The effects of topical Coenzyme Q–10 after cataract surgery. A clinical and confocal study.
PAOLO FOGAGNOLO

18.24 Autologous cryoprecipitate for attaching conjunctival autografts after pterygium excision
ANAS ANBARI

18.30 Collyrium with eledoisin stimulating lacrimal secretion
PIERA CAPRA

18.36 Diffusion of cyanocobalamin in human corneas after topical application: a pharmacokinetic study
SALVATORE TROISI

18.42 Crystalline corneal deposits in monoclonal gammopathy: in vivo confocal microscopy
IACOPO PALADINI

18.48 The use of PRP in the ocular graft versus host disease
MARIAROSA ASTORI

18.54 Ocular antibiotics: sensitivity and resistance. 3500 positive microbiological cultures in three years at the Ophthalmic Hospital in Turin. Analysis of the data.
GIAN LUCA BILETTA

19.00 Long–term effectiveness of autologous cultured limbal stem cells grafts in patients with limbal stem cell deficiency due to chemical burns.
MATTIA PASSILONGO

# FRIDAY, 29TH JUNE

E.C.M. MAIN ROOM

## REFRACTIVE SURGERY

**08.30 - 09.40** Chairman: P. Vinciguerra

08.30 Optical modeling for laser refractive surgery and IOL power calculation
SILVIA SCHUMACHER - MICHAEL MROCHEN

08.40 Custom Ablation: Wavefront–guided or Wavefront–optimized?
EDWARD E MANCHE

08.50 Diagnostic follow–up with the OPD aberrometer
ALAIN SAAD - DAMIEN GATINEL

09.00 How much we can correct
MICHAEL KNORZ

09.10 Iatrogenic complications
OMID KERMANI

09.20 Pregnancy may trigger late onset of keratectasia after laser in situ keratomileusis
FARHAD HAFEZI

PANEL DISCUSSION: Rm. Appolloni, R. Bellucci, F. Romano

## KERATOCONUS

**09.50 - 10.40** Chairmen: M. Campanelli, C. Roberts, D. Tan

09.50 Classifying keratoconus: why the old schemes do not work? A new proposal
FABRIZIO CAMESASCA - PATRICIA TORO

10.00 Update on keratoconus semeiology
PAOLO VINCIGUERRA

10.10 Guidelines for treatment
VINCENZO SARNICOLA - PAOLO VINCIGUERRA

PANEL: M. Belin, P. Bonci, S. Shimmura

## CROSS-LINKING: NEW DEVELOPMENTS

**10.40 - 12.10** Chairman: D. Epstein

10.40 UV Beam profile
SILVIA SCHUMACHER - MICHAEL MROCHEN

10.50 Indications
ELENA ALBÈ

10.55 Biomechanics of corneal collagen cross–linking
CYNTHIA ROBERTS

11.05 Epi–off
ALDO CAPOROSSI

11.15 Epi–on
MARCO NARDI - GIOVANNA GABBRIELLINI

11.25 Iontophoresis
PAOLO VINCIGUERRA

11.35 Results of combined PRK –CCL for keratoconus
VIKENTIA KATSANEVAKI

11.45 CXL: Primary therapy in the treatment of ulcerative keratitis
PIETRO ROSETTA

PANEL: G. Alessio, A. Saad, R. Mencucci, A. Mularoni, J.B. Randleman

## DALK

**12.10 - 13.20** Chairman: D. Tan

12.10 The history of keratoplasty
PETER LAIBSON

12.20 Different techniques
SHIGETO SHIMMURA

12.30 Learning curve and complications
VINCENZO SARNICOLA - PATRICIA TORO

12.40 DALK challenges today
PAOLO VINCIGUERRA

12.50 Results and long–term survival
GIORGIO MARCHINI - EMILIO PEDROTTI

PANEL DISCUSSION: L. Buzzonetti, P. Ducoli, G. Perone, P. Rama, N. Shamie

## INFECTIONS IN THE POST-SURGICAL & HIGH RISK PATIENT
## SYMPOSIUM SPONSORED BY THE CORNEA SOCIETY

**14.50 - 15.45** Chairman: D. Tan

14.50 Post–keratoplasty infections
DENISE DE FREITAS

15.00 Post–refractive surgery infections
SHAHZAD I. MIAN

15.10 Infections with KPRO
DONALD TAN

15.20 Infections in immunocompromised & healthcare worker
ELMER TU

PANEL DISCUSSION: M.W. Belin, R. Mencucci, P. Rama, F. Regine

# FRIDAY, 29TH JUNE

## LUNCH COURSES

13.20 - 14.50 - **MAIN ROOM** - COURSE IN ITALIAN ONLY

### LIGHT SNACK COURSE: BROMFENAC: L'ESPERIENZA CLINICA ITALIANA

MAX 130 Persone - Pass presso stand: Bausch & Lomb

**MODERATORI**: ROBERTO BELLUCCI, RITA MENCUCCI
**PANEL**: CAMILLA ALOVISI, MARCO AZZOLINI, ROBERTO BELLUCCI, RITA MENCUCCI, GIACOMO SANFELICI, CLAUDIO SAVARESI

DISCUSSIONE FINALE

13.00 - 14.30 - **ROOM 2** - COURSE IN ITALIAN ONLY

### LUNCH COURSE: THEALOZ - UNA NUOVA OPPORTUNITÀ TERAPEUTICA PER LA SUPERFICIE OCULARE

MAX 150 Persone - Pass presso stand: Théa Farma

**MODERATORI**: PASQUALE ARAGONA, MAURIZIO ROLANDO, VINCENZO SARNICOLA

**RELATORI**: PASQUALE ARAGONA, MAURIZIO ROLANDO, ANDREA LEONARDI, ANTONIO DEL PRETE, ROMINA FASCIANI, SAVERIO LUCCARELLI, PIETRO COLOSI, MARCO LAZZAROTTO, CLAUDIA GUARRACINO, SALVATORE TROISI, ROMOLO PROTTI, FRANCO SPEDALE, ANTONIO LONGO

13.00 - 14.30 - **ROOM 3** - COURSE IN ITALIAN ONLY

### LUNCH COURSE: SOLUZIONI INTEGRATE PER LA CHIRURGIA DEL SEGMENTO ANTERIORE

MAX 50 Persone - Pass presso stand: Zeiss

1. Toric Solution e sistema di allineamento intra–opertaorio
   FABRIZIO CAMESASCA
2. Tecnologia IDIS per la chirurgia della Cataratta video assistita
   ALESSANDRO MORICO
3. Chirurgia refrattiva ALL–FEMTO per il trattamento della miopia
   LEONARDO MASTROPASQUA - MARIO NUBILE
4. ReLEx con femtosecond laser: una nuova opzione in chirurgia refrattiva
   BERTRAM MEYER

**ACCESS TO THE LUNCH COURSES AND THE SYMPOSIA ARE BY INVITATION ONLY OF THE ORGANIZING COMPANIES.
ACCESS PASSES ARE AVAILABLE AT THE RELEVANT STAND.
L'ACCESSO AI LUNCH COURSES E AI SIMPOSI E' SOLO SU INVITO DELLE AZIENDE ORGANIZZATRICI.
IL PASS DI ACCESSO PUÒ ESSERE RITIRATO PRESSO IL RELATIVO STAND.**

# FRIDAY, 29TH JUNE

E.C.M. MAIN ROOM

## PHAKIC IOLs

**15.45 - 17.00** Chairman: V. Orfeo, G. Tassinari

15.45 Overview
DANIELE TOGNETTO

15.55 Iris fixated–IOLs
ROBERTO BELLUCCI

16.05 Phakic–angle–fixated IOLs: torsional stability
OMID KERMANI

16.15 Long–term results with Cachet phakic IOLs
MICHAEL C KNORZ

16.25 Posterior chamber phakic IOLs
PAUL DOUGHERTY

16.35 Phakic IOLs vs refractive surgery or Relex
SCIPIONE ROSSI

PANEL DISCUSSION: A. Franchini, S. Fruscella, V. Maurino, A. Montericcio, S. Morselli, G. Perone

**15.30 - 17.00 ROOM 2 - COURSE IN ITALIAN ONLY**

## SIMPOSIO NIDEK: OPD SCAN III

MAX 40 Persone - Pass presso stand: Nidek

1. I segreti dell' OPD Scan III – Semplicità e alta definizione
   GUIDO BATTARRA
2. L'analisi dell'astigmatismo
   PAOLO VINCIGUERRA
3. La mappa di gradiente, come conoscere il futuro
   PAOLO VINCIGUERRA
4. L'analisi della perdita dell'acuità visiva
   PAOLO VINCIGUERRA
5. La IOL Station
   PAOLO VINCIGUERRA
6. La valutazione dell'aberrazione sferica prima della cataratta – Quando e perché impiantare IOL asferiche
   ROBERTO CARNEVALI
7. Impara a conoscere la tua chirurgia con lenti premium usando l'OPD Scan
   SCIPIONE ROSSI

CONCLUSIONI

# FRIDAY, 29TH JUNE / 17.00 - 19.00

INNOVATIONS - MAIN ROOM

## REFRACTIVE SURGERY

MODERATORS: F. Camesasca, L. Mastropasqua

17.00 Presbyopia correction with the Supracor technique in hyperopic eyes
ROBERTO BELLUCCI

17.06 Emmetropic presbyopia treatment: long–term near vision improvement by optimal keratoplasty
STELLO PECORARO - HARRY GLEN

17.12 Combined femtolasik and corneal inlay to treat hyperiopic presbyopia
MARCO FANTOZZI

17.18 Laser blended vision – a new treatment for presbyopia
KLAUS DITZEN

17.24 Research and trials on Relex, the new form of femtosecond intrastromal lenticular for myopia and astigmatism.
JODHBIR MEHTA

17.30 Three–year Intracor results with pros and cons
SINAN GOKER

17.36 Interest of combining ocular and corneal wavefront data to detect Forme Fruste Keratoconus.(OPD scan)
ALAIN SAAD - DAMIEN GATINEL

17.42 SMILE (Small Incision Lenticular Extraction)
DONALD TAN

17.48 Optimal femtosecond laser parameters to improve the interface quality of the anterior stroma for i–LASIK
SEBASTIANO SERRAO

17.54 Effectiveness and security of LASIK with Visumax 500: preliminary results
EMMA AMASIO BARTOLI

18.00 Femtosecond laser corneal surgery: refractive and therapeutic applications
FILIPPO INCARBONE

18.06 A novel method to measure changes in biomechanics of the entire globe
FARHAD HAFEZI

18.12 New perspectives to utilize biomechanical properties the Corvis® St
SVEN REISDORF

18.18 Femtosecond laser–assisted LASIK to correct medium to high hyperopic defects
LUIGI MOSCA

18.24 OPA LASIK, a new profile for better results
TAMER GAMALY

18.30 Multifocal presbyopia correction with PRESBYTEC GAUSS excimer laser: results and two years follow–up with 15 Italian centers
GIOVANNI CITRONI

18.36 Principles and clinical experience with the Kamra inlay for presbyopia correction (2 years of follow up) Acufocus
ALAIN SAAD - DAMIEN GATINEL

## FRIDAY, 29TH JUNE / 17.00 - 19.00 — INNOVATIONS - *ROOM 2*

### EXCIMER SURFACE ABLATION - PHAKIC IOLs

MODERATORS: G. Alessio, M. Nubile

17.00 Improved visual acuity following PRK surgery using a novel corneal shield
EDWARD MANCHE

17.06 Two year results of toric ICL for KC
VIKENTIA KATSANEVAKI

17.12 Distance variation during accommodation between lens and Acrysof Chachet phakic IOL
SIMONETTA MORSELLI

17.18 A prospective eye to eye comparison of myopic eyes undergoing PRK with wavefront–guided versus wavefrontoptimized technology.
EDWARD MANCHE

17.24 PRK and contact lens
ALBERTO MONTERICCIO

17.30 Safety and effectiveness of Visian ICL in young, low and moderate myopes
PAUL DOUGHERTY

17.36 A prosective eye to eye comparison of myopic eyes undergoing LASIK using two wavefront–guided excimer lasers.
EDWARD MANCHE

17.42 Use of essential amino acids supplementation in the corneal and ocular surface disorders.
ANNA M ROSZKOWSKA

17.48 The effect of limbal marking prior to laser ablation on the magnitude of cyclotorsional error
XIANGJUN CHEN

17.54 Femtosecond Arcuate Incision and Phakic IOL: a combined refractive surgery in pediatric patient
LUCA BUZZONETTI

18.00 PRL implant: 5 years experience
GIUSEPPE PERONE

18.06 PRL implant: tips and tricks
GIULIO MAIONE - FEDERICO BASILICO

18.12 Contact lens and reconstruction of the ocular surface
ALBERTO MONTERICCIO

### MISCELLANEA

MODERATORS: A. Montericcio, P. Rosetta

18.24 Refractive and aberrometric outcome after cataract surgery with toric multifocal intraocular lens implantation
VINCENZO ORFEO

18.30 Tear substitutes and UV protection
GIAMPIERO CATTANEO

18.36 The effect of CXL on the corneal limbus and the re–epitheliazation rate
FARHAD HAFEZI

18.42 Corneal tomography: a basic aid to diagnostic and surgical strategies
MARINO CAMPANELLI

18.48 Phosphates and tear substitutes
GIAMPIERO CATTANEO

## FRIDAY, 29TH JUNE / 17.00 - 18.30 — INNOVATIONS - *ROOM 3*

### CATARACT UPDATE

MODERATORS: B. Billi, P. Ducoli, V. Maurino

17.00 Design and clinical results of a trifocal diffractive IOL (FineVision IOL) – Physiol
ALAIN SAAD - DAMIEN GATINEL

17.06 Comparison in the pseudophakic presbyopia treatment with diffractive multifocal IOLs, refractive multifocal IOLs and pseudoaccommodative IOLs
EMILIO PEDROTTI

17.12 Toric diffractive multifocal IOL versus multifocal IOL with incisional keratotomies for management of cataract, astigmatism, and presbyopia
AMHED ASSAF

17.18 Rotational stability of different types of toric IOLs in cataract patients
ALESSANDRO MULARONI

17.24 PCO and pseudophakic dysphotopsya: what is the IOL design which guarantees the best compromise?
ALESSANDRO FRANCHINI

17.30 Spherical aberration at different pupil diameters before and after aspheric IOL implantation
FABRIZIO CAMESASCA

17.36 Post–LASIK Multifocal IOL implantation
SINAN GOKER

17.42 Assessment after 500 analytical systems with spherical/toric IOLs multifocal produced by the same company
CLAUDIO SAVARESI

17.48 Stromal hydration on clear corneal incision after cataract surgery: an in vivo AS–OCT study
SAVERIO LUCCARELLI

17.54 Comparison of two methods for intraocular lens power calculation after LASIK or RK
PAUL DOUGHERTY

18.00 Using OPD scan III to improve your cataract and IOL surgery
ALAIN SAAD - DAMIEN GATINEL

18.06 The Italian version of the Radner Reading Chart for assessing near vision function
ANTONIO CALOSSI

18.12 Aspheric Toric IntraOcular Lenses: preliminary results
RITA MENCUCCI

18.18 IOL implantation in artificial iris
MATTEO FORLINI

18.24 Clinical performance and patient satisfaction after implantation of new multifocal IOLs: Soleko Fil 611 pv.
DANIELE DI CLEMENTE - CLAUDIO IACOBUCCI

18.30 Comparative evaluation of pseudophakic presbyopia rehabilitation with implantation of accommodative and multifocal (refractive and diffractive) intraocular lenses
EMILIO PEDROTTI

# SATURDAY, 30TH JUNE

E.C.M. MAIN ROOM

## CATARACT UPDATE AND FEMTOCATARACT

**08.30 - 09.30** Chairman: M. Knorz

**08.30** LenSx femtosecond laser
MICHAEL C KNORZ

**08.40** The comparison of manual and femtolaser capsulorhexis
ZOLTÁN Z. NAGY

PANEL DISCUSSION: P. Ducoli, M. Gualdi, G. Lesnoni L. Mastropasqua, V. Sarnicola, P. Vinciguerra

## CONGRESS LECTURE

**09.30 - 09.40**
Management of corneal astigmatism
TERRY KIM

## OCULAR SURFACE RECONSTRUCTION SYMPOSIUM SPONSORED BY ASIA CORNEA SOCIETY

**09.40 - 10.50** Chairman: D. Tan

**09.40** DALK for ocular surface diseases
SHIGETO SHIMMURA

**09.50** Ex–vivo expansion of corneal stem cells on amniotic membrane and their outcome
RAY TSAI

**10.00** HAM for ocular stem cell expansion
JODHBIR MEHTA

**10.10** Regulatory factors for corneal epithelial cell differentiation
CHOUN-KI JOO

**10.20** Clinical application of ex–vivo expanded limbal stem cells: up–to–date and future perspectives
PAOLO RAMA

PANEL DISCUSSION: A. Lambiase, M. Nubile, V. Sarnicola

## PREMIUM IOLs SYMPOSIUM SPONSORED BY ISRS

**10.50 - 12.10**

**10.50** Biometry
GIOVANNI ALESSIO

**11.00** Multifocal Toric IOLs: one year results
OMID KERMANI

**11.10** Accomodative vs diffractive vs multifocal IOLs
SCIPIONE ROSSI

**11.20** Treatment algorithm for the dissatisfied premium IOL patient
BRADLEY RANDLEMAN

PANEL DISCUSSION: A. Franchini, M. Fortunato, A. Galan, V. Orfeo

## FREE BREAKFAST WITH THE EXPERTS FREE

**JUNE 29TH, 2012**

3) J. GUELL: Phakic IOL - 29th
5) V. KATSANEVAKI: Custom ablation in kratoconus - 29th
4) F. HAFEZI: Corneal cross-linking and infection - 29th
11) S. SCHUMACHER: Understanding cross-linking - 29th
13) S. REISDORF: Corneal biomechanics - 29th
14) C. ROBERTS: Corneal biomechanics - 29th
15) V. SARNICOLA: DALK - 29th
18) D. TAN: DMEK - 29th
20) P. VINCIGUERRA: Custom ablation - 29th
22) B. LEE: Penetrating Keratoplasty - 29th

**JUNE 30TH, 2012**

1) M. BELIN: Corneal tomography - 30th
8) P. LAIBSON: Herpes keratitis - 30th
9) H. LUBATSCHOWSKI: Trends of refractive surgery with femtosecond laser - 30th
10) E. MANCHE: Excimer surface ablation in high myopia - 30th
12) Z. NAGY Femtosecond cataract - 30th
16) V. SARNICOLA: Herpetic keratitis - 30th
17) N. SHAMIE: DSAEK - 30th
19) P. VINCIGUERRA: Corneal cross-linking: state of the art and technological innovations - 30th
21) J. WEISS: Corneal dystrophy - 30th

SCHEDULED FRI, 29TH / SAT, 30TH – 07.15 / 08.15 – ONLY FOR ERGIFE PALACE HOTEL GUESTS / MAX 9 PARTICIPANTS FOR EACH BREAKFAST

# WET LABS
## (USING EYE BANK TISSUES)

LIMITED TO 9 PARTICIPANT FOR WET LAB. DURATION: 1 HOUR.

