

International Scar Meeting in Tokyo 2010 with The 5th Japan Scar Workshop



*Nov 30th and Dec 1st, 2010
Toshi Center Hotel, Tokyo, Japan*

Table of Contents

1. Message from The President
2. Faculty of the Meeting
3. Instructions to Presenters and Attendees
4. Congress Venue: Toshi Center Hotel
5. Gala Dinner
6. Presenters
7. Lectures
8. Program Day 1
9. Program Day 2
10. Abstract: Lectures
11. Abstract: Panel Discussion
12. Abstract: Oral Presentations
13. Abstract: Poster Presentations
14. Sponsors
15. Secretariat

Message from The President

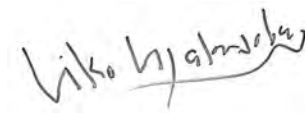
Dear colleagues,

It is great honor for me to organize the International Scar Meeting in Tokyo (ISMT) 2010. This meeting is an activity intended to allow for an information exchange about scar management among clinicians, researchers and co-medicals in the world. This meeting is formed in response to the need for further scientific research in the formation and management of scars.

The main topics of interest for this meeting will be: 1. cutaneous scarring, 2. fibrotic diseases, 3. keloids and hypertrophic scars, 4. total scar management including surgery and non-surgical therapies, 5. aesthetic scar treatments, 6. burn scar treatments, 7. management of fibrotic organs, 8. scar evaluation and educational systems, and 9. basic research of scarring and fibrotic diseases.

We welcome the input and participation of all clinical and basic researchers related to scar management, their prevention, and treatment. ISMT 2010 is going to be held in Tokyo on Nov 30th and Dec 1st. I urge all of you to attend this meeting and start preparing now as we move forward in facing our challenges.

Sincerely,



President

Hiko Hyakusoku, M.D., Ph.D,
Department of Plastic,
Reconstructive and Aesthetic
Surgery, Nippon Medical
School, Tokyo, Japan

Faculty of the Meeting

President



Hiko Hyakusoku
(Nippon Medical School Hospital, Tokyo, Japan)

Honorary Presidents (alphabetical order)



Masaki Kitajima
(International University of Health and Welfare, Tochigi, Japan)



Luc Teot
(Montpellier University Hospital, Montpellier, France)

Honorary Members (alphabetical order)



Takehiko Ohura
(Pressure Ulcer and Wound Healing Research Center, Kojin-kai, Sapporo, Japan)



Nobuyuki Shioya
(NPO Wound Healing Center, Tokyo, Japan)



Akira Tokunaga
(Nippon Medical School Musashi Kosugi Hospital, Kanagawa, Japan)

International Advisory Board (alphabetical order)



Nicole S. Gibran
(UW Regional Burn Center, Harborview Medical Center, Seattle, WA, USA)



Mark S. Granick
(New Jersey Medical School, Newark, NJ, USA)



Geoffrey C. Gurtner
(Stanford University School of Medicine, Stanford, CA, USA)



Patricia A. Hebda
(Children's Hospital of Pittsburgh, University of Pittsburgh School of Medicine, Pittsburgh, PA, USA)



Joon Pio Hong
(Asan Medical Center, University of Ulsan College of Medicine, Seoul, Korea)



Wei Liu
(Shanghai Ninth People's Hospital, Shanghai Jiaotong University School of Medicine, Shanghai, China)



Thomas A. Mustoe
(Northwestern University School of Medicine, Chicago, IL, USA)



Dennis P. Orgill
(Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA)



Oliver H. Rennekampff
(Hannover Medical School, Hannover, Germany)

Local Advisory Board (alphabetical order)



Satoshi Akaishi
(Nippon Medical School Hospital, Tokyo, Japan)



Sadanori Akita
(Nagasaki University Hospital, Nagasaki, Japan)



Kazuo Kishi
(Keio University Hospital, Tokyo, Japan)



Yu Maruyama
(Toho University, Ohashi Medical Center, Tokyo, Japan)



Hiroshi Mizuno
(Juntendo University, Tokyo, Japan)



Rei Ogawa
(Nippon Medical School Hospital, Tokyo, Japan)



Hiroyuki Ohjimi
(Fukuoka University Hospital, Fukuoka, Japan)



Akira Sugamata
(Tokyo Medical College Hospital, Tokyo, Japan)



Shigehiko Suzuki
(Kyoto University Hospital, Kyoto, Japan)



Hiroto Terashi
(Kobe University Hospital, Kobe, Japan)



Yasuyoshi Tosa
(Showa University Hospital, Tokyo, Japan)



Tetsuji Uemura
(Saga University Hospital, Saga, Japan)



Yuhei Yamamoto
(Hokkaido University Hospital, Sapporo, Japan)

Secretariat (alphabetical order)



Satoshi Akaishi
(Nippon Medical School Hospital, Tokyo, Japan)



Sadanori Akita
(Nagasaki University Hospital, Nagasaki, Japan)



Rei Ogawa
(Nippon Medical School Hospital, Tokyo, Japan)

Instructions to Presenters and Attendees

To presenters

Special lectures

Special lectures have a 20 or 30 minute slot in the program. Presenters should prepare an 15 or 25 minute talk, respectively. Session chairs will allow 15 or 25 minutes for presentations, and 5 minute will be allowed for questions. Please contact the AV volunteer for your session in the break before your talk to arrange for your presentation to be placed on the shared computer (Microsoft Windows®). We prefer you to bring your presentation, on portable media (USB disk or CD-R) in the form of Microsoft PowerPoint®, and not to use your own computer unless absolutely essential. If you want to use Macintosh®, you can use your own Macintosh® laptop. Presenters can NOT use shared Macintosh® computer.

Oral papers in general presentations

Oral papers have a 6 minute slot in the program. Presenters should prepare an 4-5 minute talk. Session chairs will allow 4-5 minutes for presentations, and 1-2 minute will be allowed for questions. Please contact the AV volunteer for your session in the break before your talk to arrange for your presentation to be placed on the shared computer (Microsoft Windows®). We prefer you to bring your presentation, on portable media (USB disk or CD-R) in the form of Microsoft PowerPoint®, and not to use your own computer unless absolutely essential. If you want to use Macintosh®, you can use your own Macintosh® laptop. Presenters can NOT use shared Macintosh® computer.

Poster papers

Maximum poster size is 90cm (width) x 180cm (height).
Please put up your poster in the morning on Day 1 (November 30th).
There are no oral presentations for poster papers.

To all attendees

Registration desk

Please complete registration on the web prior to the conference.
On the day, please stop by the registration desk to receive participation certificate, name plate and program book. The desk will open in the Toshi Center Hotel.
Registration desk will open;

Nov. 29 (Mon) 19:00-21:00
Nov. 30 (Tue) All day
Dec. 1 (Wed) All day

Congress Venue: Toshi Center Hotel

LAYOUT

FACILITIES

Exhibition
Coffee

22F -	Guest Rooms
21F -	Guest Rooms
20F -	Guest Rooms
19F -	Guest Rooms
18F -	Guest Rooms (Non-Smoking)
17F -	Guest Rooms (Non-Smoking)
16F -	Guest Rooms
15F -	Guest Rooms
14F -	Guest Rooms
13F -	Stairwell
9-12F -	Administrative Floor
8F -	Prevention of Disasters Library
7F -	Meeting Rooms
6F -	Meeting Rooms
5F -	Meeting Rooms Orion, Sakura, Matsu, Kaede, Kiku
3F -	Cosmos Hall
Lobby F -	Entrance Lobby, Reception, Coffee House IRIS, Lounge
1F -	Office Entrance, Japanese restaurant BAIRIN, Parking

Congress venue

MAP

ACCESS



Access to the Toshi Center Hotel

- 4 minute-walk from Exit No.1 of Kojimachi station, Yurakucho Subway Line.
- 4 minute-walk from Exit No.4 or 5 of Nagatacho Station, Yurakucho/Hanzomon Subway Lines.
- 3 minute-walk from Exit No.9 of Nagatacho Station,Nanboku Subway Line.
- 8 minute-walk from Exit D of Akasaka Mitsuke Station,Marunouchi / Ginza Subway Lines.
- 14 minute-walk from Kojimachi exit of Yotsuya Station, JR Chuo Line.
- By bus, Hirakawacho 2-chome Toshi Center-mae. (Shinbashi - Ichigaya - Kotakibashi Shako route)
- By car, five minutes from kasumigaseki exit, Shuto Expressway.

Gala Dinner

Time and Date : 19:00 - 21:00, Nov. 30th

Place : Royal Garden Café
(ロイヤルガーデンカフェ)
2-1-19 Kita-Aoyama Minato-ku Tokyo
(港区北青山2-1-19)
TEL. +81-3-5414-6170

Shuttle bus is going to depart from
Toshi Center Hotel.
Please check the time schedule on site.

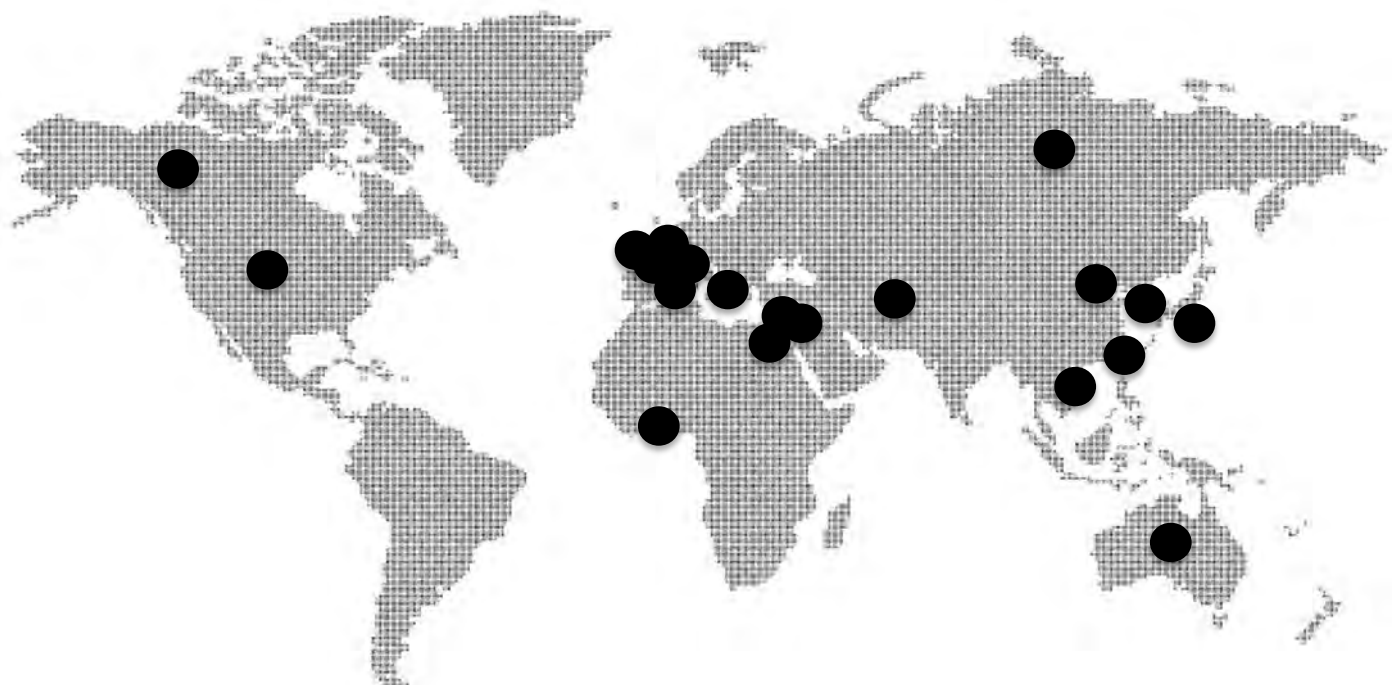


★By walk : about 20 minutes (2.2km)



You can find "Royal Garden Café" on a very beautiful Ginkgo avenue

Presenters of International Scar Meeting in Tokyo 2010



Australia
Austria
Canada
China
Egypt
France
Germany
Ghana
Greece
Israel
Italy
Japan

Netherlands
Russia
Saudi Arabia
South Korea
Uzbekistan
Vietnam
Libya
Taiwan
Turkey
UK
USA

Lectures (alphabetical order of the first author)



Human Recombinant Basic Fibroblast Growth Factor (bFGF) Improves Scar Quality Such as Softness, Elasticity of The Scar and Stratum Corneum Function and Color-Match as well as Accelerates Wound Healing

Sadanori Akita, Kenji Hayashida, Hiroshi Yoshimoto, Kozo Akino, Aya Yakabe, Akiyoshi Hirano
Department of Plastic and Reconstructive Surgery, Nagasaki University Hospital, Nagasaki, Japan



Prevention and Reduction of Scarring by TGFβ3 (Juvista/Avotermin) – Clinical and Scientific Data

Mark WJ Ferguson*,**

*Renovo, Core Technology Facility, Manchester, UK

**University of Manchester, UK



Treatment of Keloids

Ryosuke Fujimori

Fujimori's Plastic Surgery Clinic, Kyoto,
Japan



Making Sense of Wound Healing: A Role for Nerves

Nicole S. Gibran

University of Washington Department of Surgery, WA,
USA



Of Mice and Men: Mechanical Signaling and Scar Formation Across Species

Geoffrey C. Gurtner

Stanford University School of Medicine, Stanford, CA, USA



Intralesional Cryosurgery for The Treatment of Hypertrophic Scars and Keloids

Yaron Har-Shai

Plastic Surgery Unit, Carmel Medical Center and the Bruce Rappaport Faculty of Medicine,
Technion – Israel institute of Technology, Haifa, Israel



Pathogenesis of Diabetic Complications Through Bone Marrow-Derived Cells

Akinori Hara*, Norihiko Sakai*, Takashi Wada**

*Department of Disease Control and Homeostasis, Institute of Medical, Pharmaceutical and
Health Sciences, Faculty of Medicine, Kanazawa University, Ishikawa, Japan

**Department of Laboratory Medicine, Institute of Medical, Pharmaceutical and Health Sciences,
Faculty of Medicine, Kanazawa University, Ishikawa, Japan



The Effect of Nepidermin(rh-EGF) Against Scar Formation

Joon Pio Hong, JooA Lee

Plastic Surgery, Asan Medical Center University of Ulsan, Seoul, Korea



TGF-β Receptor Antagonists as Novel Agents to Promote Wound Healing and Reduce Scar Formation in Wounds of Normal Skin

Jung San Huang*, Shuan Shian Huang**

*Department of Biochemistry and Molecular Biology, St. Louis University School of Medicine,
St. Louis, USA

**Auxagen, Inc., St. Louis, USA



My Therapeutic Experience of The True Keloid for More Than 50 Years

Masashi Itoh

Department of Plastic & Reconstructive Surgery, Kantoh Rosai Hospital, Kanagawa, Japan



1. Treatment of Traumatic Scars Using Plasma Skin Regeneration (PSR) System and Fractional Laser
2. Treatment of Hypertrophic Scars Using a Long-Pulsed Dye Laser with Cryogen Spray Cooling
 Taro Kono, Hirouki Sakurai
 Department of Plastic and Reconstructive Surgery, Tokyo Women's Medical University,
 Tokyo, Japan



Modulation of Vocal Fold Scar Fibroblast by Adipose Derived Stem Cells In Vitro
 Yoshihiko Kumai
 Department of Otolaryngology Head and Neck Surgery, Kumamoto University School of
 Medicine, Kumamoto, Japan



Surgery and Chemotherapy of Keloids
 Wei Liu
 Department of Plastic Surgery, Shanghai 9th People's Hospital, Shanghai Jiao Tong University
 School of Medicine, Shanghai, China



Chymase Activity in Hypertrophic Scars
 Hajime Matsumura
 Department of Plastic Surgery, Tokyo Medical University, Tokyo, Japan



Serine Protease-Family Protein HtrA1 is Specifically Up-Regulated in Keloid Lesions
 Motoko Naitoh, Toshihiro Ishiko, Satoko Yamawaki, Katsuhiro Yosihikawa, Sigehiko Suzuki,
 Department of Plastic and Reconstructive Surgery, Graduate School of Medicine, Kyoto
 University, Kyoto, Japan



Current Keloid and Hypertrophic Scar Treatment Algorithms and Our Recent Trials
 Rei Ogawa
 Department of Plastic, Reconstructive and Aesthetic Surgery, Nippon Medical School,
 Tokyo, Japan



Forces and Matrices in Wound Healing
 Dennis P. Orgill*, Rei Ogawa**
 *Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA
 **Nippon Medical School, Tokyo, Japan



Medical Needling
 Hans-Oliver Rennekampff, Matthias Aust, Peter M. Vogt
 Department of Plastic, Hand and Reconstructive Surgery, Medical School Hannover, Germany



The Pathomechanism of The Ligamentum Flavum Hypertrophy is Similar to That of The Hypertrophic Scar Formation during Wound Healing
 Koichi Sairyo*, Rei Ogawa**, Akira Dezawa*
 *Department of Orthopedic Surgery, Teikyo University Mizonokuchi Hospital, Kawasaki, Japan
 **Department of Plastic, Reconstructive and Aesthetic Surgery, Nippon Medical School, Tokyo, Japan



Interest of The Use of Artificial Dermis in Prevention of Scar Contraction and Hypertrophy
 Luc Téot, Sami Otman, Chloé Trial, Antonio Brancatti
 Wound Healing Medico-Surgical Unit, Lapeyronie Hospital, Montpellier, France



Functional Implication of The IL-6 Signaling Pathway in Keloid Pathogenesis
 Mamiko Tosa***, Mohammad Ghazizadeh**, Masahiro Murakami*, Hiko Hyakusoku***
 *Department of Plastic and Reconstructive Surgery, Nippon Medical School Musashi-kosugi
 Hospital, Kawasaki, Japan.
 **Department of Molecular Pathology, Institute of Gerontology, Nippon Medical School,
 Kawasaki, Japan
 ***Department of Plastic and Reconstructive Surgery, Nippon Medical School, Tokyo, Japan

Program

Day 1 November 30th (Tuesday)

Welcome Remarks

8:00-8:15

Honorary President

Masaki Kitajima

President

Hiko Hyakusoku

Secretariat

Rei Ogawa

Symposium

Keloids and Hypertrophic Scarring -Clinical Studies-

8:15-9:51

Moderators

Yaron Har-Shai

Wei Liu

Special Lecture 1

8:15-8:45

SL-1 Surgery and Chemotherapy of Keloids

Wei Liu

Department of Plastic Surgery, Shanghai 9th People's Hospital, Shanghai Jiao Tong University School of Medicine, Shanghai, China

E-mail: liuwei_2000@yahoo.com

Special Lecture 2

8:45-9:15

SL-2 Intralesional Cryosurgery for The Treatment of Hypertrophic Scars and Keloids

Yaron Har-Shai

Plastic Surgery Unit, Carmel Medical Center and the Bruce Rappaport Faculty of Medicine, Technion – Israel institute of Technology, Haifa, Israel

E-mail: yaron07@yahoo.com

General Presentations

9:15-9:51

9:15-9:21

O-01 Tripoli Protocol : A Developing Nations Challenge to Managing Some Difficult Keloids

Kamal Malaker*, Mustafa Zaidi**, Rida Franca**

*Clinical Oncology and Int Medicine, Department of ICM, Ross University School of Medicine, New Jersey, Miami, USA

**Plastic Surgery, University of Tripoli Medical School, Tripoli, Libya

E-mail: kamal_malaker@hotmail.com (Kamal Malaker)

9:21-9:27

O-02 Experience of The Pressure Method Using Sponge for Hypertrophic Scar Treatment

Hajime Takahashi, Koji Kurihara

Department of Plastic Surgery, Ushiku Aiwa General Hospital, Ibaraki, Japan

E-mail: takahashi333@ivy.ocn.ne.jp (Hajime Takahashi)

9:27-9:33

O-03 Pulsed Dye Laser (PDL) in Hypertrophic Scars and Keloids: Our Experience in The Past 2 Years

Domenico Parisi, Luigi Annacontini, Michela Campanaro, Mauro Valente, Pasquale Bisceglia, Aurelio Portincasa

Plastic and Reconstructive Surgery Department, University of Foggia, Italy

E-mail: dr.maurovalente@gmail.com (Mauro Valente)

9:33-9:39

O-04 Use of Hexamethyl Pararosaniline Chloride to Treat Keloids

Tomoko Kikui

Kajimoto Clinic, Osaka

9:39-9:45

O-05 Long Pulse Nd:YAG Laser Therapy for Keloids and Hypertrophic Scars

Satoshi Akaishi, Sachiko Koike, Teruyuki Dohi, Kyoko Kobe, Hiko Hyakusoku and Rei Ogawa

Department of Plastic, Reconstructive and Aesthetic Surgery, Nippon Medical School, Tokyo, Japan

E-mail: redstoneprs@gmail.com (Satoshi Akaishi)

9:45-9:51

O-06 Strategy for Treating Ear Keloids

Chenyu Huang, Satoshi Akaishi, Teruyuki Dohi, Hiko Hyakusoku and Rei Ogawa

Department of Plastic, Reconstructive and Aesthetic Surgery, Nippon Medical School, Tokyo, Japan

E-mail: r.ogawa@nms.ac.jp (Rei Ogawa)

-Coffee Break-

Symposium
Keloids and Hypertrophic Scarring –Basic Researches Part 1-
10:15-11:51

Moderators

Hajime Matsumura

Yasuyoshi Tosa

Special Lecture 1

10:15-10:35

SL-3 Chymase Activity in Hypertrophic Scars

Hajime Matsumura

Department of Plastic Surgery, Tokyo Medical University, Tokyo, Japan

E-mail: hmatsu-tki@umin.ac.jp

Special Lecture 2

10:35-10:55

SL-4 Serine Protease-Family Protein HtrA1 is Specifically Up-Regulated in Keloid Regions

Motoko Naitoh, Toshihiro Ishiko, Satoko Yamawaki, Katsuhiro Yoshikawa, Sigehiko Suzuki,

Department of Plastic and Reconstructive Surgery, Graduate School of Medicine, Kyoto University, Kyoto, Japan

E-mail: mnaitoh@kuhp.kyoto-u.ac.jp (Motoko Naito)

Special Lecture 3

10:55-11:15

SL-5 Functional Implication of The IL-6 Signaling Pathway in Keloid Pathogenesis

Mamiko Tosa*, **, Mohammad Ghazizadeh**, Masahiro Murakami*, Hiko Hyakusoku***

*Department of Plastic and Reconstructive Surgery, Nippon Medical School Musashi-kosugi Hospital, Kawasaki, Japan.

**Department of Molecular Pathology, Institute of Gerontology, Nippon Medical School, Kawasaki, Japan

***Department of Plastic and Reconstructive Surgery, Nippon Medical School, Tokyo, Japan

E-mail: Tosa-m@nms.ac.jp (Mamiko Tosa)

General Presentations

11:15-11:51

11:15-11:21

O-07 Expression and Pathogenic Role of Cartilage Oligomeric Matrix Protein (COMP) in Keloids

Fumie Shono*, **, Shigeki Inui**, Takeshi Nakajima**, Ko Hosokawa*, Satoshi Itami**

* Plastic and Reconstructive Surgery, Graduate School of Medicine, Osaka University, Osaka, Japan

**Departments of Regenerative Dermatology, Graduate School of Medicine, Osaka University, Osaka, Japan

E-mail: fumie-s@mail.goo.ne.jp (Fumie Shono)

11:21-11:27

O-08 In Vitro and In Vivo Studies on Antifibrotic Effects of Dextran Sulphate

Chao-Kai Hsu*, **, Sheau-Chiou Chao*, Jian-You Chen*, Mei-Hui Yang*, Feng-Jie Lai***, J. Yu-Yun Lee*

*Department of Dermatology, National Cheng Kung University College of Medicine and Hospital, Tainan, Taiwan

**Institute of Clinical Medicine, National Cheng Kung University College of Medicine and Hospital, Tainan, Taiwan

***Department of Dermatology, Chi-Mei Medical Center, Tainan, Taiwan.

E-mail: kylehsu@mail.ncku.edu.tw (Chao-Kai Hsu)

11:27-11:33

O-09 In Vitro and in Vivo Evidence of Pathogenic Roles of Hic-5/ARA55 in Keloids through Smad Pathway and Profibrotic Transcription

Shigeki Inui *, Fumie Shono **, Fumihito Noguchi *, Takeshi Nakajima *, Ko Hosokawa **, Satoshi Itami *

*Departments of Regenerative Dermatology, Osaka University School of Medicine, Osaka, Japan

** Departments of Plastic Surgery, Osaka University School of Medicine, Osaka, Japan

E-mail: inui@r-derma.med.osaka-u.ac.jp (Shigeki Inui)

11:33-11:39

O-10 Influence of Oxygen Environment in Wound Healing Dynamics

Hitomi Sano*, Shigeru Ichioka**

*Department of Surgical Science, Graduate School of Medicine, the University of Tokyo, Tokyo, Japan

**Department of Plastic and Reconstructive Surgery, Saitama medical university hospital, Saitama, Japan

E-mail: sasasa116sasasa@hotmail.com (Hitomi Sano)

11:39-11:45

O-11 Inflammatory Cells in Keloids and Hypertrophic Scars

Yoshiaki Sakamoto*, Noriko Hattori**, Hiroko Ochiai*, Junzi Takano***, Kazuo Kishi**

*Department of Plastic and Reconstructive Surgery, National Hospital Organization Tokyo Medical Center, Tokyo, Japan

**Department of Plastic and Reconstructive Surgery, Keio University School of Medicine, Tokyo, Japan

***Department of Plastic and Reconstructive Surgery, Saitama Social Insurance Hospital, Saitama, Japan

E-mail: ysakamoto@z8.keio.jp (Yoshiaki Sakamoto)

11:45-11:51

O-12 Vitamin D: A Novel Therapeutic Approach for Keloid, An in Vitro Analysis

Guo-You Zhang*, **, Qing Yu*, Tao Cheng***, Tian Liao****, Chun-Lei Niu*****, An-Yuan Wang*, Xin Zheng*, Xue-guan Xie*, Wei-Yang Gao*

*Department of Hand and Plastic Surgery, the 2nd Affiliated Hospital of Wenzhou Medical College, Zhejiang, China

**Department of Dermatology, University of Lübeck, Lübeck, Germany

***Department of Orthopaedic Surgery, Shanghai Sixth People's Hospital, School of Medicine, Shanghai Jiaotong University, Shanghai, China

****Department of Otolaryngology, Head and Neck surgery, Charite Campus Benjamin Franklin, Berlin, Germany

*****Department of Head and Neck Surgery, The Third Affiliated Hospital of Harbin Medical University, Harbin, China

E-mail: Guoyou.zhang@yahoo.com; guoyou.zhang@uk-sh.de (Guo-You Zhang)

Symposium
Keloids and Hypertrophic Scarring -Basic Researches Part 2-
12:00-12:42

Moderators
Geoffrey C. Gurtner
Kazuo Kishi

General Presentations
12:00-12:42

12:00-12:06

O-13 Role of Caveolin 1 in The Pathogenesis of Tissue Fibrosis by Keloid Derived Fibroblasts in Vitro

Guo-You Zhang*,**, Qing Yu*, Tao Cheng***, Tian Liao****, Chun-Lei Niu*****, An-Yuan Wang*, Xin Zheng*, Xue-guan Xie*, Wei-Yang Gao*

*Department of Hand and Plastic Surgery, the 2nd Affiliated Hospital of Wenzhou Medical College, Wenzhou, Zhejiang Province, China

**Department of Dermatology, University of Lübeck, Lübeck, Germany

***Department of Orthopaedic Surgery, Shanghai Sixth People's Hospital, School of Medicine, Shanghai Jiaotong University, Shanghai, China

****Department of Otolaryngology, Head and Neck Surgery, Charite Campus Benjamin Franklin, Berlin, Germany

*****Department of Head and Neck Surgery, The Third Affiliated Hospital of Harbin Medical University, Harbin, China

E-mail: Guoyou.zhang@yahoo.com, guoyou.zhang@uk-sh.de (Guo-You Zhang)

12:06-12:12

O-14 Differential Gene Expression between Hypertrophic Scar Keratinocytes and Normal Keratinocytes

Ho Yun Chung*,**, Eun Jung Oh***, Hyun Ju Lim***, Tae Jung Kim*, So Yeon Jung*, Sae Hwa Jeon****, Young Joon Jun*****

*Department of Plastic & Reconstructive Surgery, Kyungpook National University, School of Medicine, Korea

**Joint Institute for Regenerative Medicine, Kyungpook National University, School of Medicine, Korea

***Department of Advanced Materials Science and Engineering, Kyungpook National University, Korea

****Tego Science Inc.

*****Department of Plastic Surgery, Catholoc University of Korea, College of Medicine, Korea

E-mail: hy-chung@knu.ac.kr (Ho Yun Chung)

12:12-12:18

O-15 Angiotensin II Regulates Phosphoinositide 3 Kinase/Akt Cascade via A Negative Crosstalk between AT1 and AT2 Receptors in Skin Fibroblasts of Human Hypertrophic Scars

Hong-Wei Liu*, Biao Cheng**, Xiao-Bing Fu***

*Department of Plastic Surgery, the First Affiliated Hospital of Jinan University, Guangzhou, Guangdong, China

** Department of Plastic Surgery, Guangzhou Liuhuaqiao Hospital, Guangzhou, China

*** Wound Healing and Cell Biology Laboratory, Institute for Basic Research, Trauma Center of Postgraduate Medical College, General Hospital of PLA, Beijing, China

E-mail: liuhongwei0521@hotmail.com (Hong-Wei Liu)

12:18-12:24

O-16 Altered Expression of Three Types of Opioid Receptors, Mu, Delta and Kappa in Human Hypertrophic Scars: Potential Role of Opioid Peptides in The Generation of Patients with Hypertrophic Scar

Biao Cheng*, Hong-Wei Liu**, Xiao-Bing Fu***

*Department of Plastic Surgery, Guangzhou Liuhuaqiao Hospital, Guangzhou, China

**Department of Plastic Surgery, the First Affiliated Hospital of Jinan University, Guangzhou, Guangdong, China

***Wound Healing Unit, Burns Institute, 304th Hospital, Trauma Center of Postgraduate Medical College, China

E-mail: chengbiaocheng@163.com (Biao Cheng)

12:24-12:30

O-17 Cellular Immunological Analysis of Keloid

Junyi Zhang*, Chunmei Wang**

*Beijing Tongren Hospital, Beijing, China

**Dongguan Kanghua Hospital, Dongguan, China

E-mail: zhang-junyi@hotmail.com (Junyi Zhang)

12:30-12:36

O-18 Keloid Pathogenesis: PAI-1's Enhancement of Collagen Accumulation in Keloid Fibroblasts Mediates Through PAI-1:uPA:uPAR:Integrin Complex

Tai-Lan Tuan*, Timothy Hsu*, Paul Benya **

*Department of Surgery, Keck School of Medicine, The Saban Research Institute of Children's Hospital Los Angeles, University of Southern California, CA, USA

**The J. Vernon Luck, Sr., M.D. Research Center of Orthopaedic Hospital, UCLA Orthopaedic Hospital and Department of Orthopaedic Surgery, David Geffen School of Medicine, University of California Los Angeles, CA, USA

E-mail: ttuan@chla.usc.edu (Tai-Lan Tuan)

12:36-12:42

O-19 Adenovirus-relaxin Gene Therapy for Keloids: Implication for Reversing Pathologic Fibrosis and Preventing Keloid Recurrence

Won Jai Lee*, Dong Won Lee*, Yong Oock Kim*, Il-Kyu Choi**,***, Dong Kyun Rah*, Ju Hee Lee****, Chae-Ok Yun**,****

*Institute for Human Tissue Restoration, Department of Plastic & Reconstructive Surgery,

**Brain Korea 21 Project for Medical Sciences, Institute for Cancer Research, Severance Biomedical Science Institute, Yonsei University College of Medicine, Seoul, Korea

***Graduate Program for Nanomedical Science

****Department of Dermatology, Yonsei University, Seoul, Korea

E-mail: pswjlee@yuhs.ac (Won Jai Lee)

-Coffee Break-

Luncheon Seminar

13:00-13:30

Moderator

Hiko Hyakusoku

LS-1 Current Keloid and Hypertrophic Scar Treatment Algorithms and Our Recent Trials

Rei Ogawa

Department of Plastic, Reconstructive and Aesthetic Surgery, Nippon Medical School, Tokyo, Japan

E-mail: r.ogawa@nms.ac.jp

-Coffee Break-

Interactive Symposium between Japan Scar Workshop (JSW)*

*Simultaneous interpretation: Japanese → English

13:45-15:45

Moderators

Sadanori Akita

Rei Ogawa

Part 1: Learn from Japanese Keloid Masters

13:45-14:45

Special Lecture 1

13:45-14:15

SL-6 My Therapeutic Experience of The True Keloid for More Than 50 Years

Masashi Itoh

Department of Plastic & Reconstructive Surgery, Kantoh Rosai Hospital, Kanagawa, Japan

Special Lecture 2

14:15-14:45

SL-7 Treatment of Keloids

Ryosuke Fujimori

Fujimori's Plastic Surgery Clinic, Kyoto, Japan

Part 2: Panel Discussion: Classification and Evaluation of Keloid and Hypertrophic Scars

—A Trial of Japan Scar Workshop (JSW)—

14:45-15:45

Panelists

Yasuyoshi Tosa

Satoko Yamawaki

Satoshi Akaishi

Munetomo Nagao

Keisuke Okabe

Jun Yamamoto

-Coffee Break-

Symposium
Aesthetic Scar Management
16:00-17:10

Moderators
Mark W.J. Ferguson
Hiroyuki Ohjimi

Special Lecture 1
16:00-16:20

SL-8 Prevention and Reduction of Scarring by TGFβ3 (Juvista/Avotermin) – Clinical and Scientific Data

Mark W.J. Ferguson*, **

*Renovo, Core Technology Facility, Manchester, UK

**University of Manchester, UK

E-mail: mark.ferguson@renovo.com

Special Lecture 2
16:20-16:40

SL-9 Treatment of Traumatic Scars Using Plasma Skin Regeneration (PSR) System and Fractional Laser

Taro Kono, Hiroyuki Sakurai

Department of Plastic and Reconstructive Surgery, Tokyo Women's Medical University, Tokyo, Japan

E-mail: tkono@prs.twmu.ac.jp (Taro Kono)