### THURSDAY, 28TH JUNE — WET LAB - *WET LAB ROOM*

**10.00 - 11.00**
1) Amniotic membrane transplantation
MARIO NUBILE

**11.00 - 12.00**
2) DALK – Tan Technique (Big Bubble)
DONALD TAN

**15.00 - 16.00**
4) DSAEK– Sarnicola Technique (By suture)
VINCENZO SARNICOLA

**16.00 - 17.00**
5) DSAEK – Tan Technique (Endoglide)
DONALD TAN

### FRIDAY, 29TH JUNE — WET LAB - *WET LAB ROOM*

**09.00 - 10.00**
6) DALK – Marchini Technique (pd DALK)
GIORGIO MARCHINI

**10.00 - 11.00**
7) DSAEK – Standard Technique
VINCENZO MAURINO - MARK WILKINS

**11.00 - 12.00**
8) DALK – Shimmura Technique (Viscodissection)
SHIGETO SHIMMURA

**16.00 - 17.00**
9) DALK – Sarnicola Technique (Big Bubble – Air Viscobubble)
VINCENZO SARNICOLA

**17.00 - 18.00 WET LAB ROOM**
**MAX 60 Persone - Pass presso stand: SOOFT**

Corneal analysis after combined treatment iontophoresis + UV–A
RITA MENCUCCI

Transepithelial riboflavin distribution and concentration in corneal stroma after iontophoresis prior to collagen crosslinking
FRANCOISE MALECAZE

**CXL treatment with iontophoresis + UV-A: Basic principles, applications and results of the treatment**
PAOLO VINCIGUERRA

**DISCUSSION**

**WET LAB: PRACTICAL APPLICATIONS OF IONTOPHORESIS TECHNIQUE**
EDOARDO STAGNI

WET LAB IN ITALIAN ONLY - BY INVITE ONLY

### SATURDAY, 30TH JUNE — WET LAB - *WET LAB ROOM*

**09.00 - 10.00**
10) Big Bubble Dalk
BARRY LEE

## WET LAB REGISTRATION FEE € 100,00 + IVA

# DOTAZIONE TECNICA DELLE SALE
# TECHNICAL INSTRUCTIONS FOR PRESENTERS

## LINEE GUIDA PER LA PRESENTAZIONE DELLE RELAZIONI

Le sale congressi sono provviste della seguente dotazione tecnica:
- Video proiezione (esclusivamente con sistema DVD)
- Proiezione da computer

E' necessario essere muniti di n. 2 copie del lavoro su CD o DVD da consegnare al centro slides per prova proiezioni. Le presentazioni da PC dovranno essere predisposte con programma POWER POINT su:
- CD or DVD
- Chiavetta USB
- USB Drive

Non è prevista la proiezione di diapositive, lucidi o VHS. Il materiale video o informativo dovrà essere consegnato in lingua inglese al personale tecnico del centro prova proiezioni (centro slides) almeno 3 ore prima dell'inizio della sessione. Non verrà assicurata la proiezione di supporti differenti da quelli sopra indicati e consegnati dopo il termine o direttamente al tecnico di sala.
Non sarà possibile utilizzare il proprio computer, per cui coloro che avranno salvato la propria relazione solo sul PC dovranno riversarne una copia di supporto magnetico (CD, DVD, Pen Disk USB) prima di consegnarla ai tecnici del centro slides. Non sarà possibile proiettare in contemporanea un video e una proiezione da computer, in quanto ogni aula sarà attrezzata con un solo proiettore dedicato alternativamente a proiettare un video o una presentazione da computer. Potranno essere proiettati video all'interno della presentazione. I formati video supportati sono: DVD e MPEG AVI / WMV. I relatori che possiedono video con codec differenti da quelli specificati sono tenuti a portare con la presentazione anche i files di installazione dei codec utilizzati per permettere ai tenici l'installazione.
Tutti i relatori sono pregati di rispettare rigorosamente il limite di tempo previsto per ognuno precedentemente comunicato per iscritto dalla Segreteria. Un minuto prima dell'interruzione, un segnale sonoro/luminoso avvertirà che il tempo a disposizione sta per scadere e l'audio verrà progressivamente disattivato.

## GUIDELINES FOR ELECTRONIC PRESENTATIONS

We recommend that presentations be created with Microsoft PowerPoint. The ROL&SICSSO speaker ready room and technicians are available during the Congress.
We recommend that presenters bring their presentation to the speaker room on any of the following formats listed below. A backup copy is strongly suggested.
- CD or DVD
- Memory Stick
- USB Drive

The speaker ready room is staffed with technicians available to assist with any compatibility issues, assist you with loading a presentation, and answer any questions you may have. You should make sure all fonts appear as expected and all sound/video clips are working properly. When the presentation is to be given, the file will be loaded on the computer in the meeting room from the speaker ready room. Each presentation room will be staffed with an audiovisual (AV) technician, who will assist in starting each presentation. Once the presentation is launched, the presenter will control the program from the podium using a confidence monitor. Internet access is not available during your presentation or in the speaker ready room. **Verification of proper performance, particularly if video is included in the presentation, is essential**. Care must be taken to be certain video clips will play correctly in your presentation. Standard video formats include MPEG AVI, and WMV (Microsoft Windows). Review the Microsoft Knowledge Base article on the web at: **http://office.microsoft.com/en-us/powerpoint/FX100648971033.aspx**
Within each format, there may be different types of compression used. These include MPEG, AVI, WMV. Each format or "codec" has certain features, which affect the final output. You may need to try different settings when the video clips to get the best quality. There is a trade-off between high quality videos and large files. Use short video segments when needed, and try to keep the file to less than 20 Mb.
Macintosh based presentations will not be supported. It is not allowed to bring your laptop to the session.
All presenters are requested to adhere strictly to the time limit previously communicated by the Congress Secretariat. One minute before the break, a sound / light warns you that your time is running out and the audio will be faded out

# 2nd JOINT
# INTERNATIONAL CONGRESS
## Refr@ctive.online and SICSSO

## ABSTRACTS

## *ELENA ALBÈ*

### A CURIOUS COMPLICATION AFTER CORNEAL CROSS LINKING IN AN ADULT PATIENT WITH PROGRESSIVE KERATOCONUS

PURPOSE: To discuss the present state-of-the-art knowledge on the causes of postoperative cross linking (CXL) complications, on available guidelines pertaining pre-operative contra-indications, and evaluate if any other analysis has to be done to prevent serious transitory refractive side effects.

METHODS: In 2009 an healthy 39 years old male underwent in both eyes to Riboflavin-Ultraviolet A-induced CXL with instillation of 0,1%riboflavin-20%dextrane solution 30 minutes before UVA irradiation and every 5 minutes for an additional 30 minutes during irradiation.

Uncorrected visual acuity (UCVA), best spectacle corrected visual acuity (BSCVA), sphere and cylinder refraction, topography, tomography, aberrometry and endothelial cell count were evaluated at baseline and at 1, 3, 6, 12, 24 and 36 months follow-up.

RESULTS: At 1 months his BSCVA decreased significantly in his right eye from 0.8 to 0.6 (P from -1.25 cylinder at 94° to +7.0sf -1.0cyl at 90°. Mean apical corneal power decreased significantly from 40.00D to 31.35 D at one month (Pr pachymetry decreased significantly (Plattest point. No endothelial cell loss was observed during time. UCVA recovered in the next 2 years to 1.0 with no sphere neither cylinder correction. Keratometry and pachymetry recovered in the next two years to preoperative values. At 2 years follow up the patient came in with a diagnosis of spondyloarthritis and HLAB27+. Left eye was treated after 15 days from the first one. Similar but less dramatic changes in refraction and topography were seen, with the recover of BSCVA at one year postop.

CONCLUSION: HLAB27 positivity could change the classic response of collagen tissue to riboflavin-UVA treatment. Therefore a complete rheumatologic check up should probably be suggested to patients to avoid serious but transitory changes in refraction after CXL.

## *ANAS ANBARI*

### AUTOLOGOUS CRYOPRECIPITATE FOR ATTACHING CONJUNCTIVAL AUTOGRAFTS AFTER PTERYGIUM EXCISION.

PURPOSE: To report efficacy, safety, and reliability of autologous cryoprecipitate in pterygium excision surgery and to compare it to the traditional method of using absorbable sutures with regards to surgical time and patient comfort.

METHODS: A study was carried out in a specialized eye clinic in Damascus-Syria. 54 patients (90 eyes) had surgical excision of nasal pterygium (whether primary or recurrent) and an autologous conjunctival grafting.

Patients were distributed to have autologous cryoprecipitate or absorbable sutures (8/0 vicryl) to attach the conjunctival graft. Surgical time was noted and postoperative pain was graded. Follow up period ranged from 6 –18 months (average 12 months).

RESULTS: There were 42 primary and 48 recurrent nasal pterygium excised in a traditional way. All patients had autologous conjunctival grafts from the same eye. 47 patients had Autologous Cryoprecipitate and 43 had sutures to attach the free conjunctival graft. The average pain was significantly lower when glue had been used

## *AHMED ASSAF*

### TORIC DIFFRACTIVE MULTIFOCAL IOL VERSUS MULTIFOCAL IOL WITH INCISIONAL KERATOTOMIES FOR MANAGEMENT OF CATARACT, ASTIGMATISM, AND PRESBYOPIA

PURPOSE: To compare the outcome of multifocal toric intraocular lens with standard multifocal lens combined with incisional keratotomies in patients with pre-existing bilateral corneal astigmatism and undergoing bilateral sequential cataract surgery.

METHODS: Recruited in this study patients with age-related cataract and corneal astigmatism between 1.0 and 2.5 D without other ocular pathology. Bilateral AcrySof® IQ ReSTOR® Multifocal Toric IOL was assigned for group A while patients in group B received bilateral implantation of a AcrySof® IQ ReSTOR® Multifocal IOL combined with limbal relaxing incision. Both groups were age matched. Follow up examinations scheduled at 3wks, 3 months and 6 months postoperatively.

RESULTS: Ucorrected visual acuity (UCVA) for distance was significantly superior in group A. UCVA for near and intermediate distances showed no statistical significant differences. Mesopic contrast sensitivity for group A was significantly superior to group B at 12 and 18 cycles per degree. Photic phenomena reported to be less in group A. Residual refractive cylinder was significantly less in group A (0.45D) compared to group B (0.88D).

## *MARCO ASTORI*

### PLATELED LYSATE IN OCULAR GVHD

AUTHORS: ***Astori M., Mazzucco L., Dolcino D.***

PURPOSE: Can the platelet lysate (PRP) re-ephitelize the Corneal Epithelial Defects of the ocular surface in the chronic Graft Versus Host Disease?

METHODS: the PRP is obtained undergoing 3 thermal shock (-80°+ 37°c)to break the membranes of plateled to release more of the GF. the doses are disposable, prepared in a sterile environment-biohazard hood the product is kept by the patient, should remain fully frozen (-20°) and thawed just before use.

RESULTS: All the patients have shown a clear reduction of needed time for epithelium regeneration and reparative process stabilisation.

## *MARIAROSA ASTORI*

### THE USE OF PRP IN THE OCULAR GRAFT VERSUS HOST DISEASE

PURPOSE: Can the platelet lysate (PRP) re-ephitelize the Corneal Epithelial Defects of the ocular surface in the chronic Graft Versus Host Disease?

METHODS: the PRP is obtained undergoing 3 thermal shock (-80°+ 37°c)to break the membranes of plateled to release more of the GF. the doses are disposable, prepared in a sterile environment-biohazard hood the product is kept by the patient, should remain fully frozen (-20°) and thawed just before use.

RESULTS: All the patients have shown a clear reduction of needed time for epithelium regeneration and reparative process stabilisation.

## *ALESSANDRA BALESTRAZZI*

VISUAL ACUITY AFTER CORNEAL COLLAGEN CROSS LINKING IN PROGRESSIVE KERATOCONUS.

PURPOSE: to evaluate visual and refractive outcomes after corneal collagen cross linking in keratoconus and in iatrogenic corneal ectasia

METHODS: We evaluated 150 eyes with progressive keratoconus or iatrogenic corneal ectasia who underwent standard corneal collagen cross-linking with ultraviolet A light and riboflavin

0.1%. The patient's age was comprise from 9 to 42 years. We conducted follow-up examinations at 1, 3, 6 ,12 months and in some cases at 24 and 36 months after treatment. We reported changes in uncorrected distance visual acuity, corrected distance visual acuity, maximum keratometry value and average keratometry value .

RESULTS: Almost 70 % of the eyes showed improvements in mean uncorrected distance visual acuity and corrected distance visual acuity of about two lines at six months and at 1 year after treatment. The maximum improvement was in the group of patients with preoperative K readings lower than 55 D and with lower spherical defect and in eyes without Vogt's striae before the treatment . Our findings support the utility of early cross linking in patient with keratoconus for the best results in term of visual acuity.

## *EMMA AMASIO BARTOLI*

EFFECTIVENESS AND SECURITY OF LASIK WITH VISUMAX 500: PRELIMINARY RESULTS

AUTHORS: ***Amasio Bartoli E., Piccinini R., Piccinini P., Bartoli E., Arpini L.***

PURPOSE: To test effectiveness and security of Lasix with Visumax 500 in the treatment of every refractive defects: myopia, hypermetropia and astigmatism, included patients in presbyopic age

METHODS: We included 195 eyes of 105 patients affected by myopia, hypermetropia and astigmatism: myopic, hypermetropic and mixed.The average spherical equivalent was -3.28 +-3.35D, the variable defect was from -11.5 sph to +4.5 sph. We used for ours treatments Visumax Femtosecond Laser (Carl Zeiss Meditec), MEL80 Excimer Laser (Carl Zeiss Meditec), Wasca Aberrometer equipped with CRS-Master software (Cerl Zeiss Meditec). Refractive treatments according to the Bartoli/Zeiss method for presbyopia compensation.

RESULTS: One month after the treatment the UCVA was 0.89 +- 0.18, with -0.5 +-0.5D of residual spherical equivalent. The BSCVA was 0.95 +- 0.10. We observed the following intraoperative complications: loss of suction, free cap and opaque bubble layer. We observed the following postoperative complications: striae of the flap, epithelial growth in the interface . We didn't observed in our patients diffuse lamellar keratitis

## *FEDERICO BASILICO*

PRL IMPLANT: TIPS AND TRICKS

AUTHORS: ***Basilico F., Incarbone F., Perone G.***

PURPOSE: To describe the personal 'injection technique' to implant a phakic posterior chamber lens (PRL) implantation in mild to severe myopia correction.

METHODS: video description of the technique

RESULTS: Our experience supports the real effectiveness of the injection technique of a phakic posterior chamber lens (PRL) in mild to severe myopia correction: shorter procedure for the patient, much simpler and safer introduction of the folded lens and lower risk of intraoperative contamination are some of the advantages.

## *CINZIA BATISTI*

ONE YEAR OF APPLICATION IPO-ISOTONIC RIBOFLAVIN IN THIN CORNEAS: EXPERIENCE OF SINGLE ISTITUTION, SIENA

AUTHORS: ***Batisti C., Menicacci F., Fruschelli M., Motolese E.***

PURPOSE: The application in keratoconic eye with corneal thickness at least 400 micron after epithelial removal association iso and ipotonic riboflavin.

METHODS: Corneal thickness at least 400 micron after epithelial removal, oxibuprocaine or tetracaine, abrasio corneae 8 diameter, imbibition with isotonic riboflavin and then pachymetry if cornea thinner than 400 micron swell with hypotonic riboflavin and radiate cornea only clear cornea protect limbal stem cells.

## *ROBERTO BELLUCCI*

PRESBYOPIA CORRECTION WITH THE SUPRACOR TECHNIQUE IN HYPEROPIC EYES

AUTHORS: ***Bellucci R., Cargnoni M.***

PURPOSE: The Supracor technique is a newly developed algorithm to correct for presbyopia in hyperopic Ten eyes of 5 patients aged 48-55 years, affected by hyperopia +1D to +2.5D, and with astigmatism lower than 1D are considered here. Lasik correction of the defect was performed with a 110 µ microkeratome head and a Perfect Vision 217 Zyoptix excimer laser. During the procedure, a central steepening was created, providing +2.0D of positive addition over a 1.5 mm optical zone. Visual acuity, refraction and patient satisfaction were considered in the postoperative. Current follow-up is 6 months.

RESULTS: Best corrected visual acuity was 0 logMAR or better in every eye before surgery, and refraction was +1.78±0.38D. Six months postoperatively, uncorrected distance visual acuity 0.01±0.04 logMAR, and refraction was -0.15±0.30 D. Presbyopia was corrected in every eye, with 8 eyes able to read Jaeger 2 uncorrected, and 2 eyes able to read Jaeger 3 at 40 cm. Transient myopia occurred in the weeks after surgery, and driving spectacles were necessary in 1 patient for the first month.

## *GIANLUCA BILETTA*

COMBINATION OF DSAEK TECHNIQUE AND IOL REMOVAL FROM THE ANTERIOR CHAMBER AND REPOSITIONING WITH IRIS FIXATION IOL

AUTHORS: ***Biletta G.L., D'Amelio S.***

PURPOSE: To demonstrate the effectiveness of this combination technique in cases of bullous keratopathy secondary to the IOL in AC.

METHODS: clincal case series

RESULTS: At 6 months of the follow-up we were able to demonstrate that the cornea achieved a stable clarity after the secondary

implant of the IOL (iris fixation) in the posterior chamber. No intra-op complications were reported (the IOP was stable) This combination technique allows physicians to implant the IOL in the same surgical time to avoid surgical trauma.

## *PAOLO BONCI*

### DALK, INDICATIONS AND METHODS

PURPOSE: La lamellare anteriore profonda aumenta le sue indicazioni: il

risparmio della Descemet anche nei casi più gravi di interessamento corneale cambia significativamente la prognosi della chirurgia del trapianto della cornea.

METHODS: Vengono analizzati a distanza minima di un anno le chirurgie lamellari anteriori eseguite negli ultimi 10 anni (700 lamellari) raggruppate per patologia e analizzate statisticamente.

RESULTS: Si evidenziano i recuperi funzionali, le percentuali di complicanze postoperatorie, le metodologie applicative della tecnica.

## *PAOLO BONCI*

### MUSHROOM PK WITH EXCIMER LASER

PURPOSE: La Pk a fungo nasce da una intelligente idea diassociare i vantaggi di una lamellare anteriore e di una PK. Ampia superficie refrattiva e piccola area endoteliale immunocompetente. La metodica esecutiva prevede l'uso del laser ad eccimeri che contribuisce a rendere la tecnica più semplice e sicura.

METHODS: 17 casi selezionati per caratteristiche e morfologia di danno corneale vengono msottoposti a tale procedura.Vengono analizzati i risultati con follow-up minimo di 9 mesi.

RESULTS: Risultati refrattivi e complicanze intra e postoperatorie vengono analizzate e comparate con tecniche tradizionali.

## *PAOLO BRUSINI*

### POSTOPERATIVE CORNEAL HIGHER-ORDER ABERRATIONS AFTER PENETRATING KERATOPLASTY, DEEP ANTERIOR LAMELLAR KERATOPLASTY (DALK), AND AUTOMATED LAMELLAR THERAPEUTIC KERATOPLASTY (ALTK) FOR KERATOCONUS

AUTHORS: ***Brusini P., Salvetat M.L., Pedrotti E., Miani F., Zeppieri M., Marcigaglia M., Passilongo M., Marchini G.***
PURPOSE: To compare the corneal higher-order aberration (HOAs) measurements in patients with keratoconus (KC), and postoperative patients after penetrating keratoplasty (PK), deep-anterior-lamellar-keratoplasty (DALK) or automated-lamellar-therapeutic-keratoplasty (ALTK) for keratoconus. An age-matched control group with normal corneas was also included in the study. Methods: One eye of the following subjects was considered: 40 non surgical patients with KC; 23 PK; 17 DALK; 18 ALTK (all postoperative patients for keratoconus); and 38 controls. All subjects underwent imaging with a rotating Scheimpflug camera to assess the HOAs from the anterior (ACS) and posterior corneal surface (PCS) within the central 4-mm and 6-mm zones. The conversion of the corneal elevation profile into corneal wave-front data was performed using the Zernike polynomials. Total, 3rd and 4th order HOAs were considered. Differences amongst groups were assessed using the Kruskal-Wallis. RESULTS: The total HOAs from both corneal surfaces were significantly lower in controls than in the other groups ($p<0.001$), as expected. Considering the 3rd and 4th order aberrations of the ACS, the PK group showed significantly higher trifoil, whereas the KC and ALTK groups showed significantly higher coma in comparison with the other groups ($p<0.01$). Considering the 3rd and 4th order aberrations from the PCS, coma appeared significantly higher in KC, DALK and ALTK groups in comparison with controls and PK eyes ($p<0.01$). CONCLUSIONS: The HOAs after DALK and ALTK were comparable, except for coma from the ACS, which was significantly higher after ALTK, indicating a higher irregularity of the central anterior corneal profile. These results may be due to a non-homogeneous residual recipient stromal bed after ALTK compared with DALK, which tends to be thinner in the paracentral region and thicker in the periphery after ALTK.