General Presentations
16:40-17:10

16:40-16:46

O-20 Autologous Fat Graft and Scar Treatment

Marco Ettore Attilio Klinger, Fabio Caviggioli, Francesco Maria Klinger, Andrè Salval

Università degli Studi di Milano, Dipartimento di Medicina Traslazionale, IRCCS Istituto Clinico Humanitas, Milano, Italy

University of Milan,

E-mail: marco.klinger@humanitas.it (Marco Ettore Attilio Klinger)

16:46-16:52

O-21 Combination Laser Treatments & Classification of Cutaneous Scars

Yongsoo Lee

Oracle Dermatology Clinic, Daejeon, South Korea

E-mail: exusia@naver.com

16:52-16:58

O-22 Ablative Fractional Erbium-YAG Laser for The Treatment of Atrophic Post-Acne Scarring

Gerd G Gauglitz, Helene Callenberg, Daniel Müller, Thomas Ruzicka, Peter Kaudewitz

Department of Dermatology and Allergology, Ludwig Maximilians University, Munich, Germany

E-mail: Gerd.gauglitz@med.uni-muenchen.de (Gerd G Gauglitz)

16:58-17:04

O-23 Scar Remodeling with Adipose Fat Graft Solving PMPS

Fabio Caviggioli, Marco Ettore Attilio Klinger, Davide Forcellini, Valeriano Vinci

Department of Medical Translaational, IRCCS Istituto Clinico Humanitas, University of Milan, Milano, Italy

E-mail: fabio.caviggioli@gmail.com (Fabio Caviggioli)

17:04-17:10

O-24 Cosmetic and Psychological Effectiveness of Rehabilitation Make-up® For Post-burn Scar Patients

Takeshi Iimura*,**, Reiko Kazuki*, Hiko Hyakusoku*, Rei Ogawa*

*Department of Plastic, Reconstructive and Aesthetic Surgery, Nippon Medical School, Tokyo, Japan

**Department of Plastic and Reconstructive Surgery, Saga University Hospital, Saga, Japan

E-mail: r.ogawa@nms.ac.jp (Rei Ogawa)

Evening Seminar

17:10-18:10

Moderator

Hiroshi Mizuno

ES-1 Treatment of Hypertrophic Scars Using a Long-Pulsed Dye Laser with Cryogen Spray Cooling

Taro Kono, Hiroyuki Sakurai

Department of Plastic and Reconstructive Surgery, Tokyo Women's Medical University, Tokyo, Japan

E-mail: tkono@prs.twmu.ac.jp (Taro Kono)

Gala Dinner

Royal Garden Café

19:00-21:00

Program

Day 2 December 1st (Wednesday)

Symposium
Fibrosis and Fibrotic Disorder of Organs Throughout The Body
8:30-9:54

Moderators
Koichi Sairyo
Sadanori Akita

Special Lecture 1
8:30-8:50

SL-10 Pathogenesis of Diabetic Complications Through Bone Marrow-Derived Cells

Akinori Hara*, Norihiko Sakai*, Takashi Wada**

*Department of Disease Control and Homeostasis, Institute of Medical, Pharmaceutical and Health Sciences, Faculty of Medicine, Kanazawa University, Ishikawa, Japan

**Department of Laboratory Medicine, Institute of Medical, Pharmaceutical and Health Sciences, Faculty of Medicine, Kanazawa University, Ishikawa, Japan

E-mail: ahara@m-kanazawa.jp (Akinori Hara)

Special Lecture 2
8:50-9:10

SL-11 Modulation of Vocal Fold Scar Fibroblast by Adipose Derived Stem Cells In Vitro

Yoshihiko Kumai

Department of Otolaryngology Head and Neck Surgery, Kumamoto University School of Medicine, Kumamoto, Japan

E-mail: kumayoshi426yk@gmail.com

Special Lecture 3
9:10-9:30

SL-12 The Pathomechanism of The Ligamentum Flavum Hypertrophy is Similar to That of The Hypertrophic Scar Formation during Wound Healing

Koichi Sairyo*, Rei Ogawa**, Akira Dezawa*

*Department of Orthopedic Surgery, Teikyo University Mizonokuchi Hospital, Kawasaki, Japan

**Department of Plastic, Reconstructive and Aesthetic Surgery, Nippon Medical School, Tokyo, Japan

E-mail: sairyokun@hotmail.com (Koichi Sairyo)

General Presentations
9:30-9:54

9:30-9:36

O-25 Integra as a Biomechanical Adjunct in Reducing Post-Operative Tendon Adhesion Formation

Mayer Tenenhaus

Division Plastic and Reconstructive Surgery, University of California at San Diego Medical Center, SD, USA

E-mail: m.tenenhaus@sbcglobal.net

9:36-9:42

O-26 Immunoinflammatory Cells in Posttraumatic Tendon Adhesions – an Immunohistochemical Study

Horst Koch*, Jasna Sisic*, Christine Daxböck**, Herbert Juch**

*Graz Medical University, Department of Surgery, Division of Plastic Surgery, Graz, Austria

**Graz Medical University, Institute of Histology and Embryology, Graz, Austria

E-mail: horst.koch@medunigraz.at (Horst Koch)

9:42-9:48

O-27 Telomerase Expression and Telomere Length in Idiopathic and Autoimmune Pulmonary Fibrosis in Human Bone Marrow Mesenchymal Stem Cells (BM-MSCs)

Katerina Antoniou, Athanasia Proklou, Konstantinos Karagiannis, Giannoula Soufla, Rena Lymbouridou, Nikolaos M. Sifakas

Department of Thoracic Medicine, Interstitial Lung Disease Unit, Medical School, University of Crete, Greece

E-mail: katerinaantoniou@yahoo.gr (Katerina Antoniou)

9:48-9:54

O-28 The Role of Circulating Fibrocytes in Keloids

Munetomo Nagao*, Utano Tomaru**, Akihiko Oyama***, Yuhei Yamamoto***, Seiichiro Kobayashi*

* Department of Plastic & Reconstructive Surgery, Iwate Medical University, Iwate, Japan

** Department of Pathology, Hokkaido University Graduate School of Medicine, Hokkaido, Japan

*** Department of Plastic & Reconstructive Surgery, Hokkaido University Graduate School of Medicine, Hokkaido, Japan

E-mail: munetomonagao@max.odn.ne.jp (Munetomo Nagao)

-Coffee Break-

Interactive symposium between Japanese Society for Wound Healing (JSWH)

Wound Healing and Scarring Part 1

10:15-11:45

Moderator

Joon Pio Hong

Jung San Huang

Special Lecture 1

10:15-10:45

SL-13 The Effect of Nepidermin (rh-EGF) Against Scar Formation

Joon Pio Hong, JooA Lee

Plastic Surgery, Asan Medical Center University of Ulsan, Seoul, Korea

E-mail: joonphong@amc.seoul.kr (Joon Pio Hong)

Special Lecture 2

10:45-11:15

SL-14 Human Recombinant Basic Fibroblast Growth Factor (bFGF) Improves Scar Quality Such as Softness, Elasticity of The Scar and Stratum Corneum Function and Color-Match as well as Accelerates Wound Healing

Sadanori Akita, Kenji Hayashida, Hiroshi Yoshimoto, Kozo Akino, Aya Yakabe, Akiyoshi Hirano

Department of Plastic and Reconstructive Surgery, Nagasaki University Hospital, Nagasaki, Japan

E-mail: akitas@hf.rim.or.jp (Sadanori Akita)

Special Lecture 3

11:15-11:45

SL-15 TGF- β Receptor Antagonists as Novel Agents to Promote Wound Healing and Reduce Scar Formation in Wounds of Normal Skin

Jung San Huang*, Shuan Shian Huang**

*Department of Biochemistry and Molecular Biology, St. Louis University School of Medicine, St. Louis, USA

**Auxagen, Inc., St. Louis, USA

E-mail: huangjs@slu.edu (Jung San Huang)

-Coffee Break-

Luncheon Seminar

12:00-12:30

Moderator

Luc Téot

LS-2 Forces and Matrices in Wound Healing

Dennis P. Orgill*, Rei Ogawa**

*Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA

**Nippon Medical School, Tokyo, Japan

E-mail: dorgill@partners.org (Dennis P. Orgill)

-Coffee Break-

Interactive symposium between Japanese Society for Wound Healing (JSWH)

Wound Healing and Scarring Part 2

12:45-14:15

Moderators

Nicole S. Gibran

Hiroshi Mizuno

Special Lecture 1

12:45-13:15

SL-16 Interest of The Use of Artificial Dermis in Prevention of Scar Contraction and Hypertrophy

Luc Téot, Sami Otman, Chloé Trial, Antonio Brancatti

Wound Healing Medico-Surgical Unit, Lapeyronie Hospital, Montpellier, France

E-mail: lteot@aol.com (Luc Teot)

Special Lecture 2

13:15-13:45

SL-17 Of Mice and Men: Mechanical Signaling and Scar Formation Across Species

Geoffrey C. Gurtner

Stanford University School of Medicine, Stanford, CA, USA

E-mail: ggurtner@stanford.edu

Special Lecture 3

13:45-14:15

SL-18 Making Sense of Wound Healing: A Role for Nerves

Nicole S Gibran

University of Washington Department of Surgery, WA, USA

E-mail: nicoleg@u.washington.edu

-Coffee Break-

Interactive symposium between Japanese Society for Wound Healing (JSWH)

Wound Healing and Scarring Part 3

14:45-16:03

Moderators

Dennis P. Orgill

Shigehiko Suzuki

General Presentations

14:45-16:03

14:45-14:51

O-29 Human Homologous Tissues as Novel Scaffolds for Soft Tissue Reconstruction

Luca Lancerotto*, Vincenzo Vindigni*, Andrea Volpin*, Andrea Porzionato**, Tiziana Martinello***, Franco Bassetto*

*Clinic of Plastic Surgery, University of Padova, Italy

**Unit of Clinic Anatomy, University of Padova, Italy

***Department of Veterinary Sciences, University of Padova, Italy

E-mail: luca.lancerotto@unipd.it (Luca Lancerotto)

14:51-14:57

O-30 Healing of Large Midline Wounds in Infants: Unlike in Adults, Does Conservative Approach Give Better Results?

M. Taifour Suliman

Department of Surgery, Plastic Surgery Unit, King Khalid Civil Hospital, Tabuk, Saudi Arabia

E-mail: mtaifour1@yahoo.com

14:57-15:03

O-31 Ex Vivo Expanded Endothelial Progenitor Cell Transplantation Improves Wound Healing and Scarring

Rica Tanaka*, **, Haruchika Masuda**, Rie Ito**, Michiru Kobori**, Tsuyoshi Fukui*, Takayuki Asahara**, Muneo Miyasaka*

* Department of Plastic and Reconstructive Surgery, Tokai University School of Medicine, Kanagawa, Japan

** Department of Regenerative Medicine, Tokai University School of Medicine, Kanagawa, Japan

E-mail: rica@is.icc.u-tokai.ac.jp (Rica Tanaka)

15:03-15:09

O-32 In Vivo Guided Healing of Microvascular Structures

Vincenzo Vindigni*, Franco Bassetto*, Laura Pandis*, Barbara Zavan**, Sandro Lepidi***, Giovanni Abatangelo**

*Clinic of Plastic and Reconstructive Surgery, University of Padova, Italy

**Unit of Histology, University of Padova, Italy

***Clinic of Vascular Surgery, University of Padova, Italy

E-mail: vincenzo.vindigni@unipd.it (Vincenzo Vindigni)

15:09-15:15

O-33 Clinical Data Acquisition of Wounds and Scars Using A Handheld 3D Stereophotographic System: First Experiences

David B. Lumenta, Lars-Peter Kamolz, Harald Selig, Maike Keck, Manfred Frey

Division of Plastic and Reconstructive Surgery, Department of Surgery, Medical University of Vienna, Austria

E-mail: david.lumenta@meduniwien.ac.at (David B. Lumenta)

15:15-15:21

O-34 Scar Rating Scales: Examining The Evidence

Zephania Tyack*, Megan Simons**, Anneliese Spinks***, Jason Wasiak****

*Central Queensland Health Services District, Rockhampton; School of Medicine, The University of Queensland, Brisbane, QLD, Australia

**Occupational Therapy Department, Royal Children's Hospital, Brisbane, QLD; School of Health and Rehabilitation Sciences, The University of Queensland, Brisbane, QLD, Australia

***School of Medicine, Griffith University, Meadowbrook, QLD, Australia

****Victorian Adult Burns Service and School of Public Health and Preventative Medicine, Monash University, The Alfred Hospital, Commercial Rd, Melbourne, VIC, Australia

E-mail: Megan_Simons@health.qld.gov.au (Megan Simons)

15:21-15:27

O-35 Influence of Negative Atmospheric Pressure on Cultured Human Dermal Fibroblasts

Yoshihiro Takami*, Jingping Guo**, Shimpei Ono*, Hakan Orbay*, Rei Ogawa*, Hiko Hyakusoku**

*Department of Plastic Surgery, Nippon Medical School, Tokyo, Japan

**Department of Plastic Surgery, Kunming Medicine College, Yunnan, China

E-mail: nyonyal@aol.com (Yoshihiro Takami)

15:27-15:33

O-36 Blood Injection in Wound Healing

Mohammed M. Al Azrak

AL HELAL Specialized Hospital , Cairo, Egypt

E-mail: mohammedazraq@yahoo.com

15:33-15:39

O-37 Scarless Wound Closure by Humain Hair

Mohammed M. Al Azrak

AL HELAL Specialized Hospital , Cairo, Egypt

E-mail: mohammedazraq@yahoo.com

15:39-15:45

O-38 Treatment of Giant Congenital Melanocytic Nevi with Enzymatically Separated Epidermal Sheet Grafting

Hirokazu Shido, Ruka Ninomiya, Keisuke Okabe, Eri Konno, Kazuo Kishi

Department of Plastic Surgery Keio University Hospital, Tokyo, Japan

E-mail: hikkydream1_1_3@yahoo.co.jp (Hirokazu Shido)

15:45-15:51

O-39 Management Radiation Ulcer Scar by Operation Treatment

Vu Quang Vinh

Vietnam National Institute Of Burn, Vietnam

E-mail: vuvinhvb@gmail.com

15:51-15:57

O-40 A New Technique to Reduce Raw Surface Area of The Donor Site of Split Thickness Skin Grafting

Shigeki Sakai*, Keisuke Okabe*, Ruka shimizu*, Eri Konno*, Asako Hatano*, Hirokazu shido*, Takako Otsu*, Tatuya Kato*, Naohiro Ishii**, Kazuo Kishi*

*Department of Plastic and Reconstructive Surgery, Keio University Hospital, Tokyo, Japan

**Department of Plastic and Reconstructive Surgery, Ohtawara Red Cross Hospital, Tochigi, Japan

E-mail: shigekix724@hotmail.com (Shigeki Sakai)

15:57-16:03

O-41 Recruited Chip Skin Grafting for Improving The Skin Appearance of The Donor Site of A Split Thickness Skin Graft

Asako Hatano, Ruka Shimizu, Keisuke Okabe, Kazuo Kishi

Department of Plastic and Reconstructive Surgery, Keio University, Tokyo, Japan

E-mail: a-cyan@galaxy.ocn.ne.jp (Asako Hatano)

-Coffee Break-

Symposium
Surgery for Burn Wounds and Scar Contractures
16:30-18:06

Moderators
Hans-Oliver Rennekampff
Rei Ogawa

Special Lecture
16:30-17:00

SL-19 Medical Needling

Hans-Oliver Rennekampff, Matthias Aust, Peter M. Vogt
Department of Plastic, Hand and Reconstructive Surgery, Medical School Hannover, Germany
E-mail: rennekampff.oliover@mh-hannover.de (Hans-Oliver Rennekampff)

General Presentations
17:00-18:06

17:00-17:06

O-42 Usefulness of Super-thin Flaps in Burn Reconstructive Surgery

Rei Ogawa, Hiko Hyakusoku
Department of Plastic, Reconstructive and Aesthetic Surgery, Nippon Medical School Hospital, Tokyo, Japan
E-mail: r.ogawa@nms.ac.jp (Rei Ogawa)

17:06-17:12

O-43 Expansion Prefabricated Crossing Area Supply Super-thin Flap: An Experimental Study and Clinical Application

Chunmei Wang*, Sifen Yang*, Junyi Zhang**, Hiko Hyakusoku***
*Dongguan Kanghua Hospital, Dongguan, China
**Beijing Tongren Hospital, Beijing, China
***Nippon Medical School, Tokyo, Japan
E-mail: chunmei22@hotmail.com (Chunmei Wang)

17:12-17:18

O-44 A Treatment Algorithm for Postburn Cervical Contracture: The Role of A Free Composite Scapular Flap

Danru Wang, Yixin Zhang, Rong Jin, Jun Yang, Yunliang Qian
Department of Plastic and Reconstructive Surgery, Ninth People's Hospital, Shanghai Jiao Tong University School of Medicine, China
E-mail: wangdanru@hotmail.com (Danru Wang)

17:18-17:24

O-45 Management of Contractures: A Five Years Prospective Study at Komfo Anokye Teaching Hospital in Kumasi, Ghana

Emmanuel Adu
School of Medical Sciences, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana
E-mail: aduemmanuel@hotmail.com

17:24-17:30

O-46 Children Living with Burn Scarring: Can Cosmetic Camouflage Improve Psychosocial Well-being?

James-Chadwick Jessica*, Newcombe Peter**, Martin Graham***, Kimble Roy*

*The Centre for Children's Burns and Trauma Research; The University of Queensland, Royal Children's Hospital, Brisbane, Australia

**School of Social Work and Human Services, The University of Queensland, Brisbane, Australia

***Child and Adolescent Psychiatry, The University of Queensland, Royal Brisbane and Women's Hospital, Brisbane, Australia

E-mail: j.jameschadwick@uq.edu.au (James-Chadwick Jessica)

17:30-17:36

O-47 About Scar Deformities of The Foot

Babur M. Shakirov, Usuf M. Achmedov, Hydoiberdy K. Karabaev, Komil R. Tagaev, Abror A. Polvonov
Samarkand State Medical Institute, Burn department of RSCUMA, Inter - Regional Burn Center, Samarkand, Uzbekistan

E-mail: baburshakirov@yahoo.com (Babur M. Shakirov)

17:36-17:42

O-48 Technique of Tissue Expansion for Resurfacing as A Treatment of Postburn Facial Scars

Sifen Yang*, Chunmei Wang*, Junyi Zhang**, Hiko Hyakusoku***

*Dongguan Kanghua Hospital, Dongguan, China

**Beijing Tongren Hospital, Beijing, China

***Nippon Medical School, Tokyo, Japan

E-mail: yangsifen@163.com (Sifen Yang)

17:42-17:48

O-49 Promoting Wound Healing Activity Using Indian Costus (Saussurea lappa)

Wadiah Saleh Backer, Faten A. Khorshid, Solafa Abdulrahman Zahran

Biochemistry Department, King Abdulaziz University, Saudi Arabia

E-mail: wbacker@kau.edu.sa (Wadiah Saleh Backer)

17:48-17:54

O-50 A Long Term Evaluation of Integra and Split Thickness Skin Grafts in Cute Burns and Reconstructive Surgery

Dai QA Nguyen, Tom S Potokar, Patricia Price

Welsh centre of Burns and Plastic Surgery, Wound Healing Unit Cardiff Medical School, UK

E-mail: dainguyen@doctors.org.uk (Dai QA Nguyen)

17:54-18:00

O-51 I.I.I.: Integra® Interdisciplinary Indications

L. Annacontini, D. Parisi, M. Valente, A. Campanale, M. Grieco, A. Portincasa

Institution: Plastic and Reconstructive Surgery Department, University of Foggia, Italy

E-mail: lannacontini@hotmail.com (L. Annacontini)

Closing Remarks

18:00-18:15

President

Hiko Hyakusoku

Secretariat

Rei Ogawa

Poster Presentations

P-01 Treating Infected Wounds with A Hydro Balance Dressing Containing phmb

Bettina Gunst*, Anneke Andriessen**

* EHPAD Department, Local Hospital of St Laurent de Chamousset, France

**Andriessen Consultants ,Malden, Netherlands

E-mail: bettyinf2000@hotmail.com (Bettina Gunst)

P-02 The Management of A Patient with A Non-Healing Venous Leg Ulcer Using A HydroBalance Dressing

Bettina Gunst*, Marc Wister**

*EHPAD Department, Local Hospital of St Laurent de Chamousset, France

**Department of Geriatrics, Melun Medical Centre, France

E-mail: bettyinf2000@hotmail.com (Bettina Gunst)

P-03 Use of The Hydroclean Active* Absorbent Irrigated Dressing Pad for Wound Cleansing in Old People's Home

Mark Wiser, Caroline Van Wijk

Department of Geriatrics, Melun Medical Centre, France

E-mail: marc.wiser@free.fr (Mark Wiser)

P-04 Treatment of An Infected Venous Leg Ulcer with An Hydrobalance Wound ressing Containing PHMB*

Mark Wiser, Caroline Van Wijk

Department of Geriatrics, Melun Medical Centre, France

E-mail: marc.wiser@free.fr (Mark Wiser)

P-05 Treatment of One Wound And Two Pressure Ulcers with A Superabsorbant Dressing*

Mark Wiser

Department of Geriatrics, Melun Medical Centre, France

E-mail: marc.wiser@free.fr (Mark Wiser)

P-06 Evaluation of The Donor Site in Patients who Underwent Reconstruction with A Free Radial Forearm Flap

Osamu Ito*, Masumi Suzuki*, Hiroki Miyashita**, Takayuki Shirai*, Minako Ito*

*Department of PRS, Yokohama City Minato Red Cross Hospital, Yokohama, Japan

**Department of PRS, Tokyo Medical & Dental University, Tokyo, Japan

E-mail: osaito1005@yahoo.co.jp (Osamu Ito)

P-07 Effective Approaches to The Treatment of Postburn Scar Consequences

Valentin I. Sharobaro, Vladimir A. Zlenko, Andrew M. Tkachev, Guzal M. Isamutdinova

A.V.Vishnevsky Institute of Surgery, Moscow, Russia

E-mail: sharobarovi@mail.ru (Valentin I. Sharobaro)

P-08 Reconstruction of Complex Scar Deformations of The Face after Burns

Valentin I. Sharobaro*, Igor V. Otvagin**, Andrew M. Tkachev*, Guzal M. Isamutdinova*

*A.V.Vishnevsky Institute of Surgery, Moscow, Russia

**Smolensk State Medical Academy, Smolensk, Russia

E-mail: sharobarovi@mail.ru (Valentin I. Sharobaro)

P-09 The Role of Wnt Signal Pathway in Keloid Pathogenesis

Shinichi Igota*, ***, Mamiko Tosa**, ***, Mohammad Ghazizadeh***, Masahiro Murakami**, Hiko Hyakusoku****

*Department of Plastic and Reconstructive Surgery, Higashi totuka Memorial Hospital, Yokohama, Japan.

**Department of Plastic and Reconstructive Surgery, Nippon Medical School Musashi-kosugi Hospital, Kawasaki, Japan.

***Department of Molecular Pathology, Institute of Gerontology, Nippon Medical School, Kawasaki, Japan

****Department of Plastic and Reconstructive Surgery, Nippon Medical School, Tokyo, Japan

E-mail: tosa-m@nms.ac.jp (Mamiko Tosa)

P-10 Analysis of Diseases that Resemble Keloid and A Diagnosis is Difficult

Hiroaki Kuwahara*, Mamiko Tosa*, Itaru Iwakiri*, Mayuko Tajima*, Masahiro Murakami*, Hiko Hyakusoku**

*Department of Plastic and Reconstructive Surgery, Nippon Medical School Musashi-kosugi Hospital, Kawasaki, Japan.

**Department of Plastic and Reconstructive Surgery, Nippon Medical School, Tokyo, Japan.

E-mail: tosa-m@nms.ac.jp (Mamiko Tosa)

P-11 Impact of Maggot Debridement Therapy in Patients with Ischemic Foot Ulcer

Yoshiko Matsuda

Department of Surgery Kusumoto Hospital, Hiroshima, Japan

E-mail: star3david@yahoo.co.jp

P-12 Assessment of Recurrence Regions of Keloid Operated with Z-Plasty

Kaho Matsuda, Fumiaki Shimizu, Miyuki Uehara, Seiichi Sato, Daisuke Masuda, Hiroko Taneda, Aiko Kato
Department of Plastic Surgery, Faculty of Medicine, Oita University, Oita, Japan

E-mail: kaho1025@med.oita-u.ac.jp (Kaho Matsuda)

P-13 Existence of Neurites Promotes Differentiation of Dermal Fibroblasts into Myofibroblasts and Induces Contraction of Collagen Matrix in Vitro

Toshihiro Fujiwara*, Kenji Fukuda*, Soh Nishimoto*, Masao Kakibuchi*, Ko Hosokawa**, Tateki Kubo***

*Department of Plastic and Reconstructive Surgery, Hyogo College of Medicine, Hyogo, Japan

**Department of Plastic and Reconstructive Surgery, Osaka University Graduate School of Medicine, Osaka, Japan

***Department of Plastic and Reconstructive Surgery, Osaka Rosai Hospital, Osaka, Japan

E-mail: fuji-t@hyo-med.ac.jp.

P-14 Caveolin 1 Inhibits Transforming Growth Factor- β 1 Activity via Inhibition of Smad Signaling by Hypertrophic Scar Derived Fibroblasts in Vitro

Zhang Guo-You*, **, He Bin***, Liao Tian****, Lin Ding-Sheng*, Wang An-Yuan*, Zheng Xin*, Xie Xue-guan*, Gao Wei-Yang*

*Department of Hand and Plastic Surgery, the 2nd Affiliated Hospital of Wenzhou Medical College, Zhejiang Province, China

**Department of Dermatology, University of Lübeck, Lübeck, Germany

***Department of Orthopedic Surgery,

Second Hospital Affiliated to Zhejiang University of Traditional Chinese Medicine, Hangzhou, China

****Department of Otolaryngology, Head and Neck surgery, Charite Campus Benjamin Franklin, Berlin Germany

E-mail: Guoyou.zhang@yahoo.com, guoyou.zhang@uk-sh.de (Zhang Guo-You)

P-15 The Effect of Keratinocytes on Myofibroblasts in Hypertrophic Scar

Ho Yun Chung*, **, Eun Jung Oh***, Hyun Ju Lim***, Tae Jung Kim*, So Yeon Jung*,
Sae Hwa Jeon****, Hwan Sung Cho*****

*Department of Plastic & Reconstructive Surgery, Kyungpook National University, School of Medicine, Korea

**Joint Institute for Regenerative Medicine, Kyungpook National University, School of Medicine, Korea

***Department of Advanced Materials Science and Engineering, Kyungpook National University, Korea

****Tego Science Inc., Korea

*****Dept. of Orthopedic Surgery, Kyungpook National University, School of Medicine, Korea

E-mail: hy-chung@knu.ac.kr (Ho Yun Chung)

P-16 Measurement of Keloid Color

Masayo Aoki*, Jyunichi Nakao*, Teruyuki Dohi*, Satoshi Akaishi*, Tsuguhiro Miyashita**, Hiko Hyakusoku*,
Rei Ogawa*

*Department of Plastic, Reconstructive and Aesthetic Surgery, Nippon Medical School, Tokyo, Japan

**Department of Radiation Oncology, Nippon Medical School Hospital, Tokyo, Japan

E-mail: r.ogawa@nms.ac.jp (Rei Ogawa)

P-17 Flap Surgery for Severe Keloids: Our Trials of Flap Surgery Performed For the Purpose of Tension Reduction

Teruyuki Dohi, Satoshi Akaishi, Shimpei Ono, Shimpei Nara, Takeshi Iimura, Hiko Hyakusoku, Rei Ogawa

Department of Plastic, Reconstructive and Aesthetic Surgery, Nippon Medical School, Tokyo, Japan

E-mail: r.ogawa@nms.ac.jp (Rei Ogawa)

P-18 Analysis of the regions of the body where keloids tend to occur

Yasutaka Omori, Satoshi Akaishi, Hiko Hyakusoku, Rei Ogawa

Department of Plastic, Reconstructive and Aesthetic Surgery, Nippon Medical School, Tokyo, Japan

E-mail: redstoneprs@gmail.com (Satoshi Akaishi)

P-19 Visual Analysis of the Relationship Between Keloid Growth Patterns and Stretching Tension by Using the Finite Element Method

Mai Watanabe, Satoshi Akaishi, Masataka Akimoto, Hiko Hyakusoku, Rei Ogawa

Department of Plastic, Reconstructive and Aesthetic Surgery, Nippon Medical School, Tokyo, Japan

E-mail: redstoneprs@gmail.com (Satoshi Akaishi)

P-20 Comparison of Thyroidectomy Scar Treatments Initiated at Different Time Points Using a Fractional Carbon Dioxide Laser: A Prospective, Evaluator-Blinded Study

Jin Young Jung*, Jihyun Kim*, Jong Ju Jeong**, Woong Youn Chung**, Kee-Hyun Nam**, Won Jai Lee***,
Yong Oock Kim***, Ju Hee Lee*

*Departments of Dermatology and Cutaneous Biology Research Institute,

**Department of Surgery,

***Department of Plastic and Reconstructive Surgery,

Yonsei University College of Medicine, Seoul, Korea

E-mail: pswjlee@yuhs.ac (Won Jai Lee)

P-21 Comparison of Thyroidectomy Scar Treatments using Non-ablative 1,550-nm Erbium Glass and Ablative 10,600-nm Carbon Dioxide Fractional Lasers

Jin Young Jung*, Suhyun Cho*, Jong Ju Jeong**, Woong Youn Chung**, Kee-Hyun Nam**, Won Jai Lee***, Yong Oock Kim***, Ju Hee Lee*

*Departments of Dermatology and Cutaneous Biology Research Institute,

**Department of Surgery,

***Department of Plastic and Reconstructive Surgery,

Yonsei University College of Medicine, Seoul, Korea

E-mail: pswjlee@yuhs.ac (Won Jai Lee)

P-22 Histological and ultrastructural studies on the impact of antioxidants against the toxicity of certain heavy metals in the ovarian chicken

Fawzi I. Amer*, El-Sayed Fikri A. El-Dawi*, Osama A. H. Abo Zenada**, Etedal A.H.Huwait**

*Department of Zoology, Fac. of Science, Ain Shams Univ., Cairo, Egypt.

**Department of Zoology, Fac. of Science, King Abd El-Aziz Univ., Jeddah, Kingdom of Saudi Arabia

E-mail: ehuwit@gmail.com

P-23 The Most Current Algorithms for the Prevention and Treatment of Keloids and Hypertrophic Scars

Rei Ogawa, Satoshi Akaishi, Hiko Hyakusoku

Department of Plastic, Reconstructive and Aesthetic Surgery, Nippon Medical School, Tokyo, Japan

E-mail: r.ogawa@nms.ac.jp (Rei Ogawa)

P-24 Scar Contracture Evaluation and Classification

Rei Ogawa*, Julian J. Pribaz**

*Department of Plastic, Reconstructive and Aesthetic Surgery, Nippon Medical School, Tokyo, Japan

**Division of Plastic Surgery, Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA

E-mail: r.ogawa@nms.ac.jp (Rei Ogawa)

P-25 Small-Wave Incision Method for Hypertrophic Scar Reconstruction

Chenyu Huang, Shimpei Ono, Hiko Hyakusoku, Rei Ogawa

Department of Plastic, Reconstructive and Aesthetic Surgery, Nippon Medical School, Tokyo, Japan

E-mail: r.ogawa@nms.ac.jp (Rei Ogawa)

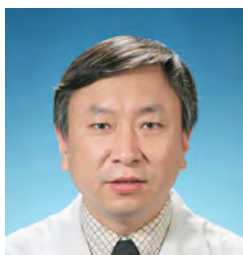
P-26 Influence of dexterity on requirement for scar therapy

Naghm Darhouse

Anne Alexander John Radcliffe Hospital, Oxford, UK

E-mail: darhousen@yahoo.com

Lectures



SL-1 Surgery and Chemotherapy of Keloids

Wei Liu

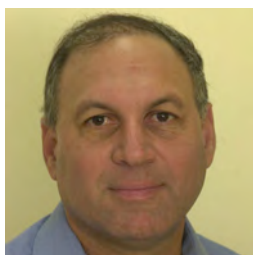
Department of Plastic Surgery, Shanghai 9th People's Hospital, Shanghai Jiao Tong University School of Medicine, Shanghai, China

E-mail: liuwei_2000@yahoo.com

Keloid is big challenge to physicians because of its difficulty to cure and high recurrence frequency. The common strategy is to eliminate or demolish keloid tissue, such as surgery, high dose chemotherapy, cryotherapy and radiotherapy. These often lead to high relapse rate simply because trauma is a trigger for keloid development. We employed low dose of 5-FU for keloid therapy base on the hypothesis that angiogenesis is the major cause for keloid growth and relapse and low dose 5-FU will demolish capillary network inside the keloid without causing tissue necrosis, and will inhibit fibroblast proliferation and thus to inhibit relapse. By combinational injection of low dose 5-FU and steroid with a particular regime of decreasing drug doses and extending injection internals, we have achieved more effective therapeutic result comparing previous routine keloid therapy. Also, much lower recurrence rate can be achieved using this therapy. Currently, we also combined chemotherapy with surgical excision and found it an efficient way for treating most excisable keloids. In addition, related basic research of keloid biology revealed the future direction of keloid therapy.

Biography of Dr. Wei Liu

Dr. Liu graduated from Shanghai Second Medical University in 1983 with a MD degree and graduated from University of Arkansas for Medical Science in 1998 with a PhD degree followed by two year postdoctoral training on wound healing at Institute of Reconstructive Plastic Surgery of New York University. He has been a plastic surgeon since 1983 and now mainly focuses on basic and applied researches of tissue engineering and wound healing after his return to China in 2000. Currently, Dr. Liu is a Professor of Plastic Surgery of Shanghai Jiao Tong University School of Medicine with the clinical role in scar treatment, and Associate Directors of Shanghai Tissue Engineering Center and Shanghai Institute of Plastic and Reconstructive Surgery, Chief Scientific Officer of National Tissue Engineering Center of China. Dr. Liu is the principle investigator of four national key projects of tissue engineering research sponsored by Chinese Ministry of Science and Technology. Dr. Liu is the organizer of 8th TESI annual meeting and was elected as the Council Member of TERMIS Asia-Pacific Chapter. Besides more than 40 original articles published in international journals, he has contributed several invited review articles in Tissue Engineering, Biomaterials and Current Gene Therapy, etc. He currently is the editorial board member of Journal of Tissue Engineering and Regenerative Medicine, Biomaterials and Special Issue Editor of the journal of Tissue Engineering and has presented more than 20 invited speeches at various international conferences. Dr. Liu's clinical work focuses on keloid and scar treatment and he currently serves as the Scientific Committee Member of International Scar Club based in Montpellier, France and has presented keynote and invited speeches in Scar Club meetings.



SL-2 Intralesional Cryosurgery for The Treatment of Hypertrophic Scars and Keloids

Yaron Har-Shai

Plastic Surgery Unit, Carmel Medical Center and the Bruce Rappaport Faculty of Medicine, Technion – Israel Institute of Technology, Haifa, Israel

E-mail: yaron07@yahoo.com

In the recent years an intralesional cryosurgery technology (CryoShape) for the treatment of HSK had been developed¹⁻⁴. This method, which is FDA and CE approved, has been applied successfully on almost 1000 HSK in Israel, Europe and the USA, with clinical results which are significantly superior to the conventional available treatment modalities. Basic science research revealed that HSK tissue is rejuvenated, i.e., the HSK collagen following cryosurgery becomes apparently normal, probably, therefore, the no response rate is less than 3%. The gathered clinical data demonstrates that the average volume scar reduction following a single intralesional cryo-session is 70%, 60% and 50% in the ear, back and shoulders and the chest, respectively. In addition, the subjective and objective clinical symptoms are significantly alleviated a week following treatment. Neither worsening nor infection of the treated HSK has been documented. The pain during and after the cryosurgical treatment has been reduced due to the application of a pain control protocol, which consists of trans-lesional local anesthesia and pain relief tablets. In addition by using the intralesional approach, a significant lower hypopigmentation rate (8.3%) had been demonstrated. The reason is that the melanocytes are located in the recovery zone when utilizing the intralesional approach. This finding encourages the application of the intralesional cryosurgery method in dark-skinned individuals suffering from HSK. In conclusion, intralesional cryosurgery has gone through major developments and refinements which provide effective clinical solutions and is ought to become one of the evidence-based legitimate and leading technologies in the treatment of HSK.

1. Har-Shai Y., Amar M., Sabo E., Intralesional cryotherapy for enhancing the involution of hypertrophic scars and keloids. *Plastic and Reconstructive Surgery*, 111: 1841-1852, 2003.
2. Har-Shai Y., Sabo E., Rohde E., Hayms M., Assaf C., Zouboulis C.C., Intralesional cryosurgery markedly enhances the involution of recalcitrant auricular keloids – A new clinical approach supported by experimental studies. *Wound Repair and Regeneration*, 14:18-27, 2006.
3. Har-Shai Y., Dujovny E., Rohde E., Zouboulis C.C., Effect of skin surface temperature on skin pigmentation during contact and intralesional cryosurgery of keloids. *The Journal of the European Academy of Dermatology and Venereology*, 21: 191- 198, 2007.
4. Har-Shai Y., Brown W., Labbe' D., Domp Martin A., Goldine I., Gil T., Mettanes I., Pallua N., Intralesional cryosurgery for the treatment of hypertrophic scars and keloids following aesthetic surgery. *International Journal of Lower Extremity Wounds*, 7:169-175, 2008.

Biography of Dr. Yaron Har-Shai

Prof. Har-Shai is a qualified Plastic and Reconstructive Surgeon since 1992 and the Director of the Plastic Surgery Departments at Carmel and Linn medical centers at Haifa. He had participated and attended many professional fellowships in the USA, Canada, and Europe in the fields of facial aesthetic surgery, microsurgery, craniofacial and reconstructive surgery. Prof. Har-Shai is a past president of the Israel Society for Plastic Surgery and a corresponding member of the American and European societies of Plastic Surgery. He has developed many innovative surgical procedures and published, in peer-review journals, more than 80 original articles in basic sciences and clinical research, in addition to chapters in high quality textbooks, in the field of plastic, reconstructive and aesthetic surgery. Prof. Har-Shai was awarded prestigious prizes by the Israel Society for Plastic Surgery (Kaplan Prize and the President award), the Faculty of Medicine (distinguished lecturer) and the International Society of Cryosurgery. His articles are cited in the international medical literature and his innovations are applied in many medical centers around the world. Prof. Har-Shai is well recognized and is invited and lectures at national and international professional meetings. He is a member in editorial boards and a reviewer of high level scientific journals. For many years, Prof. Har-Shai is extensively dedicated to basic science research and the development of applied medical technologies in the field of hypertrophic scars and keloids. Lately, his new and advanced intralesional cryosurgery technology (CryoShape) is achieving significant and successful clinical results in this challenging medical area.



SL-3 Chymase Activity in Hypertrophic Scars

Hajime Matsumura

Department of Plastic Surgery, Tokyo Medical University, Tokyo, Japan

E-mail: hmatsu-tki@umin.ac.jp

Background: Chymase is a serine protease that acts as chymotrypsin in mast cell granules and is known to accumulate inflammatory cells, and also, it is reported that chymase plays an important role in the formation of hypertrophic scars. In this study, chronological changes of chymase activity in the animal hypertrophic model using Clown miniature swine. **Methods:** Eight Clown miniature swines were used and four skin defects (7.5 x 7.5 cm, depth 0.060 inch) were created. Skin biopsies were taken at 15th, 30th, 60th, 90th, 120th day after the first procedure. Chymase activity, skin thickness, TGF- β concentration were evaluated. **Results:** 1) No chymase activities were found in the normal skin. In the scar tissue, chymase activity gradually increased up to the 90th day, then gradually decreased. The peripheral tissue showed higher activity compared to the center of the scar. 2) The thickness of scar tissue gradually thickened. After its peak at the 90th day, the scar gradually thinned down. 3) In the normal skin, TGF- β was not found over time. In the scar tissue, the center part showed a high concentration, and the peak came at the 15th day. Afterward, it gradually decreased, and at the 120th day, the concentration was returned to normal level. **Conclusions:** Chymase activity was highest at the peripheral scar, and increased deeply related to the thickness of the hypertrophic scar. We speculate that chymase participate in the pathophysiology of hypertrophic scar.

Biography of Dr. Hajime Matsumura

Education

M.D. Tokyo Medical University, Tokyo, Japan

Faculty position

Professor, Department of Plastic Surgery, Tokyo Medical University, Tokyo, Japan

2008-present

Hospital position

Staff Surgeon, Tokyo Medical College Hospital

1993-present

Doctor of medical science (PhD)

Tokyo Medical University

1994

Board certifications

Japan Society of Plastic and Reconstructive Surgery

Japanese Association for Acute Medicine

Japanese Society for Burn Injuries

Japanese Society for Surgery of the hand

Licensure

Medical License of Japan

1987

Limited Medical License, State of Washington

1995

Organizations

American College of Surgeons (FACS)

American Burn Association

International Society for Burn Injuries

International Confederation for Plastic, Reconstructive and Aesthetic Surgery

Japan Society of Plastic and Reconstructive Surgery (*board of trustees*)

Japanese Society for Burn Injuries (*board of trustees*)

Japanese Society for Surgery of the Hand (*board of trustees*)

Japanese Society of Cranio Maxillofacial Surgery (*board of trustees*) ...and others



SL-4 Serine Protease-Family Protein HtrA1 is Specifically Up-Regulated in Keloid Legions

Motoko Naitoh, Toshihiro Ishiko, Satoko Yamawaki, Katsuhiro Yoshikawa, Sigeiko Suzuki,

Department of Plastic and Reconstructive Surgery, Graduate School of Medicine, Kyoto University, Kyoto, Japan

E-mail: mnaitoh@kuhp.kyoto-u.ac.jp (Motoko Naito)

Background: Keloids are a dermal fibrotic disease whose etiology remains unknown. We previously tested 9,000 genes to search for keloid-specific genes by cDNA microarray analysis and found that 32 genes were strongly up-regulated in keloid legions. HtrA1, a member of the HtrA family of serine protease, was one of the keloid specific genes. HtrA1 has been suggested to play a role in the pathology of various diseases including age-related macular degeneration, osteoarthritis and malignant melanoma by modulating proteins in extracellular matrix or cell surface. The aim of our study is to clarify the role of HtrA1 in keloid pathogenesis. **Methods:** Total RNA was isolated from keloid legions of six patients and two normal control skin samples. The expression levels of HtrA1 were examined by Northern blot analysis. Paraffin sections were obtained from keloid and normal skin tissue samples. Immunohistochemical with anti HtrA1 antibody and in situ hybridization with a specific probe for HtrA1 were performed. **Results:** The mRNA level of HtrA1 was markedly elevated in all keloid legions, relative to normal skin. In situ hybridization analysis demonstrated that the fibroblast-like cells strongly expressed HtrA1 particularly in the margin of keloid lesions. In contrast, no HtrA1 staining was observed in the fibroblast of normal skins. Immunohistochemical experiments demonstrated that HtrA1 protein was strongly expressed in keloid legions. **Conclusions:** HtrA1 expression is upregulated in keloid lesions particularly at the margin. HtrA1 may contribute to the development of keloid lesions by remodeling keloid-specific extracellular matrix or cell surface molecules.

Biography of Dr. Motoko Naitoh

Education

1992 M.D. Kyoto University Medical School, Kyoto, Japan

2002 Ph.D. (Medical Science) Kyoto University Graduate School of Medicine, Kyoto, Japan

Professional Training and Employment

1992-1994 Junior Resident in Plastic and Reconstructive Surgery, Kyoto University

1994-1997 Senior Resident in Primary Care and Emergency Medicine,
Kobe City General Hospital, Kobe, Japan

1997-1998 Clinical Fellow in Plastic and Reconstructive Surgery, Kyoto University

2002-2005 Instructor in Plastic and Reconstructive Surgery, Kyoto University

2005-2007 Research Assistant Professor in Horizontal Medical Research Organization,
Kyoto University, Kyoto, Japan

2007 Research Assistant Professor in Plastic and Reconstructive Surgery, Kyoto University



SL-5 Functional Implication of The IL-6 Signaling Pathway in Keloid Pathogenesis

Mamiko Tosa^{*,**}, Mohammad Ghazizadeh^{**}, Masahiro Murakami^{*}, Hiko Hyakusoku^{***}

^{*}Department of Plastic and Reconstructive Surgery, Nippon Medical School Musashi-kosugi Hospital, Kawasaki, Japan ^{**}Department of Molecular Pathology, Institute of Gerontology, Nippon Medical School, Kawasaki, Japan ^{***}Department of Plastic and Reconstructive Surgery, Nippon Medical School, Tokyo, Japan

E-mail: Tosa-m@nms.ac.jp (Mamiko Tosa)

Background: Keloid is characterized by fibroblastic cell proliferation and excessive collagen synthesis. The molecular mechanism behind keloid pathogenesis remains unclear. We have studied a role of IL-6 signal pathway in the keloid to realize the elucidation of the keloid development mechanism and the development of the new molecular target drug. Here, we report the results of research. **Methods:** Primary cultures of keloid fibroblasts (KFs) and nonlesional fibroblasts (NFs) were subjected to induction or inhibition of IL-6 or its specific receptor IL-6 receptor alpha (IL-6R α) and detection of their effect on extracellular matrix gene expression using PCR analysis. The levels of gp130 and several downstream targets in IL-6 signaling were also examined. **Results:** Addition of IL-6 peptide to NFs culture or inhibition of IL-6 or its receptor IL-6Ra by their corresponding antibodies in KFs culture revealed a dose-dependent increase or decrease in collagen type I alpha 2 and fibronectin 1 mRNAs, respectively. Induction of IL-6 by IL-1b peptide and stimulation by IL-6 peptide in NFs, or inhibition of IL-6 or IL-6Ra in KFs cultures demonstrated a dose-dependent increase or decrease in procollagen I synthesis, respectively. The mRNA and protein expressions of gp130 and several downstream targets in IL-6 signaling (JAK1, STAT3, RAF1, and ELK1) were upregulated in KFs versus NFs. **Conclusions:** Our results indicate that IL-6 signaling may play an integral role in keloid pathogenesis and provide clues for development of IL-6 receptor blocking strategies for therapy or prophylaxis of keloid scars.

Biography of Dr. Mamiko Tosa

Education

Nippon Medical School, Tokyo, Japan	1986-1992
Doctor of Medicine (M.D.)	

Post Doctral

Resistrar in Plastic and Reconstructive Surgery, Nippon Medical School Hospital, Tokyo, Japan	1992-1993
Registrar in General Surgery, Funabashi Hospital, Chiba, Japan	1993-1994
Assist. Prof. of Plastic and Reconstructive Surgery, Nippon Medical School Hospital, Tokyo, Japan	1995-1998
Assist. Prof. of Plastic and Reconstructive Surgery, Nippon Medical School Musashi-kosugi Hospital, Kawasaki, Japan	1999-2007
Senior Reseach scientist of Molecular Pathology, Institute of Gerontology, Nippon Medical School, Kawasaki, Japan	2000-present
Doctor of Philosophy (Ph.D.)	
Senior. Prof. of Plastic and Reconstructive Surgery, Nippon Medical School Musashi-kosugi Hospital, Kawasaki, Japan	2008-present



SL-6 My Therapeutic Experience of The True Keloid for More Than 50 Years

Masashi Itoh

Department of Plastic & Reconstructive Surgery, Kantoh Rosai Hospital,
Kanagawa, Japan

- 1) The true keloid I refer to in this text means the Spontan keloid classified by Saalfeld E.&U. in 1932. Recurrence occurs without fail by the simple surgical resection alone showing character of high anti therapeutic. It has been said that irradiation is effective since 100 years ago.
I irradiated Siemens superficial irradiation (Dermopan) after operation, which necessarily did not work effective for all cases. As the result of my application of irradiation of Electron Beam since 1992, I could get much better performance accompanied with increase of effectiveness.
- 2) Cryosurgery: In 1981 Hirshowitz B. reported combination therapy of cryosurgery using Liquid Nitrogen and local injection of adreno cortical steroid. I immediately applied two kinds of treatment of simple cryo-surgery and cryosurgery after superficial irradiation to compare the effectiveness of the two methods. I kept following up this trial for more than 20 years since 1981. Although patients required some troublesome their own after care treatment, even the simple cryosurgery showed certainly high effectiveness.
- 3) Combination therapy of local injection of adreno cortical steroid after applying superficial irradiation (therapy without operation).
Simmer down and flattening of the true keloid were realized by applying local injection of adreno cortical steroid since around 1956. The keloid symptom have, however, recurred by discontinuation of the therapy. I, then, applied local injection of adreno cortical steroid after superficial irradiation. It was very much effective as a matter of course. At the time when the patient started to feel itching (irritable pain) before recurrence of the keloid during period of the following up, the itching (irritable pain) disappeared by the additional injection of adreno cortical steroid. This method is very much effective in the simmer down area of extension and enlargement of the true keloid.
- 4) Case of ultra anti therapeutic : I have experienced a range of cases that do not get better easily resisting to the various methods of therapy. I can not help admitting that the cause is not cleared up yet. I think a key leading to solution of this problem exists in research of basic medicine for the fibroblast cells as well as research furthermore stepping up to genetic element in the cells.

Biography of Dr. Masashi Itoh

1951 June - 1958 March	Dept. Dermatology & Urology , Tokyo Metropolitan Police Hospital
1958 April - 1969 June	Dept. Plastic and Reconstr.Surgery. Tokyo Metropolitan Police Hospital
1965 Jan - 1965 Dec	Dept. Plastic Surgery. Middlemore Hospital. Auckland. New Zealand
1969 July - Present	Dept. Plastic & Reconstr. Surgery, Kantoh Rosai Hospital
1991 Dec - 2009 April	Dept. Plastic Reconstr. Surgery & Dermatology, Fujisawa Goshomi Hospital



SL-7 Treatment of Keloids

Ryosuke Fujimori

Fujimori's Plastic Surgery Clinic, Kyoto, Japan

Keloids are associated with inflammation, which can be considered to be a normal biological response of the human body. Consequently, the purpose of keloid treatment should be the reduction of the inflammation rather than extirpation. Supporting this is that mature keloid scars, in which the inflammation is reduced, tend to be more aesthetically acceptable than immature scars. Moreover, it remains unclear whether keloids can recur after keloidectomy, which suggests that keloidectomies could actually make keloids worse. Anti-inflammatory approaches to the management of keloids are as follows.

Release of contractures: A notable cause of keloid scarring is scar contractures. Contractures occur after physical stimulation, especially that provided by compression, and they often arise on bumpy surfaces. Thus, after releasing a contracture, it is important to fix the wound in an extended position and wait until the inflammation has subsided. However, if this approach is considered to be inappropriate due to the poor constitution of the patient, post-operative radiation therapy should be performed.

Radiation therapy: Radiation therapy is effective for true keloids in patients with constitutional problems. A total of 25 Gy should be considered as the standard dose. Radiation therapy is known to prevent inflammation for an indefinite period of time.

Opening of inclusion cysts: It is important to remove inclusion cysts in keloids, which often have atheroma and hairs. This is because these cysts may expand the existing inflammation in the keloid.

Keloidectomy and simple suture: keloidectomy and simple suture are easier to perform after radiation therapy and can lead to aesthetic improvements. However, even if keloidectomy and simple suture are selected, the priority during surgery should be the release of contractures and the removal of inclusion cysts. In general, the procedure should involve an intrakeloidal incision.

Conservative therapy: If keloids are small and lack contractures, conservative therapy can be applied. In general, smaller and newer keloids tend to respond to conservative therapy.

Biography of Dr. Ryosuke Fujimori

Education and faculty positions

- 1959 Graduate Kyoto University Faculty of Medicine
- 1968 Assistant Professor of Kyoto University, Department of Dermatology
- 1977 Assistant Professor of Kyoto University, Department of Plastic Surg.
- 1988 President of the Fujimori's Plastic Surgery Clinic

License and certifications

The degree of Doctor of Medicine in Kyoto University: March 11, 1979

The specialist in Japan Society of Plastic Surgery: April 1, 1979

Position of societies

- Former Director of Japan Society of Plastic Surgery (JSPS)
- Former Director of Japan Society of Aesthetic Plastic Surgery (JSAPS)
- Honorable Member of Japan Society of Skin Surgery (JSSS)
- Member of International Society of Plastic Surgery (ISPS)
- Member of International Society of Aesthetic Plastic Surgery (ISAPS)



SL-8 Prevention and Reduction of Scarring by TGFβ3 (Juvista/Avotermin)

– Clinical and Scientific Data

Mark W.J. Ferguson^{*,**}

^{*}Renovo, Core Technology Facility, Manchester, UK

^{**}University of Manchester, UK

E-mail: mark.ferguson@renovo.com

Background: Skin wounds on early mammalian embryos heal without scarring by contrast to adult wounds which scar. Of the many differences between embryonic and adult wound healing, relative levels of the TGFβ isoforms appear important in scarring. TGFβ3 is present at high levels in embryonic wounds, which heal without a scar, but at low levels in adult wounds which scar. Exogenous application of Human Recombinant TGFβ3 to experimental skin wounds in rats, mice and pigs resulted in a marked reduction in scarring. Human Recombinant Active TGFβ3 (Juvista/Avotermin) is therefore being developed as a potential human pharmaceutical for the prevention and reduction of scarring. **Methods:** A series of double-blind, placebo-controlled, prospectively-powered safety and efficacy trials have been conducted in a variety of surgical settings - small incisions under the arms of human volunteers, following scar revision surgery, following varicose vein surgery. All trials utilize a within-patient control involving either the treatment of bilaterally symmetrical wounds made by the same surgeon at the same time on the same patient, one with Juvista and the other with placebo, in a double-blind, randomized fashion or treating one end of a long wound with Juvista and the other end with placebo in a double-blind, randomized fashion. **Results:** Clinical trials utilizing doses of Juvista of 200 or 500ng/100μl/Lcm of wound margin injected at the time of wound closure and 24 hours later show a statistically and clinically significant improvement in scarring compared to placebo. The improvement in scar appearance is first evident around 6 weeks following wound closure and is maintained to at least 12 months following wound closure. Some trials involved biopsy of the Juvista and placebo treated human scars. In these studies, Juvista treatment resulted in a regeneration of the epidermal and dermal structure to more closely resemble that of normal skin e.g. rete ridges, reformation of papillary dermis, basket weave organization of extracellular matrix in reticular and papillary dermis. This, combined with the sustained macroscopic improvements in scarring suggests that the beneficial effects of Juvista will be permanent. Juvista treated scars are generally flatter, less noticeable, have a more normal colour and blend in better with the surrounding skin. Juvista improves the appearance of normal scars and of disfiguring (hypertrophic) scars e.g. following scar revision surgery. **Conclusions:** Animal data, combined with data from an extensive Phase II clinical trial programme (1500 human subjects dosed to date) indicate that Juvista shows promise as a new human pharmacological treatment, administered at the time of wound closure and 24 hours later, which allows the wound to heal with the regeneration of a more normal skin structure and an improved scar appearance. Juvista is currently being tested in a large (over 350 patients), multi-centre, multi-national, Phase III trial, utilising a double-blind, placebo-controlled, prospectively powered, within-patient design following scar revision surgery. This trial is on track to report data in H1 2011.

Biography of Dr. Mark W.J. Ferguson

Professor Mark Ferguson is the Co-founder (with Dr Sharon O’Kane) and CEO of Renovo a Biotechnology Company spun out of the University of Manchester (www.renovo.com). Since the age of 28, Mark Ferguson has been Professor in the School of Biological Sciences at the University of Manchester, where he has held a number of administrative posts including Head of Department and Dean (1986-2007). He now holds an honorary Professorship at the University of Manchester. He has more than 30 years of experience in biomedical research including developmental biology, regenerative medicine, wound healing and scarring. He has served as President and Secretary of the European Tissue Repair Society, was a member of MHRA's Safety of Medicines Biologics sub-committee and has served as a member of Government committees including chairing the UK Government Foresight Committee on Health and Life Sciences. He is currently President of the Manchester Medical Society and a member of the UKTI Life Sciences Marketing Board.



SL-9 Treatment of Traumatic Scars Using Plasma Skin Regeneration (PSR) System and Fractional Laser

Taro Kono, Hiroyuki Sakurai

Department of Plastic and Reconstructive Surgery, Tokyo Women's Medical University, Tokyo, Japan

E-mail: tkono@prs.twmu.ac.jp (Taro Kono)

Background: Several modalities have been advocated to treat traumatic scars, including surgical techniques and laser resurfacing. Recently, a plasma skin regeneration (PSR) system has been investigated. **Methods:** Twenty Asian patients with traumatic scars were treated with PSR system. Three treatments were performed at monthly intervals with PSR, using energy settings of 2 to 3J. **Results:** Nine of 20 patients showed more than 50% improvement. The average pain score on a 10 point scale VAS score was 5.8 +/- 1.3SD and all patients tolerated the treatments. The average re-epithelization time was 7.3 +/- 2.8SD days. Temporary and local hyperpigmentation was observed in four patients and this hyperpigmentation disappeared within three months. Hypopigmentation and worsening of scarring were not observed. **Conclusions:** Plasma treatment is clinically effective and is associated with minimal complications when used to treat traumatic scars Asian patients. However, deep traumatic scars are resistant to plasma treatment. More recently, fractional non-ablative and ablative laser have been used to treat traumatic and acne scars. There is a possibility to get more improvement of deep scars. Further studies are warranted to evaluate these treatments.

Biography of Dr. Taro Kono

Dr. Taro Kono obtained his M.D. at the Faculty of Medicine of the Kagoshima University in Japan in 1993. He completed his professional training in the Department of Plastic & Reconstructive Surgery of the Tokyo Women's Medical University from 1993 to 1995 and the Department of Surgery of the Metropolitan General Hospital from 1995 - 1997. Since 1998, Dr. Kono has been working together with other professions in publicizing more than 130 publications on plastic surgery and laser surgery, and was invited to speak at local and international meetings. He is an associate editor of Lasers in Medical Science, editorial boards of Journal of Cosmetic and laser therapy, Plastic Surgery International, an instructor and council member of Japanese Society for Laser Surgery and Medicine, Fellow member of American Society of Laser Surgery and Medicine. He is now the Lecturer and Chief of Laser Unit and assistant professor at the Department of Plastic and Reconstructive Surgery of the Tokyo Women's Medical University in Japan.



SL-10 Pathogenesis of Diabetic Complications Through Bone Marrow-Derived Cells

Akinori Hara*, Norihiko Sakai*, Takashi Wada**

*Department of Disease Control and Homeostasis, Institute of Medical, Pharmaceutical and Health Sciences, Faculty of Medicine, Kanazawa University, Ishikawa, Japan

**Department of Laboratory Medicine, Institute of Medical, Pharmaceutical and Health Sciences, Faculty of Medicine, Kanazawa University, Ishikawa, Japan

E-mail: ahara@m-kanazawa.jp (Akinori Hara)

In chronic kidney disease (CKD), it has been recognized that development of cardiovascular disease is promoted as kidney function deteriorates (cardiorenal syndrome). However, details of the cardiorenal syndrome remain investigated. On the other hand, CKD progresses to end-stage kidney failure, showing pathological characteristics of kidney fibrosis. The histological picture of kidney fibrosis is characterized by the accumulation and activation of leukocytes and increased expression of chemokines/chemokine receptors. In this aspect, our recent studies uncovered the evidence that a circulating cell (i.e., the fibrocyte) can contribute to the progression of kidney fibrosis in mouse models and biopsy specimens of patients with CKD. Fibrocytes are bone marrow-derived mesenchymal progenitor cells that express a variety of cell-surface markers related to leukocytes and mesenchymal cells. While fibrocytes have been shown to be involved in wound healing and cochlear physiology, this distinct population of the cells is related to various human fibrosing disorders, including skin, and lung as well as kidney. Recently, fibrocytes have been found to be novel cellular mediators of development and progression of diabetic complications. This finding suggests that the bone marrow-mediated mechanism may be present in the development and progression of organ dysfunction in patients with diabetes. Moreover, it has been revealed that fibrocytes are target cells of renin-angiotensin system inhibitors which are widely used in patients with CKD. Here, we introduce the data supporting the pivotal role of bone marrow-derived cells, especially fibrocytes, in the pathogenesis of diabetic complications including nephropathy, and report the therapeutic possibility by regulating fibrocytes.

Biography of Dr. Akinori Hara

Education

1994-1995	Kanazawa University School of Liberal Arts
2000	M.D. Kanazawa University School of Medicine
2006	Ph.D. Kanazawa University Graduate School of Medicine, Division of Internal Medicine, Kanazawa, Japan

Postdoctoral Training

2000-2010	Clinical Fellow in First Department of Internal Medicine (Nephrology), Kanazawa University Hospital, Japan
-----------	---

Licensure and Certification

2000	Passed the 94th Examination of Japanese National Board
2006	Japanese Board of Internal Medicine Certificate
2010	Japanese Board of Rheumatology Certificate
2010	International Trauma Life Support Basic Provider
2010	Japan Prehospital Trauma Evaluation and Care Provider

Academic Appointments

2008-	Lecturer of bedside teaching in Department of Disease Control and Homeostasis, Kanazawa University Graduate School of Medical Science
-------	--

Hospital Appointments

2008-	Clinical Fellow in Department of Laboratory, Kanazawa University Hospital, Kanazawa, Japan
2010-	Associate in Department of Emergency and Critical Care Medicine



SL-11 Modulation of Vocal Fold Scar Fibroblast by Adipose Derived Stem Cells In Vitro

Yoshihiko Kumai

Department of Otolaryngology Head and Neck Surgery, Kumamoto

University School of Medicine, Kumamoto, Japan

E-mail: kumayoshi426yk@gmail.com

Background: Objective of this study is to explore adipose-derived stem cells and scar fibroblast interactions as a potential pathway for remodeling of vocal fold scar tissue. **Methods:** Scar fibroblasts (SFs) and adipose-derived stem cells (ASCs) from the ferret were cultured alone and in combination in a cell-contact-independent paracrine system. For co-culture experiments, the cells were combined in Transwell plates for 6 days, followed by 1 or 3 days of monoculture, at the end of which assays were performed. Scar fibroblasts were isolated from vocal folds electrocauterized two weeks previously. ASCs were isolated from lipoaspirated subcutaneous abdominal fat of two ferrets. To assay cellular interactions in co-culture system, we measured (1) the production of hyaluronic acid (HA) and collagen via enzyme-linked immunosorbent assay (ELISA), (2) the secretion of HGF (ELISA), (3) the expression of α -smooth muscle actin (α -SMA), cell proliferation and apoptosis of SFs (via flow cytometry). Other experiments examined the effects of anti-HGF on cellular interactions. **Results:** Non-contact co-culture led to significant decreases for SFs in collagen production ($p<.05$), proliferation ($p<.05$), and α -SMA expression ($p<.05$), while HA production increased ($p<.05$). Co-culture also caused an increase in HGF secretion from the ASCs ($p<.05$). Blockade of ASC-derived HGF by anti-HGF antibody treatment abolished the inhibitory effects of ASCs on SF collagen synthesis ($p<.05$). **Conclusions:** ASCs influence scar fibroblasts to adopt a less fibrotic profile and it appears that HGF is at least one of the soluble factors responsible for this effect. Implanted ASCs could potentially ameliorate vocal fold scar by acting as a long-term, intrinsic source of HGF.

Biography of Dr. Yoshihiko Kumai

5/1999-9/1999

Resident: Department of Otolaryngology Head and Neck Surgery, Kumamoto University, Graduate School of Medicine

10/1999-9/2001

Resident: Department of Otolaryngology Head and Neck Surgery, Osaka Red Cross Hospital

10/2001-3/2003

Medical Staff, Department of Otolaryngology Head and Neck Surgery, Kumamoto University, Graduate School of Medicine

3/2003 –3/2007

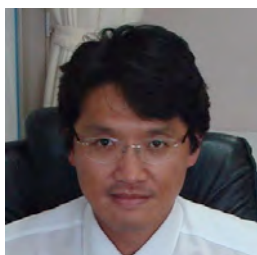
Graduate Fellow, Department of Otolaryngology Head and Neck Surgery, Kumamoto University, Graduate School of Medicine

4/2007-3/2009

Research Fellow, Center for Laryngeal Surgery and Voice Rehabilitation, Massachusetts General Hospital, Harvard Medical School

4/2009-

Assistant Professor, Department of Otolaryngology Head and Neck Surgery, Kumamoto University, Graduate School of Medicine



SL-12 The Pathomechanism of The Ligamentum Flavum Hypertrophy is Similar to That of The Hypertrophic Scar Formation during Wound Healing

Koichi Sairyo*, Rei Ogawa**, Akira Dezawa*

*Department of Orthopedic Surgery, Teikyo University Mizonokuchi Hospital, Kawasaki, Japan

**Department of Plastic, Reconstructive and Aesthetic Surgery, Nippon Medical School, Tokyo, Japan

E-mail: sairyokun@hotmail.com (Koichi Sairyo)

Background: Lumbar spinal canal stenosis (LSCS) is very common degenerative spinal disorder among the elderly population. One of the main causes of the disorder is hypertrophy of the ligamentum flavum (LF). We have evaluated the LF hypertrophy with reference to the pathologic similarity to the hypertrophic scar formation during the cutaneous wound healing process. **Methods:** The hypertrophied LF tissue was collected en bloc during surgery for patients with LSCS. To understand the scarring and fibrosis of the LF, MT staining was used. EVG was used to evaluate the state of the elastic fibers. For the immuno-histochemistry, the production of type I and type III collagen was evaluated. Also, the production of alfa smooth muscle actin (SMA) was investigated. **Results:** In the hypertrophied LF, some area showed loss of elastic fiber on EVG. The area was stained in green on MT, indicating the site being scarring (fibrosis). The scarring is pronounced in the dorsal half of the LF rather than the dural side. The mean fibrosis index (0 to 4) was 1.7 at the dural aspect and 3.2 at the dorsal aspect. The fibrotic site was positively stained by type I and III collagen. However, the staining of type III was stronger and wider. Regarding alfa-SMA, the most endothelial cells of the vessels were stained. Additionally, the fibroblast-like cells in the scarring site were stained, indicating the cell to be the myofibroblast. In the dural aspect, only few cells were positive by SMA. However, there were many alfa-SMA positive cells. **Conclusions:** The pathomechanism of the LF hypertrophy in patient with LSCS is similar to that of hypertrophic scar of the skin. The condition of hypertrophic scars is called as fibroproliferative disorder (FPD). Thus, it seems that LF hypertrophy would also be the FPD in the ligament.

Biography of Dr. Koichi Sairyo

Education

Dec. 8, 1994	<i>PhD degree, Medical Science</i> University of Tokushima, Tokushima, Japan (1988 – 1994)
Mar. 31, 1988	<i>MD degree, University of Tokushima, Tokushima, Japan</i>

Board certification in Japan

1988	National Board of Medical Doctor (physician)
1994	Approved Orthopaedic Surgeon by Japanese Orthopaedic Association
2003	Board-certified spine surgeon
2008	Board-certified endoscopic spine surgeon

Professional and academic employment history

April 1, 1992,	Resident, Department of Orthopedic Surgery, Health Insurance Naruto Hospital
Oct. 15, 1995,	Visiting Scholar & Postdoctoral associate, Iowa Spine Research Center, Department of Biomedical Engineering, University of Iowa.
Oct. 1, 1999- Dec 2009	Associate Professor, Department of Orthopedics, University of Tokushima, Japan
Sep. 1, 2003	Sabbatical (until Dec. 31, 2005)
Sep. 1, 2003- Dec.2005	Visiting Scholar, Spine Research Center, Departments of Bioengineering and Orthopaedic Surgery, University of Toledo, Toledo, Ohio.
Jan. 1, 2010	Associate Professor, Department of Orthopedic Surgery, University of Teikyo Mizonokuchi Hospital, Kanagawa, Japan



SL-13 The Effect of Nepidermin(rh-EGF) Against Scar Formation

Joon Pio Hong, JooA Lee

Plastic Surgery, Asan Medical Center University of Ulsan, Seoul, Korea

E-mail: joonphong@amc.seoul.kr (Joon Pio Hong)

Background: In this pig wound model study of Nepidermin (recombinant human- epidermal growth factor (Easyef[®]), Daewoong Pharmaceutical Company, Seoul, Korea), the effect against scarring is investigated.