## *LUCA BUZZONETTI*

### TRANSEPITHELIAL CORNEAL CROSS-LINKING IN CHILDREN: 18 MONTHS FOLLOW UP.

AUTHORS: ***Buzzonetti L., Petrocelli G.***
PURPOSE: to report 18 months follow up after transepithelial cross linking in children.

Methods: 13 eyes with keratoconus were evaluated (mean age 14.4±3.7 years; range 8-18). Corrected Distance Visual Acuity (CDVA), spherical equivalent, K readings, coma, spherical aberration and high order aberrations (HOAs) for 5.0mm pupil, and thinnest point were measured preoperatively and 1, 3, 6, 9, 12, 18 months postoperatively by Scheimplflug camera, as well as the index BCV (Baiocchi-Calossi-Versaci) that allows the evaluation of the presence and of the state of an ectasia through the analysis of specific HOAs. Endothelial cell density and anterior segment OCT were evaluated. A paired Student t test was used to compare preoperative and the 12 and 18 months postoperative data. A P value <0.05 was considered as significant.

RESULTS: CDVA, K readings and HOAs showed significant changes 18 months after treatment ($P<0.05$). Spherical equivalent, coma, spherical aberration, thinnest point and endothelial cell density did not statistically change ($P>0.05$). The mean demarcation line depth was 105µ. No side effects were observed.

CONCLUSIONS: the transepithelial cross linking appears as a safe treatment in children and shows a limited, but favourable effect on keratoconic eyes of pediatric patients 18 months after treatment.

FINANCIAL DISCLOSURE: The Authors have no financial or proprietary interests in this study.

## *LUCA BUZZONETTI*

### FEMTOSECOND ARCUATE INCISION AND PHAKIC IOL: A COMBINED REFRACTIVE SURGERY IN PEDIATRIC PATIENT

AUTHORS: Buzzonetti L., Fortunato M., Petrocelli G., Valente P.

PURPOSE: to evaluate the efficacy of sequential femtosecond arcuate incision and phakic IOL implantation to correct an high post penetrating keratoplasty refractive error in pediatric patient.

METHODS: A 16 years old patient 3 years after a penetrating keratoplasty in RE had a BCVA 0.4 with -12sph and -4cyl axis 50° (0.8 with foramen) and intolerance to contact lenses, while in LE the UCVA was 0.1. A single arcuate incision performed by the

IntraLase femtosecond laser (Abbot Medical Optics) was planned by aberrometric evaluation. Two months after a AcriSof Cachet phakic IOL (Alcon) was implanted. BCVA, corneal topography and aberrometry by Sirius scheimplflug camera (CSO) and endothelial cells count were evaluated pre- and postoperatively. The follow up is 12 months.

RESULTS: two months after arcuate incision BCVA was 0.7 with -11sph and -2cyl axis 180°. One year after Phakic IOL implantation BCVA was 0.1 with +1.0 cyl axis 70°, the endothelial cells count did not show significant change and corneal High Order Aberrations decreased for 3.0 and 5.0mm pupil.

## *ROBERTA CALIENNO*

### S100 EXPRESSION IN NORMAL AND PATHOLOGICAL SCLEROCORNEAL LIMBUS

AUTHORS: ***Calienno R., Curcio C., Lanzini M., Nubile M., Colasante M., Mastropasqua L.***

PURPOSE: Several molecules have been proposed as corneal epithelial stem cell (SC) markers but none of them is able to identify SC in normal or pathological conditions.S100 proteins make up the largest subfamily of the EFhand Ca+binding protein family. The function of S100 is unknown but its expression was already known in pterigium and corneal epithelium in keratoconus.The aim of this study was to evaluate expression of S100 proteins as an early marker of SC deficiency. METHODS: The expression of S100 proteins was evaluated in four healthy sclerocorneal limbus and in five cases of pathological limbus due to severe inflammation: a case of corneal melting and perforation in advanced herpes simplex (HSV) disease, three cases of endophthalmitis and a case of fungal infection were analyzed. All samples were fixed in formalin,embedded in paraffin and stained by immunohistochemistry. RESULTS: In normal limbus, S100 proteins were positive and in particular we observed no difference between different dimension crypts. No expression of S100 was detected in almost all pathological cases.This result suggest that S100 proteins can be useful as marker of early pathological changes in SC niches.

## *ANTONIO CALOSSI*

### THE ITALIAN VERSION OF THE RADNER READING CHART FOR ASSESSING NEAR VISION FUNCTION

AUTHORS: ***Calossi A., Radner W., Boccardo L., Fossetti A.***

PURPOSE: As visual acuity tests are poor predictors of thereal-world function,performance-based tests, e.g., reading speed measurements, can be used for the determination of near visual function. Particularly, when we need to evaluate the performance of a near vision correction, i.e. multifocal IOL or presbyopic refractive procedures, reading acuity as well as reading speed are good predictors of everyday visual function. The characteristics of a good reading chart are: logarithmically diminishing print size, simultaneous measurement of reading acuity and reading speed, and the calculation of one score for reading acuity corrected for the number of reading errors. The original German-language Radner Reading Chart meets all these requirements, and above all emphasizes the principle of 'sentence optotypes' i.e. highly standardized sentences, because sentence complexity also influences reading performance. The aim of this study was to create an Italian version of the Radner Reading Chart according to Radner's strict principles.

METHODS: To develop 36 short Italian optotype sentences for the construction of a test based on the Radner reading test, 41 sentences were constructed in Italian following the procedure defined by Radner to obtain sentence optotypes with comparable structure and the same lexical and grammatical difficulty. Sentences were statistically selected and standardized in 220 normal subjects. The most equally matched sentence optotypes in terms of reading speed and number of reading errors were selected for the introduction and printing of the first Italian version of the Radner Reading Chart.

RESULTS: The mean reading speed of the test persons was 186.5 +/- 31.3 w/min. 36 phrases fulfilled the test item criteria for the reading chart: mean +/- 3.6%. The reliability analyses yielded an overall Cronbach's alpha coefficient of 0.98. The 36 short single Italian sentences were highly comparable in syntactical structure; number, position, and length of words; lexical difficulty; and reading length. The Italian Radner Reading Chart is precise and practical and therefore useful for research and clinical practice to simultaneously measure near reading acuity and reading speed.

## *FABRIZIO CAMESASCA*

### SPHERICAL ABERRATION AT DIFFERENT PUPIL DIAMETERS BEFORE AND AFTER ASPHERIC IOL IMPLANTATION

PURPOSE: To prospectively evaluate the total, corneal and internal ocular spherical aberration before and after implantation of SN60WF, an IOL with an aspheric posterior surface and a negative mean Z(4,0) of -0.20 µ, at different pupil diameters.

METHODS: All eyes underwent complete ophthalmological examination and high-order aberrations (HOA) evaluation under mesopic conditions with NIDEK OPD aberrometer preoperatively and one month after surgery. Wavefront aberrations were reconstructed using 3rd through 6th order Zernike polynomial decompositions for a 3, 4, and 5 mm pupil.

RESULTS: Sixty-three eyes of 46 patients – mean age 71.41 ± 9.85 - underwent uneventful cataract surgery with topical anesthesia and insertion of an Alcon SN60WF aspheric IOL through a 3.2 mm incision. Mean IOL power was +20.38 ± 4.03 D (range: +29.50 D to +9.00D). Mean follow-up period was 19.90 ± 9.40 days. Corneal spherical aberration remained unchanged. Internal SA remained unchanged for a 3 mm pupil (from 0.04 ± 0.03 µ to 0.03 ± 0.02 µ), decreased significantly for a 4 mm pupil (from 0.13 ± 0.16 µ to 0.08 ± 0.06 µ), and remained unchanged for a 5 mm pupil (from 0.28 ± 0.23 µ to 0.26 ± 0.24 µ). Postoperative UCVA was 0.73 ± 0.29, and BSCVA was 0.92 ± 0.19 with -0.14 ± 1.19 sph, -0.62 ± 0.59 cyl (-0.43 ± 1.17 SE).

CONCLUSIONS: Insertion of this aspheric IOL decreased internal SA for a 4 mm pupil, bringing its total value towards normal, noncatararactous eye values. Smaller or larger pupil measurements showed no decrease in internal SA.

## *MARINO CAMPANELLI*

### CORNEAL TOMOGRAPHY: A BASIC AID TO DIAGNOSTIC AND SURGICAL STRATEGIES

The author describes the main features and the limits of Orbscan II tomograph and its applications in corneal pathology: screening and follow up of keratoconus and refractive surgery, special strategies in the follow up of PKP, tomographical approach to incisional surgery for congenital and surgical astigmatism.

## *PIERA CAPRA*

COLLYRIUM WITH ELEDOISIN STIMULATING LACRIMAL SECRETION

PURPOSE: Clinical experience of a collyrium stimulating,not substituting lacrimal (and salivary)secretion as it acts on M3 cholinergic muscarinic receptors of basolateral membrane of acinar and ductal cells of lacrimal (and salivary) gland

METHODS: Four groups of patients with poor lacrimal secretion were controlled subjectivelly and objectivelly at the beginning of treatment and after treatment;this consisted in a topical administration of 5-20 micrograms of collyrium six times /day for a period varying from 10 to 60 days

RESULTS: Seven of ten patients of the first group had a good result of the conditions of ocular surface:five patients of second group had a very good result:the result was good in seven of nine patients of the third group.The fourth group was composed of 22 patients of Gougerot-Sjogren syndrome.In 20 cases the objecive coditions of the cornea were better:in 19 cases patients felt subjectivelly, too, better. In two cases collyrium was not tolerated.

## *CIRO CARUSO*

UV-A RAYS ABSORPTION IN HUMAN CORNEAS BEFORE AND AFTER TRANS-EPITHELIAL RIBOFLAVIN APPLICATION: AN EXPERIMENTAL STUDY

AUTHORS: ***Caruso C., Barbaro G., Troisi S., Pacente L., Del Prete A.***

PURPOSE: experimental study to determine the absorption percentages of ultra-violet A (UV-A) rays in human corneas after topical application of a riboflavin solution.

METHODS: we measured the UV-A energy delivered from the posterior surface of 10 corneas under UV-A irradiation (3 mW/cm2) before and at different times after topical application of a riboflavin solution as occurs in trans-epithelial cross-linking (TE-CXL).

RESULTS: Corneal UV-A average absorption percentages were: 59% (1.23 mW/cm2) without solution; 79% (0.62 mW/cm2) after 30 minutes of topical solution application and following washing with BSS; 70% (0.90 mW/cm2) after 30 minutes of continuous UV-A irradiation. CONCLUSION: the data suggest an intra-stromal riboflavin consumption due to UV-A rays (186 molecules/104 photons) and that UV energy in TE-CXL should not exceed 1.5mW/cm2.

## *CIRO CARUSO*

CHANGES IN STUDENT TEST RESULTS IN KERATOCONUS-AFFECTED PATIENTS AFTER VISUAL ACUITY MEASUREMENTS WITH DIFFERENT SCALES: STATISTICAL AND MATHEMATIC ISSUES.

AUTHORS: ***Caruso C., Barbaro G., Troisi S., Pacente L., Del Prete A.***

PURPOSE: To determine the best standards in measuring visual acuity for statistical and experimental purposes in keratoconus-affected patients undergiung Trans-epithelial cross-linking.

METHODS: 25 eyes of 19 keratoconus-affected patients (11 males; 8 females, mean age 26.68 years, std. dev. 7.44 years) were selected. Their uncorrected visual acuity (UCVA) was measured using Snellen and LogMAR scales before and 6 months after trans-epithelial cross-linking treatment. Mathematical and statistical formulae were applied on the outcomes of visual acuity measures.

RESULTS: Student tests showed different results when the same values of visual acuity were expressed in the Snellen scale (P>0.29), in the LogMAR scale (P>0.09) and in term of the minimum angle of resolution (Pth base 10 of the LogMAR measures.

## *GIAMPIERO CATTANEO*

*TEAR SUBSTITUTES AND UV PROTECTION*

Novel formulations and drug delivery technologies were the main driver of innovation in Pharmaceutical industry in the last decade, since the discovery of real innovative new chemical entities was less fruitful. This trend is expected to be confirmed also in the future with few exceptions. In ophthalmology preservative-free multi-dose eye drop dispenser is a good example of innovation, solving major of the current issues associated with ophthalmic multidose devices. Another example of innovative approach is the ultraviolet screen ingredient added to a tear substitute eye drop preparations to protect the eyes from the effects of light.

Human exposure to UVB radiation from sunlight is increasing with ozone depletion and UVB radiation are known to induce reactive oxygen species generation, which in turn causes cellular damage and a significant decrease in corneal antioxidant protective mechanisms, Tests in animals models showed the efficacy of eye drops containing an UV absorber (actinoquinol) combined with hyaluronic acid (an anionic nonsulfated mucopolysaccharide) that significantly reduced the ocular disturbances evoked by the UVB doses. Actinoquinol/hyaluronic acid protected the rabbit cornea from changes in corneal thickness and microscopical damage induced by UVB radiation at a dose equivalent to three repeated daily exposures of 2.6 hrs of solar UVB radiation impinging on the human cornea. Good tolerability in humans was also confirmed. The absorption ability of actinoquinol/hyaluronic acid drops is very important not only for young people with healthy eyes performing outdoor activities in sunny weather, but also for older people who have a similar antioxidant content in their tears as do young people, but a lower tear flow rate. Therefore, older subjects have a poorer overall defense against photooxidative and other oxidative processes. This could predispose older persons to corneal stress and the development of dry eye disease.

## *GIOVANNI CITRONI*

MULTIFOCAL PRESBYOPIA CORRECTION WITH PRESBYTEC GAUSS EXCIMER LASER:RESULTS AND TWO YEARS FOLLOW-UP WITH 15 ITALIAN CENTERS.

J want to report with two Years Follow - Up our experiences to treat Presbyopia in ametropic Patient with satisfactory result.

The average postoperative refraction equivalent spherical in treated patients was -0.49 ± 0.52 D at 1 month, -0.64 ± 0.46 D at 3 months and -0.18 ± 0.25 D at 12 months.

ABSTRACT: Purpose :Report our experiences and Follow-up in the treatment of presbyopia with multifocal correction of the cornea obtained with the excimer laser in patients with Myopia

Hyperopia and Astigmatism

METHODS: Ametropic 156 patients (310 eyes), mean age 52.2 years, were treated with PRK laser multifocal with PRESBYTEC GAUSS Excimer Laser in 15 Italian Centers

RESULTS:In all cases we obtained a natural visual acuity satisfactorily for near vision, as that obtained for far vision. In no case have lost lines of correct visual acuity.

CONCLUSION: Correction of presbyopia with multifocal corneal excimer laser for ametropic patients in our experiences , was one refractive procedure safe, accurate and reproducible.

We should confirm the results obtained with a multicenter study with a wider follow-up .

## *KLAUS DITZEN*

### LASER BLENDED VISION – A NEW PROCEDURE TO CORRECT PRESBYOPIA.

PURPOSE: Description of an new corneal excimerlaser-surgery to correct presbyopia with LASIK.

METHODS: LASIK was done bilateral simultaneously with the Schwind Pendula Microkeratom in combination with the Carl-Zeiss-Meditec Excimerlaser MEL 80. There were treated 18 myopic and 23 hyperopic eyes, age – range from 41-54 years. The dominant eye was corrected to zero, the non-dominant eye to -1,5 D.

RESULTS: The outcomes after Laser Blended Vision showed a good subjective acceptance and satisfaction. There were a good stability, safety and predictability. Postoperatively all patients needed no reading glasses. No nightvision and contrast-sensitivity problems were noted. Binocular vision was reduced only in the first postop period.

CONCLUSIONS: Laser Blended Vision correction for presbyopia combines the advantage of micro-monovision and increased depth of field in both eyes. The full corrected dominant eye and the intended undercorrected non-dominant eye showed a satisfactory neural adaption.

## *PAUL DOUGHERTY*

### SAFETY AND EFFECTIVENESS OF VISIAN ICL IN YOUNG, LOW AND MODERATE MYOPES

PURPOSE: 104 eyes of 56 patients who underwent Visian ICL surgery by a single surgeon (PJD) with mean follow-up of 13.1 (range 3-50) months and mean age of 29.6 (range 21-40) years were studied to evaluate the safety and effectiveness of Visian ICL in young, low and moderate myopes.

METHODS: Pre-operatively, these eyes had a mean BCVA of 20/21, mean spherical equivalent of -7.0 +/- 1.6 (range 3.0 to 9.9) D and mean cylinder of 1.0 +/- 0.9 (range 0 3.0) D. 29 eyes (27.9%) required intra-op LRI. 19 eyes (18.3%) required post-op enhancement with LASIK, PRK or LRI. At the last post-op visit, these eyes had a mean UCVA of 20/21.1, mean BCVA of 20/19.5, mean spherical equivalent of -0.1 +/- 0.3 D, and mean cylinder of 0.3 +/- 0.7 D. 88/104 eyes (84.6%) had pre-op UCVA equal or better than pre-op BCVA, and 27/104 eyes (26.0%) had post-op UCVA better than pre-op BCVA. RESULTS: Of the 90 eyes that had 20/20 or better pre-op BCVA, 75/90 (83.3%) had UCVA of 20/20 or better, and 21/90 (23.3) were 20/15 or better. 32/104 eyes (30.8%) gained 1 or more lines of BCVA while only 4/104 (3.8%) lost 1 line of BCVA (all 20/15 to 20/20). No complications were seen at the last follow-up visit including cataract, lens opacity, glaucoma or corneal failure with the exception of 4 eyes of 2 patients with mild dry eye symptoms.

## *PAUL DOUGHERTY*

### COMPARISON OF TWO METHODS FOR INTRAOCULAR LENS POWER CALCULATION AFTER LASIK OR RK

PURPOSE: To determine whether keratometry values obtained with an RGP contact lens over-refraction (CTL) are more accurate than those obtained with the Zeiss IOLMaster (IOM) in predicting cataract surgery manifest refraction spherical equivalent (MRSE) outcomes of patients with a prior history of LASIK or RK.

METHODS: Fifty-two eyes of 33 patients were included: 9 H-LASIK eyes, 27 M-LASIK eyes and 16 RK eyes. Charts were analyzed to evaluate the accuracy of both methods in determining the 3-month post-op MRSE using the HofferQ formula for eyes 23.0 mm.

RESULTS: In the H-LASIK group, the mean of the absolute differences between the actual MRSE and the target MRSE was less (p=0.001, paired t-test) for IOM (1.10 +/- 1.22 D) than for CTL (1.49 +/-1.20 D). In the M-LASIK group, the mean of the absolute differences was less (p=0.003) for IOM (1.11 +/- 1.07 D) than for CTL (1.52 +/- 1.11 D). In the RK group, the mean of the absolute difference was similar (p=0.60) for CTL (1.37 +/-1.00 D) and IOM (1.49 +/- 1.05 D).

## *MARCO FANTOZZI*

### COMBINED FEMTOLASIK AND CORNEAL INLAY TO TREAT HYPERIOPIC PRESBYOPIA

AUTHORS: ***Fantozzi M., Malandrini A., Catanese AM, Canovetti A., Menabuoni L., Lenzetti I.***

PURPOSE: To evaluate a combined refractive treatment to improve near vision in presbyopic patient with hyperopia.

METHODS: A prospective, nonrandomized, clinical study of 24 eyes of 12 hyperopic patients (mean age was 52.87±3.64 years) who had undergone bilateral laser in situ keratomileusis (LASIK) to correct their hyperopia using 150 kHz AMO Intralase femtosecond laser and, three months later, who had undergone implant of corneal inlay (Flexivue Microlens, Presbia) in their non dominant eye to correct presbyopia. Mean preoperative refractive error was +1.89 ± 0.75 diopters (D) sphere with 0.54 ± 0.36 D cylinder: all patients received full distance refractive correction. All patients were required to attend follow up at 1 week and 1,3 and 6 months.

RESULTS: Twelve eyes completed 6-month postoperative follow up: mean corrected visual acuity was 20/20 ± 1 line at six months. Monocular mean uncorrected near visual acuity was J8 (0.482±0.925 logMAR) preoperatively, J2 (0.139±0.851 logMAR) at 1 months, J1-J1+ (0.05 ± 0.054 logMAR) at 3 months. Contrast sensivity reduction was clinically insignificant. Combined surgery with hyperopic LASIK and corneal inlay was effective and stable over 6 months, also the Flexivue microlens improved near visual acuity with minimal impact on UDVA or mesopic contrast sensitivity in the implanted eye. This treatment significantly reduced spectacle dependence.

## *PAOLO FOGAGNOLO*

THE EFFECTS OF TOPICAL COENZYME Q-10 AFTER CATARACT SURGERY.
A CLINICAL AND CONFOCAL STUDY.

PURPOSE: To evaluate the postoperative effects of topical coenzyme Q-10 (CoQ10) in patients who underwent cataract surgery.

METHODS: 40 consecutive patients who underwent uneventful cataract surgery (3.2-mm temporal incision, phacoemulsification+IOL in the bag) were treated with topical antibiotics and corticosteroids for 2 weeks after surgery and, thereafter, were randomized to receive CoQ10 or saline solution (SS) twice daily for 9 months.

Patients received the following tests before surgery and at day 14, and month 3, 6, 9:

non-invasive break-up time (NIBUT), Schirmer test (ST), BUT, aesthesiometry (AE), in vivo confocal microscopy of the sub-basal nerve plexus of the cornea (SBP); a questionnaire for ocular surface (OSDI) was also recorded. The density of the sub-basal nerves was calculated inthe central (CFD) and temporal (TFD) cornea.

RESULTS: At day 14, surgery induced a reduction of CFD and TFD respectively of 25-35% and 50%; indices of ocular surface stability were all impaired. The treatment with CoQ10 was associated with faster nerve regeneration than SS (at month 3, CFD

+1.5±1.9 v +0.2±1.8, P=0.04, and TFD +2.5±1.7 v ¬+1.0±1.6, P=0.007; at month 6, TFD +2.7±1.9 v +1.4±1.5, P=0.02) and better stability of ocular surface (NIBUT and BUT) throughout the study. Adherence to treatment was 85-93%; no relevant side effects were found, apart from occasional burning in 10% of CoQ10 patients.

## *CESARE FORLINI*

IOL IMPLANTATION IN ARTIFICIAL IRIS.

AUTHORS: ***Forlini C., Bratu A. (Department of Ophthalmology, "S.Maria delle Croci" Hospital, Ravenna, Italy), Forlini M. (Eye Clinic, University of Modena, Italy), Rossini P. (Department of Ophthalmology, "S.Maria delle Croci" Hospital, Ravenna, Italy)***

PURPOSE: Nearby cosmetic IOL and pupillary reconstruction,the artificial iris is a bettersolution. We show ourstrategy to suture a foldable IOL on the backsurface of the artificial iris to achieve a cosmeticand refractive result on postraumatic aniridia

METHODS: we reviewed 2 eyes with combined anterior and posterior segment injuries. Open-sky surgery technique and mini-invasive 25/23G system was used to repair ocular injuries, necessitating the use of TKP for exploration and reconstruction. But, at the end, the iris was too much destroyed for reconstruction. So, after 3 months, we performed artificial iris (Dr. Schmidt Intraocularinsen Artificialiris ) implantation with intraocular lens suturing at the artificial iris.

RESULTS: In these cases with posttraumatic aniridia, the artificial iris with intraocular lens was stable. In the case of posttraumatic aniridia, the artificial iris with suturing IOL on the back surface of the artificial iris is a good option for cosmetic and refractive result.

## *CATERINA GAGLIANO*

ROLE OF LIPID BASED COMPOUNDS ON DYSFUNCTIONAL TEAR SYNDROME ASSOCIATED WITH COMPUTER USE

AUTHORS: ***Gagliano C., Amato R., Rocca D., Scollo D.***

PURPOSE: Dysfunctional tear syndrome has shown a marked increase due to visual display terminal (VDT)use. Reduced blinking while focusing can have a direct effect on the spread across ocular surface of tear film and on the delivery of lipid secretion from MGs to the lid margin. We performed a study to determine the association between VDT work duration and changes in tear film status, precorneal tear stability, lipid layer status and MGs secretion. The effecacy of lipid based compounds in the management of dry eye in visual display terminal users was analyzed.

METHODS: Sixty adult subjects who used computers 4 hours or more per day were divided into dry eyesufferers and controls based on their scores on the Ocular Surface Disease Index (OSDI). The outcome measures evaluated were dysfunctional tear syndrome (DTS) level, meibomian gland disease grade, Schirmer test result, fluorescein tear break-up time, osmolarity, corneal fluorescein staining grade, lisamine staining (Marx line), and irritative eye symptoms. We compared the effects of sodium hyaluronate and lipid based compounds in alleviating the symptoms and signs of dry eye related to computer use.

RESULTS: In all patients examined, evaporative dry eye (64%) was the most common type, followed by the mixed evaporative and aqueous tear deficiency (25%) types. We observed a positive correlation between signs and symptoms of lipid deficiency of the tear film both in subjects with dry eye than in controls when using the computermore than 5 hours. We showed that treatment with lipid based compounds significantly

## *CATERINA GAGLIANO*

INFLAMMATORY MEDIATORS IN TEARS: WHAT ARE THE SOLUTIONS?

The physiologically protective mucosal immune system of the ocular surface consists of lymphocytes, accessory leukocytes and soluble immune modulators. Their involvement has also been observed in inflammatory ocular surface diseases, including dry eye syndrome. The most important factor in the various forms of inflammation of the ocular surface including the stages of severe dry eye, is the presence of defects and epithelial cell activation with an exponential growth of sub-clinical inflammation and inflammatory cytokines with potential activation of T cells and deregulation resident of the mucosal immune system. The different events of the ocular surface may lead to epithelial alterations . Both forms - reduced secretion and evaporative dry eye that forms hesitate in chronic mechanical irritation. The form evaporative is linked to a deficiency of MGD lipid and results in tear hyperosmolarity that directly exerts an activation cell and a reduced tear clearance with an increase of inflammatory cytokines. The persistent subclinical inflammation, modulated by a deregulation of the EALT, leads to an altered balance in cell differentiation and tissue remodeling, which typically results in the squamous metaplasia of the ocular surface.

We have on the ocular surface physiological mechanisms that contrast the inflammatory cascade. Today, it is possible to improve the compensatory responses including endogenous antiinflammatory, neuroprotective mechanisms and appropriate vascular remodeling using oxygenation pathways of arachidonic acid and phospholipids.

## *TAMER O. GAMALY*

### OPA LASIK, A NEW PROFILE FOR BETTER RESULTS

PURPOSE: To analyze the results of Optimized Prolate Ablations (OPA) profile of the Nidek NAVEX excimer laser system, laser in situ Keratomileusis (LASIK), for the for correction of compound myopic astigmatism. VENUE: MAGRABI Eye & Ear Hospitals & Centers, Muscat-OMAN. METHODS: In a prospective study, OPA LASIK was used to treat patients with compound myopic astigmatism. The study included 32 eyes of 16 patients. All eyes were measured by the Nidek OPD-Scan II, averaging of 5 maps were done, and then treated with the OPA profile. TED and OTE were used.

RESULTS: Mean follow-up was 6 months. At baseline, the mean preoperative spherical equivalent was -3.3 D. At last follow-up, UCVA, refraction and BSCVA were measured as well as the wave front data.

CONCLUSIONS: OPA LASIK with the Nidek NAVEX system is safe, effective and predictable in correcting compound myopic astigmatism. Prolate cornea over the mesopic pupil was achieved (more physiological).

## *HARRY GLEN*

### EMMETROPIC PRESBYOPIA TREATMENT: LONG-TERM NEAR VISION IMPROVEMENT BY OPTIMAL KERATOPLASTY

AUTHORS: ***Glen H., Rodgers K.J., Berry M.***

PURPOSE: To evaluate the safety and effectiveness of the NTK Optimal Keratoplasty (Opti-K®) device and procedure for treating eyes with emmetropic presbyopia to achieve uncorrected near visual acuity (UNVA) improvement while maintaining (or improving) uncorrected distance visual acuity (UDVA).

METHODS: 63 eyes with emmetropic presbyopia (MRSE = -0.25 to +0.75 D; mean add: 1.97 ± 0.37 D) of 33 patients (28 female, 5 male; mean age: 50.1 ± 5.5 y) received primary treatments (Txs) by the NTK Opti-K® device (using laser thermal keratoplasty with a sapphire applanation window for cornea epithelium protection) in order to achieve UNVA improvement. 41 eyes also received staged secondary Txs. Patients were treated by a multifocal vision protocol for "best" UNVA improvement in both eyes. Follow-up (f/u) extends to 26m post-secondary Tx.

RESULTS: Safety – No adverse events or significant (p been observed. Effectiveness – Geometric mean (gm) UNVA improvements were significant (p to a final value of 2.0 ± 1.9 lines at 26m. Gm UDVA improved at most f/u times. "Optimal keratoplasty" has been achieved - corneas have been reshaped to improve UNVA while improving or preserving UDVA. Patient neuroadaptation to "multifocality" or "blended vision" produced by Opti-K® occurred immediately post-Tx.

CONCLUSIONS: In eyes with emmetropic presbyopia, optimal keratoplasty (Opti-K®) appears to be safe and effective for improving UNVA while retaining UDVA. The procedure is noninvasive, simple, rapid, comfortable and repeatable. Although UNVA improvement is temporary, patients have elected to have additional Opti-K® Txs when needed to maintain "vision rejuvenation".

## *SINAN GOKER*

### VISUAL RESULTS FOLLOWING IMPLANTATION OF A REFRACTIVE MULTIFOCAL IOL IN ONE EYE AND PRESBY-LASIK SUPRACOR IN THE CONTRALATERAL EYE

AUTHORS: ***Goker S., Ayoglu B.***

PURPOSE: To compare distance and near visual results of mixing & matching Supracor presbylasik in one eye and Mulitfocal IOL in the contralateral eye and evaluate the benefits of combining 2 different methods.

METHODS: 10 presbyopic patients aged between 49-59 had unilateral Supracor presbylasik (Technolas 217p) and the alter eye implanted refractive Restore (Alcon) multifocal IOL.Follow-up time is available 6-12 months(mean: 9,2 months). Distance, near and intermediate visual acuities assessed monocular and binocularly. The results compared with 10 bilaterally multifocal IOL implanted eyes and bilaterally Supracor performed 10 patients at the same age and similar refraction . Wavefront analyzes,topographic changes and patient satisfaction also determined.

RESULTS: Visual outcomes and patient satisfaction is very good in mix&match group. Supracor eyes distance visual acuity compromises on the first few months because of myopic shift and the recovery time is longer and the eyes with IOL distance visual recovery was faster and better but near vision gain found same, intermediate vision was better in supracor eyes. None of the patients in mix group suffered about halos. Refractive lens exchange or corneal presbylasik algorithms are both good and safe options with some challenges and different desadvantages. Combining both methods gives better results and limits the expected complications.

## *SINAN GOKER*

### THREE-YEAR INTRACOR RESULTS WITH PROS AND CONS

PURPOSE: To present the long term results of IntraCor presbyopia treatment technic

METHOD: In a prospective clinical study IntraCOR presbyopic laser correction performed on 123 eyes of 79 mild hyperopic or emmetropic patients latest results are evaluated. Preoperatively routine eye examination included distance vision(Snellen) and near vision (Jaegger), intraocular eye pressure, corneal thickness, fundoscopic evaluation . The patients underwent intrastromal photodistruption with Femtec femtosecond laser. The photodistruption pattern customised to each patient regarding keratometric values, refraction, age and corneal thickness. The patients followed post operativley 1st day, 1st week and 1st month, 6th month and 12th months.

RESULTS: The mean age of the patients is 50.8 (44-60). Follow up time is 18..4 mo(6 month-48 months) since February 2008. 4 year results revealed a stable Uncorrected Near Visual Acuity(UNVA) with statistically significant gain from mean J12.9 to J1.6 (J7-J1) ((p< 0.001). %10 eyes lost 1 snellen line and %11.6 eyes lost 2 Snellen lines on Best Corrected VA because of late onset of corneal haze or decentered treatment zone(2 eyes).

On %20.1 patients needed enhancement treatment. 24 eyes had performed PRK, 11 eyes Lasik and 10 eyes Arcuate Keratotomy. The results of enhancemnt treatments presented and discussed which way is best for these patients.

CONCLUSION: After the learning curve ,we changed our patient selection and postoperative medical protocol and the recent results appear with better results. Intracor shows stable refractive outcomes and %80 patient satisfaction in presbyopia correction. But it is hard to do enhancement and most complications if occured are not reversible.

## *FARHAD HAFEZI*

### THE EFFECT OF CXL ON THE CORNEAL LIMBUS AND THE RE-EPITHELIAZATION RATE

PURPOSE: Corneal collagen cross-linking (CXL) is a technique to arrest primary (keratoconus and pellucid marginal degeneration) and secondary (iatrogenic) keratectasia. CXL in patients suffering from Pellucid marginal degeneration(PMD) requires UVA irradiation close to the inferior limbus. Currently, there is controversy whether the limbal stem cells may suffer from UVA irradiation or not. Many surgeons cover the limbus and the peripheral cornea, which might compromise the therapeutic effect of CXL for PMD. We have tested the effect of CXL on the corneal limbus in an experimental setting.

METHODS: We performed epi-off CXL in male New Zealand White Rabbits using 1) various irradiation areas (central cornea alone, whole cornea including the entirelimbus), 2) UVA light at 365 nm, 3) various intensities (3mW, 10mW) and 4) various irradiation durations (10 min, 30 min). The right eye was the treated eye and the left eye served as control. Investigations include light microscopy, immunohistochemistry, Western blotting and rt-PCR.

RESULTS: Preliminary data demonstrate an absence of thrombosis of limbic vessels and a complete re-epithelialization of the cornea within 48 hours, irrespective of UVA intensity and/or duration of irradiation. The rate of re-epithelialization is an indirect indicator for the regenerative capacity of limbal stem cells.

CONCLUSIONS: Direct irradiation of the corneal limbus does not affect the efficacy of corneal re-epithelialization. This might indicate that the limbal stem cells keep their regenerative capacity even when irradiated with UVA. CXL with eccentric irradiation for the treatment of PMD can be performed without shielding the corneal limbus.

## *FARHAD HAFEZI*

### A NOVEL METHOD TO MEASURE CHANGES IN BIOMECHANICS OF THE ENTIRE GLOBE

AUTHORS: ***Hafezi F., Richoz O.***

PURPOSE: Some ocular diseases (i.e. malignant myopia) are linked to abnormal scleral biomechanical properties. A weakened sclera subjected to constant intraocular pressure (IOP) may lead to progressive elongation of the eye and some glaucoma diseases could be caused by a excessive scleral rigidity mainly in the optic nerve head. We developed an easy-to-use, inexpensive and sensible system to measure changes in the biomechanical properties of the globe.

METHODS: After extracting the lens and vitreous with a cannula via the optic nerve head, the cannula is placed in the vitreous cavity and is connected to a manometer to control IOP. The globe is then placed in a paraffin seal chamber to measure volume changes via fluid displacement (Fig. 1). We analyzed the volume modification in five globes by changing the IOP. Compliance was calculated by dividing the volume modification through the pressure modification by averaging 5 measurements and performing a trendline calculation.

RESULTS: All eyes showed distinct volume expansion for low pressure modifications (first 10 mmHg). Volume expansion slowed down when IOP was raised by up to 20 mmHg.

The mathematical model confirms our observation ($\Delta V/\Delta P = 0$ when $P > 20$) (Fig. 2).

CONCLUSIONS: This method shows promising results but needs further experimentation to better investigate its reliability.

## *JAVAD HASHEMIAN*

### THE VISUAL AND REFRACTIVE OUTCOMES OF ACRYSOF TORIC INTRAOCULAR LENS IN SUBJECTS WITH CATARACTS AND CORNEAL ASTIGMATISM

PURPOSE: To assess visual and refractive outcomes and rotational stability after phacoemulsification with toric intraocular lens (IOL) implantation.

METHODS: This prospective, nonrandomized, and selfcontrolled study included 48 eyes of consecutive patients with more than 1.50 diopter (D) of preexisting corneal astigmatism having phacoemulsification with AcrySof Toric IOL implantation (Alcon Laboratories Inc, Fort Worth, Texas, USA). Uncorrected visual acuity (UCVA), best corrected visual acuity (BCVA), refractive sphere, and keratometric and refractive cylinder were recorded preoperatively and 2 and 6 months after surgery. Toric IOL axis shift was also measured.

RESULTS: Preoperatively, 100% of patients BCVA were lower than 20/40. At 6 months postoperation, UCVA was 20/40 or better in95.8% of the eyes, with 66.6 % achieving 20/25 or better. 100 % of eyes achieved 20/40 or better BCVA. Mean refractive cylinder was reduced significantly after surgery from 2.800 D to0.901 D (P es evaluated).

## *DANIELE DI CLEMENTE*

### CLINICAL PERFORMANCE AND PATIENT SATISFACTION AFTER IMPLANTATION OF NEW MULTIFOCAL IOLS: SOLEKO FIL 611 PV.

AUTHORS: ***Iacobucci C., Di Nardo E., Di Clemente D., Billi B.***

PURPOSE: To determine the results and the visual performance following an implantation of a new Multifocal refractive iol for cataract surgery able to avoid postoperative visual problems In common with other traditional multifocal IOLs

METHODS: This IOL has central area with 3,75 D. progressive additional power steps and contiguous area has additional of 2,1 D.,so the principle of optical working never creates double pictures at the same time on optical axis,but only one collimate whit retina 462 eyes were enrolled in this retrospective study. 76 patients were performed with bilateral implantation ,all with a new multifocal IOL-Soleko Fil 611 pv,Italy-.

Were analized UCVA and BCVA for distance, near and interme-

diate vision. Vision was measured using ETDRS charts,including high and low contrast VA and glare /optical aberrations.

RESULTS: Preliminary results at one year following surgery are presented.

The patients were divided in three groups: A, B, C.

A: 180 patients,average age 69,63 y., monocular UCVA for distance 20/20 : 75%

B: 224 patients,average age 73,65 y., monocular UCVA for distance 20/25 : 72,76%

C: 58 patients ,average age 78,25 y , monocular UCVA for distance 20/40 : 70,68%

GROUP A : UCVA for near :J2 68,33%,only 8,88% use always spectacles

GROUP B : UCVA for near : J2 68.75%,only 7,58% use always spectacles

GROUP C : UCVA for near : J3 62,06,%,only 9,30% use always spectacles

Vision for distance was similar in hiperopes and miopes,but miope,especially under 70 years old had better near vision.