Methods: Total of 7 domestic pigs with weight of 15 – 20 Kg were used to evaluate the effect of Nepidermin on acute full thickness wounds with 5 x 5 cm dimensions. The wound was categorized into two groups; Group EGF dressed with nepidermin twice daily and covered with compound dressing (Versiba[®], Convatec, USA) and Group non-EGF dressed twice daily only with the compound dressing. Wounds were evaluated daily until epithelialization was achieved. Digital photos were used and evaluated using Bersoft image measurement (v 4.01, USA) to measure granulation, epithelialization and contracture (scar formation). **Results:** Findings in granulation showed total granulation achieved at 5 days in EGF group and 9 days in non-EGF group. The EGF group showed faster rate of epithelialization compared to the non-EGF group. Total epithelialization of the wounds was achieved at an average of 45 days while the non-EGF group was epithelialized at average of 53 days. In comparing the rate of contracture, it showed similar contraction rate in the early phase but the rate of contracture seemed to slow down in EGF group at about 2 weeks ending in a fairly less contracture at 53 days. Biopsies showed better defined epidermo-dermal junction with thicker epithelium in the EGF group. **Conclusions:** The overall effect of EGF can be seen not only in epithelialization but also in the rate of granulation formation. Interesting was the fact that contracture was less observed in the EGF group compared to non-EGF group. This data coincides with the reports of EGF having favorable condition against wound contracture. Although the number of specimens are small to conclude in a solid statistical basis, it can be observed that the effects of EGF are to stimulate epithelialization, granulation and perhaps to suppress contracture of the wound.

Also presented are the clinical trials for the split thickness skin graft donor site scars.

Biography of Dr. Joon Pio Hong

Joon Pio Hong M.D., Ph.D., M.M.M. is Professor of Plastic and Reconstructive Surgery at the Asan Medical Center and the University of Ulsan, College of Medicine. He received his BS degree from the Yonsei University of College of Medicine and his MS degree in medicine and PhD degree from the Graduate School of Yonsei University. He received his Masters of Medical Management from University of Southern California at Marshall School of Business. He is active member in number of professional associations such as Korean society of Plastic surgery, American society of plastic surgery, Wound healing society (US and Korea) and World society of reconstructive microsurgery. He is also editors for International Wound Journal, Wound Technology Journal and Korean Society of Aesthetic Plastic Surgery Journal. His major work has been research and clinical practice in wound healing and microsurgery and has been invited over 20 countries to present his work. He has over 100 publications in this field of practice.



**SL-14 Human Recombinant Basic Fibroblast Growth Factor (bFGF)
Improves Scar Quality Such as Softness, Elasticity of The Scar and Stratum
Corneum Function and Color-Match as well as Accelerates Wound Healing**

Sadanori Akita, Kenji Hayashida, Hiroshi Yoshimoto, Kozo Akino, Aya Yakabe,
Akiyoshi Hirano

Department of Plastic and Reconstructive Surgery, Nagasaki University Hospital,
Nagasaki, Japan

E-mail: akitas@hf.rim.or.jp (Sadanori Akita)

Background: Post-burn or post-wounding scar quality as well as the scars of the lower extremity is important in esthetics as well as in function. Recently, a growth factor, namely human recombinant basic fibroblast growth factor (bFGF), is widely used for burn and other wounds at early stage of the injury and surgery and for difficult wounds, together with porcine-derived bi-layered artificial dermis. Thus, clinical effectiveness and versatility were evaluated by objective tools. **Methods:** Sequential burn and wound reconstruction as well as intractable lower extremity reconstruction by a artificial dermis with or without bFGF administration and secondary split-thickness skin grafting was compared with normal control in terms of quantitative and qualitative wound healing by clinical assessment, measurement for hardness using a durometer, elasticity and extension ability by cutometer, and the corneal layer moisture parameters at least six months after the final wound healing and procedures. The color-match is also evaluated with hand-held objective skin coloring. **Results:** Healing rate was significantly accelerated by early administration of bFGF in burns. In the staged reconstruction with an artificial dermis and split-thickness skin grafting, there was significantly less skin hardness using a durometer and cutometer in bFGF treatment compared to non-bFGF treatment (16.2 ± 3.83 vs. 29.2 ± 4.94 , $P < 0.01$). Moisture parameters such as effective contact coefficient, TEWL, water content and thickness in non-bFGF treatment were all significantly greater than those in bFGF treatment, while water content and thickness in bFGF treatment were comparable to those of the control. The split-thickness skin grafting with bFGF leads to better color-match in comparison to the split-thickness skin grafting alone. **Conclusions:** The use of human recombinant bFGF from the early stage of burn and wound treatment and surgeries demonstrated better clinical quality as well as accelerating healing rate.

Biography of Dr. Sadanori Akita

Dr. Akita started plastic surgical training program at Nagasaki University Hospital. He then proceeded to Graduate School of Nagasaki University (four-year, PhD course), specializing in plastic and reconstructive surgery from 1990 to 1994. In 1993, he further started research fellowship at Cedars-Sinai Medical Center, University of California, Los Angeles (UCLA) under supervision of Dr. Shlomo Melmed, M.D. on a cytokine expression and its regulation in vivo by using a transgenic animal model until 1996. He has published more than 45 English peer-reviewed articles. He serves as a general secretary of World Union of Wound Healing Societies, which will be held in Yokohama, September 2-6, 2012, <http://wuwhs2012.com/> and will be a president of world union of wound healing societies, the years of 2012 to 2016, http://www.wuwhs.org/board_members.php.

International peer-review publication: 65

Invitational lectures (International): 35

Invitational lectures (Domestic): 25

International presentations: 68

Awards (International): 10

Awards (Domestic): 8 (including "Best scholar Award" in Nagasaki University in 2006)

Scientific committee (International): 14

Scientific committee (Domestic): 22

Scientific grant received: 28 since 1997



SL-15 TGF- β Receptor Antagonists as Novel Agents to Promote Wound Healing and Reduce Scar Formation in Wounds of Normal Skin

Jung San Huang*, Shuan Shian Huang**

*Department of Biochemistry and Molecular Biology, St. Louis University School of Medicine, St. Louis, USA

**Auxagen, Inc., St. Louis, USA

E-mail: huangjs@slu.edu (Jung San Huang)

Background: Recent animal experiments and genetic evidence have revealed that TGF- β or TGF- β -induced cellular signaling may provide excellent targets for developing effective wound healing-promoting and scar-reducing agents. The prototype TGF- β receptor antagonist previously developed in our laboratory was demonstrated to promote wound healing and reduce scarring in several standard animal skin burn/excision wound models. However, the efficacy of the antagonist is limited by its poor solubility in aqueous solution at neutral pH. Recently, we generated derivatives of the prototype antagonist which exhibit excellent solubility in aqueous solution and tissue penetration activity, and potent TGF- β antagonist activity *in vitro* and *in vivo*.

Methods: The efficacies of the derivatized antagonists in promoting wound healing and reducing scar formation were evaluated using standard pig partial/full-thickness skin burn injury models. Briefly, uniform partial- and full-thickness burn wounds were made symmetrically on the back of pigs using modified soldering irons. After wounding, gels containing the antagonist and vehicle only were applied to the burn wounds every 2 days for the first 10 days and twice a week during the experimental periods. **Results:** Topical application of the derivatized antagonist accelerates wound closing in both partial- and full-thickness burn as compared to wounds treated with vehicle only. The wounds treated with the antagonist showed less contraction than those treated with vehicle only. Less scar formation was observed in the wounds treated with the antagonist. **Conclusions:** TGF- β receptor antagonists have a great potential to be novel agents to accelerate wound healing and reduce scar formation in humans.

Biography of Dr. Jung San Huang

Dr. Jung San Huang is an internationally well-known scientist in the field of growth factor research. In the early 80th, he played an important role in elucidating the structure-function relationship of platelet-derived growth factor (PDGF). In 1983, Dr. Huang and his collaborators (from Washington University School of Medicine, St. Louis, Missouri, USA, Imperial Cancer Research Fund Laboratories, London, UK and University of Uppsala, Sweden) discovered that the oncogene v-sis of simian sarcoma virus (SSV) encodes PDGF. SSV is an RNA tumor virus which causes fibrosarcoma. This finding has been recognized as one of the most important findings in cancer research in the last few decades. The authors in the *Nature* paper (*Nature* 304, 35-39, 1983; *Science* 221, 1348-1350, 1983) describing the finding, were nominated as candidates for the Nobel Prize in Medicine in 1983. Following the finding, Dr. Huang and his colleagues discovered the protein tyrosine kinase activity of the PDGF β -type receptor. Together with Dr. Stanley Cohen's finding of the EGF receptor protein kinase activity, this finding signified the beginning of the signal transduction research era. Dr. Cohen is a Nobel laureate. In this time period, he proposed an autocrine transformation hypothesis which is well accepted now. Recently, Dr. Huang and his colleagues discovered the type V TGF- β receptor-mediated signaling pathway which involves insulin receptor substrate (IRS) proteins and a protein phosphatase. This pathway is enhanced in diabetic patients. Dr. Huang's laboratory identified several nature antagonists and enhancers for TGF- β . Dr. Huang and his colleagues demonstrated that high plasma levels of cholesterol cause atherogenesis, at least in part, by suppressing TGF- β responsiveness in the aortic endothelium. More recently, Dr. Huang's team has discovered a novel mechanism for regulating interstitial-lymphatic flow. This mechanism was discovered through targeting gene disruption of cell-surface retention sequence binding protein-1 (CRSBP-1) which was discovered in Dr. Huang's laboratory in the early 90th.



SL-16 Interest of The Use of Artificial Dermis in Prevention of Scar Contraction and Hypertrophy

Luc Téot, Sami Otman, Chloé Trial, Antonio Brancatti

Wound Healing Medico-Surgical Unit, Lapeyronie Hospital, Montpellier, France

E-mail: lteot@aol.com (Luc Teot)

Abnormal scarring remains a major source of functional and cosmetic disorders occurring after wounds and burns. The dermal part of the skin is recognized as playing a major role in the contraction process. The skin dermis is poorly involved in superficial wounds keeping intact the basal membrane and the source of keratinocytes, like hair follicles and annexiae. In scars observed after limited depth wounds, the skin elasticity is preserved, even when the extracellular matrix is somehow altered. On the opposite, in wounds of extended depth, the loss of dermal component results in absence of elasticity and fibroblastic cell proliferation issuing to hypertrophy and contraction. These phenomenons may be explained either by differences in cell populations, by extracellular matrix reactions to different stimuli or also in chemical control of interactions between them.

Partial thickness skin grafting has demonstrated its interest in preventing hypertrophic scar except on the edges of the skin graft, but a limited benefit on the risk of contraction, due to the small amount of dermal tissue provided. On the contrary, full thickness skin grafts with an intact dermal component rarely lead to severe contraction. The recent development of dermal substitutes could open a place for their use in pathologic scar prevention. Multiple devices, integrating different technologies, are now proposed for use in burns and reconstructive surgery. These artificial dermis formed either by a single layer of product (to be immediately covered by skin grafts), or a double layer (a collagen based product covered by a film, to be repopulated before a second procedure of skin grafting), some of them being of allogenic origin, or derived from synthetic compounds, sometimes having been previously repopulated by cells (fibroblasts, keratinocytes or both). Extensive researches are still to be done, both in fundamental research as in clinical trials establishing the real benefit of these technologies.

Biography of Dr. Luc Téot

Associate Professor

Plastic and Reconstructive Surgery, Burns and Plastic Unit, Wound Healing Unit in Montpellier University Hospital

Trained

Paris and Montreal, Wound Healing, Reconstructive Surgery and Microsurgery

Founding member

French WHS, the Scar Club, and the International Academy of Wound Technology

Past President

ETRS, World Union of Wound Healing Societies

Associate Editor

Europe of Wound Repair and Regeneration`

Scientific Board

Wound Repair and Regeneration, Journal of Wound Care, Int Wound Journal, IJLEW, Vulnologia, Indian WMA, and Journal of Wound Technology

54 International peer review articles

45 in French

41 book chapters

15 books as editor or coordinator

356 oral presentations in English, Italian or French



SL-17 Of Mice and Men: Mechanical Signaling and Scar Formation Across Species

Geoffrey C. Gurtner

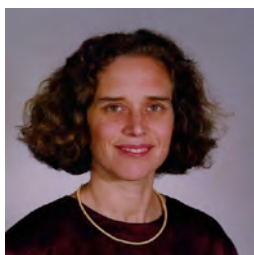
Stanford University School of Medicine, Stanford, CA, USA

E-mail: ggurtner@stanford.edu

Background: Scar formation causes significant morbidity and mortality worldwide, but attempts to stimulate regenerative repair focusing solely on single factors have been only modestly successful, suggesting that we must address the broader context of cellular and environmental relationships to have a greater impact. Mechanical forces have long been suspected to affect scar formation, but the intrinsic mechanisms remain poorly understood. **Methods:** Our laboratory has developed a murine model of hypertrophic scar formation and has demonstrated that the mechanical environment is a primary determinant for pro-fibrotic processes. Using microarray, transgenic tools, and pharmacologic strategies, we have elucidated key mechanotransduction pathways that impact both inflammation and myriad downstream fibrotic mechanisms in mice. We have also found that many of these biologic processes also occur in larger animals such as the red Duroc pig, generally regarded as the best animal representation of human scarring. **Results:** We demonstrate that fibrosis during porcine wound repair can be controlled by manipulating skin stresses with a novel stress-shielding device. Off-loading of wounds significantly reduces fibrosis and promotes the regeneration of native tissue morphology. In a prospective human pilot study, stress-shielding of abdominal incisions produced a highly significant improvement in scar appearance as judged by either lay people or plastic surgeons ($p=0.004$). **Conclusions:** Together, these studies demonstrate that mechanical forces are of fundamental importance in scar formation and that approaches to modulate mechanical stimuli can significantly reduce pathologic fibrosis. More broadly, this suggests that the mechanical environment may be critically important for both tissue and organ regeneration.

Biography of Dr. Geoffrey C. Gurtner

Dr. Geoffrey C. Gurtner is a Professor and Associate Chairman of Surgery at Stanford within the division of Plastic Surgery. He was formerly the Program Director of Plastic Surgery at the NYU School of Medicine. Dr. Gurtner is a *magna cum laude* graduate of Dartmouth College and an AOA graduate of the University of California-San Francisco School of Medicine. He completed a general surgery residency at the Massachusetts General Hospital/Harvard Medical School program, a plastic surgery residency at the NYU School of Medicine and received advanced training in microsurgery at the University of Texas-MD Anderson Cancer Center. Dr. Gurtner is double boarded in general surgery and plastic surgery. He is the author of over 120 peer-reviewed publications in both the scientific and surgical literature. He is an Editor for the sixth edition of *Grabb & Smith's Plastic Surgery* and the third edition of *Plastic Surgery* (formerly Mathes). Dr. Gurtner was awarded the James Barrett Brown Award (for best plastic surgery paper) in both 2009 and 2010. Dr. Gurtner's NIH funded laboratory seeks to understand the role the physical environment (both mechanical and chemical) and stem/progenitor cells play in how organisms respond to injury. This has led to multiple patents and patent applications in vascular medicine, wound healing and aesthetics. Dr. Gurtner is active in the development of new technologies for clinical practice and has founded several venture backed start-up companies in the San Francisco Bay Area.



SL-18 Making Sense of Wound Healing: A Role for Nerves

Nicole S. Gibran

University of Washington Department of Surgery, WA, USA

E-mail: nicoleg@u.washington.edu

Background: For many patients with hypertrophic scars, pruritis is the most distressing symptom, which leads to wound excoriation and chronic wound formation. In spite of the clinical significance of abnormal innervation in scars, the nervous system has been largely ignored in the pathophysiology of hypertrophic scars. The neuropeptide substance P induces inflammation and mediates angiogenesis, keratinocyte proliferation, and fibrogenesis. Substance P activity is tightly regulated by neutral endopeptidase (NEP), a membrane bound metallopeptidase that degrades substance P at the cell membrane. Just as neuropeptides have proinflammatory effects, we have recently determined that they also have anti-inflammatory responses to injury. **Methods:** We combine in vitro endothelial and neuronal progenitor studies and in vivo animal models of impaired wound repair to demonstrate a role for neuronal modulation of wound repair. **Results:** Altered substance P levels contribute to impaired cutaneous healing responses associated with diabetes mellitus or hypertrophic scar formation. Exogenous substance P or NEP inhibition enhances wound closure kinetics in diabetic murine wounds suggesting that diabetic wounds have insufficient substance P levels to promote a neuroinflammatory response necessary for normal wound repair. Conversely, increased nerve numbers and neuropeptide levels together with reduced NEP levels in human and porcine hypertrophic scars suggest that excessive neuropeptide activity induces exuberant inflammation in hypertrophic scars. **Conclusions:** Our observations about the role of neuroinflammation in cutaneous repair suggest that neuronal modulation of responses to injury in chronic non-healing ulcers in type II diabetes mellitus and hypertrophic scars in deep partial thickness wounds may provide therapeutic targets.

Biography of Dr. Nicole S. Gibran

Nicole S. Gibran, M.D., F.A.C.S. received her bachelor's degree at Brown University, and her medical degree at Boston University. After a residency in the Boston University Department of Surgery, she completed a clinical fellowship in the UW Burn Center with Drs David Heimbach and Loren Engrav and an NIH Trauma Research Fellowship in the Skin Biology Laboratory of Dr Karen Holbrook. She joined the UW Department of Surgery as an Assistant Professor in 1994. Now a Professor in the UW Department of Surgery, Dr Gibran is an attending surgeon at Harborview Medical Center where she has been the Director of the UW Burn Center and the UW Burn Fellowship since 2002. In this role she has emphasized team building and mentoring residents and junior faculty with interest in burns. In addition to fulfilling duties in patient care and teaching, Dr. Gibran has developed the UW Burn Center Research Laboratory with emphasis on aberrant healing processes including hypertrophic scar formation and chronic non-healing wounds seen with diabetes mellitus. She has over 100 publications in the area of wound repair, response to injury, and burns. Her primary research focus on the role of nerve-derived mediators in responses to cutaneous injury has been funded by NIGMS and NIDDK since 1997. She has served on the Surgery Anesthesia and Trauma IRB study section in the NIH Center for Scientific Review since 2001 and was Chair from 2005 - 2007. Dr Gibran has been a member of the American Burn Association since 1991 serving on the Research, Program and Ethics committees and the Committee on the Organization and Delivery of Burn Care. While Chair of the CODBC, her committee guided the ABA organizational policy on disaster planning for burn mass casualties. Currently she serves on the ABA Board of Trustees as President Elect. She also serves on the Board of the Wound Healing Society and is Chair of the Research Committee for the International Society of Burn Injuries. She is on the editorial boards of the Journal of Burn Care and Research, Surgery and Shock. Dr Gibran gains most of her creativity and energy from keeping up with her husband Dr Frank Isik and her two sons, Alexander and Oliver; from these individuals she has learned her most valuable life lessons.



SL-19 Medical Needling

Hans-Oliver Rennekampff , Matthias Aust, Peter M. Vogt

Department of Plastic, Hand and Reconstructive Surgery, Medical School
Hannover, Germany

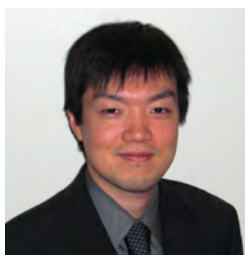
E-mail: rennekampff.oliover@mh-hannover.de (Hans-Oliver Rennekampff)

Background: Patients with postburn scarring frequently request help in improving the aesthetic appearance of their residual cicatricial deformity. A variety of operative and non operative procedures are performed to improve post burn scar quality, however options are limited in circumferential scars and large areas. Medical needling is intended to improve scar quality by percutaneous collagen induction. **Methods and results:** In comparison to other means medical needling preserves the epidermis and basement membrane and solely leads to micro injury of the dermis. Subsequent release of cell and tissue derived factors is considered to modulate dermal structure and collagen deposition. Pre treatment of scarred area intended to treat is performed with vitamin A and Vitamin C oil for 3 month. This is followed by 3 mm needling. Postoperatively patient discomfort is minimal probably due to preservation of the epidermis. Post treatment the patient is encouraged to use topical vitamin A and vitamin C cream or oils to promote better healing and greater production of collagen.

Conclusions: So far patient satisfaction has been very good and assessment by scar scales has demonstrated significant improvement. Therefore we consider medical needling as a helpful tool in the armamentarium of reconstructive surgeons.

Biography of Dr. Hans-Oliver Rennekampff

1967 - December 1979	Education G. Büchner-Gymnasium at Bad Vilbel
April 1980 - April 1986	Medical School, Johann Wolfgang Goethe University Frankfurt/Main
April 1986	Medical License
October 1986	Medical Thesis
July 1986 - July 1987	civil service
July 1987 - September 1989	residency in general surgery, Dept of Surgery, University of Kiel,
Sept. 1989 - Sept. 1990	clinical fellowship, Dept of Thoracic Surgery, Mitsui Memorial Hospital, Tokyo, Japan,
Oct. 1990 - May 1994	residency in general surgery, Dept of Surgery, University of Kiel,
1994	board exam and license in general surgery
May 1994 - May 1996	research fellowship, Regional Burn Center, University of California, San Diego
June 1996 - October 1997	residency in plastic surgery, Dept of Plastic Surgery, Burn Center, Medical School Hannover,
November 1997 - April 2000	senior resident, Dept of Hand and Plastic Surgery, BG Trauma Center, University of Tübingen
1999	board and license plastic surgery
since April 2000	staff surgeon, Dept of Plastic, Hand and Reconstructive Surgery, Burn Center, BG Trauma Center, University of Tübingen
2000	Venia legendi in Plastic Surgery
	Faculty of the University of Tübingen
Feb 2006 - 2007	chief of the Section of Burn Surgery and Skin Regeneration at BG Trauma center Tübingen
May 2006	Professor at the Eberhard Karls University of Tübingen, Germany
since Oct 2007	Full Professor at the Medical School Hannover, Dept of Plastic Hand and Reconstructive Surgery, Burn Center, Hannover, Germany



LS-1 Current Keloid and Hypertrophic Scar Treatment Algorithms and Our Recent Trials

Rei Ogawa

Department of Plastic, Reconstructive and Aesthetic Surgery, Nippon Medical School, Tokyo, Japan

E-mail: r.ogawa@nms.ac.jp

Background: Despite the multitude of reports on the treatment of hypertrophic scars (HSs) and keloids, clear algorithms for multimodal therapies are lacking. This paper presents an evidence-based review of the previous papers and proposes algorithms for the treatment and prevention of HSs and keloids. Moreover, we report the results of our recent trials testing these algorithms. **Methods:** The methodological quality of the clinical trials was evaluated. In addition, the baseline characteristics of the patients, the interventions that were applied, and the outcomes of treatment were extracted. **Results:** Important factors that promote HS/keloid development include mechanical forces on the wound, wound infection, and foreign body reactions. For keloids, the treatment method that should be used depends on whether scar contractures (especially joint contractures) are present and whether the keloids are small/single or large/multiple. Small/single keloids can be treated radically by surgery with adjuvant therapy (which includes radiation or corticosteroid injections) or by nonsurgical monotherapy (which includes corticosteroid injections, cryotherapy, laser, and anti-tumor/immunosuppressive agents like 5-fluorouracil). Large/multiple keloids are difficult to treat radically and are currently only treatable by multimodal therapies that aim to relieve symptoms. Long-term follow-up is recommended after the treatments have been concluded. Conservative therapies (which include gel sheeting, taping fixation, compression therapy, external/internal agents, and make-up/camouflage therapy) should be administered on a case-by-case basis. In our recent trials, we advanced these conventional concepts and found this led to better outcomes. **Conclusions:** Over the last decade, the number of randomized controlled trials on keloid/HS treatments has increased. Although these studies suffer from various limitations, they have greatly improved scar management. Future high quality clinical trials are likely to further significantly improve the keloid/HS treatment algorithms that are currently available.

Biography of Dr. Rei Ogawa

Rei Ogawa is an Associate Professor in the Department of Plastic, Reconstructive, and Aesthetic Surgery, at the Nippon Medical School in Tokyo, Japan. He concurrently serves as the Director of the school's Mechanobiology and Wound Healing Laboratory. Associate Professor Ogawa obtained a M.D. and Ph.D., following which he worked as a Research Fellow at the Tissue Engineering and Wound Healing Laboratory at the Brigham and Women's Hospital, Harvard Medical School, Boston, USA. His area of clinical expertise is reconstructive surgery and scar management, for example, abnormal scar (keloid and hypertrophic scars) prevention and treatment and he is considered to be a leading expert in the field of mechanobiology of scarring. Dr. Ogawa has established a method to regenerate high-quality cartilage using mechanical force (hydrostatic pressure) loading and holds several national patents in the field of tissue engineering. His recent research have focused on the mechanobiology of cells and its application to tissue engineering and wound healing. A prolific researcher and writer, Associate Professor Ogawa has co-authored over 20 chapters in international/national books, 200 papers in international/national scientific journals, and has presented over 500 papers at international/national conferences. In addition, he is on the editorial board of several international scientific journals and is an active member of many international medical societies (e.g., American Society of Plastic Surgeons (ASPS), Plastic Surgery Research Council (PSRC), and Orthopaedic Research Society (ORS)).



LS-2 Forces and Matrices in Wound Healing

Dennis P. Orgill*, Rei Ogawa**

*Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA

**Nippon Medical School, Tokyo, Japan

E-mail: dorgill@partners.org (Dennis P. Orgill)

Background: Our aging population with high levels of obesity and diabetes add to the growing number of acute and chronic wounds. We have focused our methods on a directed proliferative response to wounding including mechanical forces, extracellular matrix analogs and biologics to address this need. **Methods:** We review our multiple clinical and pre-clinical studies using micromechanical forces, collagen-based scaffolds with biologics. **Results:** Mechanical forces can dramatically alter the biology of wound healing. Specific forces increase the rate of angiogenesis and cell proliferation, change nascent blood vessel morphology and alter peripheral nerve growth. These observations correlate to the degree of surface microdeformations of the wounds and the response can be modulated by changes in time of application and waveform. Properly designed collagen-based scaffolds induce a regenerative response by producing a dermal-like structure that differs from scar. When used clinically, they produce a remarkably normal appearing skin. Biologics including cells and growth factors can further augment the healing response. **Conclusions:** Micromechanical forces, properly designed collagen-based scaffolds and biologics including growth factors and cells are powerful methods to modulate the wound healing response to allow for accelerated healing and a regenerative response. In the future, clinicians may be able to use these principles synergistically to specific wound types to simplify reconstructive procedures, accelerate the healing response, reduce pain and induce a regenerative response.

Biography of Dr. Dennis P. Orgill

Positions and Employment

1992- Assistant in Surgery, Plastic Surgery, Children's Hospital, Boston, MA
1993-2002 Associate Director, Burn Center, Brigham and Women's Hospital, Boston, MA
1994-2002 Associate Director of Trauma, Plastic Surgery, Brigham and Women's Hospital, Boston, MA
1995- Associate Chief, Division of Plastic Surgery, Brigham and Women's Hospital, Boston, MA
1996- Courtesy Staff, Beth Israel Deaconess Medical Center (East), Boston, MA
1997- Senior Surgeon, Brigham and Women's Hospital, Boston, MA
1998- Staff Member, Faulkner Hospital, Jamaica Plain, MA
2000- Staff Member, Dana Farber Cancer Institute, Boston, MA
2000- 2008 Associate Professor of Surgery, Harvard Medical School, Boston, MA
2003- 2008 Director, Burn Center, Brigham and Women's Hospital, Boston, MA
2005-2010 Assistant Program Director, Combined Harvard Plastic Surgery Program
2008- Professor of Surgery, Harvard Medical School, Boston, MA

Other Experience and Professional Memberships

1983- 2010 Member, Massachusetts Medical Society
1992- 2010 Member, American Burn Association
1992- Member, Plastic Surgery Research Council
1996- Fellow, American College of Surgeons
1996- Member, Tissue Engineering Society
1997- 2009 Member, American Medical Association
1998- 2008 Member, Boston Surgical Society
1999- Member, American Society of Plastic and Reconstructive Surgeons
2002- Member, American Society for Reconstructive Microsurgery
2005- Member, American Association of Plastic Surgery
2008- Associate Member, Association of Academic Chairmen of Plastic Surgery



ES-1 Treatment of Hypertrophic Scars Using a Long-Pulsed Dye Laser with Cryogen Spray Cooling

Taro Kono, Hiroyuki Sakurai

Department of Plastic and Reconstructive Surgery, Tokyo Women's Medical University, Tokyo, Japan

E-mail: tkono@prs.twmu.ac.jp (Taro Kono)

Background: Hypertrophic scars are common and cause functional and psychological morbidity. Various treatments such as use of intralesional corticosteroids, excision, pressure therapy, and carbon dioxide laser ablation have been advocated in the past. This study was performed to determine the effectiveness of the 595-nm long pulsed-dye laser (LPDL) with cryogen spray cooling (CSC) treatment of hypertrophic scars. **Methods:** 14 Asian patients with 20 hypertrophic scars were treated by LPDL with CSC. After two treatments, photographic and clinical assessments were recorded in all patients. Treatment outcome was graded by a blind observer using the Vancouver General Hospital (VGH) Burn Scar Assessment Scale. **Results:** Treatment of hypertrophic scars with the LPDL led to a significant improvement of $51.4 \pm 14.7\%$ in the VGH score only 3 months after the first treatment. **Conclusions:** LPDL with CSC treatment of hypertrophic scars can effectively improve scar pliability and texture and decrease erythema, and associated symptoms yielding cosmetically and functionally acceptable clinical results. Every effort must be made to prevent the development of hypertrophic scars or keloids after surgery or trauma. Epithelization using topical agents such as basic fibroblast growth factor spray, excellent surgical technique and efforts to prevent postsurgical infection are of prime importance.

Biography of Dr. Taro Kono

Dr. Taro Kono obtained his M.D. at the Faculty of Medicine of the Kagoshima University in Japan in 1993. He completed his professional training in the Department of Plastic & Reconstructive Surgery of the Tokyo Women's Medical University from 1993 to 1995 and the Department of Surgery of the Metropolitan General Hospital from 1995 - 1997. Since 1998, Dr. Kono has been working together with other professions in publicizing more than 130 publications on plastic surgery and laser surgery, and was invited to speak at local and international meetings. He is an associate editor of *Lasers in Medical Science*, editorial boards of *Journal of Cosmetic and laser therapy*, *Plastic Surgery International*, an instructor and council member of Japanese Society for Laser Surgery and Medicine, Fellow member of American Society of Laser Surgery and Medicine. He is now the Lecturer and Chief of Laser Unit and assistant professor at the Department of Plastic and Reconstructive Surgery of the Tokyo Women's Medical University in Japan.

Panel Discussion

Classification and Evaluation of Keloids and Hypertrophic Scars -A Trial of Japan Scar Workshop (JSW)-

Moderator

Sadanori Akita

Rei Ogawa

Panelists

Yasuyoshi Tosa

Satoko Yamawaki

Satoshi Akaishi

Munetomo Nagao

Keisuke Okabe

Jun Yamamoto

Japan Scar Workshop (JSW) has worked to establish the unified classification and evaluation system of keloid and hypertrophic scars since 2007. The many grey zones between typical hypertrophic scars and keloids in actual clinical situation make differential diagnosis a challenge. These two conditions, however, have been considered different in many traditional textbooks. They can also be considered unified as fibroproliferative disorders (FPD) of skin. Thus, we have attempted to develop a grading system for symptoms of these diseases. The purpose of this system is for every physician to become capable of adequately evaluating the degree of symptoms of hypertrophic scars and keloids and thus select appropriate treatment methods the results of which can be evaluated accurately. The first system that we developed was deliberated upon at the 4th JSW meeting in 2009 at which we requested the JSW members to use it in actual clinical situations. In this session, we will discuss the pros and cons of this system in an attempt to develop a second system. Moreover, we encourage international participants of this International Scar Meeting in Tokyo 2010 to voice out their opinion as it will help us in developing an “international classification and evaluation system of the fibroproliferative disorders of the skin.”

Classification and Evaluation of Keloids and Hypertrophic Scars in 2009 (Japan Scar Workshop)

Classification (for the evaluation of symptoms and selection of appropriate treatment methods)			Evaluation (for the judgement of treatment results and following-up)			
1. Age	0—30 y/o	2	1. Induration			
	31-60 y/o	1	0: Non	1: Weak	2: Mild	3: Strong
	61 y/o-	0				
2. Human Race	Africans	2	2. Elevation			
	Others	1	0: Non	1: Weak	2: Mild	3: Strong
	Caucasians	0				
3. Size (Max×Min cm ²)	Over 20cm ²	1	3. Redness of scars			
	Under 20cm ²	0	0: Non	1: Weak	2: Mild	3: Strong
4. Elevation	Over 5mm	2				
	Under 5mm	0	4. Erythema around scars			
5. Horizontal growth	Clearly exists	3	0: Non	1: Weak	2: Mild	3: Strong
	Not clear	0				
6. Shape	Characteristic shape e.g. butterfly shape	3	5. Spontaneous pain and pressing pain			
	Others	0	0: Non	1: Weak	2: Mild	3: Strong
7. Erythema around scars	Clearly present	2				
	Not clear	0	6. Itch			
8. Subjective symptom (e.g. pain, itch)	Always present	2	0: Non	1: Weak	2: Mild	3: Strong
	intermittent	1	Total 0-18 points			
	Non	0	Remarks			
9. Causes	Unknown or minute wounds	3	Weak: symptoms exist less than 1/3 of the area, or intermittently. Strong: symptoms exist in the entire region, or are continuous Mild: Between weak and strong			
	Specific wound type such as surgical wounds	0				
10. Region	Anterior chest, scapular-shoulder regions, suprapubic region	2				
	Others	0				
11. Number	Multiple	2				
	Solitary	0				
12. Familial tendency	Clearly exists	1				
	Not clear	0				
Total 0-25 points						
Reference						
0-5 points: normal scar characteristics						
5-15 points: hypertrophic scar characteristics						
15-25 points: keloid characteristics						

Oral Presentations

O-01 Tripoli Protocol : A Developing Nations Challenge to Managing Some Difficult Keloids

Kamal Malaker*, Mustafa Zaidi**, Rida Franca**

*Clinical Oncology and Int Medicine, Department of ICM, Ross University School of Medicine, New Jersey, Miami, USA

**Plastic Surgery, University of Tripoli Medical School, Tripoli, Libya

E-mail: kamal_malaker@hotmail.com (Kamal Malaker)

Significant improvement in the understanding of wound healing, scarring and keloid biology has been achieved in last 10 years. Prevention still remains the best option. Modern biological approach to prevention is improving, but are not available in countries where keloid is a serious clinical and social problem. Hence in Tripoli Burns and Plastic Surgery Hospital under the ages of Libyan board for medical specialists, a protocol has been developed, which is cheap, easily available and accessible to developing and resource poor countries. A combination of intra lesional dexamethasone and hyaluronidase infiltration, geometrically compatible, continuous pressure are applied using customized applicators, kept for a week, when it is changed for assessment and re-application. The procedure is repeated for 6-8 weeks depending on tolerance and response. Some cases due to their size and height, underwent debulking surgery, prior to application of Tripoli Protocol regimen. Over a period of 13 years, involving two Academic centres, in Libya, Tripoli Medical centre and Burns and Plastic Surgery Hospital of Tripoli and In Saudi Arabia, the Princess Noura Regional Oncology centre, King Abdul Aziz Medical city in Jeddah, 71 cases have been treated with minimum of 6 months of follow up whose result will be presented. The treatment is simple, for conventionally untreatable, socially and aesthetically unacceptable keloids, which can be used safely in developing and resource scarce nations.