Only 0,86% patients (n.3)had moderate glare optical aberrations. In a further 0,86% patients there was a complication result from incorrect lens power that required IOL explantation.

67,74% of groups A,B,C, altogether considered,never use presbyopic spectacles.

CONCLUSIONS: Excellent results were obtained with Soleko Fil 611 pv especially when implanted bilaterally, but ,in all cases, this new IOL providing good results for distance and significatively near vision without problems of other traditional multifocal IOL.

## *FILIPPO INCARBONE*

### FEMTOSECOND LASER CORNEAL SURGERY: REFRACTIVE AND THERAPEUTIC APPLICATIONS

AUTHORS: ***Incarbone F., Perone G., Basilico F.***

PURPOSE: To describe the Femtosecond laser as a tool in both refractive and therapeutic corneal surgery.

METHODS: Slides and video description of the Femtosecond laser in refractive and corneal surgery: Flap creation in LASIK, tunnel creation in IntraCorneal rings implantation; Corneal arcuate incisions for astigmatism correction; Lamellar cuts for Penetrating Keratoplasty, Lamellar Keratoplasty and Endothelial Keratoplasty.

RESULTS: Our experience supports the real effectiveness of the Femtosecond Laser both in refractive and therapeutic corneal surgery

## *CHOUN-KI JOO*

### NOVEL NONCONTACT MEIBOGRAPHY WITH ANTERIOR SEGMENT OPTICAL COHERENCE TOMOGRAPHY: HS MEIBOGRAPHY

AUTHORS: ***Joo C-K., Hwang H.***

PURPOSE: To present novel noncontact meibography with anterior segment optical coherence tomography (OCT) which is widely used in clinics for the anterior segment (cornea, anterior chamber angle, etc.) and compare the results with pre-existing infrared meibography.

METHODS: This research was done at the Seoul St. Mary's Hospital with two volunteers. Pre-existing infrared meibography was done on the subjects and photographs of the meibomian gland with the anterior segment OCT were taken again. With the anterior segment OCT, a tomogram of the meibomian gland could be taken and a picture of the whole meibomian gland could be taken from the infrared images for monitoring.

RESULTS: The resolution of the pre-existing infrared meibography was a pixel size of 640x480. In the anterior segment OCT, the meibomian glands were clearly identified just beneath the palpebral conjunctiva. The infrared images for monitoring of OCT was no problem in grading the meibomian gland. The resolution was 239x178 or 129x95 pixels depending on the save option of the photograph.

## *CHOUN-KI JOO*

### REGULATORY FACTORS FOR CORNEAL EPITHELIAL CELL DIFFERENTIATION

AUTHORS: ***Joo C-K., Rho C.***

PURPOSE: To evaluate surgically induced astigmatism (SIA) when the clear corneal incision is located on the preoperative steep meridian of the corneal astigmatism in phacoemulsification cataract surgery.

METHODS: Ninety-five patients with preoperative corneal astigmatism >0.50 diopters (D) were evaluated. The corneal incision meridian was chosen by rounding the steep corneal meridian to the closest 10°. All incisions were enlarged to 3.0 mm before implantation of the intraocular lens. Patients were grouped according to incision location: 30 eyes in the temporal, 32 eyes in the superotemporal, and 33 eyes in the superior incision group. Preoperative keratometric data were compared with data collected 2 months after surgery. Polar value analysis was used to analyze the SIA. Hostelling's trace test was used for comparison of intra-individual changes.

RESULTS: At 2 months postsurgery, the combined mean polar values for SIA changed significantly in the temporal(Hostelling's T2 = 0.418; P = 0.008), superotemporal (Hostelling's T2 = 1.078; P ively).

## *ANTONIO LABORANTE*

### CROSS-LINKING TRANSEPITHELIAL (CXL TE): OUR EXPERIENCE

AUTHORS: ***Laborante A., Longo C., Mazzilli E.***

PURPOSE: to evaluate corneal trasparency by taking slit lamp photographs, pain test 0-10 (Numeric Pain Intensity Scale I, Numeric Rating Scale-NRS), uncorrected visual acuity (UCVA), best spectacle corrected visual acuity (BSCVA),the keratometric parameters and comatic aberration were calculated after Cross-Linkin Transepithelial (CLX TE) using RICROLIN TE (Riboflavin 0,1% and Enhancer) METHODS: 25 eyes of 25 patients with keratoconus 2°-3° stage ( according to Krumeich) was treated with CLX TE ( Riboflavin0,1 % + trishydroxymethhylaminomethane + ethylenediaminetetraacetic acid). Laser CSO CBM Vega was used. Corneal transparency, intensity pain, UCVA, BSCVA, keratometric and comatic aberration parameters were calculated in preoperatory and after six months posttreatment. Advantages of transepithelial cross-linking: it doesn't need operating room, corneal thickness less 400 micron, easier technique, pre-treatment VA maintenance, better patient compliance – children, no post treatment pain, no complications derived from disepithelization.

RESULTS: no pain, good corneal transparency, USCVA improved of 2 lines and BSCVA improved of 3 lines after six months the average K improved by 0,5±0,15 Diopters. Comatic Aberration 2.42µm±0.87µm during pretretment,1.82±0.97µm after 6 months. the comatic aberration improved of the 50%, stable of the 38%. The Cross-Linking technique works at 100 microns depth.

## *MANUELA LANZINI*

### TRANSEPITHELIAL AND TRADITIONAL COLLAGEN CROSS-LINKING: CLINICAL AND MORPHOLOGICAL RESULTS, FOLLOW UP AT 12 MONTHS.

AUTHORS: ***Lanzini M., Calienno R., Nubile M., Salgari N., Mastropasqua L.***

PURPOSE: To compare morphological and refractive results in patient after Traditional and Transepithelial Cross-linking techniques

METHODS: 70 eyes of 64 patients (age range: 16-44 years) affected by progressive keratoconus were randomly divided into two groups; 35 underwent traditional crosslinking procedure (TR-CXL) and 35 underwent transepithelial crosslinking (TE-CXL) (VEGA CBMX-linker SOOFT Italia SpA, Montegiorgio, Italia). UCVA, BCVA, altitudinal corneal topography(OCULUS Pentacam®HR), pachimetry, anterior segment OCT (AS-OCT) (RT-Vue®, Optovue) and in vivo confocal microscopy (LSIVCM) (HRT II Rostock Cornea Module, diode-laser 670nm, Heidelberg Engineering GmbH, Germany) were performed preoperatively and postoperatively at 7 days, 1 month, 3 months,6months and one year after surgery.

RESULTS: In both groups the analysis of UCVA, BCVA, Kmax and thinnest point didn't showed statistically significant modifications among preoperative time and follow up at every control. In vivo confocal microscopy examination showed in TR-CXL group an important grade of inflammation and tissutal edema stable until six months after surgery, followed by a significant anterior stromal keratocytes density reduction. In TE-CXL group anterior stromal keratocites density didn't showed significant reduction during follow-up, while a minimal grade of inflammation and slight corneal edema were present only at 7 days post surgery and not present at the other controls. AS-OCT examination showed an hyperreflective deep stromal line, persistent during follow up in TR-CXL group (293,31 +/- 62,6 micron to the corneal surface at the first postoperative day with trend of progressive superficialization during follow up); In TE-CXL group the hyperreflective line was more superficial (105,7 +/- 15,2 micron to the corneal superficial (105,7 +/- 15,2 micron to the corneal surface)and present only at the first postoperative control.TR and TE Cross-linking procedures resulted both safe and effective in the stabilization of pregressive keratoconus. Moreover TE-CXL seems to induce low and transient stromal inflammatory modifications

## *STEFANO LIPPERA*

### THE SMALL BUBBLE A NEW TECHNIQUE FOR DEEP ANTERIOR LAMELLAR KERATOPLASTY

AUTHORS: ***Lippera S., Marcucci L., Pallotta G., Ferroni P., Morodei S., Mercanti L.***

TITLE OF SUBMISSION: The small bubble a new technique for deep anterior lamellar keratoplasty

PURPOSE: To describe and evaluate a new surgical variant of the Anwar "big bubble" deep anterior lamellar keratoplasty (DALK).

METHODS: In this retrospective study, 26 eyes affected by keratoconus underwent DALK either with "big bubble" (14 eyes) or "small bubble" (12 eyes) technique. The "small bubble" technique is an air-visco dissection to help separating the stroma from Descemet membrane if no big bubble is achieved. The mean best corrected visual acuity (BCVA) was measured preoperatively and after 6 and 12 months in both groups. The Student'st-test was used for statistical analysis.

RESULTS: 7 eyes didn't complete the study, 1 eye dropped-out for post-operative infective complication and 1 eye had stromal rejection. The mean preoperative BCVA was 0.24 ± 0.17 in the big bubble group and 0.23 ± 0.16 in the small bubble group (p = 0.944). At 6 months mean BCVA was 0.54 ± 0.14 in the big bubble group and 0.54 ± 0.19 in the small bubble group (p = 0.903). At 12 months mean BCVA was 0.80 ± 0.16 in the big bubble group and 0.70 ± 0.17 inthe small bubble group (p = 0.219). There were no statistically significant VA differences between the two groups at 6 and 12 months after surgery. "Small bubble" technique can be considered a safe and effective alternative to the "big bubble" DALK.

## *SCHIANO LOMORIELLO*

### PRE-DESCEMETIC AND DESCEMETIC DALK. AN IN VIVO CONFOCAL MICROSCOPY STUDY

PURPOSE: To compare the confocal microscopic features ofthe lamellar interface after 2 types of deep anterior lamellar keratoplasty (DALK): Descemetic with total stromal resection versus pre-Descemetic with deep stromal dissection

METHODS: Thirty eyes of 30 patients who had keratoconus with healthy endothelium were treated by DALK using the air technique. Baring of Descemet

membrane (DM) was achieved for 18 eyes (Descemetic group). A ?ne stromal layer was left in 12 eyes (pre-Descemetic group). Interface clarity, corneal topography, confocal microscopy, and endothelial cell count were analyzed

RESULTS: In all the patients a deep lamellar interface was identified. Microscopic features of the interface were different in the two groups studied. In the descemetic group the interface was identifiable as an homogeneous hyper-reflectivity, with variable transparency and possible presence of bright microdots. In the pre-descemetic group the interface was represented as an evident discontinuity in the deep stromal extracellular architecture with absence of keratocites associated with hyper-reflectivity, and possible presence of microdots. Also the Z-scan curve

were different between the two groups. In the descemetic patients we observed just one unique deep peak of hyper-reflectivity, just above the descemet membrane. In the pre-descemetic group we observed two peaks of reflectivity, at the level of the endothelium and in the deep stroma. Measuring the reflectivity of the interfaces at one months follow up we observed a grater reflectivityof the pre-descemetic group (165,12± 30,71)compared with the descemetic patients (140,15± 22,31). After six months of follow up the peak of reflectivity were comparable in the two groups(134,71±29,15) (142,71±20,23).

## *SAVERIO LUCCARELLI*

### STROMAL HYDRATION ON CLEAR CORNEAL INCISION AFTER CATARACT SURGERY: AN IN VIVO AS-OCT STUDY

AUTHORS: ***Luccarelli S., Sacchi M., Bonsignore F., Nucci P.***

PURPOSE: To evaluate the effects of stromal hydration on clear corneal incision (CCI) architecture during a after cataract surgery using anterior segment optical coherence tomography (AS-OCT).

METHODS: Two groups of 20 eyes each were examined, one group without stromal hydratation the other with stromal hydratation of the tunnel. Clear corneal incisions in adult eyes were examined using an high resolution AS-OCT imaging system RTVUE (OPTVUE) within 1 hour of surgery and 1 day -7days-30 days after surgery. All the CCIs had stromal hydration with a balanced salt solution. Incisions were made with a 2.80mm steel keratome. Intraocular pressure (IOP) was measured 1 hour and 1 day -7days-30 days after surgery. The CCI length and corneal thickness in the corneal apex and at the CCI site were measured using software built into the AS-OCT system.

RESULTS: Fourty CCIs were evaluated. Stromal hydration significantly increased the measured CCI length (Phree features were evaluated : local detachment of descemet membrane, endothelial gaping and loss of coaptation of the wound.

## *EDWARD MANCHE*

### IMPROVED VISUAL ACUITY FOLLOWING PRK SURGERY USING A NOVEL CORNEAL SHIELD

PURPOSE: To prospectively evaluate PRK visual acuity outcomes using a novel corneal shield technology.

METHODS: 24 eyes of 12 consecutive myopic patients were treated with wavefront-guided PRK. All eyes had a novel corneal shield placed at the conclusion of the PRK surgery. The corneal shield is designed to maintain good visual acuity throughout the immediate postoperative period.

RESULTS: At post op day seven, 88% of eyes in the achieved an UCVA of 20/40 or better and 40% of eyes achieved an UCVA of 20/20 or better.

CONCLUSIONS: Wavefront-guided PRK using the novel corneal shield technology yielded faster recovery of UCVA compared to wavefront-guided PRK using bandage contact lenses. There was an increased incidence of light sensitivity and the sensation of heavy eyelids with use of the novel corneal shield.

## *EDWARD MANCHE*

### A PROSPECTIVE EYE-TO-EYE COMPARISON OF MYOPIC EYES UNDERGOING PRK WITH WAVEFRONT-GUIDED VERSUS WAVEFRONT-OPTIMIZED TECHNOLOGY

PURPOSE: To prospectively compare outcomes between wavefront-guided PRK and wavefront-optimized PRK in the treatment of myopia. Outcome measures include high contrast snellen acuity, low contrast snellen acuity (25% and 5%), safety, efficacy, predictability and higher order aberration analysis.

METHODS: One-hundred and forty eyes of 71 consecutive patients with myopia were treated with wavefront-optimized and wavefront-guided PRK. One eye was treated with wavefront-guided PRK using the AMO Visx S4 IR excimer laser system and the fellow eye was treated with wavefront-optimized PRK using the Alcon Allegretto Wave Eye-Q excimer laser system. Eyes were randomized by ocular dominance. The mean pre-operative spherical equivalent refraction was -4.66 +/- 2.29 and -4.55 +/- 2.31 in the wavefront-guided group and wavefront-optimized group, respectively. The mean cylinder was +0.87 +/-0.72 and +0.74 +/-0.73 in the wavefront-guided group and wavefront-optimized group respectively. There were no statistically significant differences in pre-operative higher order aberrations between the two groups.

RESULTS: At post op year one, 93% and 89% of eyes were within 0.50 diopters of the intended correctionl in the wavefront-guided group and wavefront-optimized group respectively. At the one-year post-op visit the mean spherical equivalent refraction was -0.18 +/- 0.36 in the wavefront-guided group and -0.14 +/- 0.32 in the wavefront-optimized group. At one year, the mean cylinder was reduced to +0.21 +/- 0.24 in the wavefront-guided group and +0.24 +/- 0.24 in the wavefront-optimized group. At one year, there was a greater induction of total higher order aberrations in the wavefront-optimized group compared to the wavefront-guided group. At one year, a greater percentage of eyes achieved an uncorrected visual acuity of 20/16 or better in the wavefront-guided group compared to the wavefront-optimized group.

CONCLUSIONS: Wavefront-guided PRK had better predictability, better 5% contrast acuity and better uncorrected visual acuity outcomes compared to the wavefront-optimized group. There was no difference in safety between the two groups.

## *EDWARD MANCHE*

### A PROSPECTIVE, RANDOMIZED, EYE-TO-EYE COMPARISON OF TWO WAVEFRONT-GUIDED EXCIMER LASER SYSTEMS FOR MYOPIC LASIK

PURPOSE: To prospectively compare LASIK outcomes between two wavefront-guided excimer lasers.

METHODS: 100 eyes of 50 consecutive myopic patients were treated with WFG LASIK. One eye was treated with the Allegretto laser and the fellow eye was treated with the CustomVue laser. The mean pre-op spherical equivalent refraction was -3.88 +/- 1.67 and -4.18 +/-1.73 in the Allegretto group and CustomVue group respectively.

RESULTS: At post op month six, 100% of eyes in the Allegretto group and 91% of eyes in the CustomVue group were within 0.50 diopters of the intended correction.

CONCLUSIONS: WFG LASIK using the Allegretto laser had better predictibility, better uncorrected visual acuity results and lower induced total higher order aberrations compared to the CustomVue laser. WFG LASIK using the CustomVue laser had greater gains in 5% contrast acuity compared to the Allegretto laser. There were no differences in safety between the two platforms.

## *RODOLFO MASTROPASQUA*

EFFECT OF LAMELLAR GRAFT THICKNESS ON THE ANATOMICAL AND FUNCTIONAL OUTCOMES IN DSEK PATIENTS.

AUTHORS: ***Mastropasqua R., Parisi G., Passilongo M., Pedrotti E., Marchini G.***

PURPOSE: To evaluate refraction and best corrected visual acuity (BCVA) in relation to the donor endothelial lamellar thickness (DELT) and the total corneal central thickness (TCCT) in patients who underwent Descemet's stripping endothelial keratoplasty (DSEK).

METHODS: 30 eyes of 30 patients were examined 12 months after DSEK with endotelial bottom prepared by intrastromal dissection with a stable stromal interfacies. Central thicknesses were determined using AS-OCT (mean value of 5 scans for each eye). Refraction and BCVA were determined using Snellen chart.

RESULTS: The mean of DELT was 158,60 ± 62,14 um (range 72-256) and the mean of TCCT was 637,19 ± 91,65 um (range 522-750). BCVA was 0.71 + 0.18 (range 1-0.35) with a refraction in spherical equivalent (SE) of + 0.89 + 0,24 D. The correlation between BCVA, SE, DELT and TCCT shows a low statistical correlation (Pearson method: r= -0.517 for DELT and r= -0,423 for TCCT).

CONCLUSIONS: DELT and TCCT seem have a influence about time of visual recovry and time of steroid use; while they seem have a low influence about BCVA and SE.

## *RODOLFO MASTROPASQUA*

DALK/PK IN PATIENTS WITH HSV-RELATED CORNEAL SCARRING.

AUTHORS: ***Parisi G., Mastropasqua R., Passilongo M., Pedrotti E., Marchini G.***

PURPOSE: To determine the visual outcome, graft survival and complications after deep anterior lamellar keratoplasty (DALK) or PK in patients with herpes simplex virus (HSV)-related corneal scarring.

METHODS: A retrospective analysis of the patients who had DALK or PK for HSV-related corneal scarring between January 2004 and December 2011 was performed. Mean follow-up was 38 months. The principal outcomes measures were as follows: complete ocular examination, uncorrected visual acuity (UCVA), best-corrected visual acuity (BCVA),corneal topography. Viral reactivation or rejection episode were recorded.

RESULTS: Preoperative visual acuity ranged from hand movements (HM) to 0.5. Mean BCVA at last visit was 0.6. Ten eyes had recurrence of HSV-related inflammation, fourteen developed graft rejection and eight of them had rejection,two developed fungine keratitis. Graft survival rate was 72%. Eight patients underwent to a second corneal transplant. Five eyes had an increase of intraocular pression that required topic medical treatment,and in one of them was necessary glaucoma surgery.

CONCLUSIONS: DALK or PK for herpetic corneal scarring shows a comparable visual outcome and better graft survival rate of DALK than PK. There is significant risk of recurrence of HSV-related inflammation and graft rejection that requires timely recognition and adequate management.

## *VINCENZO MAURINO*

FEMTOSECOND LASER-ASSISTED MUSHROOM CONFIGURATION PENETRATING KERATOPLASTY AND DEEP ANTERIOR LAMELLAR KERATOPLASTY IN SEVERE KERATOCONUS

AUTHORS: ***Maurino V., Fung S., D'Aiello F.***

PURPOSE: To evaluate the outcomes after femtosecond laser-assisted mushroom configuration penetrating keratoplasty (PK) and deep anterior lamellar keratoplasty (DALK) in advanced keratoconus.

METHODS: Eleven eyes of eleven patients (7 male; 4 female) with a mean age of 31 ± 9.9 years (range 21-51)underwent femtosecond laser-assisted mushroom configuration PK and DALK. Preoperative riskfactors include previous hydrops (n=4) and previous laser-assisted in situ keratomileusis (n=1). Recipient and donor corneas were treated with 150-KHz Femtosecond laser (Intralase FSTM System; Abbott Medical Optics, Inc, Santa Ana, CA) to create mushroom-shaped recipient bed and donor. The donor posterior side cut depth was always set at 80 ?m from endothelium to avoid donor femtosecond laser penetration during the laser procedure.

RESULTS: Mean follow up was 10.7 months (range 4-19months). Preoperative mean best corrected visual acuity (BCVA) was 1.26 ± 0.51 LogMAR and mean central cornea thickness was 278 ± 109?m. Mean keratometric (K) value and mean maximum K value were 63.1 ± 7.84 D and 76.0 ±9.3 D respectively. In total, 4 patients underwent PK and 7 patients underwent DALK, with 2 of thelatter convertedto PK due to Descemet membrane perforations. At the last follow-up,mean BCVA was 0.69 ± 0.34 LogMAR, mean spherical equivalent refractive error was -3.4 ±2.92 D, and mean cylindrical refractive error was 5.1 ± 3.2 D.Postoperative mean K value was 43.3 ± 1.5D and the mean maximum K value was 49.0 ± 2.4 Selective suture removals were performed in six patients at a mean of 8.5 ± 6 months postoperatively.

CONCLUSIONS: This preliminary series demonstrate that femtosecond laser-assisted mushroom-configuration keratoplasty is a feasible and safe procedure in patients with advanced keratoconus. Despite the pre-existing high-risk characteristics, this technique provides good wound approximation and wound healing while producing comparable results to those with less severe disease.

## *JODHBIR MEHTA*

RESEARCH AND TRIALS ON RELEX, THE NEW FORM OF FEMTOSECOND INTRASTROMAL LENTICULAR FOR MYOPIA AND ASTIGMATISM.

PURPOSE: To descried the early inflammatory changes in femtolasik v RELEX

METHODS: paired eye study examining the early refractive and inflammatory changes following femtolasik and RELEX in a paired contralateral eye study in a rabbit model of refractive surgery. Animals were assessed by slit lamp, ASOCT, in vivo confocal microscopy, and corneal topography. Immunohistochemistry was performed for CD 11b, TUNEL and Extracellular matrix protein markers

RESULTS: Refractive surgery was performed at 2 different po-

wers -3, -6, -9 D in all animals. There was more postoperative inflammation at day 1 in the femtoLASIK eyes at powers above -6 and -9D compared to the RELEX eyes. Corneal topography showed less flattening of the corneal topography at higher ablations with RELEX compared to FemtoLASIK. There was greater extracellular matrix remodeling in Femtolasik compared to RELEX

CONCLUSION: RELEX caused less inflammation and matrix remodeling compared to femotlasik at -6D and -9D. This will stimulate less corneal remodeling in the long term hence lower risk of regression.

## *RITA MENCUCCI*

### ASPHERIC TORIC INTRAOCULAR LENSES: PRELIMINARY RESULTS

AUTHORS: ***Mencucci R., Giordano C., Stiko E., Favuzza E., Menchini U.***

PURPOSE: To present the results of aberrometricalevaluation and quality of life test for theassessment of visual performance pre and postimplantation of aspheric ToricIntraOcular Lenses(IOLs)

METHODS: Four groups of astigmatic patients underwent standard uneventfulphacoemulsification with the incision on the steepest axis. Thirty-six were implanted with Alcon Acrysof toric IOLs SN60T, ten with Alcon Acrysof IQ aspheric toric IOLs (SN6AT), ten with AMO Tecnis aspheric Toric IOLs (ZCT100-400), twenty-four with aspheric Alcon Acrysof SN60WF IOLs (control group). Wavefront aberrometry (Astigmatism WF error, PSF Strehl ratio, MTF Area ratio A/D H/D, Total and corneal WF error Longitudinal Spherical Aberration and corneal asphericity coefficient Q) at 4.00 mm pupil diameter (OPD Scan II, NIDEK), corneal topography, objective refraction (OPD Map, Zonal refraction OPDScanII Map) and Uncorrected Distance Visual Acuity (UDVA) were measured preoperatively and three months postoperatively in the four groups. Quality of life test (NEI-RQL 42) was performed in the four groups after surgery.

RESULTS: Post-operatory UDVA was significantly (pups than in control group. Wavefront aberrometry showed a considerably better optical quality in the three toric IOL groups in comparison with control group, in terms of astigmatism (Zernike Polynomial Z 2,2, Z 2,-2), PSF (Strehl ratio) and MTF Area ratio at 4.00 mm pupil diameter. The Longitudinal Spherical Aberration in the Alcon aspheric toric group, for any corneal coefficient Q value, was always positive. The NEI-RQL 42 test after surgery showed a significantly better quality of life in the three toric groups in comparison with control group. Wavefront aberrometry is a useful tool to test optical and visual performance after toric IOL implantation. The NEI-RQL 42 test is a sensitive instrument to detect the visual benefits of Toric IOLs. Aspherical platform in toric IOLs enhances the optical performance of these lenses. There is an association between objective optical performance of Toric IOLs and subjective improvement in quality of life.

## *ALBERTO MONTERICCIO*

### CONTACT LENS AND RECONSTRUCTION OF THE OCULAR SURFACE

PURPOSE: La ricostruzione della superficie oculare dopo traumi chimici, fisici e iatrogeni necessita quasi sempre l'uso di membrane amniotiche con lo scopo di ridurre il più possibile i processi flogistici e proteggere la cornea. L'utilizzo di una lente sclerale medicamentosa, ad ampio diametro, può assolvere in maniera significativa a questo scopo.

METHODS: Vengono usati in tutti i casi di ricostruzione della superficie oculare una lente sclerale ad ampio diametro.

RESULTS: l'utilizzo di una lente a contatto sclerale terapeutica ad ampio diametro nella ricostruzione della superficie oculare oltre a proteggere l'area limbare nel suo complesso aiuta la riepitelizzazione e riduce i rischi di nuove vascolarizzazioni.

## *ALBERTO MONTERICCIO*

### PRK AND CONTACT LENS

PURPOSE: Vengono descritti i benifici delle lenti a contatto dopo trattamento Laser ad eccimeri con tecnica PRK .

METHODS: nei trattamenti bilaterali di PRK sia miopico che ipermetropico sono stati utilizzati a scopo bendaggio e terapeutico due lenti a contatto di diverso materiale (polimero) e diverso diametro. Nei controlli giornalieri dei primi 4 giorni sono stati valutati oltre alla velocita di riepitilizzazione i quadri sintomatoligici soggettivi riferiti dai pazienti.

RESULTS: Dagli studi effettuati è possibile indicare come scelta migliore l'uso di una lente a contatto ad ampio diametro, medicamentosa (Aloe) e di materiale ionico.

## *ALBERTO MONTERICCIO*

### SURGERY OF PTERIGIUM

PURPOSE: Nella chirurgia dello pterigio le complicanze più frequenti sono le recidive. la riduzione di queste

sono legate al tipo di intervento chirurgico. In questo lavovo vengono analizzati i vari tipi di interventi chirurgici.

METHODS: Vengono analizzati tutti gli interventi di pterigio eseguiti tra il 2008 e il 2011 con tecnica di autotrapianto di congiuntiva e uso di colla di fibrina.

RESULTS: dall'analisi effettuata su tutti i casi analizzati è possibile affermare che la percentuale di recidive risulta ridotta in maniera significativa e l'autotrapianto di congiuntiva con colla di fibrina considerata la tecnica migliore.

## *SIMONETTA MORSELLI*

### DISTANCE VARIATION DURING ACCOMMODATION BETWEEN LENS AND ACRYSOF CHACHET PHAKIC IOL

AUTHORS: ***Morselli S., Toso A.***

PURPOSE: To evaluate the variation of distance during accommodation between lens and Acysof Cachet phakic IOL by using OCT-Visante in order to predict the possibility of pIOL-lens contact. METHODS: 29 eyes of 15 patients were studied after pIOL implantation measuring the distance between anterior surface of lens and posterior surface of pIOL by using OCT-Visante on visual axis. Measures were done in non-accomodating status and then performing a defocus curve. Also the distance between pIOL and endothelium was recorded. RESULTS: The average distance lens-pIOL during non-accomodative status was 0.8 mm±0.05. During accommodation the average distance was 0.7 mm±0.1. The di-

stance between endothelium and pIOL during non-accomodative status was 1.86 mm±0.12 while the distance during accommodation was 1.78 mm±0.08. Conclusions: the mean distance between posterior surface of the Acrysof Cachet pIOL and anterior surface of lens decreases during accommodation. This evidence would confirm that this pIOL is safe because it never touchs the lens during the accommodation as well. The distance between anterior surface of pIOL and endothelium lightly decreases during accommodation, due to the irido-lenticular diaphragm movement.

## *LUIGI MOSCA*

### FEMTOSECOND LASER-ASSISTED LASIK TO CORRECT MEDIUM TO HIGH HYPEROPIC DEFECTS

AUTHORS: ***Mosca L.[1], Balestrazzi A.[2], Iacobelli L.[3], Mosca L.[1,3], Guccione L.[1], Legrottaglie E.F.[1], Giannico M.I.[1], Balestrazzi E.[1]***

1 Catholic University of "Sacro Cuore" – "A. Gemelli" Polyclinic, Department of Ophthalmology– Rome, Italy

2 Ophthalmic Hospital, Refractive Service - Rome, Italy

3 Gruppo INI – Grottaferrata, Rome, Italy

PURPOSE: To evaluate efficacy and safeness of femtosecond laser assisted LASIK to correct congenital hyperopic defects.

METHODS: from May 2007 to April 2011, 116 eyes of 67 patients (divided in three groups: A, B, C) were submitted to femtosecond laser assisted LASIK. In the group A (86 eyes of 49 patients, 29M,20F; mean age: 40.24yrs ±9.21SD) the operation was carried on with a 60kHz femtosecond laser and the ablation was performed on dry stroma with a Technolas 217c excimer laser for a mean refractive error in SE of +3.34D ±1.24SD (range: +0.75 / +7.25), a mean cylinder of +1.60 ±1.48SD (range: +0.50 / + 5), a mean UCVA of 0.58 ±0.21SD and mean BSCVA of 0.98 ±0.06SD; the mean laser refractive treatment in SE was of +3.02D ±1.24SD. In the group B (17 eyes of 10 patients, 5M,5F, mean age: 26.76yrs ±8.79SD), the operation was carried on with a 150kHz femtosecond laser and with a VISX S4 excimer laser, for a mean refractive error in SE of +3,69D ±1.16SD (range: +2 / +6), mean cylinder of +1.85D ±1.18SD (range: +0.50 / +4), mean UCVA of 0.12 ±0.08SD and mean BSCVA of 0.95 ±0.07SD; the mean refractive laser treatment in SE was of +3.54D ±1.13SD. In the group C (13 eyes of 8 patients with a mean pupil diameter of 7.97mm ±0.23SD and a mean refractive error in SE of +3.38D ± 1.16SD), an iLASIK with a 150kHz femtosecond laser and a wavefront customized (WaveScan) excimer laser ablation with a VISX 4S excimer laser was performed for a mean ablation in SE of +2.70D ±1.13SD, a mean astigmatism of 1.25D ±1.18SD and a mean UCVA of 0,42 ±0.18SD.

RESULTS: In group A, after a mean follow-up of 32.36 mos ±10.12SD (max.48 months), the mean UCVA was 0.96±0.18SD and the mean BSCVA was 0.98±0.11SD; in group B, after a mean follow-up of 13.42 mos ±8.64SD (max. 34 months), the mean UCVA was 0.98±0.21SD and the mean BSCVA was 0.99±0.12SD; in group C, the mean postoperative UCVA was 0.99±0.08SD.

CONCLUSIONS: femtosecond laser assisted hyperopic LASIK is a safe and effective refractive technique. The 150kHz femtosecond laser reduce the procedure times, with better patient compliance. The customized wavefront ablation allows to correct medium to high hyperopic defects even with pupil diameter greater than 7mm with excellent refractive results.

None of the authors have financial interests in any product mentioned.

## *ALESSANDRO MULARONI*

### LONG TERM RESULTS OF ASSOCIATION ICRS AND CXL TE IN KERATOCONI PATIENTS

AUTHORS: ***Mularoni A, Piccinini A.R., Basenghi C.***

PURPOSE: to explain long term results of two conservative tecniques in keratoconic patients

## *ALESSANDRO MULARONI*

### ROTATIONAL STABILITY OF DIFFERENT TYPES OF TORIC IOLS IN CATARACT PATIENTS

AUTHORS: ***Mularoni A., Fiorini P.F., Primitivo S.***

PURPOSE: to evaluate behaviour of different kind of toric IOLs and their rotational stability

## *MARIO NUBILE*

### IN VIVO CONFOCAL MICROSCOPY WITH HISTOLOGICAL CORRELATIONS IN THE DIAGNOSIS OF LIMBAL STEM CELL DEFICIENCY

AUTHORS: ***Nubile M., Lanzini M., Calienno R., Curcio C., Mastropasqua A., Colasante M., Mastropasqua L.***

Ophthalmology Clinic, Center of Excellence in Ophthalmology, University "G. d'Annunzio" of Chieti and Pescara, Italy.

PURPOSE: to correlate in vivo confocal microscopy and impression cytology features of the corneal surface epithelia in patients with clinical sings of partial or total limbal stem cell deficiency and to examine the microscopic limbal morphology in these cases.

DESIGN: Observational case control study. Methods: 20 eyes of 17 consecutive patients (mean age 53.9 ± 9.2 years) presenting with clinical suspect of limbal stem cell deficiency and 10 eyes of 10 healthy control subjects were enrolled. In vivo confocal microscopy and impression cytology (PAS, Citokeratin 12 and 19) staining were performed in the central cornea. The inter-examination agreement was determined. Moreover confocal microscopy scans were obtained in all patients to assess microscopic structure of the corneo-scleral limbus, in all quadrants.

RESULTS: Confocal microscopy and impression cytology agreement in testing the diagnostic hypotheses was high (k=0.85). The two methods were concordant in 18 out of 20 examined eyes (90%), revealing presence of corneal epithelium only in 7 cases, conjunctival epithelium only (total limbal stem cell deficiency) in 5 cases, and presence of mixed epithelium in 6 cases (partial limbal stem cell deficiency). Confocal imaging of the limbus revealed normal Vogt's palisades structure and epithelial transition in the healthy eyes whilst it demonstrated a variable degree of alterations, including loss of the limbal palisades and of the normal epithelial mosaic, cystic epithelial changes and subepithelial fibrosis in the eyes affected by partial or total limbal stem cell deficiency.

CONCLUSIONS: Confocal microscopy was useful for the non invasive, in vivo diagnosis of limbal stem cell deficiency, with a high degree of concordance with impression cytology, and to detect limbal alterations associated with partial or total conjunctivalization of the cornea.

## *VINCENZO ORFEO*

REFRACTIVE AND ABERROMETRIC OUTCOME AFTER CATARACT SURGERY WITH TORIC MULTIFOCAL INTRAOCULAR LENS IMPLANTATION

AUTHORS: ***Orfeo V., Boccuzzi D.***

Unità Operativa di Oculistica, Clinica Mediterranea, Napoli

PURPOSE: To evaluate refractive and aberrometric outcome after cataract surgery and toric multifocal lens implantation in patients with cataract and corneal astigmatism.

METHODS: Patients with cataract , corneal astigmatism and motivation for spectacle independency had cataract surgery with implantation of a toric multifocal IOL. Authors evaluated refractive and aberrometric outcome after surgery and residual refractive astigmatism.

RESULTS: The use of multifocal toric IOLs is suitable for astigmatic correction in patients that aspire for spectacle independency. Authors report good refractive results and low residual astigmatism with good UCVA and good near vision. Authors report low incidence of glare, halos and starburst symptoms.

## *LUIGI PACENTE*

TRANS-EPITHELIAL CROSS-LINKING WITH RIBOFLAVIN SOLUTION: TWO-YEAR CLINICAL RESULTS

AUTHORS: ***Pacente L., Troisi S., Barbaro G., Del Prete A., Caruso C.***

PURPOSE: the authors report the clinical results at 24 months after Trans-Epithelial Cross-Linking (TE-CXL) performed on keratoconus-affected eyes.

METHODS: 25 progressive keratoconus-affected eyes (mean patient age 26 years; range from 17 to 43 years) underwent TE-CXL treatment performed with a solution of riboflavin, aminoacids and vitamin E. The progression was clinically documented in the last 6 months before treatment (9 eye stage 1, 7 eye stage 2, 9 eye stage 3 according Krumeich). Evaluation parameters (preop,1,3,6,12,24 months after treatment) comprised uncorrected visual acuity, best spectacle-corrected visual acuity, spherical spectacle-corrected visual acuity, endothelial cells count, optical and ultrasound pachymetry, corneal topography, surface aberrometry, corneal tomography, posterior segment coherence tomography, and in vivo confocal microscopy.

RESULTS: At 24 months from treatments, average UCVA (LogMAR ) showed a slight improvement at 24 months (0.81 versus 0.87); BSCVA (LogMAR ) significantly improved (0.01 versus 0.1, Pficant versus pre-op values. Corneal central thickness was stable. Results of this study indicates that TE-CXL with the proposed solutions appears to be effective in limiting or even stopping keratoconus progression, without relevant side effects.

## *IACOPO PALADINI*

CRYSTALLINE CORNEAL DEPOSITS IN MONOCLONAL GAMMOPATHY: IN VIVO CONFOCAL MICROSCOPY

AUTHORS: ***Paladini I., Pieretti G., Menchini U., Mencucci R.***

PURPOSE: To describe the in vivo confocal microscopy corneal findings in a patient with bilateral corneal deposits caused by an underlying monoclonal gammopathy.

METHODS: A 68 years old man came to our centre for anophthalmologic examination. Besides visualacuity, the examination included slit-lampbiomicroscopy, intraocular pressure, and fundoscopy. Confocal microscopy was performed using Confoscan 4 ( Nidek Technologies Padova, Italy) with a 40× lens because of the presence of bilateral crystalline corneal deposits. Serological tests were performed too.

RESULTS: Every layer of the cornea is interested by deposits with high reflectivity especially in the epithelium and anterior stroma. The emathological tests evidenced a monoclonal gammopathywith high levels of Immunoglobulin G.

CONCLUSION: Crystalline corneal deposits in monoclonal gammopathy can be usefully evaluated by confocal microscopy. These manifestations may be evaluated long before systemic signs of the pathology appear so the early diagnosis is mandatory.

## *FRANCO PASSANI*

AMNIOTIC MEMBRANE APPLICATION ASSOCIATED WITH PERFORATING KERATOPLASTY: LONG TERM RESULTS

AUTHORS: ***Passani F., Pianini V., Passani A.***

PURPOSE: Postoperative evaluation of penetrating keratoplasty with and without amniotic membrane application

METHODS: We performed 30 PK (A group) and 30 PK associated with amniotic membrane application (B group), removed 15 days after surgery, in eyes with post-traumatic or post-infectious cornea opacities. We examined the grafts at 3, 15, 30 days and at 3, 6, 12 months with slit lamp and anterior segment photos. We executed pachimetry and endothelial cells count at 15 days and at 1, 3, 6, 12 months

RESULTS: A group: we found anterior chamber reduction (Seidel positive) in 2 cases, punctata keratitis in 33% , Descemet's folds in 40% of patients. The pachimetry at 15 days was 699±40 microns; the corneal thickness per cent reduction was 6% at 1 month, 17% at 3 months, 25% at 6 and 12 months. Endothelial cells count was 2580 c/ mm² at 15 days, 2498 c/ mm² at 1 month, 2302 c/ mm² at 3 months, 2160 c/ mm at 6 months², 2072 c/mm² at 12 months. We reported 3 graft failure's cases at 12 months.