O-02 Experience of The Pressure Method Using Sponge for Hypertrophic Scar Treatment

Hajime Takahashi, Koji Kurihara

Department of Plastic Surgery, Ushiku Aiwa General Hospital, Ibaraki, Japan

E-mail: takahashi333@ivy.ocn.ne.jp (Hajime Takahashi)

Background: We sometimes see hypertrophic scar after the wound healing of burn, trauma, surgery etc. For treatment of these hypertrophic scar, we use several methods as surgery, steroid injection, steroid tape, steroid ointment, silicone, pressure, oral medication so on. After these treatment there remain small spotty hypertrophy on the scar. For the treatment of these spotty type hypertrophy, we apply small sized sponge on that, and had a good result. We would like to show the method and the result. **Methods:** To put on the small sized sponge on the top of the spotty sized hypertrophic scar and fix it by elastic bandage. If necessary, we inject steroid solution as additional treatment. **Results:** The method as above is very effective. We would like to present the clinical result. **Conclusions:** The small sized sponge application fixed by elastic bandage firmly to the spotty sized hypertrophy is very effective.

O-03 Pulsed Dye Laser (PDL) in Hypertrophic Scars and Keloids: Our Experience in The Past 2 Years

Domenico Parisi, Luigi Annacontini, Michela Campanaro, Mauro Valente, Pasquale Bisceglia, Aurelio Portincasa

Plastic and Reconstructive Surgery Department, University of Foggia, Italy

E-mail: dr.maurovalente@gmail.com (Mauro Valente)

Background: Pathological scars affect about 3% of world population. Common integrated protocol includes application of silicone sheets, local infiltration of corticosteroids, massage with scar ointment, total sun protection. Recently the Pulse dye laser was used with satisfactory results in the treatment of hypertrophic and keloids scars. Biological mechanisms of its interaction with pathologic scars are still not completely clear.

Methods: January 2008 - June 2010 38 patients (18 hypertrophic scars, 20 keloids), 18F-12M, range 16-68, mean age 42, were treated. 12 affected head&neck, 18 trunk, 4 arms, 2 legs of whom 29 results of surgery,

4 of trauma, 4 of cosmetic procedures and 1 burn. Each received PDL treatment related to clinical conditions (mean fluence 7,5 J/cm², pulse duration 1.5 ms and spot size 7 mm) for 3-to-8 treatments at 4-week intervals and followed by daily application of hydrating products. All patients were assessed with the “VANCOUVER SCAR SCALE”. **Results:** After 4 treatments: 30% showed an improvement. After 8 treatments: 70% pz showed clinical improvement (50% high results, 20% moderate to low results). Overall compliance was good. In only 2 patients we had complications such as skin depigmentation and new scar making. In 3 cases we had improvement of the keloids. **Conclusions:** Our results show the effectiveness of PDL in selected patients programming its parameters depending on local clinical aspect. Our follow up showed symptoms reduction in grade for hypertrophic scars, stable results (no relapses) in keloids.

O-04 Use of Hexamethyl Pararosaniline Chloride to Treat Keloids

Tomoko Kikui
Kajimoto Clinic, Osaka

Hexamethyl pararosaniline chloride (HPC) is also known as gentian violet, crystal violet, and pyoktanin. It is a histological dye. Due to its antiseptic properties, it has also been used in diluted form to treat aphthosis in infants. More than 20 years ago, I was using a solution of 1% HPC to locate the blind base of a congenital facial fistula when I accidentally injected it into the subcutaneous tissue. This led to the discovery that the injection of 1 ml of 1% HPC into subcutaneous tissue induces necrosis. This in turn suggested that the topical application of HPC might be an effective way to treat keloids, which are benign skin tumors that are thought to be due to the hyperproduction of collagen fibers and connective tissues. To determine the optimal HPC treatment regimen for keloids, a study was performed. In total, the keloids of 67 patients (one patient had multiple keloids while the remaining patients each had one keloid) were injected with a 0.1~0.5% solution of HPC diluted with xylocain, which had been shown by a preliminary study to be the optimal concentration of HPC. During each intrakeloidal injection, the solution was directed by the needle to the centre of the keloidal mass rather than to the keloidal surface or the adjacent normal subcutaneous tissue. Depending on the volume of the keloid, 0.1~0.8 cc was injected. Injections were repeated at 2~4 week intervals. After each intrakeloidal injection, the keloid was observed to become a violet color. This coloration disappeared naturally within 1-4 weeks. Simple keloids had to be injected several times (up to 20 times) before they became flat. In total, 95% of the patients stated that the injections provided relief from the pain and itching. The injections had a specific, remarkable effect on pyogenic keloids. The volume and discoloration of all keloids was improved by the injections. In conclusion, the necrotizing properties of HPC mean that it can be used to effectively treat keloids.

O-05 Long Pulse Nd:YAG Laser Therapy for Keloids and Hypertrophic Scars

Satoshi Akaishi, Sachiko Koike, Teruyuki Dohi, Kyoko Kobe, Hiko Hyakusoku and Rei Ogawa
Department of Plastic, Reconstructive and Aesthetic Surgery, Nippon Medical School, Tokyo, Japan
E-mail: redstoneprs@gmail.com (Satoshi Akaishi)

Background: Keloids and hypertrophic scars, which can occur after dermal injury, are often painful and cosmetically unappealing. Current treatment modalities suffer from limitations associated with treating darker skin, and they can also be limited in terms of the depth of penetration and are often associated with a period of downtime after each session. This study investigates the efficacy with which a new modality, zero-downtime microsecond-pulsed 1064 nm Nd:YAG laser treats keloids and hypertrophic scars. The efficacy, adaptability and limitations of Nd:YAG laser therapy for keloids and hypertrophic scars were assessed. In addition, to help develop new and improved methods for treating keloids and hypertrophic scars, the mechanism by which Nd:YAG laser therapy improves keloids and hypertrophic scars was analyzed. **Methods:** Twenty-two patients with keloids (n=16) or hypertrophic scars (n=6) were treated at 3–4 week intervals with a 1064 nm Nd:YAG used in non-contact mode with a 5-mm spot size, a fluence of 14 J/cm², and a 0.3-ms pulse

duration. To determine the mechanism by which Nd:YAG laser therapy improves keloids and hypertrophic scars, biopsies and thermographic measurements were taken. **Results:** After an average of 14 sessions per patient, the aggregate scar severity scores improved from 9.86 (pretreatment) to 6.34. The histological and thermographic data revealed the collagen fibers had been disrupted, even though the temperatures that were achieved during laser therapy were below the theoretical threshold for collagen disruption. The histological analysis also revealed a lack of blood vessel coagulation, which suggests that Nd:YAG laser therapy operates via a mechanism that differs from the ones used by current treatment modalities. **Conclusions:** The Nd:YAG laser effectively treats keloids and hypertrophic scars with no downtime by generating heat-induced inflammation that results in collagen fiber degradation. This new modality functions by a different mechanism to that employed by current modalities and could, when used in combination with other modalities, improve the management of keloids and hypertrophic scars in the future.

O-06 Strategy for Treating Ear Keloids

Chenyu Huang, Satoshi Akaishi, Teruyuki Dohi, Hiko Hyakusoku and Rei Ogawa

Department of Plastic, Reconstructive and Aesthetic Surgery, Nippon Medical School, Tokyo, Japan

E-mail: r.ogawa@nms.ac.jp (Rei Ogawa)

Background: In our facility, patients with keloids on the upper part of the auricle (the cartilaginous part of the auricle) and/or the earlobe are treated with multimodal therapy that consists of simple or core excision followed by postoperative radiation and taping fixation. In this paper, we report the outcomes of this algorithm for treating ear keloids. **Methods:** Earlobe keloids were extirpated together with a minimal margin of normal skin. The excision was made from the anterior to the posterior earlobe, and the keloid was then hollowed out. In many cases, a wedge incision was made on the earlobe and the shape was trimmed. After hemostasis, the wound was sutured with 6-0 prolene® and 5 Gy of electron-beam irradiation was delivered the day after the operation. This radiation therapy was repeated on the following day. Keloids on the upper part of the auricle were treated by core excision because tight suturing in this area and the concomitant high stretching tension on the skin can cause the keloid to recur. Thus, the inner fibrous core of these auricular keloids was excised and a flap with a superficial dermis and subcapsular vascular plexus was elevated. The flap was then closed by simple suturing with perichondrium. Electron-beam irradiation (5 Gy/day) was delivered for 3 days starting the day after the operation. **Results:** In our facility, before 2002, all ear keloids were excised completely and then subjected to post-operative electron beam irradiation (15 Gy/3 fractions/3 days). For this period, the recurrence rates for keloids on the earlobe and the upper part of the auricle were 5.7% (n=35) and 38.5% (n=13), respectively. After 2002, the treatment algorithm described above was introduced. The recurrence rates for both ear regions are now below 10%. **Discussion:** Previous articles support our observations regarding the effectiveness of excision and postoperative radiation for ear keloids. We were able to successfully reduce the total dose of radiation needed to prevent keloid recurrence on the ear. Moreover, our observations suggest that for the upper part of the auricle, the core excision method may be better than simple direct suturing since it prevents mechanical stress on the wound that could promote the recurrence of the keloid.

O-07 Expression and Pathogenic Role of Cartilage Oligomeric Matrix Protein (COMP) in Keloids

Fumie Shono^{***}, Shigeki Inui^{**}, Takeshi Nakajima^{**}, Ko Hosokawa^{*}, Satoshi Itami^{**}

^{*}Plastic and Reconstructive Surgery, Graduate School of Medicine, Osaka University, Osaka, Japan

^{**}Departments of Regenerative Dermatology, Graduate School of Medicine, Osaka University, Osaka, Japan

E-mail: fumie-s@mail.goo.ne.jp (Fumie Shono)

Background: Keloid and normal dermis were sampled from different patients in most studies. Therefore, biases inevitably occur in results with individual differences. To avoid this problem, we prepared pairs of keloid tissues and control normal dermis sampled from the same patients. **Methods:** To elucidate gene expression differences between keloid and normal skin, microarray analysis was performed using RNAs extracted from keloid-derived fibroblasts (KDFs) and from normal skin-derived fibroblasts (NDFs) from

the same patient with a typical keloid. Focusing on cartilage oligomeric matrix protein (COMP) gene, the 2nd most up-regulated, overproduction of COMP protein in keloid was confirmed by western blotting and immunohistochemical staining. Moreover, to reveal COMP function in keloids, COMP siRNA was transfected and relation of amount between COMP and type I collagen were measured by RT-PCR, western blotting, and immunochemical staining. **Results:** COMP was 2nd enhanced gene (48 fold) and 1st was unknown gene by the microarray analysis. Immunohistochemically, 66.7% of keloids were positively stained by anti-COMP antibody while all normal negatively. By western blotting, overproduction of COMP protein in KDFs and keloids was confirmed. In every patient, Keloid/Normal ratios of COMP had the same tendency. By the transfection with COMP siRNA, type I collagen mRNA and its protein in KDFs were decreased. At 96hr after transfection, type I pro-collagen was reduced and the extracellular accumulation of type I collagen was diminished. **Conclusions:** COMP accelerates collagen deposition that facilitates keloid formation, thus providing a new therapeutic target.

O-08 In Vitro and In Vivo Studies on Antifibrotic Effects of Dextran Sulphate

Chao-Kai Hsu^{*,**}, Sheau-Chiou Chao^{*}, Jian-You Chen^{*}, Mei-Hui Yang^{*}, Feng-Jie Lai^{***}, J. Yu-Yun Lee^{*}

^{*}Department of Dermatology, National Cheng Kung University College of Medicine and Hospital, Tainan, Taiwan

^{**}Institute of Clinical Medicine, National Cheng Kung University College of Medicine and Hospital, Tainan, Taiwan

^{***}Department of Dermatology, Chi-Mei Medical Center, Tainan, Taiwan.

E-mail: kylehsu@mail.ncku.edu.tw (Chao-Kai Hsu)

Background: Dextran sulfate (DS) is sulfuric acid esters of polysaccharide. Intralesional DS had been commonly used to treat keloid. However, the mechanism for this therapeutic effect is unclear. **Methods:** Primary dermal fibroblast cultures from keloid and normal skin were used to study the in vitro effects of DS (high MW 500 KDa with 17% sulphur-substituted) on fibroblast proliferation by WST-1 assay, migration by scratch assay, collagen gel contraction by stressed delayed released fibroblast-populated collagen lattices (ADR-FPCL), and mRNA expression of selected cytokines, growth factors, matrix proteins and enzymes by RT-PCR. A well-established rabbit ear model of hypertrophic scarring was used to study antiscarring effect of DS in vivo. **Results:** DS (25~100 mg/ml) showed a dose-dependent antiproliferative effect on both NF and KF, with a greater effect on KF at DS 50-100 mg/ml ($p=0.047$). DS suppressed wound closure in a dose-dependent fashion in both NF and KF by scratch assay without difference between NF and KF groups. DS also suppressed the contraction of ADR-FPCL in NF and KF over 24h in a dose-dependent manner with a greater effect on KF. RT-PCR studies showed variable inhibitory effects of DS on TGF β -1, -2, -3 mRNA expression in most fibroblast strains with a tendency of dose-dependent effect. In the rabbit ear model, DS treatment of full-thickness dermal wounds decreased the scar elevation index by 15.6 % compared to control wounds ($p=0.036$). **Conclusions:** Our results suggest that DS has both in vitro and in vivo antifibrotic effects. Further studies are needed to evaluate its therapeutic potentials in preventing hypertrophic scar or keloid.

O-9 In Vitro and in Vivo Evidence of Pathogenic Roles of Hic-5/ARA55 in Keloids through Smad Pathway and Profibrotic Transcription

Shigeki Inui^{*}, Fumie Shono^{*,**}, Fumihito Noguchi^{*}, Takeshi Nakajima^{*}, Ko Hosokawa^{**}, Satoshi Itami^{*}

^{*}Departments of Regenerative Dermatology, Osaka University School of Medicine, Osaka, Japan

^{**}Departments of Plastic Surgery, Osaka University School of Medicine, Osaka, Japan

E-mail: inui@r-derma.med.osaka-u.ac.jp (Shigeki Inui)

Background: Hic-5, a TGF- β -inducible transcriptional coregulator, is considered to play a role in keloids and reportedly enhances phosphorylation of Smad2/3 through suppressing Smad7 expression.

Methods: Keloid-derived fibroblasts (KDFs) were transiently transfected with Hic-5 expression vectors or mock vectors and then extracted RNA was subjected to semi-quantitative RT-PCR for type I and III collagen. By

ELISA type I collagen in the conditioned media and deposition on the cell surfaces were measured. Fifteen keloid samples and six normal skin samples were immunohistochemically analyzed with anti-Hic-5 and anti-phosphorylated Smad2/3 (p-Smad2/3) and anti-Smad7 antibodies. After transfecting siRNA against Hic-5 into KDFs, Western blot was performed for p-Smad2/3. **Results:** Semi-quantitative RT-PCR showed that the overexpression of Hic-5 increases the type I and III collagen mRNA. The ELISA indicated that Hic-5 overexpression does not alter the type I collagen in the conditioned medium but increases the cell-associated type I collagen. By the immunohistochemical study Hic-5 p-Smad2/3 or Smad7 was positively stained in 8, 10 or 7 among 15 cases, respectively. Normal dermis (n=6) showed no positive staining of Hic-5, p-Smad2/3 and Smad7. Moreover, the staining intensity of Hic-5 significantly correlates with that of p-Smad2/3 but not with that of Smad7, suggesting that Hic-5 stimulates TGF- β -Smads signaling independently from Smad7 in keloids. In support of this, silencing Hic-5 mRNA using siRNA decreased pSmad2/3 by 23.6% but did not alter Smad7 expression in KDFs. **Conclusions:** Hic-5 enhances collagen production as a stimulator for TGF- β -Smad signaling through pSmad2/3 in keloid formation.

O-10 Influence of Oxygen Environment in Wound Healing Dynamics

Hitomi Sano*, Shigeru Ichioka**

*Department of Surgical Science, Graduate School of Medicine, the University of Tokyo, Tokyo, Japan

**Department of Plastic and Reconstructive Surgery, Saitama medical university hospital, Saitama, Japan

E-mail: sasasa116sasasa@hotmail.com (Hitomi Sano)

Background: Pathophysiology of keloids and hypertrophic scar formation has been considered to involve an abnormal metabolic condition. Our previous study indicated that keloids and hypertrophic scars consume more oxygen than mature scars. Although oxygen plays an essential role in wound healing, hypoxia might prevent keloid hypertrophic scar formations. Optimal oxygen environment for wound healing is still unknown. This study aims to experimentally evaluate the wound healing dynamics under different oxygen environment. **Methods:** We applied an oxygen non-permeable membrane (Polyvinylidene chloride, oxygen permeability: 40-90ml/m² · 24hr · 1atm) and an oxygen permeable membrane (Polymethylpentene, oxygen permeability: 60000-65000ml/m² · 24hr · 1atm) to excisional skin defects in ddY mice (n=8). Each group was defined as the non-permeable group and the permeable group. Topical oxygen environments were assessed with oxygen tension under the membrane. The wound area, thickness of granulation tissue and the vascular density were analyzed 7 days after the operation. **Results:** The oxygen tensions on 7 days after operation were 111.9 ± 39.4mm Hg in the permeable group, 7.8 ± 5.7mm Hg in the non-permeable group. Wound size significantly decreased and granulation was thicker in the permeable group in comparison with the non-permeable group. The vascular density of the non-permeable group significantly increased. **Conclusions:** Our result suggested that sufficient oxygen allowed adequate epithelialization and granulation formation. Enhanced neovascularization in the non-permeable group likely implies compensation of hypoxic condition.

O-11 Inflammatory Cells in Keloids and Hypertrophic Scars

Yoshiaki Sakamoto*, Noriko Hattori**, Hiroko Ochiai*, Junzi Takano***, Kazuo Kishi**

*Department of Plastic and Reconstructive Surgery, National Hospital Organization Tokyo Medical Center, Tokyo, Japan

**Department of Plastic and Reconstructive Surgery, Keio University School of Medicine, Tokyo, Japan

***Department of Plastic and Reconstructive Surgery, Saitama Social Insurance Hospital, Saitama, Japan

E-mail: ysakamoto@z8.keio.jp (Yoshiaki Sakamoto)

Background: The keloids and hypertrophic scars are assumed to participate the inflammatory cells and their chemical mediators, but profiling of detailed inflammatory cells is not taken. Therefore we analyzed inflammatory cells, manifestation of T cell in particular. **Methods:** Three keloid patients and three hypertrophic scar patients who were treated by operation, and the resected skin lesions were used to

analyze the subtype of Regulatory T cell and T-helper cells. As a control, we used trunk region skin tissue of three healthy people. **Results:** All four groups including the protuberance region of the keloid, the flare region of the keloid, hypertrophic scar, and normal skin are found the Foxp3 positive cells which the marker of regulatory T cells, but did not show significant difference to positive rate of Foxp3. In the flare region, Th2 cells of anti-interleukin-4 antibody positive were dominant, instead in the normal skin and hypertrophic scars, Th1 cells of anti-interferon- γ antibody positive were dominant. And compared with the flare region, the protuberance region of the keloid showed the tendency that there were little onsets of Th2 cells. And the immunisation dyeing of Interleukin -17 in the flare region showed a manifestation rise of a Th17 cell than other groups. **Conclusions:** In the flare region of the keloid, the onset of Th2 predominant helper-T cells and the manifestation rise of Th17 cells did not contradicted fibrosis and persistent inflammation in flare region. And it was supposed that this was one of the causes of persistent inflammation in the flare region of the keloid.

O-12 Vitamin D: A Novel Therapeutic Approach for Keloid, An in Vitro Analysis

Guo-You Zhang^{*,**}, Qing Yu^{*}, Tao Cheng^{***}, Tian Liao^{****}, Chun-Lei Niu^{*****}, An-Yuan Wang^{*}, Xin Zheng^{*}, Xue-guan Xie^{*}, Wei-Yang Gao^{*}

^{*}Department of Hand and Plastic Surgery, the 2nd Affiliated Hospital of Wenzhou Medical College, Zhejiang, China

^{**}Department of Dermatology, University of Lübeck, Lübeck, Germany

^{***}Department of Orthopaedic Surgery, Shanghai Sixth People's Hospital, School of Medicine, Shanghai Jiaotong University, Shanghai, China

^{****}Department of Otolaryngology, Head and Neck surgery, Charite Campus Benjamin Franklin, Berlin, Germany

^{*****}Department of Head and Neck Surgery, the Third Affiliated Hospital of Harbin Medical University, Harbin, China

E-mail: Guoyou.zhang@yahoo.com; guoyou.zhang@uk-sh.de (Guo-You Zhang)

Background: Vitamin D and its metabolites play an important role in cell proliferation, differentiation and some other tissue fibrosis. However their effects on dermal fibrosis-keloid are unknown. Here, we investigate the effect of 1,25-dihydroxyvitamin D₃(1,25D) in the pathogenesis of tissue fibrosis by keloid fibroblasts. **Methods:** Keloid fibroblasts were cultured and exposed to a different concentration 1,25D in the absence or presence of transforming growth factor (TGF- β 1). Keloid fibroblasts phenotypes and protein production were analyzed by real-time reverse transcriptase-polymerase chain reaction, Western blot, immunofluorescence and multiplexed enzymelinked immunosorbent assay techniques. Collagen synthesis was evaluated by measuring 3H-proline incorporation. The effect of 1,25D on cell proliferation and viability was evaluated by Formazan assay, PCNA antigen expression and the colorimetric conversion of 3-[4, 5-dimethylthiazol-2-yl]-2, 5-diphenyltetrazolium bromide. **Results:** We confirmed the presence of vitamin D receptors (VDRs) in cultured keloid fibroblasts. Fibroblasts transfected with a vitamin D response element reporter construct and exposed to the active vitamin D metabolite, 1,25D, showed increased promoter activity indicating VDR functionality in these cells. Incubation of keloid fibroblasts with 1,25D suppressed TGF- β 1 induced collagen type I, fibronectin and α -smooth muscle actin expression. 1,25D also modulated plasminogen activator inhibitor-1 (PAI-1) and matrix metalloproteinase (MMP-9) expression induced by TGF- β 1. Interestingly, 1,25D induced hematopoietic growth factor (HGF) mRNA expression and protein secretion in keloid fibroblasts. **Conclusions:** This study highlights key mechanistic pathways through which vitamin D decreases fibrosis, and provides a rationale for studies to test vitamin D supplementation as a preventive and/or early treatment strategy for keloid and related fibrotic disorders.

O-13 Role of Caveolin 1 in The Pathogenesis of Tissue Fibrosis by Keloid Derived Fibroblasts in Vitro

Guo-You Zhang^{*,**}, Qing Yu^{*}, Tao Cheng^{***}, Tian Liao^{****}, Chun-Lei Niu^{*****}, An-Yuan Wang^{*}, Xin Zheng^{*}, Xue-guan Xie^{*}, Wei-Yang Gao^{*}

^{*}Department of Hand and Plastic Surgery, the 2nd Affiliated Hospital of Wenzhou Medical College, Wenzhou,

Zhejiang Province, China

**Department of Dermatology, University of Lübeck, Lübeck, Germany

***Department of Orthopaedic Surgery, Shanghai Sixth People's Hospital, School of Medicine, Shanghai Jiaotong University, Shanghai, China

****Department of Otolaryngology, Head and Neck Surgery, Charite Campus Benjamin Franklin, Berlin, Germany

*****Department of Head and Neck Surgery, The Third Affiliated Hospital of Harbin Medical University, Harbin, China

E-mail: Guoyou.zhang@yahoo.com, guoyou.zhang@uk-sh.de (Guo-You Zhang)

Background: Recent studies have implicated that caveolin-1 plays an important role in the regulation of transforming growth factor- β 1 (TGF- β 1) signaling and participates in the pathogenesis of tissue fibrosis. However their effects on dermal fibrosis-keloid are unknown. The aim of this study was to investigate the effect of caveolin 1 in the pathogenesis of tissue fibrosis by keloid fibroblasts. **Methods:** Keloid fibroblasts were cultured and exposed to a different concentration caveolin-1 cell-permeable peptides (cav-1p) in the presence of TGF- β 1. Keloid fibroblasts phenotypes and protein production were analyzed by real-time reverse transcriptase-polymerase chain reaction, Western blot, and multiplexed enzymelinked immunosorbent assay techniques. The effect of cav-1p on cell viability was evaluated by the colorimetric conversion of 3-[4, 5-dimethylthiazol-2-yl]-2, 5-diphenyltetrazolium bromide. **Results:** Caveolin 1 was markedly decreased in the keloid derived fibroblasts. Moreover, cav-1p significantly reduced TGF- β receptor type I levels and SMAD2/3 phosphorylation in response to added TGF- β 1. Additionally, TGF- β 1 decreased cav-1 expression in human skin fibroblasts. Caveolin 1 was able to suppress TGF- β 1-induced (extra cellular matrix)ECM production in cultured keloid fibroblasts through the regulation of the mutagen-activated protein kinase (MAPK) pathway. **Conclusions:** Caveolin 1 appears to participate in the pathogenesis of tissue fibrosis in keloid. Restoration of caveolin 1 function by treatment with a cell-permeable peptide corresponding to the caveolin 1 scaffolding domain may be a novel therapeutic approach in keloid.

O-14 Differential Gene Expression between Hypertrophic Scar Keratinocytes and Normal Keratinocytes

Ho Yun Chung^{*,**}, Eun Jung Oh^{***}, Hyun Ju Lim^{***}, Tae Jung Kim^{*}, So Yeon Jung^{*}, Sae Hwa Jeon^{****}, Young Joon Jun^{*****}

^{*}Department of Plastic & Reconstructive Surgery, Kyungpook National University, School of Medicine, Korea

^{**}Joint Institute for Regenerative Medicine, Kyungpook National University, School of Medicine, Korea

^{***}Department of Advanced Materials Science and Engineering, Kyungpook National University, Korea

^{****}Tego Science Inc.

^{*****}Department of Plastic Surgery, Catholoc University of Korea, College of Medicine, Korea

E-mail: hy-chung@knu.ac.kr (Ho Yun Chung)

Background: There is no clear evidence of the original cause of hypertrophic scar, and the effective method of treatment is not yet established. Recently the steps of searching in gene and molecular level are proceeding. We are trying to recognize the difference between keratinocytes of hypertrophic scar and normal skin. Then we do support the comprehension of the scar formation mechanism and scar management. **Methods:** Total RNAs were extracted from cultured keratinocytes from 4 hypertrophic scars and normal skins. The cDNA chips were prepared. A total 3063 cDNAs from human cDNA library were arrayed. And the scanning data were analyzed. Then we selected a target gene, which demonstrated the strongest intensity difference. In vitro and vivo analyses were performed. **Results:** On microarray, Heat shock protein, tumor rejection antigen, and so on were more than 2 fold intensity genes. Among them, heat shock 70 kd protein (HSP70) showed the strongest intensity difference. The strong expression of HSP70 was confirmed in western blots and immunocytochemistry in vitro. In immunohistochemical finding, the increased expression of HSP70 in whole epidermal layer was shown in hypertrophic scar. **Conclusions:** In this study, it can be sure that heat shock

proteins get the important role in the process of wound healing and scar formation. This study provides basic biologic information for scar research. The new way of the prevention and treatment of scar formation would be introduced with further investigations.

O-15 Angiotensin II Regulates Phosphoinositide 3 Kinase/Akt Cascade via A Negative Crosstalk between AT1 and AT2 Receptors in Skin Fibroblasts of Human Hypertrophic Scars

Hong-Wei Liu^{*}, Biao Cheng^{**}, Xiao-Bing Fu^{***}

^{*}Department of Plastic Surgery, the First Affiliated Hospital of Jinan University, Guangzhou, Guangdong, China

^{**}Department of Plastic Surgery, Guangzhou Liuhuaqiao Hospital, Guangzhou, China

^{***}Wound Healing and Cell Biology Laboratory, Institute for Basic Research, Trauma Center of Postgraduate Medical College, General Hospital of PLA, Beijing, China

E-mail: liuhongwei0521@hotmail.com (Hong-Wei Liu)

Background: Angiotensin II (Ang II) stimulation has been shown to regulate proliferation of skin fibroblast and production of extracellular matrix, which are very important process in skin wound healing and scarring; however, the signaling pathways involved in this process, especially on human subjects, are less explored.

Methods: We used skin fibroblasts of human hypertrophic scar, and observed the effect of Ang II on Akt phosphorylation and phosphoinositide 3 kinase (PI 3-K) activity. **Results:** Immunofluorescence staining showed that cultured fibroblasts derived from hypertrophic scars coexpressed both AT1 and AT2 receptors. Ang II increased Akt phosphorylation and PI3K activity in cultured hypertrophic scar fibroblasts dose- and time-dependently. In addition, the Ang II-induced Akt phosphorylation was blocked by wortmannin, a PI 3-K inhibitor. This Ang II-activated PI 3-K/Akt cascade was markedly inhibited by valsartan, an AT1 receptor specific blocker, whereas enhanced by PD123319, an AT2 receptor antagonist. On the other hand, the Ang II- or EGF-induced activation of PI 3-K/Akt was strongly attenuated by AG1478, an inhibitor of epidermal growth factor (EGF) receptor kinase. Moreover, Ang II stimulated tyrosine phosphorylation of EGF receptor and p85 α subunit of PI 3-K accompanied by an increase in their association, which were inhibited by valsartan, and enhanced by PD123319. **Conclusions:** Our results showed that AT1 receptor-mediated activation of PI 3-K/Akt cascades is at least partially via the transactivation of EGF receptor, which is under a negative control by AT2 receptor in hypertrophic scar fibroblasts. These findings contribute to understanding the molecular mechanism of hypertrophic scar formation.

O-16 Altered Expression of Three Types of Opioid Receptors, Mu, Delta and Kappa in Human Hypertrophic Scars: Potential Role of Opioid Peptides in The Generation of Patients with Hypertrophic Scar

Biao Cheng^{*}, Hong-Wei Liu^{**}, Xiao-Bing Fu^{***}

^{*}Department of Plastic Surgery, Guangzhou Liuhuaqiao Hospital, Guangzhou, China

^{**}Department of Plastic Surgery, the First Affiliated Hospital of Jinan University, Guangzhou, Guangdong, China

^{***}Wound Healing Unit, Burns Institute, 304th Hospital, Trauma Center of Postgraduate Medical College, China
E-mail: chengbiaocheng@163.com (Biao Cheng)

Background: Pruritus or nociceptive pain is a significant clinical problem of hypertrophic scar. Recently, emerging evidence has indicated the possible involvement of opioid receptors (ORs) in abnormal cutaneous sensation; however, little is explored about the pathophysiological role of OR in local cacesthesia in hypertrophic scars. To study the expression profile of ORs in normal human skin and hypertrophic scar with cacesthesia. **Methods:** Skin biopsy was performed in 10 patients newly diagnosed as hypertrophic scar with cacesthesia or 10 healthy individuals, respectively. Parts of these skin tissues were subjected to primary culture of keratinocytes and fibroblasts. Localization of ORs was examined by immunofluorescence staining and quantitation of ORs was determined by real-time polymerase chain reaction (PCR).

Results: Immunofluorescence staining revealed that MOR, DOR and KOR were co-expressed and mainly

located in the keratinocytes and fibroblast-like cells. Real-time PCR indicated that the expression of MOR, DOR and KOR in hypertrophic scars was enhanced compared with the normal skin. In consistant with the results from skin biopsy, we observed similar expression pattern of MOR, DOR and KOR in the cultured keratinocytes and fibroblasts, derived from normal skin and hypertrophic scars. **Conclusions:** Our results demonstrated that expression of three types of ORs including MOR, DOR and KOR was marked upregulated in human hypertrophic scars, suggesting the possible link between upregulated ORs and local cacesthesia in hypertrophic scars.

O-17 Cellular Immunological Analysis of Keloid

Junyi Zhang*, Chunmei Wang**

*Beijing Tongren Hospital, Beijing, China

**Dongguan Kanghua Hospital, Dongguan, China

E-mail: zhang-junyi@hotmail.com (Junyi Zhang)

Background: Keloid is a challenge for us. Until today people still have not found the factors genetating the keloid. But recent researchs have shown the cellular immunological reaction has a close relationship with the formation of keloids. **Methods:** I: compare the pathological slice stained by HE between the keloid tissue and the normal skin tissue to find the characteristic change of the keloid. II: recognize the lymphocyte in the keloid tissue by the immunohistochemistry experiment. III: abstract the mRNA from the keloid and normal skin frozen tissue, then analysis the product by the RT-PCR and electrophoresis to identify the mechanism of lymphocyte in the keloid. **Results:** We find that there are plenty of lymphocyte masses away from the blood vessels which are surrounded by the collagen. To recognize the CD4 and CD8 on the surface of T cell, we have done the immunohistochemistry experiments. Among the 10 cases (1 failed), 6 cases have CD8 and 3 have CD4(one of them both has CD4 and CD8) and 1 has no CD4 or CD8. The mRNA from the 15 cases of keloid was detected to affirm the active molecules secreted by lymphocyte. 12 case have granzyme B. 11 have perforin. 6 have granulysin. None has granzyme A. 1 case failed in the mRNA abstraction. Among the 4 normal skin, only one had granzyme B. None have other molecules. **Conclusions:** In the keloid tissue, the lymphocytes gather away from the blood vessels which are surrounded by the collagen tissue. The gathered lymphocytes consist of T cell and NK cell and most of them are T cell. They can secrete perforin, granzyme and granulysin to cause the lysis and apoptosis of the target cells.