B group: the anterior chamber depth was always kept present (Seidel negative) and we didn't find epithelial sofference; we reported Descemet's folds in 5% of cases. The pachimetry was 662±12 microns at 15 days; the corneal thickness percent reduction was 5% at 1 month, 15% at 3 months, 22% at 6 months. Endothelial cells count was a 2602 c/ mm² at 15 days, 2520 c/ mm² at 1 month, 2332 c/ mm² at 3 months, 2184 c/mm² at 6 months, 2098 c/mm² at 12 months. We found 1 graft failure's case at 12months. Corneal thickness reduction at 12 months (compared with thickness found at 15 days): 25% A group, 22% B group. Endothelial cells reduction at 12 months: 22% A group, 21,5% B group.

## *MATTIA PASSILONGO*

LONG TERM EFFECTIVENESS OF AUTOLOGOUS CULTURED LIMBAL STEM CELLS GRAFTS IN PATIENTS WITH LIMBAL STEM CELL DEFICIENCY DUE TO CHIMICAL BURNS

AUTHORS: ***Passilongo M., Parisi G., Pedrotti E., Marchini G.***

BACKGROUND: Chemical burns cause depletion of limbal stem cells and eventually lead to corneal opacity and visual

loss. We investigated the long-term effectiveness of autologous cultured limbal stem cell grafts in patients with limbal stem cell deficiency.

DESIGN: Prospective, non-comparative interventional case series.

PARTICIPANTS: Sixteen eyes from 16 patients with severe, unilateral limbal stem cell deficiency caused by chemical burns.

METHODS: Autologous ex vivo cultured limbal stem cells were grafted onto the recipient eye after super-ficial keratectomy.

Main Outcome Measures: Clinical parameters of limbal stem cell deficiency (stability/transparency of the corneal epithelium, superficial corneal vascularization and pain/photophobia), visual acuity, cytok-eratin expression on impression cytology specimens and histology on excised corneal buttons.

RESULTS: At 12 months post-surgery, evaluation of the 16 patients showed that 10 (62.6%) experienced complete restoration of a stable and clear epithelium and 3 (18.7%) had partially successful outcomes (re-appearance of conjunctiva in some sectors of the cornea and instable corneal surface). Graft failure (no change in corneal surface conditions) was seen in three (18.7%) patients. Penetrating keratoplasty was performed in seven patients, with visual acuity improving up to 0.8 (best result). For two patients, regeneration of the corneal epithelium was confirmed by molecular marker (p63, cytokeratin 3, 12 and 19, mucin 1) analysis. Follow-up times ranged from 12 to 50 months.

CONCLUSIONS: Grafts of autologous limbal stem cells cultured onto fibrin glue discs can successfully regenerate the corneal epithelium in patients with limbal stem cell deficiency, allowing to perform successful cornea transplantation and restore vision.

## *EMILIO PEDROTTI*

### COMPARATIVE EVALUATION OF PSEUDOPHAKIC PRESBYOPIA REHABILITATION WITH IMPLANTATION OF ACCOMMODATIVE AND MULTIFOCAL (REFRACTIVE AND DIFFRACTIVE) INTRAOCULAR LENSES.

PURPOSE: A comparative randomized prospective clinical trial to evaluate acuity and quality of vision after accommodative, refractive and diffractive multifocal IOLs implantation.

METHODS: Sixty patients (120 eyes) undergoing bilateral phacoemulsification were divided into 3 groups of 20 (40 eyes). Each group was submitted to a post operatively follow-up of 12 months during which uncorrected visual acuity (UCVA) and best corrected visual acuity (BCVA), uncorrected near visual acuity (UNVA) and best distance corrected near visual acuity (BDCNVA), accommodative amplitude and mean addiction for near were determined. It were also evaluated conrtast sensitivity for distance and for near, defocus curve and lecture velocity.

RESULTS: There was no statistical difference (p>0,01) in UCVA and BCVA between the three groups.

Near vision results (UNVA, DCNVA and mean addiction for near) were better into the group implanted with the diffractive IOL while the other two groups showed a bigger accommodative amplitude.

CONCLUSIONS: Both multifocal and accommodative IOLs provide an adeguate distance and near vision restoration, with patients hight satisfaction. The diffractive multifocal IOL seems to provide better performance for near vision while accommodative and refractive multifocal IOLs seem to give more useful accommodative amplitude for intermediate vision. The refractive multifocal IOLs seems show a little lower performance for near vision and a little better performance for intermediate vision in comparison with the diffractive one.

## *GRAZIELLA PELLEGRINI*

### ALTERATIONS OF EPITHELIAL STEM CELL MARKER PATTERNS IN HUMAN DIABETIC CORNEAS AND EFFECTS OF C-MET GENE THERAPY

AUTHORS: ***Pellegrini G., Saghizadeh M., Soleymani S., Harounian A., Bhakta B., Troyanovsky S.M., Brunken W.J., Ljubimov A.V.***

PURPOSE: We have previously identified specific epithelial proteins with altered expression in human diabetic central corneas. Decreased hepatocyte growth factor receptor (c-met) and increased proteinases were functionally implicated in the changes of these proteins in diabetes. The present study examined whether limbal stem cell marker patterns were altered in diabetic corneas and whether c-met gene overexpression could normalize these patterns.

METHODS: Cryostat sections of 28 ex vivo and 26 organ-cultured autopsy human normal and diabetic corneas were examined by immunohistochemistry using antibodies to putative limbal stem cell markers including ATP-binding cassette sub-family G member 2 (ABCG2), N-cadherin, !Np63", tenascin-C, laminin #3 chain, keratins (K) K15, K17, K19, $1 integrin, vimentin, frizzled 7, and fibronectin. Organ-cultured diabetic corneas were studied upon transduction with adenovirus harboring c-met gene.

RESULTS: Immunostaining for ABCG2, N-cadherin, !Np63", K15, K17, K19, and $1 integrin, was significantly decreased in the stem cell-harboring diabetic limbal basal epithelium either by intensity or the number of positive cells. Basement membrane components, laminin #3 chain, and fibronectin (but not tenascin-C) also showed a significant reduction in the ex vivo diabetic limbus. c-Met gene transduction,which normalizes diabetic marker expression and epithelial wound healing, was accompanied by increased limbal epithelial staining for K17, K19, !Np63", anddiabetic marker "3$ integrin, compared to vector-transduced corneas.

## *GIUSEPPE PERONE*

### PRL IMPLANT: 5 YEARS EXPERIENCE

AUTHORS: ***Perone G., Federico B., Incarbone F.***

PURPOSE: To describe the results of our 5 years experience in phakic posterior chamber lens (PRL) implantation in mild to severe myopia correction. METHODS: Slides and video description of the technique which we developed over 5 years experience. Preparation, surgery and follow-up of 203 eyes of 109 patients with myopia within –5,13D and –30,63D will be shown.

RESULTS: Our experience supports the real effectiveness of the phakic posterior chamber lens (PRL) in mild to severe myopia correction whenever other refractive possibilities are impossible due either to relative too high defects or to low pachimetric values.

## AUGUSTO POCOBELLI

### MONITORING OF ENDOTHELIAL CELL DENSITY DURING SIMULATION OF DSAEK PHASES IN VITRO USING THIN-C DESWELLING MEDIUM AND TWO DIFFERENT GLIDES FOR ENDOTHELIUM INSERTION

AUTHORS: ***Pocobelli A. (1), Colabelli Gisoldi R. (1), Amici C. (1), D'Amato Tothova J. (3), Macaluso C. (2)***

(1) Eye Bank of Rome, S. Giovanni Addolorata Hospital, Rome; (2) Dept. of Ophthalmology, University of Parma, Parma; (3) R&D Alchimia.Srl, Ponte San Nicolò, Italy

PURPOSE: To monitor endothelial cell density (ECD) loss at different steps of a simulated DSAEK surgery, after use of a deswelling medium.

METHODS: Human donor corneas were incubated in a de-swelling medium at4°C for 4h or a standard organ culture control medium. DSAEK surgery was simulated using a Moria microkeratome equipped with a 350 µm cutting head. After cutting, tissues were punched, positioned and transited through a "Tan endoglide" (I-Med Pharma.) or a new "Macaluso Thin DSAEK inserter"(Janach) suitable for a3.5 mm tunnel, before endothelium insertion in porcine eyes. ECD was evaluated with trypan blue staining before microkeratome cutting, immediately after cutting, after glide transition, and after injection in the porcine eye. Tissue thickness was measured by Visante OCT (Carl Zeiss) equipped with an OCT adaptor (OBC,Miami) for in-vial measurement.

RESULTS: The deswelling medium allowed us to obtain lamellar tissue with an average thickness of 126 µm, which was significantly thinner than control lamellar tissue (average thickness: 179 µm). Donor corneas showed an initial ECD of 2480 cells/mm2 on average. After microkeratome cutting, a similar ECD loss of 140 cells/mm2 was observed for THIN-C and control corneas. Simulation of transition through the glide and tissue insertion into the eye, induced similar ECD loss for both glides. THIN-C de-swelled corneas showed markedly lower ECD loss during transit through the glide and insertion into the porcine eye.

CONCLUSION: The de-swelling medium allows preparation of ultra-thin tissues for DSAEK, which can be introduced with two different diameter glides for transplant insertion without damaging the tissue.

## SVEN REISDORF

### NEW PERSPECTIVES TO UTILIZE BIOMECHANICAL PROPERTIES – THE CORVIS® ST

PURPOSE: Development of methods for evaluation of biomechanical properties of the cornea

METHODS: Review

RESULTS: The new Corvis® ST is a new non-contact tonometer in combination with an ultra-high-speed Scheim¬pflug camera (more than 4000 images/sec) that can visualize the reaction of the cornea on the air-pulse. Conclusions can be drawn regarding the bio¬mechanical properties of the cornea from the response of the cornea after the air-pulse. Based on the measured IOP, the biomechanical properties and the corneal thickness, the Corvis ST has the potential to determine a highly accurate value close to the "True IOP". The Corvis ST can also be used to monitor changes of the deformation response of the cornea caused by e.g. corneal ectasia and corneal crosslinking.

In ectatic corneas the viscoelastic properties of the cornea differ from those in normal corneas. Therefore the parameters that describe the deformation response of the cornea can be used to distinguish between normal and ecstatic corneas. With the Corvis ST significant changes in the deformation response of the cornea after crosslinking can also be observed.

## CYNTHIA ROBERTS

### CONSERVATION OF ARCLENGTH IN KERATOCONUS: BENDING OR BULGING?

AUTHORS: ***Roberts C.J.[1,2], Mahmoud A.M.[1,2], Liu J.[1,2], Sharalaya Z.[3], Mauger T.F.[1], Lembach R.G.[1,2], Hendershot A.J.[1], Kuennen R.[1], Klyce S.D.[4]***

1 Department of Ophthalmology

2 Department of Biomedical Engineering

3 College of Medicine

*The Ohio State University, Columbus, OH*

4 Mount Sinai School of Medicine, *New York, NY*

PURPOSE: It has been reported that surface area is conserved between normal (NL) and keratoconic (KCN) corneas, except those with advanced disease, indicating redistribution of surface area rather than bulging in keratoconus. The purpose of the current study was to evaluate corneal arclength prior to and during deformation in KCN and NL corneas.

METHODS: A total of 16 eyes of 10 NL subjects and 15 eyes of 14 subjects with moderate KCN were recruited. All subjects underwent examination with the CorVis ST (Oculus, Wetzlar, Germany), with intraocular pressure (IOP) measured by the PASCAL Dynamic Contour Tonometry (DCT) (Ziemer, Port, Switzerland), as well as IOP with corneal compensation (IOPcc) measured using the Ocular Response Analyzer (ORA)(Reichert, Buffalo, NY). For each device, multiple exams were performed in an attempt have three valid measurements. For DCT, only quality 3 or better were accepted. For the CorVis ST, Corneal arc length was determined in the central 6mm of the horizontal meridian in the Scheimpflug images of the CorVis ST in ~140 images over a 30ms airpuff. The maximum and minimum arclengths were extracted from these images, as well as the initial and final arclengths. Δarclength was calculated as the difference between maximum and minimum values. Groups were statistically compared with a t-tests for all parameters.

RESULTS: All eyes decreased in arclength from initial state to applanation, and then continued to decrease to maximum deformation. Maximum arclength corresponded to initial state and minimum arclength corresponded to maximum deformation. No difference was found in maximum ($p=0.42$) or minimum ($p=0.96$) arclength during deformation between NL and KCN groups. ΔarcLength was statistically greater ($p < 0.032$ using the Satterthwaite method for unequal variances) in NL ($0.124 \pm 0.050$mm) than KCN ($0.093 \pm 0.019$mm). IOP was not different between groups using DCT ($p=0.24$) or ORA ($p=0.10$).

CONCLUSIONS: A consistent decrease in arclength during deformation within 6mm in both NL and KCN is consistent with conservation of arclength across the cornea. The greater change in central arclength in normal corneas compared with

KCN may be interpreted that corneas with keratoconus had a greater compensatory change in arclength in the annulus outside of 6mm, which is consistent with peripheral location of the cone.

Results imply a redistribution of corneal mass in keratoconus which is consistent with conservation of surface area and a bending vs bulging theory of shape change in keratoconus.

## *ANNA MARIA ROSZKOWSKA*

### USE OF ESSENTIAL AMINO ACIDS SUPPLEMENTATION IN THE CORNEAL AND OCULAR SURFACE DISORDERS.

AUTHORS: ***Roszkowska A.M., Aragona P.***

Ophthalmology Clinic, Department of Surgical Specialties, University of Messina, Italy

In this presentation we overview the effects of oral and topical amino acid supplementation in corneal and ocular surface disorders. Oral supplementation with AA improved significantly epithelial resurfacing and corneal nerves restoration in patients who undergone laser refractive procedure. Additionally in these subjects regular and fast corneal healing decreased prevalence of haze in the postoperative period.

Adding AA at HA eye drops has determined a statistically significant increase of BUT and corneal recovery rate if compared with HA alone so the use of HA + AA eyedrops may represent a useful tool for the treatment of moderate/severe dry eye.

Both systemic and topical AA supplementation should be considered as a valid support in restoration of the corneal and ocular surface integrity.

## *CLAUDIO SAVARESI*

### ASSESSMENT AFTER 500 ANALYTICAL SYSTEMS WITH SPHERICAL/TORIC IOLS MULTIFOCAL PRODUCED BY THE SAME COMPANY

AUTHORS: ***Savaresi C., Visentin E., Federici P.***

PURPOSE: Assess the degree of patient satisfaction after implantation of toric IOLs and Multifocal Spherical, for the correction of ametropia such as myopia, hyperopia, astigmatism and presbyopia

METHODS: There were studied 250 patients 500 eyes, which were implanted during cataract surgery spherical and toric IOLs Multifocal all produced by the same company, the values of the IOLs implanted ranged from Sf. -10.00D to Sf. +30.00 D up correctly astigmatism was 6.00D Cyl. Before the choice of the IOL to implant all patients were examined to evaluate the clinical status of the eye, the suitability of the plant type Multifocal IOL spherical or toric and post-intervention assessment of expectations.

RESULTS: The study involved 3 ophthalmologists, the same team. The data obtained demonstrate a high degree of satisfaction / very high for patients who were implanted Multifocal IOLs. In this study, has been instrumental in-depth clinical analysis and evaluation of post-surgery expectations before the choice of the IOL to be implanted in the patient was subjected. To the surprise of the authors, patients with the highest level of satisfaction for the choice of IOls, were found in younger patients.

## *SILVIA SCHUMACHER*

### NEW ACCELERATED CORNEAL CROSS-LINKING WITH BEAM OPTIMIZATION

A new generation of corneal cross-linking devices are emerging. The new generation offers higher intensities and optimized beam shaping in order to accelerate and enhance the treatment of keratoconus. The new illumination concept will be discussed and the effectiveness of this approach is presented.

## *SILVIA SCHUMACHER*

### MODELLING FOR LASER REFRACTIVE SURGERY AND IOL POWER CALCULATION

Optical ray-tracing offers the possibility to improve IOL and ablation profile calculations. Optical ray-tracing does take into account all optical surfaces within the eye and thus offers a very high degree of individualization. The concept of ray-tracing for IOL and ablation profile calculations is presented and the clinical benefits are discussed.

## *SILVIA SCHUMACHER*

### THE IMPACT OF ILLUMINATION INTENSITY AND THE BEAM PROFILE ON CORNEAL CROSS-LINKING

Nowadays several corneal cross-linking illumination systems are available on the market. They partly differ by their illumination intensity and their beam profile. First generation UV-illumination systems have a Gaussian or homogenous beam profile and an intensity of 3 mW/cm2. Features of the currently available second generation devices are a higher irradiation intensity of up to 30 mW/cm2 and a specially shaped optimized beam profile.

The impact of the higher irradiation intensity and modified beam profile on the cross-linking effect will be discussed.

## *GIUSEPPE SCIUTO*

### INTRAOPERATIVE OPTICAL COHERENCE TOMOGRAPHY FOR EVALUATION OF LAMELLAR AND PENETRATING KERATOPLASTIES

AUTHORS: ***Sciuto G.*, Ceccuzzi R.°, Bianchi P°***

*Ophthalmic Unit of Carlo Poma Hospita of Mantua

°IRCCS Foundation, San Matteo Hospital of Pavia

PURPOSE: We report a new intraoperative study utilizing aspectral- domain optical coherence tomography analysis before and after anterior, posterior and penetrating keratoplasties

METHODS: Spectral - domain optical coherence tomography represents an established imaging tecnique used for diagnostics of anterior segment structures in pre-operative evaluation.

RESULTS: In this study we present for the first time theintraoperative and early post-operative data of patients operated of anterior , posterior andpenetrating keratoplasties. With this report we want to stress how essential this innovative tecnique could be for verification of surgical results and also for the management of intraoperative and early post-operative complications, showing fundamental details for understanding in corneal transplatation surgery. This study is in progress and we discuss futher data in the near future.

## *VINCENZO SCORCIA*

ANTERIOR SEGMENT OCT APPLICATION IN CORNEAL SURGERY

Optical coherence tomography (OCT) was originally proposed for posterior imaging. Recently, several applications have been developed for its use also for the anterior segment. The presentation will focus on the advantages resulting from its application in helping a correct clinical diagnosis and selecting the right surgical procedure. Several clinical cases, including pre-operative and post-operative images, will be shown to better explain the several purposes it may achieve.

## *SEBASTIANO SERRAO*

OPTIMAL FEMTOSECOND LASER PARAMETERS TO IMPROVE THE INTERFACE QUALITY OF THE ANTERIOR STROMA FOR I-LASIK

AUTHORS: ***Serrao S.[1], Buratto L.[2], Lombardo G.[3], Ducoli P.[1], Schiano Lomoriello D. [1], Rosati M.[1], Lombardo M.[1]***

1 IRCCS Fondazione G.B. Bietti, Via Livenza 3, 00198 Rome, Italy

2 CAMO, P.zza della Repubblica, Milano

3 CNR - IPCF Unit of Cosenza, c/o LiCryL laboratory, Ponte Pietro Bucci 33/B, 87036 Rende (CS)

PURPOSE: To analyze the interface quality of the anterior stroma after femtosecond (FS) laser flap creation using Atomic Force Microscopy (AFM).

METHODS: A 110 µm depth flap was created in twenty human corneal tissues using a commercial FS laser (Intralase iFS, Abbott). The tissues were divided into four groups of various cutting parameters: pulse energy and spot separation were set respectively at 1) 0.75 µJ and 6 µm, 2) 0.65 µJ and 5 µm, 3) 0.55 µJ and 4 µm and 4) 0.45 µJ and 4 µm. Four more tissues were cut using a motorized microkeratome (160 µm head Hansatome, Bausch & Lomb). AFM (Autoprobe CP, Veeco) analysis was performed, after removing the flap, on the stromal bed of each sample.

RESULTS: Tissues treated with higher pulse energies and wider spot separations (groups 1 and 2) showed a rougher stromal bed interface (RMS rough: 0.23 ± 0.008 µm and 0.24 ± 0.009 respectively) than tissues of groups 3 and 4 (RMS rough: 0.18 ± 0.006 µm and 0.18 ± 0.008 µm respectively; ANOVA: $P<0.001$). The surface quality of tissues treated with pulse energies of 0.55µJ or lower and 4 µm spot separation was comparable to that obtained with the microkeratome (RMS rough = 0.17 ± 0.006 µm; Tukey: $P>0.05$).

CONCLUSIONS: The FS stromal interface quality is greatly improved when setting pulse energy lower and spot separations narrower than those currently used in the clinical setting. FS laser, with optimal adjusted spot parameters, can provide a flap interface smoothness comparable to that provided by the microkeratome.

## *SHIGETO SHIMMURA*

LONG-TERM RESULTS OF DEEP ANTERIOR LAMELLAR KERATOPLASTY (DALK) BY THE VISCO BUBBLE TECHNIQUE

PURPOSE: Deep anterior lamellar keratoplasty (DALK) is a technique for corneal stromal disease with healthy endothlelium. The procedure is especially effective for young patients since it does not cause endothelial rejection as in penetrating keratoplasty (PKP). However, the long term results of DALK compared to PKP is still not clear. We will present our data on the long term results of DALK.

METHODS: We retrospectively compared DALK cases with PKP cases in a case control study. All surgeries were performed by the same surgeon (S. S.). All cases were followed for at least 2 years. All DALKcases were performed by the visco-bubble technique using either Viscoat® or Healon V® to

dissect host Descemet's membrane. A total of 15 DALK cases and 21 PKP cases were enrolled and visual acuity, spherical equivalent (SE), manifest astigmatism and endothelial cell densities were compared. The average follow-up period was 4.5 years for the DALK group and 5.3 years for the PKP group.

RESULTS: There was no statistical difference in final LogMAR visual acuity was 0.14 in the DALK group and 0.07 in the PKP group. Average manifest astigmatism was also similar at 3.5 ±4.5D in the DALK group and 3.7 ± 2.7D in the PKP group. Average decrease in endothelial density after surgery significantly less in the DALK group (11.0 ± 16.6%) compared to PKP (59.5 ±29.0%). DALK offers the same visual function compared to PKP while maintaining endothelial density.

## *LEOPOLDO SPADEA*

CORNEAL REGULARISATION FOR REFRACTIVE PURPOSES ASSOCIATED TO CXL AFTER LK IN KERATOCONUS

PURPOSE: To report the results of a combined treatment of customized excimer laser–assisted photorefractive keratectomy (PRK) and corneal collagen crosslinking (CXL) for residual refractive error in a group of patients previously submitted to lamellar keratoplasty for keratoconus.

METHODS: Five eyes (4 RE) of 5 patients (4 male), who had originally been treated for keratoconus in one eye by excimer laser–assisted lamellar keratoplasty, subsequently present residual ametropia (-6.2D ±1.76SD; range, –3.75/–8.50). After a mean of 43.2 months ± 11.5SD they were submitted to a combined simultaneous treatment of corneal regularisation by topographically guided transepithelial excimer laser PRK (central corneal regularization, CCR) and by riboflavin-UVA–induced corneal CXL.

RESULTS: After a mean of 16 months ±7.6SD (range, 6 – 24) the BSCVA improved from 0 to 2 lines, the MRSE reduce from -1.5 to 8D (-1.2D ±1.76, $p=0.01$), and topographic keratometric astigmatism reduced from 0 to 1.2D. All the corneas remain clear haze

## *EDOARDO STAGNI*

### TRANS-EPITHELIAL CORNEAL COLLAGEN CROSS-LINKING: A BILATERAL, PROSPECTIVE STUDY

AUTHORS: ***Stagni E., Filippello M., O'Brart D.***

PURPOSE: To evaluate the efficacy of trans-epithelial cross-linking (TE-CXL) in patients with bilateral progressive keratoconus: long term results.

METHODS: Twenty patients with a history of bilateral progressive keratoconus were recruited. The worst eye was treated with TE-CXL while the fellow eye was left untreated as a control. TE-CXL was performed by applying Ricrolin TE (Riboflavin 0.1%, dextrane T500 with trometamol (Tris-(hydroxymethyl) aminometane) and sodium ethylenediaminetetraacetic (EDTA)) on the intact corneal epithelium for 2 hours before irradiation with ultraviolet A (370nm at 3mW/Cm2) for 30 minutes. Follow-up was 18 months in all eyes.

RESULTS: Transient hyperaemia and mild foreign body sensation were reported in 8 eyes (40%) following treatment which settled after 24 hours. In treated eyes there were statistically significant improvements in uncorrected and best corrected visual acuity and topographically derived keratometry, cone apex power and high order aberrations (p)

## *ALEKSANDAR STOJANOVIC*

### TRANSEPITHELIAL CXL WITH 0.5% HYPOTONIC RIBOFLAVIN

AUTHORS: ***Stojanovic A., Chen X.***

PURPOSE: To evaluate safety and efficacy of "epithelium-on" corneal cross-linking (CXL) using 0,5 % hypotonic Riboflavin solution.

METHODS: Retrospective consecutive case series of 100 keratoconic eyes of 80 patients treated by CXL without epithelial removal was evaluated. Riboflavin 0.5% hypotonic solution without Dextran was used in addition to tensioactive penetration enhancers and superficial epithelial scarification.

RESULTS: At the final examination 12-14 months after surgery mean uncorrected (UDVA) and corrected (CDVA) distant visual acuity increased significantly from 20/143 and 20/36 to 20/95 and 20/27 respectively (P ean corneal surface irregularity index decreased from 82.88±43.08 µm (range 21.0 to 209.0) to 71.18±34.63µm (range 15.0 to 159.0) (Pelial cell count decreased insignificantly from 2617±398 to 2598±374 (P=0.31)

## *PATRICIA TORO*

### LONG TERM GRAFT SURVIVAL IN DEEP ANTERIOR LAMELLAR KERATOPLASTY

AUTHORS: ***Toro P., Sarnicola E., Sarnicola V.***

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

DESIGN: Retrospective, consecutive, non-comparative, cases series report.

PARTICIPANTS: A total of 806 eyes of 711 patients with stromal corneal diseases and healthy endothelium.

METHODS: 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.

MAIN OUTCOMES: Follow-up time, graft survival rate and preoperative and postoperative endothelial cell density.

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.

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.

## *ACHILLE TORTORI*

### DALK OUR EXPERIENCE

AUTHORS: ***Tortori A., Gifuni L., Capasso L.***

PURPOSE: To report and evaluate cases of complications in DALK procedures ended successfully.

METHODS: Review of surgical video performed by singlesurgeon at one institution. Recorded complication were classified as intraoperative either early or late.

RESULTS: The advance in surgical instrumentation and theincreased awareness by the surgeon lead to manage complications and helps novice surgeons to learn the procedure faster.

## *SALVATORE TROISI*

### DIFFUSION OF CYANOCOBALAMIN IN HUMAN CORNEAS AFTER TOPICAL APPLICATION: A PHARMACOKINETIC STUDY

AUTHORS: ***Troisi S., Caruso C., Pacente L., Ostacolo C., Del Prete A., Barbaro G.***

PURPOSE: to determine the stromal concentration of cyanocobalamin (vit.B12) in human corneas after topical application and the trans-corneal diffusionat different times.

METHODS: two solution of vit. B12 at different concentrations (solution A: 1 mg/ml; solution B: 0.04mg /100ml) were topically applied on eye-bank human corneas, mounted on Franz cells; the cyanocobalamin concentrations in the receiver compartment were estimated with HPLC at 10, 20, 30, 60, 120 and 180 minutes. Then the tissue concentrations were estimated with HPLC after extraction with bi-acid sodium phosphate.

RESULTS: cyanocobalamin was already detectable in the receiver compartment after 10 minutes with both solutions, the concentrations increasing with time. Average concentrations of

solution A in the receiver compartment were 2.93 nmol/ml at 10 minutes (SEM 0.25); 8.69 nmol/ml at 60 minutes (SEM 0.95); 18.88 nmol/ml at 180 minutes (SEM 0.56). Average concentrations of solution B in the receiver compartment were 0.13 nmol/ml at 10 minutes (SEM 0.04); 0.51 nmol/ml at 60 minutes (SEM 0.17); 0.78 nmol/ml at 180 minutes (SEM 0.26). Average tissue concentrations at 180 minutes were 0.04±0.01 nmol/mg and 0.198±0.20 nmol/mg, respectively.

## *EDOARDO VILLANI*

### HEATING WET CHAMBER GOGGLES (BLEPHASTEAM®) IN MEIBOMIAN GLAND DYSFUNCTION UNRESPONSIVE TO WARM COMPRESS TREATMENT

AUTHORS: ***Villani E., Magnani F., Canton V., Ratiglia R.***

PURPOSE: To evaluate the safety and efficacy of wet chamber warming goggles (Blephasteam®) in patients with meibomian gland dysfunction (MGD) unresponsive to warm compress treatment.

METHODS: We consecutively enrolled 15 adult patients with low-delivery, non-cicatricial, MGD unresponsive to warm compress treatment. We considered unresponsive the patients who showed no OSDI or BUT improvement after 3 weeks of treatment with warm compresses used twice a day during 10 minutes. The patients were instructed to use Blephasteam® (Laboratoires Thea, Clermont-Ferrand, France) twice a day during 10

minutes, with a following lid massage. Outcome measures were assessed in the worst eye (lower BUT) at baseline and after 3 weeks, including OSDI score, BUT, corneal fluorescein staining, MGs expressibility, Schirmer test. In vivo laser scanning confocal microscopy (LSCM) was used to study MGs in the lower eyelid, quantifying the mean acinar units diameter (manually measured as the longest axis of the acinar unit), acinar units area (calculated automatically after manual demarcation of the boundary), density of MGs (manually marked inside each 400x400 µm frame and calculated automatically with the Cell Count software, Heidelberg Engineering GmbH, Dortmund, Germany), diameter of glandular orifices (manually marked as the longest axis of orifice); meibum secretion reflectivity; inhomogeneous appearance of interstice and wall of acinar units.

RESULTS: After 3 weeks of treatment, mean OSDI score decreased from 37.7±17.5 to 23.2±12.4 and mean BUT decreased from 6.0±2.5 to 8.4±2.0 (P±2205 to 6876±1418; Pis the mainstay of the clinical treatment of MGD and its poor results may be often due to lack of compliance and standardization. Blephasteam® wet chamber warming goggles are a promising alternative to classical warm compress treatment, potentially able to improve the weaknesses of the "warming approach".

## *EDOARDO VILLANI*

### THE EYELID MARGIN IN DRY EYE: AN IN VIVO CONFOCAL STUDY

AUTHORS: ***Villani E., Magnani F., Canton V., Ratiglia R.***

PURPOSE: To evaluate by in vivo laser scan confocalmicroscopy (LSCM) the morphological changes of the eyelid margin in patients with aqueous-deficient (ADDE) and evaporative (EDE) dry eye.

METHODS: Fifteen patients with ADDE, 15 with EDE, and 15 age- and gender-matched control subjects were consecutively enrolled. Each participant completed an Ocular Surface Disease Index questionnaire and underwent a full eye exam (including BUT, fluorescein and lissamine green staining, Schirmer test and meibomian glands examination) and a LSCM examination of the inferior eyelid margin (to study epidermal superficial and basal epithelial density, meibomian glands – MGs - orifices diameter and distance from mucocutaneous junction - MCJ, tarsal cunjunctival superficial and basal epithelial density).

RESULTS: All the clinical parameters showed statistical significant differences among the groups (Pmal density. MGs orifices diameter was increased in EDE compared to both ADDE and controls (PDDE and EDE compared to controls (Puperficial and basal epithelial densities were reduced in both ADDE and EDE compared to controls

## *RICCARDO VINCIGUERRA*

### FOUR-YEAR CROSS-LINKING MORPHOLOGICAL AND CLINICAL RESULTS IN KERATOCONUS: AN ANALYSIS BY AGE

AUTHORS: ***Vinciguerra R., Morenghi E., Romano M.R., Camesasca F.I., Vinciguerra P.***

PURPOSE: To report a comparative prospective long-term functional analysis after Riboflavin UV A corneal cross-linking (CXL) in four different age groups of patients affected by progressive keratoconus (KC).

METHODS: 400 eyes of 301 patients were evaluated, the comparative functional analysis comprised the following: 49 eyes (12.25%) of patients aged between 9 and 18, 162 eyes (40.50%) of patients aged between 18 and 28 years, 138 eyes (34.50%) of patients aged between 29 and 39 years, 51 eyes ( 12.75%) of patients older than 40 years.Riboflavin-ultraviolet A (UVA)-induced CXL included instillation of 0.1% riboflavin–20% dextrane solution 30 minutes before UVA irradiation and every 5 minutes for an additional 30 minutes during irradiation. Pre- and post-op examinations included best corrected visual acuity (BCVA), corneal topography and aberrometry for the evaluation of higher-order aberrations in 3, 5, 7 mm (OPD; Nidek, Gamagori, Japan) and optical tomography, and central pachymetry with Pentacam (Oculus Inc, Lynnwood, WA).

## *RICCARDO VINCIGUERRA*

### COMPARATIVE STRES- STRAIN MEASUREMENTS OF HUMAN CORNEAS AFTER TRANSEPITHELIAL UV-A INDUCED CROSS-LINKING: IMPREGNATION WITH IONTOPHORESIS, DIFFERENT RIBOFLAVIN SOLUTIONS AND IRRADIANCE POWER

AUTHORS: ***Vinciguerra R., Spoerl E., Romano M.R., Rosett P., Vinciguerra P.***

PURPOSE: To compare the change in biomechanical properties of human cadaver corneas after standard transepithelial cross-linking (CXL-TE) versus CXL-TE using iontophoresis, different solutions and UV-A power.

METHODS: Twelve human cadaver corneas were divided in 4 different groups according to methods of impregnations and UV-A power used: Group A (three corneas, treated with CXL-TE using an irradiance power of 3 mW/cm2 for 30 minutes and riboflavin solution with 15 % dextrane and Tromethamine);

Group B

(three corneas treated with CXL-TE using an irradiance power of 3 mW/cm2 for 30 minutes and riboflavin solution with Tromethamine); Group C

(three corneas treated with CXL-TE using an irradiance power of 10 mW/cm2 for 10 minutes and riboflavin solution with Tromethamine); Group D (three corneas treated with an irradiance power of 10 mW/cm2 for 10 minutes, the impregnation was obtained with the aid of iontophoresis and a riboflavin solution with Tromethamine).

After cross- linking, static stress-strain measurements of the corneas were performed using a microcomputer-controlled biomaterial tester with a pre-stress of 5x103 Pa. Stress stain curves were fitted with an exponential function and the Young's modulus was calculated. Thickness of the cornea was measured with an ultrasound pachymeter.

RESULTS: Stress strain measurement showed an increase in corneal rigidity after cross-linking compared to standard CXL-TE, indicated by a rise in strain and in Young's modulus calculated at 10% strain. Considering group A as standard of comparison, group B showed an increase by a factor of 1.45, group C by a factor of 1.26, group D by a factor of 1.81. Mean corneal thickness was: 627 ?m for group A, 628 ?m for group B, 527 ?m for group C, 665 ?m for group D.

CXL-TE is able to increase mechanical rigidity in human corneas in selected groups. Stress strain results showed a maximal effect in the iontophoresis group, probably due to the increased riboflavin concentration in the stroma. Stress strain measurement in the other groups showed a better results using riboflavin solution without dextrane and 3 mW/cm2 of irradiance power.

## *MARK WILKINS*

### THE USE OF RITUXIMAB IN REFRACTORY INFLAMMATORY EXTERNAL EYE DISEASE

AUTHORS: ***Wilkins M., Watson M., Dart J.***

PURPOSE: Rituximab (RTX) is a monoclonal anti-CD20 antibody effective in rheumatoid arthritis and bullous skin disease. Reports show efficacy in refractory ocular inflammatory disease including, scleritis, uveitis, peripheral ulcerative keratitis and ocular mucous membrane pemphigoid (MMP). We report our experience of RTX in inflammatory external eye disease refractory to conventional immunosuppression.

METHODS: Medical records were reviewed in 11 patients with severe refractory inflammatory external eye disease and given RTX: ocular MMP (7), Moorens Ulcer (1), Vernal Keratoconjunctivitis (1), Idiopathic Keratoconjunctivitis (1) and Linear IgA (1). Patients received intravenous infusions of RTX at a dose of 375 mg/m$^2$. All current immunosuppressive agents; Dapsone (5), Prednisolone (2), Mycophenolate (5), cyclosphosphomide (2), Azathioprine (1) and Cyclosporine (3) were continued. The main outcome measure was control of ocular inflammation graded as a success (S), qualified success (QS), or failure (F).

RESULTS: Seven males and four females were identified (mean age, 56 years). Five patients with ocular MMP responded to treatment (2 S, 3 QS) with two failures. One patient responded to a further RTX infusion after relapsing. The patient with Moorens responded to treatment (S) and remains in remission for 24 months. The patient with Vernal Keratoconjunctivitis required two infusions before a response (S) was seen. The patient with Idiopathic Keratoconjunctivitis responded (QS) but the patient with Linear IgG did not respond (F). The median follow up was 12 months (range 3 – 44 months) with no adverse events reported.

CONCLUSIONS: This case series supports the growing evidence that RTX can be effective and safe in number of ocular inflammatory diseases refractory to conventional immunosuppression. However, the optimum protocol regarding frequency of infusions and concomitant immunomodulatory therapies has yet to be established.

## *XIANGJUN CHEN*

### THE EFFECT OF LIMBAL MARKING PRIOR TO LASER ABLATION ON THE MAGNITUDE OF CYCLOTORSIONAL ERROR

AUTHORS: ***Chen X., Stojanovic A., Stojanovic F., Eidet J.R., Raeder S., Oeritsland H., Paaske Utheim T.***

PURPOSE: To evaluate the residual registration error in cyclotorsional tracker controlled laser refractive surgery after limbal-marking-based manual adjustment.

METHODS: Two hundred eyes undergoing custom surface ablation were grouped into "limbal-marked" (group one) and "non-limbal-marked" (group two). Iris registration information was acquired preoperatively from all eyes. Before the surgery horizontal axis was marked in group one for use in manual cyclotorsional alignment prior to surgical iris registration. During the iris registration the preoperative iris information was compared to the eye-tracker captured image. The magnitudes of the registration error angle and cyclotorsional movement during the subsequent laser ablation were recorded and analyzed.

RESULTS: Mean magnitude of registration error angle (absolute value) was 1.82 ± 1.31 degrees (range: 0.00 to 5.50) and 2.90 ± 2.40 degrees (range: 0.00 to 13.50) for group one and two, respectively (P 2 degrees, while 22% and 20% of eyes had cyclotorsional movement during ablation > 2 degrees in group one and two, respectively.