O-18 Keloid Pathogenesis: PAI-1's Enhancement of Collagen Accumulation in Keloid Fibroblasts Mediates Through PAI-1:uPA:uPAR:Integrin Complex

Tai-Lan Tuan*, Timothy Hsu*, Paul Benya **

*Department of Surgery, Keck School of Medicine, The Saban Research

Institute of Children's Hospital Los Angeles, University of Southern

California, CA, USA

**The J. Vernon Luck, Sr., M.D. Research Center of Orthopaedic Hospital,

UCLA Orthopaedic Hospital and Department of Orthopaedic Surgery, David

Geffen School of Medicine, University of California Los Angeles, CA, USA

E-mail: ttuan@chla.usc.edu (Tai-Lan Tuan)

Background: Keloids are tumor-like skin scars that affect 10 to 20% of people of African descent, Asians, and Hispanics without appropriate treatments. Using multiple freshly isolated strains of low passage normal and keloid fibroblasts, we provided new evidence that PAI-1 (plasminogen activator inhibitor-1) over-expression and elevated collagen accumulation are intrinsic features of keloid fibroblasts, and that there is a causal relationship between PAI-1 expression and collagen accumulation. Additionally, we found that PAI-1 utilizes protease inhibition as well as another of its functions to control collagen accumulation (Tuan et al., 2008), and that integrin-associated uPAR (urokinase plasminogen activator receptor) is over-expressed in keloid fibroblasts. To test if PAI-1's ability to regulate collagen accumulation is mediated by modulating

uPA:uPAR:integrin interaction, we used adenoviral over-expression of PAI-1 on established cell lines over-expressing Wt uPAR and its mutants. **Methods:** Stable expression of uPAR and its mutants in normal fibroblasts were carried out using lentiviral vector approach and puromycin-selected cell lines were generated. These lines were used in the presence and absence of adenoviral expression of PAI-1 for the study of collagen accumulation. **Results and Conclusions:** Wild type uPAR and mutant uPAR were successfully expressed in fibroblasts using the lentiviral approach, and importantly soluble uPAR was confined to the medium. Similar to keloid fibroblasts, both PAI-1 and Wt-uPAR over-expressing cells exhibited enhanced collagen accumulation. Interestingly, the uPAR integrin mutant did not show enhanced collagen accumulation, either with or without additional PAI-1 over-expression. The results indicate that PAI-1's ability to regulate collagen accumulation may be mediated by its capacity to reverse uPA:uPAR:integrin interaction with the extracellular matrix. (The study is supported by NIH grant GM055081 from NIGMS, NIH, DHS, USA to TLT and PB).

O-19 Adenovirus-relaxin Gene Therapy for Keloids: Implication for Reversing Pathologic Fibrosis and Preventing Keloid Recurrence

Won Jai Lee*, Dong Won Lee*, Yong Oock Kim*, Il-Kyu Choi^{**,***}, Dong Kyun Rah*, Ju Hee Lee^{****}, Chae-Ok Yun^{**,****}

*Institute for Human Tissue Restoration, Department of Plastic & Reconstructive Surgery,

**Brain Korea 21 Project for Medical Sciences, Institute for Cancer Research, Severance Biomedical Science Institute, Yonsei University College of Medicine, Seoul, Korea

***Graduate Program for Nanomedical Science

****Department of Dermatology, Yonsei University, Seoul, Korea

E-mail: pswjlee@yuhs.ac (Won Jai Lee)

Background: Keloids or hypertrophic scars are pathologic proliferations of the dermal skin layer resulting from excessive collagen deposition. Because the hormone relaxin (RLX) inhibits collagen synthesis and expression in stimulated fibroblasts, a replication-incompetent adenovirus expressing RLX (dE1-RGD/lacZ/RLX) was generated to investigate its effects on expression of collagen and matrix metalloproteinases (MMPs) in keloid fibroblasts (KFs) and human dermal fibroblasts (HDFs). **Methods:** KFs were obtained from tissues excised during surgical procedures. KFs (5×10⁵ cells) and HDFCs were infected with dE1-RGD/lacZ/RLX or dE1-RGD/lacZ at multiplicity of infection (MOI) 100 for 72 hours. Three days after transfection and incubation, β-galactosidase stain was performed. The level of RLX expression was assessed by ELISA. The mRNA expressions of collagen type 1 and 3, matrix metalloproteinase 1 and 3 were examined by real time RT-PCR and ELISA. **Results:** The mRNA expression of type I and III collagen was markedly decreased by RLX regardless of transforming growth factor (TGF)-β treatment. Expression of Smad-3 and phosphorylated Smad-3 was reduced in KFs after dE1-RGD/lacZ/RLX transduction, suggesting that RLX reduces collagen synthesis by inhibiting the Smad-3 pathway. The qPCR and ELISA analysis revealed that MMP-1 and MMP-3 expression was significantly reduced in HDFs and KFs after dE1-RGD/lacZ/RLX transduction. Immunohistochemical analysis showed that expression of major extracellular matrix (ECM) components (e.g., type I and III collagen, elastin, and fibronectin) was markedly reduced in keloid spheroids transduced with dE1-RGD/lacZ/RLX. **Conclusions:** These results suggest that the antifibrotic effect of RLX-expressing adenovirus may have therapeutic effects on keloids by reversing pathologic fibrosis and preventing keloid recurrence after surgical excision.

O-20 Autologous Fat Graft and Scar Treatment

Marco Ettore Attilio Klinger, Fabio Caviggioli, Francesco Maria Klinger, Andrè Salval

Università degli Studi di Milano, Dipartimento di Medicina Traslazionale, IRCCS Istituto Clinico Humanitas, Milano, Italy

University of Milan,

E-mail: marco.klinger@humanitas.it (Marco Ettore Attilio Klinger)

Background: Considering mature scar treatment, autologous fat graft is reported to be a safe, rapid and effective procedure. New insights into properties of adipose tissue have showed effects on scars. Probably mesenchymal stem cells, that have been lost entirely in atrophied tissues, offer the capability of restoration of the skin's full mechanical and biologic properties. We present our clinical results about more than 300 patients treated with autologous fat graft in the field of mature scar treatment, including outcomes of burns, traumas and radiation damage. **Methods:** From November 2004 to July 2009, about 350 informed voluntary patients were selected for autologous fat graft. The adipocyte fraction was injected at the dermal-subdermal junction in the scar area. This surgical procedure was performed at least twice, with a 3-month interval between procedures. All patients were followed up for 18 months. At each clinical examination results were photographically documented and all patients were asked if their satisfaction degree was excellent, good or unsatisfactory and if the scar improvement was excellent, good or unsatisfactory in terms of texture, color, softness, quality of skin patterns, pain and paresthesias. In 30 patients a skin biopsy of the scar was performed before and 18 months after the last treatment. **Results:** After two treatments and a 18 months follow-up period, patients' appearance suggested a great role of lipostructure for the scars. Patients' satisfaction and the other features considered were improved. Collagen deposition and new blood vessels growth found in histological specimens demonstrated regenerative fat graft effect. **Conclusions:** Concerning scar treatment, encouraging results have been witnessed by autologous fat graft.

O-21 Combination Laser Treatments & Classification of Cutaneous Scars

Yongsoo Lee

Oracle Dermatology Clinic, Daejeon, South Korea

E-mail: exusia@naver.com

Background: As new options became available after lasers were introduced to scar treatments and the responses to the treatments are not concordant with the conventional scar classification, there needs to be a new classification for scars, which is based not only on the morphology and natural behavior but also on the responses to the treatments. As there are evidence cases that prove surgical scar revision and combination laser treatment (CLT) are compensatory to each other, indications on which kind of scars need surgical scar revision prior to CLT and which kind of scars would be better improved with CLT only are necessary.

Methods: New classification and indications for combining surgical scar revision and CLT were speculated by analyzing pre- and post-treatment photographs and characteristics of each class of scars.

Results: *Y.Lee Classification of Scars*

Cutaneous SCARS	NEW CLASS	SUBCLASS (=CONVENTIONAL CLASS)	MORPHOLOGY
	non-hypertrophic	atrophic textural	depressed flat or minimally elevated
	Fibroproliferative*	hypertrophic keloids	elevated
	FAPS =facial atrophic post-acne scars		- cluster of small pleomorphic atrophic scars congregated closely - the openings are narrow in comparison to the depth
	burn scars	Subclassification to be determined	

*include protruding scars caused by acne

Indications for surgical scar revision before CLT

Absolute indication: Land mark distortion

Relative indications: Extensive area, Functional impairment

Conclusions: The novel classification is helpful in establishing treatment plans, predicting prognosis and research. Indications on combination of surgical revision and CLT are proposed but still need further research.

O-22 Ablative Fractional Erbium-YAG Laser for The Treatment of Atrophic Post-Acne Scarring

Gerd G Gauglitz, Helene Callenberg, Daniel Müller, Thomas Ruzicka, Peter Kaudewitz

Department of Dermatology and Allergology, Ludwig Maximilians University, Munich, Germany

E-mail: Gerd.gauglitz@med.uni-muenchen.de (Gerd G Gauglitz)

Background: Atrophic post-acne scarring is a common aesthetic concern, treatable by a variety of modalities with varying success. In this study, we aimed to evaluate the safety and efficacy of erbium ablative fractional resurfacing for the therapy of post-acne scarring and to define the adequate energy dose in a representative study cohort. **Methods:** A total of forty patients (skin types I-IV, age 18 to 46 years) suffering from mild to severe atrophic acne scars were included into this study after signing informed consent. Subjects underwent five to nine treatments with the MCL 30 Demablate (Asclepion) at one month intervals with an average dose of approximately 100 J/cm². Post-treatment erythema, pain, improvements in texture, atrophy and overall satisfaction were graded on a scale from 1 to 10 by subjects and investigators after the final treatment. In a subsequent study, a three-dimensional optical profiling system (Primos imaging) is utilized to objectively measure the depths of the scars in a subpopulation of ten patients on both cheeks prior to the first treatment and at various time-points thereafter. **Results:** Post-treatment side effects were mild to moderate and transient, resolving within three to six days after the treatment. No delayed onset hypopigmentation was observed. According to the grading scores, laser treatment resulted in 35 to 50% improvements in texture, atrophy and overall satisfaction. At this time, Primos topographic analysis reveals similar results. **Conclusions:** The use of fractional Erbium-Yag Laser treatment represents a safe and effective therapeutic approach for mild to moderate atrophic post-acne scarring.

O-23 Scar Remodeling with Adipose Fat Graft Solving PMPS

Fabio Caviggioli, Marco Ettore Attilio Klinger, Davide Forcellini, Valeriano Vinci

Department of Medical Translaational, IRCCS Istituto Clinico Humanitas, University of Milan, Milano, Italy

E-mail: fabio.caviggioli@gmail.com (Fabio Caviggioli)

Background: Mastectomy with axillary dissection is still today one of the most common procedures in oncologic surgery. Unfortunately a condition of neuropathic pain, named Post-Mastectomy Pain Syndrome (PMPS) can appear after mastectomy. Although evidence regarding the epidemiology of PMPS is well known, an effective therapy is still today unknown. Considering PMPS etiology with nerve fibers entrapment in mastectomy's scar and the role of autologous fat graft on scar release, the aim of this study is to assess the clinical effectiveness of autologous fat graft in the treatment of PMPS. **Methods:** From February 2005 to August 2008 a total of 113 patients with several scar retraction and PMPS came to our unit. We performed fat tissue graft in 72 patients with several scar retractions and diagnosis of PMPS. 41 of 113 patients with PMPS did not receive lipostructure and have been considered as control group for statistic analysis. Data instruments for both arms consisted in preoperative and postoperative pain questionnaires. Patients scored their spontaneous pain using a visual analogue scale, also analgesic requirement and drug intake have been recorded. **Results:** We analyzed data with T-test statistic model with a power of 90%. Our results showed with statistical significant values (p 0,0005) that autologous fat tissue graft decreases pain in patients with PMPS. **Conclusions:** This surgical procedure is a quick low-invasive therapeutic approach able to solve PMPS, it has poor contraindications and is safe. So it is now possible to consider it as a new chance in our hands.

O-24 Cosmetic and Psychological Effectiveness of Rehabilitation Make-up® For Post-burn Scar Patients

Takeshi Iimura^{*,**}, Reiko Kazuki^{*}, Hiko Hyakusoku^{*}, Rei Ogawa^{*}

^{*}Department of Plastic, Reconstructive and Aesthetic Surgery, Nippon Medical School, Tokyo, Japan

^{**}Department of Plastic and Reconstructive Surgery, Saga University Hospital, Saga, Japan

E-mail: r.ogawa@nms.ac.jp (Rei Ogawa)

Background: Rehabilitation Make-up® is a kind of camouflage therapy for patients with scars. We reported previously that it improves both the appearance and mental condition of patients with scars. In this paper, we analyzed the effect of Rehabilitation Make-up® for post-burn scar patients. **Patients and Methods:** Thirteen patients were selected for this study. Pre- and post-treatment photographs were taken and ten independent plastic surgeons were asked to score the severity of the scars by using a zero-to-ten scale. The patients were also asked to assess their own appearance and mental condition before and after treatment by using the visual analog scale (VAS). **Results:** The scores of the plastic surgeons revealed that all cases had improved significantly in terms of scar severity. With regard to the VAS data, while all patients thought that they had improved significantly after treatment, there were marked differences between individuals in terms of how much improvement had been achieved. There was no statistically significant relationship between the objective and subjective results. **Discussion:** Both the subjective and objective data revealed that Rehabilitation Make-up® significantly improved the appearance of patients with scars. However, there were marked differences between individuals when they were asked to assess their own appearance. Thus, Rehabilitation Make-up® may be useful as a psychological therapy for patients with burn scars.

O-25 Integra® as a Biomechanical Adjunct in Reducing Post-Operative Tendon Adhesion Formation

Mayer Tenenhaus

Division Plastic and Reconstructive Surgery, University of California at San Diego Medical Center, SD, USA

E-mail: m.tenenhaus@sbcglobal.net

Background: Clinically available, biocompatible collagen-GAG material (Integra®) was evaluated as an adjunct to surgical tendon repair. **Methods:** Surgical division and repair using modified Kessler technique was performed in an animal flexor tendon model. Digits were randomized to study and control. Integra® was wrapped around the repair site of study group. Study blinded histologic assessment and grading was performed to assess healing and adhesion formation. Objective biomechanical testing and bursting strength was performed. **Results:** Control (untreated) tendons showed increased fibrous tissue surrounding the repair sites with approximately 50% of the circumference of the repair site adherent to surrounding tissue. Mean histologic grades for the study group was statistically improved 1.9 ± 0.2 vs. 3.1 ± 0.2 (paired t-test: $p < 0.01$). Cyclic work of flexion (WOF) for the control group was 0.58, 0.55, 0.46, and 0.44 N/mm vs. 0.16, 0.14, 0.10, 0.09 N/mm for the Integra® wrapped group, the difference between the groups was statistically significant (paired t-test, $p < 0.01$). The mean bursting strength of repaired tendons for control and study groups was 14.3 ± 5.30 and 11.5 ± 5.22 N respectively however no significant statistical difference was noted (ANOVA, $p = 0.71$). **Conclusions:** Collagen-GAG reduces formation of early post-operative tendon adhesions in this chicken flexor tendon repair model. Collagen-GAG wrapped tendons healed with minimal peritendinous adhesion formation and required less effort for flexion. The investing collagen-GAG membrane did not appear to interfere with either the quality or strength of healing.

O-26 Immunoinflammatory Cells in Posttraumatic Tendon Adhesions – an Immunohistochemical Study

Horst Koch*, Jasna Sisic*, Christine Daxböck**, Herbert Juch**

*Graz Medical University, Department of Surgery, Division of Plastic Surgery, Graz, Austria

**Graz Medical University, Institute of Histology and Embryology, Graz, Austria

E-mail: horst.koch@medunigraz.at (Horst Koch)

Background: T-lymphocytes and macrophages are significantly involved in the dysregulation of wound healing and the formation of pathological scars. Despite the development of advanced tendon suture techniques and special therapy concepts, tendon adhesions are still a significant clinical problem after surgery, trauma or infection. In this study we investigated whether or not these cell types also play a role in the formation of tendon adhesions. **Methods:** Tendon sheath tissue that was obtained from patients undergoing tenolysis after trauma or surgery was analysed. Material from fresh human cadavers served as control tissue. Immunohistochemistry was done on cryo sections. The quantity of CD3+, CD4+, CD8+, CD25+ and CD68+ cells was evaluated under

blinded conditions, by microscope based “manual” counting of the immuno-stained cells in the sections and by relating the absolute cell numbers to the tissue area defined by unspecific counterstaining. The tissue area of the section in mm² was determined using a computer-based automatic image analysing tool and a calibrated digital photo microscope. **Results:** A several-fold increase of CD3⁺ cells in patient tissue compared to control was observed. We also found a significant increase in CD4⁺ and CD8⁺ cells. The absolute numbers of CD4⁺ cells were higher; however, the relative increase of CD8⁺ cells appeared to be more impressive. We also recognized an increase of lymphocyte activation in patient tissue by analysing CD25⁺. Furthermore, there was an increase in CD68⁺ cells. **Conclusions:** Our study suggests that immunological processes driven by T-lymphocytes and macrophages are involved in the formation of tendon adhesions after trauma and surgery. Further investigations on lymphocyte characterization, cell-cell-interactions and on the role of dendritic cells and macrophages are conducted to clarify the role of the immune system in the process of fibrosis in these patients.

O-27 Telomerase Expression and Telomere Length in Idiopathic and Autoimmune Pulmonary Fibrosis in Human Bone Marrow Mesenchymal Stem Cells (BM-MSCs)

Katerina Antoniou, Athanasia Proklou, Konstantinos Karagiannis, Giannoula Soufla, Rena Lymbouridou, Nikolaos M. Sifakas

Department of Thoracic Medicine, Interstitial Lung Disease Unit, Medical School, University of Crete, Greece
E-mail: katerinaantoniou@yahoo.gr (Katerina Antoniou)

Background: We have recently shown increased CXCR4 expression by Idiopathic Pulmonary Fibrosis (IPF) patients' BM mesenchymal stem cells (BM-MSCs). To probe the possible involvement of BM-MSCs in the pathophysiology of Rheumatoid Lung (RA-UIP). **Methods:** BM-MSCs were studied in 10 RA patients without lung involvement, 10 patients with RA-UIP, 10 healthy controls and 10 IPF patients. We evaluated the mRNA expression of biological axis stromal-cell-derived factor-1 (SDF-1 α)/CXCR4, telomerase activity (TERC and TERT) and telomere length. **Results:** The biological axis of SDF-1 α /CXCR4 (TR1 and TR2) in mRNA level was not expressed in patients with RA. A statistically significant increased expression was revealed in CXCR4 in IPF patients compared to RA patients and healthy individuals. No statistical difference has been detected in TERC and TERT levels between RA-UIP and IPF. However, TERC levels have been found significantly decreased in both RA-UIP and IPF in comparison with controls (1.5 ± 0.83 , 4.5 ± 4.45 and 3911.59 ± 1734.91 , respectively), ($p=0.013$ and $p=0.044$, respectively). We also found increased TERT levels in RA patients in comparison with RA-UIP, IPF patients and controls (519 ± 205.06 , 2.7 ± 2.3 , 4.15 ± 12.82 and 0.55 ± 0.11 , respectively, $p=0.004$, $p=0.006$ and $p=0.006$, respectively). Telomere length has been found decreased in IPF in comparison to both controls and RA. **Conclusions:** The aforementioned results may suggest that restoring telomerase in both autoimmune and idiopathic pulmonary fibrosis emerges as possible therapeutic target.

O-28 The Role of Circulating Fibrocytes in Keloids

Munetomo Nagao^{*}, Utano Tomaru^{**}, Akihiko Oyama^{***}, Yuhei Yamamoto^{***}, Seiichiro Kobayashi^{*}

^{*}Department of Plastic & Reconstructive Surgery, Iwate Medical University, Iwate, Japan

^{**}Department of Pathology, Hokkaido University Graduate School of Medicine, Hokkaido, Japan

^{***}Department of Plastic & Reconstructive Surgery, Hokkaido University Graduate School of Medicine, Hokkaido, Japan

E-mail: munetomonagao@max.odn.ne.jp (Munetomo Nagao)

Background: Keloids are often difficult to treat. The mechanisms underlying keloid formation are only partially understood. Because multiple and recurrent lesions frequently occur in patients with keloids, we hypothesize that systemic abnormalities are involved in the pathogenesis. In this study, we analyzed fibroblast progenitor cells, called “circulating fibrocytes (CFs)”, in the peripheral blood of keloid patients. **Methods:** Blood samples were obtained from 6 patients with keloids, and 9 healthy volunteers. To isolate CFs from peripheral blood, peripheral blood mononuclear cells (PBMCs) were separated from whole blood (10ml) by Ficoll Hypaque density-gradient centrifugation, and cultured in DMEM using fibronectin pre-coating dishes. After 7

days, non-adherent cells (largely T cells) were removed, and adherent cells were cultured for additional 7 days. After 14 days incubation, we obtained CFs as spindle-shaped cells in culture dishes. Total RNAs were isolated from CFs, and cDNAs were subjected to real-time RT-PCR using oligonucleotide primers for TGF- β 1, TGF- β receptor I&II, collagen type I, α -SMA, and CXCR4. GAPDH was used for internal control.

Results: In the CFs from patients with keloids, the mRNA expression of TGF- β 1, TGF- β receptor I, α -SMA, and CXCR4 were increased, compared with CFs from normal volunteers. These expression profiles of CFs from patients with keloids were similar to those of resident fibroblasts (RFs) from patients with keloids.

Conclusions: The altered characteristics of CFs from patients with keloids may have an important role in the pathogenesis of keloids. We propose that these alterations of CFs might be useful for diagnostic marker of keloids.

O-29 Human Homologous Tissues as Novel Scaffolds for Soft Tissue Reconstruction

Luca Lancerotto^{*}, Vincenzo Vindigni^{*}, Andrea Volpin^{*}, Andrea Porzionato^{**}, Tiziana Martinello^{***}, Franco Bassetto^{*}

^{*}Clinic of Plastic Surgery, University of Padova, Italy

^{**}Unit of Clinic Anatomy, University of Padova, Italy

^{***}Department of Veterinary Sciences, University of Padova, Italy

E-mail: luca.lancerotto@unipd.it (Luca Lancerotto)

Background: Tissue engineering is undergoing a progressive but substantial change in philosophy: from looking for the ideal cells and factors, to looking for the perfect scaffold able to guide, even in an in vivo setting, regenerative or neo-generative processes. Homologous tissues may be an interesting source of de-cellularized scaffolds maintaining a complex physiological 3D structure, complete with vessels and nerves networks, to be recellularized by autologous cells. **Methods:** Rat and human omental tissue and human tendons were subjected to decellularization with two adapted protocols involving freeze-thawing cycles and enzymatic digestion. Obtained scaffolds were studied with histological and immunohistological stainings to highlight the persistence of cells, the structure and composition of the material, the persistence of frames of the vascular and neural network. Decellularized tendon tissues underwent also to preliminary recellularization tests using human tendon fibroblasts and adipose tissue derived stem cells. **Results:** Both decellularization processes (omentum and tendon) resulted in a cells-free, fat-free collagenous scaffold. Vascular channels persisted in it at immunohistochemical stainings. We observed cell adhesion and proliferation when cells were seeded in the tendon-derived matrix. **Conclusions:** Both tendon and omental adipose tissue, the first strongly fibrous, the second fat-rich well vascularized tissue, were decellularized obtaining tridimensional scaffolds suitable for recellularization. Reimplanted in vivo they may provide adequate cues for recolonization by autologous cells, such as it is known to happen for homologous skin, and maybe drive regenerative processes.

O-30 Healing of Large Midline Wounds in Infants: Unlike in Adults, Does Conservative Approach Give Better Results?

Mohamad Taifour Suliman

Department of Surgery, Plastic Surgery Unit, King Khalid Civil Hospital, Tabuk, Saudi Arabia

E-mail: mtaifour1@yahoo.com

Background: It is well known that wounds in infants heal better than in adults. But this fact is applicable only to small wounds. In larger wounds, however, scars do form in this group too. But we noticed that large wounds in the midline parts of the infant, heal with minimum scarring unlike if the wound is in the periphery. **Methods:** Three cases reports will be presented to demonstrate that wounds in the midline in infants heal better than their counterparts in the peripheries and indeed behave different than in adults. **Results:** The case of three infants with large midline wounds, is reported where the advantages of leaving such wounds in infants to heal spontaneously over surgical intervention verified. The cases are discussed and the literature is reviewed. It is concluded that the

midline wounds in infants yield better results if left to heal spontaneously. **Conclusions:** It is concluded that the midline wounds in infants yield minimum scarring if left to heal spontaneously.

O-31 Ex Vivo Expanded Endothelial Progenitor Cell Transplantation Improves Wound Healing and Scarring

Rica Tanaka^{***}, Haruchika Masuda^{**}, Rie Ito^{**}, Michiru Kobori^{**}, Tsuyoshi Fukui^{*}, Takayuki Asahara^{**}, Muneo Miyasaka^{*}

^{*}Department of Plastic and Reconstructive Surgery, Tokai University School of Medicine, Kanagawa, Japan

^{**}Department of Regenerative Medicine, Tokai University School of Medicine, Kanagawa, Japan

E-mail: rica@is.icc.u-tokai.ac.jp (Rica Tanaka)

Background: Endothelial progenitor cell (EPC) therapy has been proposed as a possible technique for augmenting neovascularization, but this approach is unlikely to be successful in diabetics who are known to have dysfunctional EPCs. We have previously reported that ex vivo expansion of diabetic EPCs restore diabetic dysfunction. This study test whether ex vivo expanded diabetic EPCs transplant accelerates wound healing and improves scarring. **Methods:** Bone marrow (BM) cells were collected from streptozotocin induced diabetic mice (DM) and wild-type mice. BM EPCs were isolated and cultured for seven days in ex vivo expansion system. Mice with excisional wounds were treated with expanded or non-expanded EPC cells or PBS. Histological analysis was performed to assess wound granulation, vascular density and mature collagen formation. **Results:** The transplantation of ex vivo expanded cells significantly increased wound healing, compared to the PBS treated group (day 7 = 62% vs 32% healed; $p < 0.05$ and by day 14 100% vs 74% healed; $p < 0.001$). Similarly, accelerated wound granulation, vascular density and mature collagen formation was seen in expanded cell treated group by day 14 ($p < 0.05$) and 21($p < 0.05$). **Conclusions:** We demonstrate that ex vivo expanded EPCs are superior choice of cell type in accelerating wound healing and improving scarring. Ex vivo expansion of diabetic EPCs may represent an effective clinical approach to therapeutically augmenting wound healing in diabetic patients.

O-32 In Vivo Guided Healing of Microvascular Structures

Vincenzo Vindigni^{*}, Franco Bassetto^{*}, Laura Pandis^{*}, Barbara Zavan^{**}, Sandro Lepidi^{***}, Giovanni Abatangelo^{**}

^{*}Clinic of Plastic and Reconstructive Surgery, University of Padova, Italy

^{**}Unit of Histology, University of Padova, Italy

^{***}Clinic of Vascular Surgery, University of Padova, Italy

E-mail: vincenzo.vindigni@unipd.it (Vincenzo Vindigni)

Background: Tissue engineering approaches rely on the ability of cells to adhere to and migrate within the construct, and to remodel its composition and/or structure. In order to support the remodelling process in vivo, we used a biomaterial that functions only as a temporary absorbable guide, which can promote the sequential and complete regeneration of vascular structures at the implantation site. We developed vascular prostheses entirely made by Hyaluronic Acid. **Methods:** Tubular structures of hyaluronan (2 mm diameter, 1 cm length) were grafted in the abdominal aorta ($n = 30$), and in the vena cava ($n = 30$) of rats. Performance was assessed at 5, 15, 30, 60, 120, and 180 days after surgery by histology and ultra-structural analysis. **Results:** These experiments resulted in three novel findings: 1) complete endothelialisation of the tube's luminal surface occurred; 2) sequential regeneration of vascular components led to complete vascular wall regeneration 15 days after surgery; and 3) the biomaterial used created the ideal environment for the delicate regeneration process during the critical initial phases, yet its biodegradability allowed for complete degradation of the construct four months after implantation, at which time, a new artery and a new vein remained to connect the vascular stumps. **Conclusions:** This study assesses the feasibility to create a completely biodegradable vascular regeneration guide in vivo, able to sequentially orchestrate vascular regeneration events needed for very small artery and vein reconstruction, opening new innovative possibilities of surgical treatment in the field of reconstructive microsurgery and paediatric vascular surgery.

O-33 Clinical Data Acquisition of Wounds and Scars Using A Handheld 3D Stereophotographic System: First Experiences

David B. Lumenta, Lars-Peter Kamolz, Harald Selig, Maike Keck, Manfred Frey

Division of Plastic and Reconstructive Surgery, Department of Surgery, Medical University of Vienna, Austria

E-mail: david.lumenta@meduniwien.ac.at (David B. Lumenta)

Background: The clinical quantification of wounds and scars is predominantly based on subjective scores. While most quantitative assessments are technically demanding and time-consuming, two-dimensional photography remains the gold standard for follow-up in daily clinical practice. Given the curved nature of the human body and the variability of images depending on the angle of image acquisition, we analysed data acquisition with a hand-held 3D stereovision device and discussed its use for clinical application.

Methods: Three independent examiners acquired images using a stereophotographic system followed by calculation of the region-of-interest's (ROI) volume change and surface irregularity. So far, we have documented a total of 16 ROIs in 10 patients and analysed the clinical course during scar/wound treatment in successive follow-up visits. **Results:** Using a handheld device permitted acquisition of standardised high-quality images in various clinical situations in a mobile and observer-independent fashion. Quantification of three-dimensional wound and scar representations allowed for distinction of volume changes, and correlated with observers' and patients' subjective findings. **Conclusions:** Handheld stereophotography is suitable for daily clinical use and permits to obtain three-dimensional representations of wounds and scars in a non-invasive fashion. Knowing the limitations and common confounders during image acquisition permits to define its optimal application in respective wounds and scars.

O-34 Scar Rating Scales: Examining The Evidence

Zephania Tyack*, Megan Simons**, Anneliese Spinks***, Jason Wasiak****

*Central Queensland Health Services District, Rockhampton; School of Medicine, The University of Queensland, Brisbane, QLD, Australia

**Occupational Therapy Department, Royal Children's Hospital, Brisbane, QLD; School of Health and Rehabilitation Sciences, The University of Queensland, Brisbane, QLD, Australia

***School of Medicine, Griffith University, Meadowbrook, QLD, Australia

****Victorian Adult Burns Service and School of Public Health and Preventative Medicine, Monash University, The Alfred Hospital, Commercial Rd, Melbourne, VIC, Australia

E-mail: Megan_Simons@health.qld.gov.au (Megan Simons)

Background: Clinicians commonly rely on rating scales when assessing burn scars. To date, there has been no systematic review of burn scar rating scales to provide evidence for the reliability and validity of scar assessment practices. **Methods:** A search strategy was applied to the following databases: Ovid MEDLINE (from 1990 onwards), EMBASE (from 1980 onwards) and the Cochrane Library (Issue 4, 2009) to identify studies meeting the inclusion criteria. Papers were reviewed (by up to 4 reviewers) in terms of reliability, validity including responsiveness (i.e., ability to detect change over time), interpretability and clinical acceptability.

Responsiveness statistics were calculated for studies with available data. **Results:** From 852 papers identified for screening, 31 papers reviewing 15 scar rating scales were selected for the final review. The 15 individual scar parameters reported included surface irregularity, scar thickness, range of motion, pigmentation, pliability and vascularity. 12 scar scales used total scores, despite no validation for this practice. The Vancouver Scar Scale and the Patient and Observer Assessment Scale were considered to be superior in psychometric performance based on existing evidence. No "gold standard" scar rating scale was identified. **Conclusions:** Recommendations related to the Vancouver and other scar assessments include not using total scores or pigmentation categories and using precise methods for scar relocation. The results of this systematic review help to bridge the gap in the current evidence base by providing information on the strengths and weaknesses of existing burn scar rating scales, to help clinicians and researchers apply best practice in the assessment of burn scars.

O-35 Influence of Negative Atmospheric Pressure on Cultured Human Dermal Fibroblasts

Yoshihiro Takami*, Jingping Guo**, Shimpei Ono*, Hakan Orbay*, Rei Ogawa*, Hiko Hyakusoku**

*Department of Plastic Surgery, Nippon Medical School, Tokyo, Japan

**Department of Plastic Surgery, Kunming Medicine College, Yunnan, China

E-mail: nyonyal@aol.com (Yoshihiro Takami)

Background: Fibroblast plays an important role in the wound healing process. It has been known that the function of fibroblasts is influenced by various factors. We paid attention to atmospheric pressure as one of those factors. In this study, the effects of atmospheric pressure on cultured fibroblasts were investigated. **Methods:** Normal human dermal fibroblasts were cultured under an atmospheric pressure of 380 mmHg or 190 mmHg for 5 days, then, the cellular proliferation, the morphological changes, TGF- β_1 production, and apoptosis induction were studied. Fibroblasts cultured under normal atmospheric pressure were used as a control. The cells were grown in a CO₂ independent medium containing 10% FBS. Cellular proliferation was determined by the Neutral Red method. The morphology of the cells was observed by H & E staining. TGF- β_1 production by fibroblasts was assayed by ELISA. Apoptosis of fibroblasts were induced by removing FCS from the culture medium. Apoptotic cells were visualized by the TUNEL method. **Results:** Under 380 mmHg of pressure, the cellular proliferation was not significantly enhanced, however, TGF- β_1 level was increased, as compared to the normal atmospheric pressure. Under 190mmHg of pressure fibroblast proliferation was enhanced, however, TGF- β_1 level was not significantly changed as compared to the normal atmospheric pressure. There was no significant difference in cellular morphology and apoptosis induction between the normal and negative atmospheric pressure conditions. **Conclusions:** It is suggested that the biological behavior of fibroblasts is altered under negative pressure and that the functional change differs by the degree of negative atmospheric pressure.

O-36 Blood Injection in Wound Healing

Mohammed Mohamed Sayed Ali Al Azrak

AL HELAL Specialized Hospital, Cairo, Egypt

E-mail: mohammedazraq@yahoo.com

Background: Healing of wounds or ulcers is a process needs triggering. It is known that injury itself is a powerful trigger of healing (it may mean that a change of the normal media at a local site of the human body). EGF, TNGF, FDGF, PDGF and other cytokines in addition to macrophages and fibroblasts are important in healing of the wounds. Ulcer or wound has an edge and a bed. Summation of factors affecting healing (systemic, local) determine the rate and course of healing of the wound or ulcer from the edge and bed. Variation of the course from few days to months tell us that the wound may stay in a specific phase of the healing process for a long time. So, need triggering again to disturb the stasis and force the wound to react. So, if the wound is surprised by a useful material, it will react again, also this material may contain specific factors affecting healing which normally may not reach the wound edge and bed in enough amount. Injection of BLOOD in the edge and bed can produce triggering and release of useful factors may alter the course of the wound. **Methods:** 15 patients were selected randomly in variation as; bed sores 8 cases, traumatic ulcers 2 cases, post operative sinuses 2 cases, diabetic pregangrene toes 2 cases, dehiscent wound of cesarean section 1 case. Samples of blood 3-5 cm taken from the patient venous blood by a syringe and re-injected again in the areas needed to enhance healing at the edges and bed in the interstitial space. Repeat the procedures 2-5 times. **Results:** Small bed sores closed in short duration 1-3 weeks, large bed sore become very nourished, healthy and accepted graft, also traumatic ulcers and wounds. Long standing post operative (ortho) DHS + plates placement sinuses 2- 3 months, closed after injection around the tract in 2 weeks. Pregangrene diabetic toe after debride and (blood + papaverin) injection, the soft tissue became more durable, more healthy toe and amputation avoided. **Conclusions:** Injection of blood into the interstitium of the wound was observed to be useful in minimizing the duration of healing and worth more advanced research.

O-37 Scarless Wound Closure by Humain Hair

Mohammed Mohamed Sayed Ali Al Azrak

AL HELAL Specialized Hospital, Cairo, Egypt

E-mail: mohammedazraq@yahoo.com

Background: Disfiguring scars of wound healing especially in the face causes various harms to the patients. Many factors contribute to the presence and appearance of scars, one of them is the suture material used to stitch the wound and more specifically the local reaction of the body repair mechanism towards the material used, regarding deposition of fibrin and collagen formation. Since all the materials used in stitching trigger the body to react, trials to use a material which may be with little or no reaction as it is not only from the body itself but also from the adnexia of the skin. (it is the HAIR) from the scalp. **Methods:** 20 cases of patients were selected randomly to be used in the trial. 6 males and 14 females there age range between 4 y and 34 y. Most of them were children and young ages presented by traumatic and surgical wounds, previous scars for revision, swelling excision and defect closure and others. Preparation of the hair by introducing it into an insulin syringe, separating its needle and added to (betadine + alcohol solution) and used to stitch with. In deep wounds dermal sutures used before use of hair by vicryl. Dehiscence of the wound occur in 2 cases due to excess burden on the wound, no infection noted, hair of the mother used to stitch her child in 2 cases with no allergic reaction noted. **Results:** Examination of the wound after 1 - 2 - 4 - 12 weeks by the naked eye and by the normal dermatology lense, reveal no apparent scars. Examination by surgical loope 5.5 magnification reveal that the scar is small linear shadow with no residual marks of the hair stitches. **Conclusions:** Hair can be prepared and used to stitch the wounds without leaving evident marks.

O-38 Treatment of Giant Congenital Melanocytic Nevi with Enzymatically Separated Epidermal Sheet Grafting

Hirokazu Shido, Ruka Ninomiya, Keisuke Okabe, Eri Konno, Kazuo Kishi

Department of Plastic Surgery Keio University Hospital, Tokyo, Japan

E-mail: hikkydream1_1_3@yahoo.co.jp (Hirokazu Shido)

Background: Treatment of giant congenital melanocytic nevi (GCMN) must be considered from both a cosmetic aspect and a medical aspect of reducing the risk of a growing malignancy. **Methods:** We treated 8 patients who had a GCMN on the trunk with an enzymatically separated epidermal sheet taken from their excised GCMN skin. All patients underwent enzymatically separated epidermal sheet grafting at the age of 2 months. With the patient under general anesthesia, we removed the affected area with an electric dermatome until the brown color had almost completely disappeared. The removed skin was immersed in dispase I solution (1000 U/mL) in Ringer's solution at 37°C for 75-105 minutes until the epidermal sheet separated from the dermis without tension. Three back lesions and 2 abdominal lesions were treated. **Results:** In all cases, the enzymatically separated epidermis grafted well, without infection. The amount of discharge that accumulated from immediately after the operation until the first dressing change (performed at 3 days after the operation) was reduced compared with that from curettage. The skin color was light brown at first, and it gradually became lighter within a few months. The grafted areas were soft and did not show significant repigmentation. In most cases, hard hairs did not grow from the treated area. Histological samples taken 1 year after the operation showed that the dermal layer was reconstituted without pigmented nevus cells. **Conclusions:** Enzymatically separated epidermal grafting is a useful method for the treatment of GCMN and leaves cosmetically satisfactory results.

O-39 Management Radiation Ulcer Scar by Operation Treatment

Vu Quang Vinh

Vietnam National Institute Of Burn, Vietnam

E-mail: vuvinhvb@gmail.com

Background: Radiation ulcers are wound caused by the acute (radiation burn) or chronic effect of ionizing radiation. The problem of the ulcer such as painful, ischemic, and fibrotic ulcer remains challenging for treatment. Conventional treatments such as wound management, necrosis excision for granulation grow up and skin graft the most were not obtained wound healing. With the development of axial pattern flap musculocutaneous and muscle flap, as well as microvascular free flap, surgeon can now recommend earlier use of adequate debridement extended necrosis ulcer and immediate coverage with regional flap or free flap. At department plastic and reconstructive surgery of National Institute of Burn since 2007, July to 2009, July we are successful surgical treatment for 20 patients including 3 male and 17 female. **Patients and Methods:** 20 patients underwent surgical by split-full thickness skin graft, regional flap, free flap. An advantage of every method was analyzed in our presentation. **Results:** A patient was not wound healing when necrosis excision for granulation grew up application. Two patients were poor results with necrosis excision and skin graft applied immediately. Seventeen patients with 18 flaps (15 regional flaps and 3 free flaps) were excellent results obtained. **Conclusions:** Radiation ulcers need early treatment follow principle necrosis excision, infection control and cover as soon as by regional flaps or free flaps.

O-40 A New Technique to Reduce Raw Surface Area of The Donor Site of Split Thickness Skin Grafting

Shigeki Sakai*, Keisuke Okabe*, Ruka Shimizu*, Eri Konno*, Asako Hatano*, Hirokazu Shido*, Takako Otsu*, Tatuya Kato*, Naohiro Ishii**, Kazuo Kishi*

*Department of Plastic and Reconstructive Surgery, Keio University Hospital, Tokyo, Japan

**Department of Plastic and Reconstructive Surgery, Ohtawara Red Cross Hospital, Tochigi, Japan

E-mail: shigekix724@hotmail.com (Shigeki Sakai)

Background: When the patients are old or in bad status for wound healing, the donor sites of the split thickness skin grafting need much time until the re-epithelialization complete. Even if the proper moisture dressing was used in these cases, the wound healing of the donor site sometimes delayed and the donor sites sometimes become clonic ulcer or hypertrophic scars. Thus it is important to reduce the time of re-epithelialization. For this purpose, we used a new idea to make the donor site smaller. **Methods:** The split thickness skin were taken with electronic dermatome, 350mm in thickness. The donor sites were sutured either by excision or by digging with inverted suture. Some patients were added recruited chipped skin grafting using excess split thickness skin. 6 patients who needed split thickness skin grafting were treated with this method. **Results:** The re-epithelialization completed from 6 days to 15 days after operation. No patients showed lasting erosion or ulcers. **Conclusions:** By making the area smaller by suturing the donor sites, the re-epithelialization tends to complete faster. The skin erosion or the ulcer in the donor site can be prevented with the recruited chip skin grafting.

O-41 Recruited Chip Skin Grafting for Improving The Skin Appearance of The Donor Site of A Split Thickness Skin Graft

Asako Hatano, Ruka Shimizu, Keisuke Okabe, Kazuo Kishi

Department of Plastic and Reconstructive Surgery, Keio University, Tokyo, Japan

E-mail: a-cyan@galaxy.ocn.ne.jp (Asako Hatano)

Background: The donor site of a split thickness skin graft undergoes scar formation. Donor sites may exhibit hypopigmentation, hyperpigmentation, redness, and disruption of skin texture. We used part of the harvested skin, and chip skin was grafted back onto the donor site to improve the skin appearance, a process we named "recruited chip skin grafting". **Methods:** Thirteen patients who needed split thickness skin grafts were treated with recruited chip skin grafting. Five patients were used as controls, for whom donor sites were treated with the traditional method. Part of the split thickness skin was minced with two surgical blades (number 24) to an approximate particle size of less than 0.5 mm. Chip skin was spread and transplanted onto the donor site and covered with polyurethane foam. Six months after the operation, the donor sites were scored for hypopigmentation, hyperpigmentation, redness, and disruption of skin texture. The gross appearance was

evaluated from the total score. **Results:** Donor sites treated with recruited chip skin grafts had significantly improved appearances compared with those of controls. Donor sites with a treated area of more than 5% of the total area tended to have better results. **Conclusions:** Recruited chip skin grafting is a good method for improving the appearance of the donor site.

O-42 Usefulness of Super-thin Flaps in Burn Reconstructive Surgery

Rei Ogawa, Hiko Hyakusoku

Department of Plastic, Reconstructive and Aesthetic Surgery, Nippon Medical School Hospital, Tokyo, Japan

E-mail: r.ogawa@nms.ac.jp (Rei Ogawa)

Background: Thin and large flaps are needed to reconstruct extensive post-burn scar contracture cases that involve contour-sensitive areas such as the face and neck. Super-thin perforator flaps or perforator-supercharged super-thin flaps are useful for such cases. A notable feature of the super-thin flap is its extreme thinness, which is due to the intraoperative primary defatting that thins it to the point that the subdermal vascular network (subdermal plexus) can be seen through the minimal fat layer. The defatting of large areas in the flap is aided by the presence of perforators. As a result, perforator supercharging permits the harvest of extremely long and large flaps. In this paper, we studied the usefulness of various perforators for super-thin flaps.

Patients and Methods: Before each operation, the flap was designed to match the shape of the recipient site and a judgment was made regarding the need for perforator supercharging. Generally, reliable vessels were chosen to serve as the flap vascular pedicles and supercharging vessels. These included the circumflex scapular vessels (CSV), the medial latissimus dorsi perforators (the dorsal intercostal perforators [DICP, D-ICAP]), the trapezius perforators (superficial cervical artery perforator [SCAP]), and the internal thoracic artery perforators (the pectoral intercostal perforators [PICP, P-ICAP]). The perforators were imaged by Doppler flowmetry or MDCT preoperatively to confirm their suitability. **Results:** Between 1984 and 2008, various types of super-thin flaps were harvested, including 33, nine, and eight cases of CSV, DICP, and PICP super-charged super-thin flaps, respectively, and 45 cases of SCAP super-thin flaps. Of the 95 cases, four exhibited partial necrosis (4.2%) and one developed complete necrosis (1.0%). The remaining 90 flaps (94.7%) provided good and acceptable results in terms of both functional and cosmetic outcomes. **Conclusions:** More research on the physiology and anatomy of super-thin flaps will help us to better predict the area of a flap that will survive. Nonetheless, our study confirms that long, large, and made-to-order super-thin flaps can be harvested reliably and that they are useful for extensive burn reconstruction.

O-43 Expansion Prefabricated Crossing Area Supply Super-thin Flap: An Experimental Study and Clinical Application

Chunmei Wang^{*}, Sifen Yang^{*}, Junyi Zhang^{**}, Hiko Hyakusoku^{***}

^{*}Dongguan Kanghua Hospital, Dongguan, China

^{**}Beijing Tongren Hospital, Beijing, China

^{***}Nippon Medical School, Tokyo, Japan

E-mail: chunmei22@hotmail.com (Chunmei Wang)

Background: The super thin flap has a great development in recent years, but the blood vessel anastomosis and the trim of flap is difficult for many doctors. Based on the research of super-thin flap and the overflow phenomenon, we designed the expansion super thin flap. **Methods:** The arteries of minipig torso were observed and analyzed through gross anatomy, blood perfusion examination, angiography and 3D reconstruction. The experiment was divided into expansion group and control group (experiment A), expansion group and delay group (experiment B). Angiographic analysis, and gross survival observation were carried on. Based on the result of experiment, we applied the super-thin flap after expansion prefabrication to 15 cases of postburn scars on face, neck and hands. **Results:** Angiography showed that in expansion group, deep iliac circumflex artery and superior epigastric artery are fully perfused with abundant anastomoses with big calibers, that in delay group, the two arterial systems were visualized but with relatively less anastomoses, smaller

calibers and smaller territory, and that in control group, the superior epigastric artery is hardly visualized. The blood perfusion of distal part of the flap in expansion group was significantly superior to others in experiment A. Whereas it was similar to the delay group in experiment B. The survival rate in expansion group is significantly higher than the control group in experiment A and the delay group in experiment B. All the super-thin flaps with a crossing area supply survived thoroughly and no ischemia and congestion were observed. **Conclusions:** A flap that included superior epigastric vessel based on the deep iliac circumflex vessel is an ideal experimental model for the crossing area supply flap. The mechanism of improvement of flap survival by expansion is bridging effect: Expansion prefabrication can change choke anastomoses into real anastomoses, bridge two neighboring axial vessels and improve the flap survival; expansion can lead to a neovascularity result and a dilation of the vessel caliber, so the perfusion of the skin is improved. The positive effect of expansion on the crossing area supply flap is confirmed and it can be applied clinically.

O-44 A Treatment Algorithm for Postburn Cervical Contracture: The Role of A Free Composite Scapular Flap

Danru Wang, Yixin Zhang, Rong Jin, Jun Yang, Yunliang Qian

Department of Plastic and Reconstructive Surgery, Ninth People's Hospital, Shanghai Jiao Tong University School of Medicine, China

E-mail: wangdanru@hotmail.com (Danru Wang)

Background: The neglect or inadequate treatment of neck burns can lead to severe structural deformities of the soft tissue and bone. Typical management using skin grafts may not prevent the negative impact of scarring contractures on maxillofacial development. The authors therefore present a treatment algorithm with a free composite scapular flap, used both functionally and aesthetically, for severe postburn cervical contractures.

Methods: The complete release of a cervical contracture was achieved by scar excision and cervicoplasty, which deepens the cervicomental angle and further prevents contracture recurrence. Based on preoperative cephalometric measurements, either vascularized scapular bone grafting or sliding genioplasty was performed. Subsequently, the neck defect was resurfaced with either a traditional single or a bilobed free scapular flap depending on the aesthetic cervical subunits involved. **Results:** 13 patients with severe postburn neck deformities were treated. A bilobed or a traditional single scapular flap with bone was used in 8 cases. Sliding genioplasty with single or bilobed scapular flap coverage was used in 5 cases. All flaps survived with no major complications. Range of motion for the neck was successfully achieved. The cervicomental angle was improved in all cases with postoperative measurements ranging from 90 to 120 degrees. There were no contracture recurrences at follow up. **Conclusions:** For severe postburn cervical contractures, the application of a free composite scapular flap can provide the soft tissue and bony components necessary for adequate reconstruction of the neck. Additionally, the sliding genioplasty will correct the retrusive chin and improve the cervicomental angle.

O-45 Management of Contractures: A Five Years Prospective Study at Komfo Anokye Teaching Hospital in Kumasi, Ghana

Emmanuel Adu

School of Medical Sciences, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana

E-mail: aduemmanuel@hotmail.com

Background: Contractures are common complications of wounds healing by secondary intention; some cases are idiopathic; a few are congenital. Contractures cause significant morbidity to patients. The true incidence of contractures in Ghana is unknown; published data on the condition in Ghana is scanty. **Methods:** A prospective study from January 2004 to December 2008 was undertaken at Komfo Anokye Teaching Hospital in Kumasi. A clinical history to document name, age, sex, site, extent and cause of the contracture was taken. Patients were examined and functional impairment recorded. A clinical photograph was taken. Patients requiring surgery had their contractures released and the defect repaired with an appropriate reconstructive technique. Patients

with minimal functional impairment underwent physical therapy without surgery. **Results:** Sixty eight patients comprising 44 males and 24 females were seen. Male to female ratio is 1.83:1. Their ages ranged from 0.66 to 60 years; mean age was 22.53 years. Seventy six sites were involved: hand (31), head and neck (9), axilla (9), elbow (9), knee (5), ankle (4), foot (4), wrist (2), perineum (1), groin (1), hip (1). The aetiologies were: burns (44). Infections (12), trauma (7), idiopathic (4), congenital (1). Seventy one surgical procedures were performed: release and flap repair (33), full thickness skin graft (23), partial thickness skin graft and splinting (6), K-pin fixation and split skin grafting (4), fasciotomy (4), excision and direct closure (4); physical therapy without surgery (2). **Conclusions:** Thermal burns and soft tissue infections are the commonest causes of contractures presenting at Komfo Anokye Teaching Hospital in Kumasi; the hands and upper half of the body are mostly involved. These causes of contractures are preventable by early and adequate treatment of the acute conditions.

O-46 Children Living with Burn Scarring: Can Cosmetic Camouflage Improve Psychosocial Well-being?

James-Chadwick Jessica*, Newcombe Peter**, Martin Graham***, Kimble Roy*

*The Centre for Children's Burns and Trauma Research; The University of Queensland, Royal Children's Hospital, Brisbane, Australia

**School of Social Work and Human Services, The University of Queensland, Brisbane, Australia

***Child and Adolescent Psychiatry, The University of Queensland, Royal Brisbane and Women's Hospital, Brisbane, Australia

E-mail: j.jameschadwick@uq.edu.au (James-Chadwick Jessica)

Background: Due to the improvement in burn injury management, many people who may have previously died are surviving, and the focus of burns research has moved to include examining the psychological and psychosocial aspects of burn injury. Burn injuries leave patients with long-term physical scarring and an altered appearance. Children with scarring are often subjected to stigmatisation, bullying and name-calling. These negative experiences can have a profound effect on psychosocial well-being particularly given society's preoccupation with physical appearance. **Methods:** This study aims to investigate whether the use of cosmetic camouflage (Microskin™) has a positive impact on psychosocial functioning, focussing on health-related quality of life, psychopathology and self-concept for children and adolescents (8-17yrs) with burn scarring. This prospective multi-centre randomised controlled trial using a wait-list design is currently being conducted across paediatric hospitals in Australia and New Zealand. 66 participants (49 females, Mage=12.74 years, SD=2.158 years) have enrolled. Data is being collected over a six-month period using reliable and valid psychometric measures. **Results:** To date, pre-to post-intervention data indicates that participants are reporting the use of Microskin positively stating that they feel happier, more confident and more comfortable in public places. Preliminary analyses of the Pediatric Quality of Life Inventory (PedsQL 4.0) have revealed significant trends in improvements for the intervention group in emotional, school and psychosocial functioning. **Conclusions:** Appearance is significant to the self-concept of children and adolescents. The findings of improved psychosocial well-being following the use of cosmetic camouflage will make a significant contribution to the long-term rehabilitation practices for children with scarring.

O-47 About Scar Deformities of The Foot

Babur M. Shakirov, Usuf M. Achmedov, Hydoiberdy K. Karabaev, Komil R. Tagaev, Abror A. Polvonov
Samarkand State Medical Institute, Burn department of RSCUMA, Inter - Regional Burn Center, Samarkand, Uzbekistan

E-mail: baburshakirov@yahoo.com (Babur M. Shakirov)

Background: Scar deformities of the foot and the ankle joint represent 5 to 7% of all post-burn deformities. The scar deformities of feet represent the complex specific pathology of bearing - motor apparatus developed as complications after burn injury are liable to occur when the burn has been deep, infected, or not properly treated.

Methods: 101 patients were treated at the Burn department of RCUMA and Inter-regional Burn Center in Samarkand, Uzbekistan. We have worked out the saving principle of treatment of post burn contractures of digits when after cut and removal of scars we tried to extract remove fully all the elements of deformities at single-moment operation. The operations must be performed within 6-12 months after healing of burn wounds to prevent secondary changes. **Results:** In 79.1% of cases, contracture was removed completely, in 15.4% there was an improvement and only in 5.5% of cases there was no improvement because of the irreversible bone-joint changes and others. **Conclusions:** The method of operation should be chosen according to both severity and localization of the injury, using local uninjured tissues and soft scars to make Z-plasty or other shaped flaps and free grafts placed on the area of the excised scars.

O-48 Technique of Tissue Expansion for Resurfacing as A Treatment of Postburn Facial Scars

Sifen Yang*, Chunmei Wang*, Junyi Zhang**, Hiko Hyakusoku***

*Dongguan Kanghua Hospital, Dongguan, China

**Beijing Tongren Hospital, Beijing, China

***Nippon Medical School, Tokyo, Japan

E-mail: yangsifen@163.com (Sifen Yang)

Background: Postburn facial scars are common sequelae that require a surgical procedure. Many methods have been proved effective clinically, but the contour of the face and the shape of the organs on it were difficult to restore and ischemic complications were often reported by previous authors. The technique of tissue expansion was applied in divisional reconstruction of facial defects that could not be primarily closed in our department during these years to search for a practical and aesthetic approach. **Methods:** 70 patients were divided into three types according to the range of scarring. Type one included lesions within one aesthetic unit. Type two included lesions covering one or more aesthetic units. Type three were extensive scarring. Multi-staged procedures were carried out in all types. In stage I the expanders were inserted in the subcutaneous pockets and subdermal vascular plexus were preserved. After the flaps were expanded, scars were removed and the covering flaps were lobulated or not and transferred into place with the addition of expanded full-thickness skin grafts if necessary in stage II. For extensive scarring, more surgical procedures needed to be performed. **Results:** A distal superficial necrosis measured 3cm×2cm of expanded flap after transferring and a small part of the expanded flap necrosis at the end stage of expansion because of the compression between two expanded flaps were observed separately in two cases. There were no other complications. No debulking procedures were necessary. Postoperative follow up for 6 months to 2 years showed satisfactory results with good appearance and function. **Conclusions:** We have been favorably impressed with the use of expanded skin flap for facial reconstruction, which has the advantages of creating a large amount of thin tissue of both good color and texture, and high viability, without the disadvantages of donor-site morbidity, and bulky appearance of flap. In our opinion, this is a good choice for facial reconstruction that can minimize contractures and deformities.

O-49 Promoting Wound Healing Activity Using Indian Costus (Saussurea lappa)

Wadiah Saleh Backer, Faten A. Khorshid, Solafa Abdulrahman Zahran

Biochemistry Department, King Abdulaziz University, Saudi Arabia

E-mail: wbacker@kau.edu.sa (Wadiah Saleh Backer)

Background: The plant Saussurea lappa (costus) has been used in traditional medicines to treat wounds. However, there are no scientific reports on wound healing activity of the Saussurea lappa in literature. So, the present study was chosen to evaluate its scientific validity. The present investigation was undertaken to determine the efficacy of Saussurea lappa on wound healing. Wound healing is the process of repair that follows injury of the skin and other soft tissues. It has three phases include inflammation, proliferative and remodeling phases. **Methods:** This study used the roots of Saussurea lappa to evaluate wound healing activity using tissue culture model as in vitro and excision wound model in rats as in vivo. In tissue culture, the fibroblast cells were used to investigate the effect of Saussure lappa on healing activity via their ability to stimulate

fibroblast proliferation. In animal model, Excision wounds were made on the back of rat and Saussurea lappa was administered topically. Two groups of animal were used: treated group which was treated topically with Saussurea lappa (6g/100ml water) and control group which left untreated. Healing was assessed by the rate of wound contraction, period of epithelialization, protein, hexosamine and hydroxyproline concentrations.

Results: The results of in vitro showed that Saussurea lappa increase proliferation of fibroblasts and thus accelerate wound healing. Application of Saussurea lappa to a wound performed in rats showed that the healing process was faster than control group without appearance of any infection. Wound contraction increased significantly in treated group compared to the control group ($P < 0.01$). Also, the period of epithelialization decreased significantly ($p < 0.001$). The results revealed that protein and hexosamine content in healed tissue were increased significantly in treated group compared to the control group. Increase in collagen content was observed, but not significant. **Conclusions:** As conclusion, Saussurea lappa may revealed a safe and effective topical medicine for accelerate wound healing.

O-50 A Long Term Evaluation of Integra® and Split Thickness Skin Grafts in Cute Burns and Reconstructive Surgery

Dai QA Nguyen, Tom S Potokar, Patricia Price

Welsh centre of Burns and Plastic Surgery, Wound Healing Unit Cardiff Medical School, UK

E-mail: dainguyen@doctors.org.uk (Dai QA Nguyen)

Background: Integra® is the most widely used skin substitute and is reported to be superior in appearance and elasticity than SSG alone. A review of the literature reveals few trials that are based on an objective evaluation of Integra® as compared to SSG. Hence the aim was to obtain objective data on the outcome of Integra®.

Methods: All patients who had been treated with Integra® greater than a year were invited for review. The Vancouver scar scale (VSS) and the Patient & Observer scale (POS) were used to evaluate whether Integra® was subjectively superior to SSG. The patients site matched normal skin was used as the control. The hypothesis that Integra is more pliable than SSG was tested using the scales to score pliability of stiffness and using the Cutometer, a suction device which measures skin elasticity. **Results and conclusion:** Six patients were available for assessment. Despite the small study size Integra® treated sites correlated well with patient's normal skin as measured by the Cutometer. This was statistically significant for the parameters U_r/U_e (elastic function) and U_r/U_f (gross elasticity). This suggests that the viscoelastic properties of Integra® are similar to normal skin. The Cutometer measurements did not correlate with the clinicians and patients subjective assessment which didn't demonstrate a difference between Integra® and SSG.

O-51 I.I.I.: Integra® Interdisciplinary Indications

L. Annacontini, D. Parisi, M. Valente, A. Campanale, M. Grieco, A. Portincasa

Institution: Plastic and Reconstructive Surgery Department, University of Foggia, Italy

E-mail: lannacontini@hotmail.com (L. Annacontini)

Background: Integra® is a temporary bilaminate membrane system derived by bovine tendon collagen and glycosaminoglycan. Its use tend to permanent dermal layer regeneration. **Methods:** Integra® indications are multiple: vascular ulcers, burns, post oncological or post traumatic reconstructions, congenital malformations. January 2004 - June 2010 84 patients (36F and 18M, 3-82 yrs, mean age 54) were treated: 68 post-surgical cases (61 post oncological demolition, 7 post traumatic cases), 5 pz affected by vascular ulcers, 4 pz after burns, 6 pz with "old" retracting scars and 1 pz affected by the Proteus Syndrome. Integra® is shaped on the lesion, fixed with the Appose, dressed with Vaseline and sterile gauzes, covered with elastic bands (T0). Regular controls were made at T7, T14, T21. After 4 weeks a split-thickness autograft (0.16 mm) is performed. **Results:** We did not observe retracting scar but in one case solved with a microsurgical reconstruction (ALT flap for foot reconstruction). Integra® results in better morfo-functional result compared to skin grafts; minor trauma if compared to the flaps; readily available; grafting can be delayed until the patient is stable and donor sites are plentiful. "Disadvantages" are: minimum training required; accuracy of the procedure; serial clinical controls;

patients selection; two-steps procedure. **Conclusions:** Most of our patients (near to 75%) obtained satisfactory morfo-functional results. With no doubt in selected patients Integra[®] can be considered a valid, safe, option to more sophisticated procedures like local and/or microsurgical flaps.

Poster Presentations

P-01 Treating Infected Wounds with A Hydro Balance Dressing Containing phmb

Bettina Gunst*, Anneke Andriessen**

*EHPAD Department, Local Hospital of St Laurent de Chamousset, France

**Andriessen Consultants, Malden, Netherlands

E-mail: bettyinf2000@hotmail.com (Bettina Gunst)

Background: An infection may be at the origin of persistent wounds, in the elderly, it can have significant repercussions because the organism is already weakened. The hydro balance with PHMB (polyhexamethylene biguanide) dressing is capable of absorbing exudates while maintaining the necessary humidity for the wound. They also procure an antimicrobial effect. The objective is to heal these wounds with a dressing while avoiding antibiotherapy by general means of which the side effects can be non-negligible in the elderly. **Methods:** 98 year old patient admitted with a history of coronopathy, arrhythmia with auricular fibrillation, under nutrition. Following a fall, he presented dermabrasions on the hand, arm and elbow. 24 hours after the application of a classic dressing (interface type) this man presented edema in the hand, inflammation and significant pain. The presence of a nauseating, greenish discharge lets us assume infection. We used the hydro balance with PHMB dressing to avoid general antibiotherapy. **Results:** The hydro balance with PHMB dressing allows a real decrease in inflammation, discharge a pain. The comfort of the dressing is very appreciated by the patient. Budding was carried out correctly, the wound healed in a few weeks. **Conclusions:** The hydro balance with PHMB dressing showed a significant antimicrobial effect in this case. Its application may be useful in handling infected wounds.

P-02 The Management of A Patient with A Non-Healing Venous Leg Ulcer Using A HydroBalance Dressing

Bettina Gunst*, Marc Wister**

*EHPAD Department, Local Hospital of St Laurent de Chamousset, France

**Department of Geriatrics, Melun Medical Centre, France

E-mail: bettyinf2000@hotmail.com (Bettina Gunst)

Background: This case describes the successful management of a 83-years old patient with a painful, non-healing venous leg ulcer, which had recurred regularly over the past 15 years. Previously her leg ulcer had been unsuccessfully treated with all the dressings and compression bandages available in the formulary. **Methods:** In February 2007 the patient presented at the dermatology department with a circumferential ulcer on her oedematous right leg. The very painful sloughy ulcer produced copious amounts of foul smelling exudate. An alginate** dressing was used and for compression a long stretch bandage was applied. In July 2007 the ulcer had not improved and the patient reported excruciating pain, for which she was given morphine. The dressing was changed to a HydroBalance* dressing and a short stretch compression bandage.*** Dressing changes took place every two days for 4 weeks and was then reduced to once a week. **Results:** After two days of treatment with the HydroBalance* dressing she reported the pain had almost gone (from 8 to 2 (VAS 0-10)). In February 2008 the ulcer was completely closed, however a small ulcer recurred in March 2008. The same dressing regime and short stretch compression was used for 4 weeks until ulcer closure. The ulcer has remained closed up till now. **Conclusions:** The dressing and bandaging regime was shown to be successful. Especially the pain reduction with the HydroBalance dressing was noted.

P-03 Use of The Hydroclean Active* Absorbent Irrigated Dressing Pad for Wound Cleansing in Old People's Home

Mark Wiser, Caroline Van Wijk

Department of Geriatrics, Melun Medical Centre, France

E-mail: marc.wiser@free.fr (Mark Wiser)

Background: In chronic wounds, the cleansing phase is a critical phase whose successful outcome is crucial for the wound healing process to continue. The dressing pad has a central role in wound bed preparation in terms of both removing necrotic debris and fibrin coatings and controlling the risk of infection. **Methods:** In three clinical cases of patients with chronic wounds that were either infected or at risk of infection, we evaluated the absorbent irrigated dressing pad in the cleansing phase. The dressing pad was changed daily, accompanied by mechanical cleansing, for a treatment period of 7 to 15 days, depending on how long it took for healthy granulation tissue to form. **Results:** We attached great importance to selecting a dressing pad that would permit gentle wound cleansing and be capable of softening and facilitating the removal of necrotic debris and fibrin coatings, while controlling exudate formation and the risk of infection. We simply fixed the Hydroclean active dressing pad with transparent adhesive film. We found that dressing pad removal was painless and atraumatic. Clear improvements in wound status were achieved quickly—reduction of inflammation, resumption of the wound healing process with the appearance of epithelial buds, and reduction in wound size. Once Hydroclean active was no longer needed, we used a hydrocellular dressing instead. **Conclusions:** The irrigating and absorbent properties of Hydroclean active achieved rapid removal of fibrin coatings, restarting the wound healing process. This dressing has the combined advantage of keeping the wound clean and making dressing changes easy. Additionally we recognized that it avoided pain and unpleasant odours.

* Hydroclean active is also marketed under the trade name TenderWet active

P-04 Treatment of An Infected Venous Leg Ulcer with An Hydrobalance Wound dressing Containing PHMB*

Mark Wiser, Caroline Van Wijk

Department of Geriatrics, Melun Medical Centre, France

E-mail: marc.wiser@free.fr (Mark Wiser)

Background: The objective of this study was to investigate the effect of a non adherent hydrobalance dressing containing PHMB (polyhexamethylene biguanide, an antiseptic active on many germs) on an infected venous ulcer, very difficult to heal. **Methods:** A 78-years-old patient with Caribbean origins, whose the main background are severe overweight, chronic venous insufficiency and hypertensive heart disease. She suffered since many years from ulcerous wounds on the lower limbs. The most hard to heal were located at the malleoli. We alternate phases of improvement after debridement and phases of recurrence of fibrin and infection (*Pseudomonas aeruginosa* and *Staphylococcus aureus*). **Results:** A daily refection of the dressing was necessary for this very exuding wound. We observed rapid vanishing of smell and good control of exudates with acceptable maceration of edges. Refections were painless, without trauma, with respect for tissue regeneration. In ten days, a new epithelialisation was obtained by the edges and above all by the base of the wound. The complete healing of both ulcers was obtained in 45 days. **Conclusions:** The hydrobalance dressing containing PHMB allowed us to heal two venous leg ulcers, infected for 2 years. Such dressing seems an interesting alternative to silver for the treatment of infected or critically colonized wounds.

P-05 Treatment of One Wound And Two Pressure Ulcers with A Superabsorbant Dressing*

Mark Wiser

Department of Geriatrics, Melun Medical Centre, France

E-mail: marc.wiser@free.fr (Mark Wiser)

Background: The objective of this study was to investigate the interest of a new superabsorbent dressing used as a primary dressing. **Methods:** A 82-years-old patient has a fracture of the neck of the femur complicated by the occurrence of pressure ulcers (heel and ankle) and of an elongated wound on the calf. The tested superabsorbent dressing has an absorbent core consisting of superabsorbent polymer particles and is indicated for the management of heavily exuding wounds. It has been used as a primary dressing on the 3 wounds after debridement. **Results:** Results were really satisfactory with the wound located on the calf: no more fibrin, apparition of granulation tissue, painless changes, complete healing in 25 days. On pressure ulcers, though less

dramatic, results are nonetheless interesting: no more fibrin, apparition of good quality granulating tissue, but a change in the protocol was necessary because of apparition of maceration due to very important exudate
Conclusions: It appears from this study that the Vliwasorb should be used as secondary dressing in combination with an alginate for very exuding wounds. It nevertheless seems interesting as primary dressing in the management of superficial wounds.

P-06 Evaluation of The Donor Site in Patients who Underwent Reconstruction with A Free Radial Forearm Flap

Osamu Ito*, Masumi Suzuki*, Hiroki Miyashita**, Takayuki Shirai*, Minako Ito*

*Department of PRS, Yokohama City Minato Red Cross Hospital, Yokohama, Japan

**Department of PRS, Tokyo Medical & Dental University, Tokyo, Japan

E-mail: osaito1005@yahoo.co.jp (Osamu Ito)

Background: A major disadvantage of free radial forearm flaps is the conspicuous donor site. However, there have been few studies on donor scars. We evaluated the donor site in patients who underwent oral-floor reconstruction with a free radial forearm flap. **Methods:** The subjects were 23 patients with malignant oral tumors, and were followed for one year or longer. The fasciocutaneous flap collection site was closed by full-thickness skin graft (FTSG) from the groin with tie-over dressing. At the scar at the donor site, five items (pigmentation, scar width, depression, wrist mobility, and sensory abnormalities) were evaluated. **Results:** Depression and pigmentation were often observed, but patient dissatisfaction was slight. While their main postoperative concern was the oral reconstruction site, after about 1 year, the donor site became more important to patients. **Conclusions:** A 100 percent take of the FTSG at the donor site should produce good results. Surgeons should pay adequate attention not only to the outcome at the reconstruction site, but also to closure of the donor site.

P-07 Effective Approaches to The Treatment of Postburn Scar Consequences

Valentin I. Sharobaro, Vladimir A. Zlenko, Andrew M. Tkachev, Guzal M. Isamutdinova

A.V.Vishnevsky Institute of Surgery, Moscow, Russia

E-mail: sharobarovi@mail.ru (Valentin I. Sharobaro)

Background: Surgical treatment of burn consequences differ both on methods and terms of treatment that determine results of rehabilitation. **Methods:** 1807 patients with postburn scar defects, deformations and contractures of various anatomic areas underwent treatment in A.V.Vishnevsky Institute of Surgery in 1998-2010. The majority of patients were persons of working-able age. Results of application of various timing, staging and techniques of treatment were compared. **Results:** Best results were achieved at the systematized approach to the treatment. At presence of significant functional defects surgical treatment was began with their elimination, irrespective of terms pasted from trauma. The first stage included correction of eyelid ectropion, microstomia, scar contractures of joints and neck. At presence of scar contractures of several joints we performed their elimination in one stage. At localization of postburn deformations in various anatomic areas we carried out one-stage simultaneous operations for their elimination. However at contractures of joints of both upper extremities or hands we did not operate them in one stage that patients could serve themselves in the postoperative period. Also complex conservative treatment was used between and after stages of surgical rehabilitation – local treatment (compressive elastic bandages, gels Dermatics, Contractubex, hormone injections), physiotherapy (electrophoresis with lidaza or phermentole, ultrasound with hydrocortisone, magnetotherapy) and balneotherapy. **Conclusions:** Early surgical treatment of significant functional defects, the systematized approach to staging of reconstruction, carrying out one-stage simultaneous operations in different anatomic areas, a combination of surgical and conservative treatment allow effective rehabilitation of patients with scars after burns.

P-08 Reconstruction of Complex Scar Deformations of The Face after Burns

Valentin I. Sharobaro*, Igor V. Otvagin**, Andrew M. Tkachev*, Guzal M. Isamutdinova*

*A.V.Vishnevsky Institute of Surgery, Moscow, Russia

**Smolensk State Medical Academy, Smolensk, Russia

E-mail: sharobarovi@mail.ru (Valentin I. Sharobaro)

Background: Scar facial deformations are formed at 30-34% of patients suffered from burns and seriously destroy their social life. Facial reconstruction after burns is one of most important and challenging parts of plastic&reconstructive surgery. **Methods:** 742 patients with postburn scar deformations of a face underwent treatment in A.V.Vishnevsky Institute of Surgery in 1998-2010. The majority of patients were persons of working-able age – from 16 to 55 years. Results of application of various timing, staging and techniques of treatment were compared. **Results:** Surgical treatment was started irrespectively of terms pasted from a burn at presence of significant functional defects (such as eyelid ectropion, microstomia, neck contracture). Otherwise reconstructive operations were performed not earlier than 6 months after trauma. Postburn scar facial deformations are characterized by deficit of tissues, applicable for plastics. Therefore, besides local flaps, tissue expansion was widely used for the reconstruction of alopecia, forehead, cheek and neck areas. The indication for free tissue transfer was the impossibility to use any local tissues or tissue expansion. Brow reconstruction was made by free hair transplant or pedicled hair bearing flap. Nose restoration was performed by combination of local or rotated flaps, skin and cartilage grafts. Ear reconstruction was done using combination of cutaneous or temporalis fascia flaps on vascular pedicles and cartilage grafts. When osseous defects were present, 3D CT and stereolithography models were used for reconstruction. **Conclusions:** Usage of modern techniques allows to achieve good results and to reduce terms of rehabilitation of patients with complex scar facial deformations.

P-09 The Role of Wnt Signal Pathway in Keloid Pathogenesis

Shinichi Igota^{*,***}, Mamiko Tosa^{**,****}, Mohammad Ghazizadeh^{***}, Masahiro Murakami^{**}, Hiko Hyakusoku^{****}

*Department of Plastic and Reconstructive Surgery, Higashi totuka Memorial Hospital, Yokohama, Japan.

**Department of Plastic and Reconstructive Surgery, Nippon Medical School Musashi-kosugi Hospital, Kawasaki, Japan.

***Department of Molecular Pathology, Institute of Gerontology, Nippon Medical School, Kawasaki, Japan

****Department of Plastic and Reconstructive Surgery, Nippon Medical School, Tokyo, Japan

E-mail: tosa-m@nms.ac.jp (Mamiko Tosa)

Background: Wnt signaling plays an important role in embryonic development and neoplasia including cell growth and differentiation. On the other hand, β -catenin is a mediator in the canonical Wnt signaling pathway. We examined the role of Wnt signaling in keloid at mRNA and protein levels with regard to the Wnt family members and the downstream target, β -catenin. **Methods:** Primary cell cultures and tissue samples from keloid and adjacent normal appearing dermis were used. Wnt family members 1, 2, 3, 4, 5a, 6, 7a and β -catenin were assessed using a semi-quantitative RT-PCR, Western blot and immunohistochemical methods. **Results:** Analyses at mRNA level showed that of the Wnt family members, Wnt 2 was sporadically expressed and Wnt 5a showed increased expression in keloid fibroblasts. Also, the expression of β -catenin mRNA was increased in keloid. Western blot analysis showed increased expression of β -catenin in keloid compared to normal fibroblasts. Immunohistochemical analyses showed marked cytoplasmic staining and moderate nuclear staining for β -catenin in keloid fibroblasts. Normal dermal fibroblasts from the same tissues showed no or trace staining. **Conclusions:** In keloid fibroblasts, increased expression of Wnt-5a which typically signals via β -catenin-independent pathway may activate the β -catenin-dependent pathway as well.

P-10 Analysis of Diseases that Resemble Keloid and A Diagnosis is Difficult

Hiroaki Kuwahara*, Mamiko Tosa*, Itaru Iwakiri*, Mayuko Tajima*, Masahiro Murakami*, Hiko Hyakusoku**

*Department of Plastic and Reconstructive Surgery, Nippon Medical School Musashi-kosugi Hospital, Kawasaki, Japan.

**Department of Plastic and Reconstructive Surgery, Nippon Medical School, Tokyo, Japan.

E-mail: tosa-m@nms.ac.jp (Mamiko Tosa)

Background: A keloid is a benign tumor with inflammation. There is a report of the resemble keloid, and the malignant tumor is included in that recently. We studied the case of disease that resembles keloid and had difficulty in diagnosis. **Methods:** We studied for the patients with keloid who come to our outpatient by April, 2008 from April, 2006. We extracted cases which suffered from a diagnosis of the keloid and was disease except the keloid, as a result. **Results:** We examined 254 patients with keloid. We detected 7 patients with other diseases except keloid (1.6%). The details of the disease are Kimura's disease, atheroma, leiomyoma, papillary dermatitis, squamous cell carcinoma, tubular adenoma, and Bednar tumor. **Conclusions:** Our study led us to the conclusion that differential diagnosis of diseases similar to keloid is important. When we hesitate about a diagnosis because a malignant tumor may be included for resemble keloid, we should perform a biopsy preoperatively.

P-11 Impact of Maggot Debridement Therapy in Patients with Ischemic Foot Ulcer

Yoshiko Matsuda

Department of Surgery Kusumoto Hospital, Hiroshima, Japan

E-mail: star3david@yahoo.co.jp

Background: In Japan, the incidence of incurable ulcers with bone infection in diabetic patients has increased. In order to avoid limb amputation in these patients, we examined the effect of maggot debridement therapy (MDT) as a treatment option. **Methods:** Three severe ischemic ulcer cases were treated with MDT at our hospital, application for implementation of the therapy was presented to the Committee of Standards of Official Conduct of Kusumoto Hospital has been approved. At first, sterile maggots were placed on the area of the foot ulcer for 3 days, removed and replaced with new maggots the next day. The 3-day course of MDT was performed for three patients (two patients received three 3-day courses and one received five 3-day courses). After the treatment courses the foot ulcers were covered with a plastic board having small holes. **Results:** With MDT, we were able to control the bone infection in all three cases. **Conclusions:** In order to avoid limb amputation in these patients, we were convinced the effect of maggot debridement therapy (MDT) as a treatment option.

P-12 Assessment of Recurrence Regions of Keloid Operated with Z-Plasty

Kaho Matsuda, Fumiaki Shimizu, Miyuki Uehara, Seiichi Sato, Daisuke Masuda, Hiroko Taneda, Aiko Kato

Department of Plastic Surgery, Faculty of Medicine, Oita University, Oita, Japan

E-mail: kaho1025@med.oita-u.ac.jp (Kaho Matsuda)

Background: Z-plasty is commonly used for reconstruction after keloidal excision. The effects of Z plasty including extending, dispersing and accordion effects can reduce the recurrence rate of keloids. However, partial recurrence of keloids is sometimes encountered. **Methods:** From 2005 to 2009, 24 patients of keloid were treated with Z plasty after keloidal excision. 20Gy/10fr postoperative electron beam irradiation was performed. The recurrence case was extracted and assessed the region of recurrence retrospectively. **Results:** Eleven of 24 cases showed the partial recurrence. In these cases, some tendency of recurrence pattern was observed. **Conclusions:** Some tendency of recurrence pattern after Z plasty was found. This fact might help us to understand the mechanism of recurrence of keloid.

P-13 Existence of Neurites Promotes Differentiation of Dermal Fibroblasts into Myofibroblasts and Induces Contraction of Collagen Matrix in Vitro

Toshihiro Fujiwara^{*}, Kenji Fukuda^{*}, Soh Nishimoto^{*}, Masao Kakibuchi^{*}, Ko Hosokawa^{**}, Tateki Kubo^{***}

^{*}Department of Plastic and Reconstructive Surgery, Hyogo College of Medicine, Hyogo, Japan

^{**}Department of Plastic and Reconstructive Surgery, Osaka University Graduate School of Medicine, Osaka, Japan

^{***}Department of Plastic and Reconstructive Surgery, Osaka Rosai Hospital, Osaka, Japan

E-mail: fuji-t@hyo-med.ac.jp.

Background: It is commonly recognized that denervation of skin causes detrimental effect on secretion of neuropeptides and the inflammatory and microvascular responses in all phase of wound healing, resulting in the delayed wound healing. We examined the effect of neurites on the differentiation of fibroblasts and on the contraction of collagen matrix in vitro, which mimics wound contraction. **Methods:** Dermal fibroblasts were obtained from dorsal skin of SD rats at three days old. PC12 cell was used as a neuronal cell model. In group 1, fibroblasts were co-cultured with undifferentiated PC12 cells without neurites. In group 2, fibroblasts were co-cultured with differentiated PC12 cells with extending neurites. In both group, the differentiation of fibroblasts into myofibroblasts by co-culture with PC12 cells and the contraction of collagen gel matrix including fibroblasts were examined. Quantitative analysis of α -SMA mRNA signal was also performed by real time RT-PCR. **Results:** The fibroblasts co-cultured with differentiated PC12 cells with neurites more strongly expressed α -SMA than the ones with undifferentiated PC12 cells without neurites. Differentiated PC12 cells with neurites induced contraction of collagen gel matrix including the fibroblasts. The expression level of α -SMA mRNA of fibroblasts co-cultured with differentiated PC12 cells was higher than the one with undifferentiated PC12 cells. **Conclusions:** Differentiated PC12 cells with neurites differentiated fibroblasts into myofibroblasts and induced contraction of collagen and α -SMA mRNA expression in fibroblasts. Therefore, in case that wound healing is delayed, promoting nerve regeneration in wound area might contribute to wound healing.

P-14 Caveolin 1 Inhibits Transforming Growth Factor- β 1 Activity via Inhibition of Smad Signaling by Hypertrophic Scar Derived Fibroblasts in Vitro

Zhang Guo-You^{***}, He Bin^{***}, Liao Tian^{****}, Lin Ding-Sheng^{*}, Wang An-Yuan^{*}, Zheng Xin^{*}, Xie Xue-guan^{*}, Gao Wei-Yang^{*}

^{*}Department of Hand and Plastic Surgery, the 2nd Affiliated Hospital of Wenzhou Medical College, Zhejiang Province, China

^{**}Department of Dermatology, University of Lübeck, Lübeck, Germany

^{***}Department of Orthopedic Surgery,

Second Hospital Affiliated to Zhejiang University of Traditional Chinese Medicine, Hangzhou, China

^{****}Department of Otolaryngology, Head and Neck surgery, Charite Campus Benjamin Franklin, Berlin Germany

E-mail: Guoyou.zhang@yahoo.com, guoyou.zhang@uk-sh.de (Zhang Guo-You)

Background: Recent studies have implicated that caveolin-1 plays an important role in the regulation of transforming growth factor- β 1(TGF- β 1) signaling and participates in the pathogenesis of tissue fibrosis. However their effects on dermal fibrosis-hypertrophic scar are unknown. The aim of this study was to investigate the role of caveolin 1 in modulating the profibrotic action of TGF- β 1 in hypertrophic scar fibroblasts and its underlying mechanisms. **Methods:** Hypertrophic scar fibroblasts were cultured and exposed to different concentration caveolin-1 cell-permeable peptides (cav-1p) in the presence of TGF- β 1. Hypertrophic scar fibroblasts phenotypes and protein production were analyzed by real-time reverse transcriptase-polymerase chain reaction, Western blot, and multiplexed enzymelinked immunosorbent assay techniques. The effect of cav-1p on cell viability was evaluated by the colorimetric conversion of 3-[4, 5-dimethylthiazol-2-yl]-2, 5-diphenyltetrazolium bromide. **Results:** Caveolin 1 was markedly decreased in the hypertrophic scar derived fibroblasts. Moreover, cav-1p inhibited TGF- β 1-induced plasminogen activator inhibitor-1 (PAI-1), α -smooth

muscle actin (α -SMA) mRNA and protein expression. Cav-1p suppressed not only TGF- β 1-induced Smad2 phosphorylation in a dose- and time-dependent manner, but also the nuclear accumulation of receptor-regulated Smads (R-Smad), Smad2 and Smad3. A Jun nuclear kinase (JNK) pathway inhibitor (SP600125) could partly reverse the inhibitory effect of cav-1p on Smad phosphorylation. **Conclusions:** Caveolin 1 appears to participate in the pathogenesis of tissue fibrosis in hypertrophic scar. Restoration of caveolin 1 function by treatment with a cell-permeable peptide corresponding to the caveolin 1 scaffolding domain may be a novel therapeutic approach in skin tissue fibrosis.

P-15 The Effect of Keratinocytes on Myofibroblasts in Hypertrophic Scar

Ho Yun Chung^{*,**}, Eun Jung Oh^{***}, Hyun Ju Lim^{***}, Tae Jung Kim^{*}, So Yeon Jung^{*},
Sae Hwa Jeon^{****}, Hwan Sung Cho^{*****}

^{*}Department of Plastic & Reconstructive Surgery, Kyungpook National University, School of Medicine, Korea

^{**}Joint Institute for Regenerative Medicine, Kyungpook National University, School of Medicine, Korea

^{***}Department of Advanced Materials Science and Engineering, Kyungpook National University, Korea

^{****}Tego Science Inc., Korea

^{*****}Dept. of Orthopedic Surgery, Kyungpook National University, School of Medicine, Korea

E-mail: hy-chung@knu.ac.kr (Ho Yun Chung)

Background: During wound healing, myofibroblasts play a central role in matrix formation and wound contraction. At the end of healing, there is evidence that myofibroblasts disappear via apoptosis. Hypertrophic scarring is a pathological condition that myofibroblasts persist in the tissue. It has been hypothesized that abnormalities in epidermal–dermal crosstalk explain this pathology. To find out how myofibroblasts respond to epithelial stimuli, we characterized myofibroblasts in monolayer co-culture with keratinocytes.

Methods: For initial assessment, human myofibroblasts from hypertrophic scar tissue (Hmyo) and TGF- β induced myofibroblasts from normal dermal fibroblasts (Imyo) were characterized by microarray. And then human keratinocytes co-culture was applied into several different experimental groups. Each group was analyzed by immunohistochemistry, RT-PCR, and Real-time PCR. **Results:** On microarray, numerous extracellular matrix- and smooth muscle cell associated genes were up-regulated in Hmyo and Imyo respectively, suggesting Hmyo are fully differentiated. Decreased collagen type 1(COL1A1) gene expression was shown in keratinocytes co-cultured Imyo and Hmyo. Smooth muscle actin (SMA) gene expression in Imyo, which was not affected by exogenous TGF- β , increased by keratinocytes co-culture. SMA gene expression in Hmyo increased by TGF- β and decreased in keratinocytes co-cultured Hmyo. **Conclusions:** These observations strongly suggest that keratinocytes play a role in the development of pathological fibrosis in hypertrophic scar by influencing the behavior of dermal fibroblasts or myofibroblasts. It is expected that this analysis would provide the basis of hypertrophic scar pathophysiology and new therapeutic approaches.

P-16 Measurement of Keloid Color

Masayo Aoki^{*}, Jyunichi Nakao^{*}, Teruyuki Dohi^{*}, Satoshi Akaishi^{*}, Tsuguhiro Miyashita^{**}, Hiko Hyakusoku^{*},
Rei Ogawa^{*}

^{*}Department of Plastic, Reconstructive and Aesthetic Surgery, Nippon Medical School, Tokyo, Japan

^{**}Department of Radiation Oncology, Nippon Medical School Hospital, Tokyo, Japan

E-mail: r.ogawa@nms.ac.jp (Rei Ogawa)

Background: The color of keloids/hypertrophic scars (HSs) is an indicator of the severity of the lesions and the effectiveness of treatment. However, color judgments can be subjective. A method by which keloid/HS color can be evaluated objectively and quantitatively has not yet been established. This paper presents our trial of a color measurement device, which was used to evaluate the color of these red scars. **Methods:** A

DermaSpectrometer[®] (CORTEX TECHNOLOGY, Hadsund, Denmark) was used to measure the color of 33 keloids from 30 patients. The erythema and melanin levels in the keloids (designated Ek and Mk, respectively) were recorded along with control data taken from the flexor aspect of the forearm (Ec and Mc,

respectively). The color was also evaluated subjectively by using a 4-point system. The Ek/Ec and Mk/Mc ratios were calculated. How Ek, Mk, Ek/Ec and Mk/Mc related statistically to the scar region, subjective color score, and patient age and sex were then assessed. **Results:** Neither Ek nor Mk varied significantly depending on scar region, subjective color score, or patient age or sex. However, the Ek/Ec ratios were significantly higher in patients under the age of 40 years (relative to >40-year-old patients) and in female patients. **Conclusions:** Ek/Ec was statistically larger in young or female patients, and it was suggested that these patients are often judged to exhibit strong redness. On the other hand, older or male patients tend to be judged to have weak redness, even when the lesion redness is severe. Thus, it is difficult to judge the severity of keloid/HS color with the naked eye. In contrast, a DermaSpectrometer[®] appears to accurately measure the color of these red scars in an objective and quantitative manner.

P-17 Flap Surgery for Severe Keloids: Our Trials of Flap Surgery Performed For the Purpose of Tension Reduction

Teruyuki Dohi, Satoshi Akaishi, Shimpei Ono, Shimpei Nara, Takeshi Iimura, Hiko Hyakusoku, Rei Ogawa
Department of Plastic, Reconstructive and Aesthetic Surgery, Nippon Medical School, Tokyo, Japan
E-mail: r.ogawa@nms.ac.jp (Rei Ogawa)

Background: Keloids can be treated surgically in two ways: the keloid is either radically resected or its mass is reduced. For both types of surgical approaches, skin grafting or flap transfer may be required if the keloid is difficult to excise completely and suture directly. This paper presents our trials of flap surgery for large and severe keloids. **Methods:** Thirteen patients with large/severe keloids located on the anterior chest wall (n=10), shoulder (n=1), or suprapubic region (n=2) were treated with vascular-pedicled flaps, including several perforator-pedicled propeller flaps. All cases received postoperative radiation therapy (20 Gy/4 fractions/4 days) and surgical tape fixation and were followed up. The postoperative courses were evaluated. **Results:** The postoperative course was uneventful for all cases and keloid recurrence was not observed. **Conclusions:** It is well known that keloids occur frequently on particular sites, including the anterior chest, shoulder, scapular area, lower abdomen, and suprapubic region. All of these sites are frequently subjected to skin stretching caused by the natural daily movements of the body. This site-specificity of keloids suggests that to prevent the development and recurrence of keloids, it would be useful to avoid subjecting wounded skin by flaps to sustained mechanical force.

P-18 Analysis of the regions of the body where keloids tend to occur

Yasutaka Omori, Satoshi Akaishi, Hiko Hyakusoku, Rei Ogawa
Department of Plastic, Reconstructive and Aesthetic Surgery, Nippon Medical School, Tokyo, Japan
E-mail: redstoneprs@gmail.com (Satoshi Akaishi)

Background: Keloids are most likely to occur in the precordial, scapular, and pubic regions of the body, but the relative frequencies with which they occur in these regions have not been analyzed at the statistical level. Consequently, we analyzed the distribution of keloids caused by small stimuli, namely idiopathic causes, acne vulgaris, and minor traumas. **Methods:** In total, 1034 keloids of 362 patients (227 males, 135 females, average age 32.4 years) were analyzed. In 211, 652, and 171 cases, the causes were idiopathic, acne vulgaris, and minor traumas (such as insect bites, bra hook trauma, and vaccination), respectively. Cases of keloids with obvious causes like surgery were excluded. The frequencies with which keloids occurred on various regions of the human body were mapped. **Results:** Moving from the head downwards, there were 101 keloids in the facial region, 487 on the precordial region, one on the side of the chest, 361 on the scapular regions, three on the upper abdomen, 16 on the lower abdomen, nine on the dorsal areas, 35 on the brachial regions, six on the antebrachial regions, 12 on the femoral regions, and three on the leg regions. **Conclusions:** A distribution map showing where keloids are most likely to occur was generated. The highly favored sites did not differ with regard to the causes of keloid development. The keloids were particularly likely to occur in sites of high skin tension,

especially the trunk of the body. This confirms that there is a close relationship between skin tension and the development of keloids.

P-19 Visual Analysis of the Relationship Between Keloid Growth Patterns and Stretching Tension by Using the Finite Element Method

Mai Watanabe, Satoshi Akaishi, Masataka Akimoto, Hiko Hyakusoku, Rei Ogawa

Department of Plastic, Reconstructive and Aesthetic Surgery, Nippon Medical School, Tokyo, Japan

E-mail: redstoneprs@gmail.com (Satoshi Akaishi)

Background: Since keloids grow and spread both vertically and horizontally, they are similar in many respects to slowly growing malignant tumors. Their horizontal growth results in characteristic shapes that depend on their location. For example, keloids on the anterior chest grow in a “crab’s claw”-like pattern, whereas shoulder keloids grow in a “butterfly” shape. These patterns may reflect the predominant directions of the skin tension at these sites. The finite element method was used to test this notion. **Materials and methods:** Keloids and normal skin structures were reproduced by using DISCUS[®] software. The contours were transferred to ADINA[®] analytical software to rebuild and mesh volumes. Moreover, we analyzed the mechanisms by which silicone gel sheets (SGS) reduce skin tension. We also varied SGS properties (e.g., hardness and thickness) to determine which types of SGSs will best reduce the tension around scars. **Results:** High tension was observed at the edges of stretched keloids. In contrast, the keloid centers were regions of low tension, which helps to explain the healing that generally occurs at the center of keloids. The “crab’s claw”-shaped invasion occurred in response to increased stretching tension. SGSs were effective in reducing the tension at the border between the scar and normal skin, although additional tension was produced on the normal skin under the lateral edge of the SGS. An SGS that was at least as hard as normal skin reduced tension most effectively.

Conclusions: These results indicate that keloid expansion occurs in the direction of skin pulling and that the skin stiffness at the keloid circumference correlates directly with the degree of skin tension. These observations strongly support the notion that skin tension is closely associated with the pattern and degree of keloid growth. Moreover, it appears that SGSs reduce tension by transferring the tension from the border of the keloid to the lateral edge of the SGS.

P-20 Comparison of Thyroidectomy Scar Treatments Initiated at Different Time Points Using a Fractional Carbon Dioxide Laser: A Prospective, Evaluator-Blinded Study

Jin Young Jung^{*}, Jihyun Kim^{*}, Jong Ju Jeong^{**}, Woong Youn Chung^{**}, Kee-Hyun Nam^{**}, Won Jai Lee^{***}, Yong Oock Kim^{***}, Ju Hee Lee^{*}

^{*}Departments of Dermatology and Cutaneous Biology Research Institute,

^{**}Department of Surgery,

^{***}Department of Plastic and Reconstructive Surgery,

Yonsei University College of Medicine, Seoul, Korea

E-mail: pswjlee@yuhs.ac (Won Jai Lee)

Background: Currently, scars are treated during the early postoperative period using pulsed dye lasers and, more recently, fractional lasers. The ideal time to treat scars with these approaches has not been fully established. The current comparative prospective study on thyroidectomy scars was designed to assess the efficacy of ablative carbon dioxide fractional lasers (CO₂ FS) at the 2-week and 3-month post-operative time points. **Methods:** The study subjects comprised 34 female patients with thyroidectomy scars. Seventeen patients started treatment 2 weeks after surgery (2-week group) and the other 17 patients began treatment 3 months after surgery (3-month group). All patients were treated twice, with a 2 month interval between treatments using CO₂ FS. **Results:** The mean value of the Vancouver scar scale (VSS) scores at 2 weeks after surgery was higher than that at 3 months after surgery. However, two months follow-up results showed the mean value of the VSS scores in the 2-week group was significantly lower than that in the 3-month group ($p<0.05$). Hypertrophic scarring after treatment was reported in 2 patients in the 3-month group. **Conclusions:** The results of the present study demonstrated that

initiating treatment for amelioration of scar formation 2 weeks after surgery is more effective and safer than starting 3 months after surgery, and CO₂ FS treatment of postoperative scarring applied earlier in the postoperative period leads to more rapid improvement in scar formation and a lower risk of adverse effects.

P-21 Comparison of Thyroidectomy Scar Treatments using Non-ablative 1,550-nm Erbium Glass and Ablative 10,600-nm Carbon Dioxide Fractional Lasers

Jin Young Jung^{*}, Suhyun Cho^{*}, Jong Ju Jeong^{**}, Woong Youn Chung^{**}, Kee-Hyun Nam^{**}, Won Jai Lee^{***}, Yong Oock Kim^{***}, Ju Hee Lee^{*}

^{*}Departments of Dermatology and Cutaneous Biology Research Institute,

^{**}Department of Surgery,

^{***}Department of Plastic and Reconstructive Surgery,

Yonsei University College of Medicine, Seoul, Korea

E-mail: pswjlee@yuhs.ac (Won Jai Lee)

Background: Various types of lasers have been used to improve the appearance of scars. Non-ablative 1,550-nm erbium-doped fractional photothermolysis systems (FPS) and 10,600-nm carbon dioxide fractional laser systems (CO₂ FS) have been effectively used to treat scars. **Methods:** The study subjects comprised of 20 female patients with thyroidectomy scars. Half of each scar was treated with FPS and the other half was treated with CO₂ FS. All patients were treated twice, with a 2 month interval between treatments. **Results:** The clinical improvements by physicians and patients were not significantly different between both lasers. However, the Erythema Index and the Melanin Index of scars by DermaSpectrometer II[®] were significantly decreased at the site treated by FPS. The hardness of scar by durometer was significantly decreased at the site treated by CO₂ FS. Hypertrophic scarring after treatment was reported in 2 patients regardless of laser types. **Conclusions:** Our study demonstrated the efficacy of FPS and CO₂ FS in postoperative scars. We suggest combined treatment using non-ablative and ablative lasers should be needed to improve scar according to the characteristics of scar.

P-22 Histological and ultrastructural studies on the impact of antioxidants against the toxicity of certain heavy metals in the ovarian chicken

Fawzi I. Amer^{*}, El-Sayed Fikri A. El-Dawi^{*}, Osama A.H. Abo Zenada^{**}, Etedal A.H. Huwait^{**}

^{*}Department of Zoology, Fac. of Science, Ain Shams Univ., Cairo, Egypt.

^{**}Department of Zoology, Fac. of Science, King Abd El-Aziz Univ., Jeddah, Kingdom of Saudi Arabia

E-mail: ehuwit@gmail.com

The objective of this study was designed to determine the effects of mixture of two heavy metals (lead and cadmium) as lead and cadmium acetate (0.17 mg / l and 0.06 mg / l) respectively on the ovarian structure of the adult Lohaman chickens. Also, the possible ameliorative impacts of 250 mg/kg of diet, vitamin C and 200 mg/kg of diet vitamin E., separately and in combination as antioxidants in treating the heavy metal toxicity. The chicks were classified into 6 groups. The light and ultrastructural microscopic studies showed marked histopathological changes in the lead and cadmium-treated groups (GII, GIII, and GIV) in comparison with G I, GV and GVI. These changes were represented by increase in number of the growing ova, presence of edematous and fibrotic areas in the interstitial tissue, undifferentiation of the thecal layer, degeneration of the thecal glands and vacuolization of the follicular cells. The administration of vitamin C alone with lead and cadmium diet (GIII), improved the constituents of the ooplasmic organelles which were represented by great numbers of elongated and healthy mitochondria and scattered transosomes. However, the administration of vitamin E alone with lead and cadmium diet (GIV), improved the cell membranes of many cells and their membranous structures such as RER and mitochondria either in thecal or follicular cells, and the fibers become more obvious. The combination of vitamins C and E in diet containing lead and cadmium (GV) were more effective than the addition of each of them alone in preventing the degeneration of the thecal layer and follicular cells and improvement of different ovarian structures such as the appearance of well developed vitelline membrane and zona radiata. Moreover, both vitamins accelerate the maturation of follicles and improve the general ovarian

structures. This study proved that the administration of a combined dose of vitamins C and E with the daily diets and drinking water in the poultry farms especially those near to the sites of pollution of the sewage and industrial wastes, is highly recommended.

P-23 The Most Current Algorithms for the Prevention and Treatment of Keloids and Hypertrophic Scars

Rei Ogawa, Satoshi Akaishi, Hiko Hyakusoku

Department of Plastic, Reconstructive and Aesthetic Surgery, Nippon Medical School, Tokyo, Japan

E-mail: r.ogawa@nms.ac.jp (Rei Ogawa)

Background: Previous reports on the treatment of hypertrophic scars (HSs) and keloids have not described clear algorithms for multimodal therapies. This paper presents an evidence-based review of previous papers and proposes algorithms for the treatment and prevention of HSs and keloids. **Review Methods:** The methodological quality of the clinical trials was evaluated, and the baseline characteristics of the patients and the interventions that were applied and their outcomes were extracted. **Results:** Important factors that promote HS/keloid development include mechanical forces on the wound, wound infection, and foreign body reactions. For keloids, the treatment method that should be used depends on whether scar contractures (especially joint contractures) are present and whether the keloids are small/single or large/multiple. Small/single keloids can be treated radically by surgery with adjuvant therapy (which includes radiation or corticosteroid injections) or by nonsurgical monotherapy [which includes corticosteroid injections, cryotherapy, laser, and anti-tumor/immunosuppressive agents (e.g., 5-fluorouracil)]. Large/multiple keloids are difficult to treat radically and are currently only treatable by multimodal therapies that aim to relieve symptoms. After a sequence of treatments, long-term follow-ups are recommended. Conservative therapies [which include gel sheeting, taping fixation, compression therapy, external/internal agents, and make-up (camouflage) therapy], should be administered on a case-by-case basis. **Conclusions:** The increase in the number of randomized controlled trials over the last decade has greatly improved scar management, although these studies suffer from various limitations. The keloid/HS treatment algorithms that are currently available are likely to be significantly improved by future, high quality clinical trials.

P-24 Scar Contracture Evaluation and Classification

Rei Ogawa*, Julian J. Pribaz**

*Department of Plastic, Reconstructive and Aesthetic Surgery, Nippon Medical School, Tokyo, Japan

**Division of Plastic Surgery, Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA

E-mail: r.ogawa@nms.ac.jp (Rei Ogawa)

It is important to diagnose, assess and classify scar contractures for selection and evaluation of appropriate surgical methods. **1. Diagnosis of Post-Burn Scar Contractures:** Differential diagnosis of ankylosis or contracture is important. Ankylosis is a stiffness of a joint, and can vary from moderate to severe. Ankylosis may involve the deeper tissues, including bone, cartilage and joint capsule and may require orthopedic surgical release. In soft tissue contractures, myogenic and neurogenic contractures should be excluded for surgical reconstruction. In connective tissue contracture, differential diagnosis by anatomical structures should be performed before planning of surgical methods. Connective tissue contractures can be classified by affected tissues; a. Cutaneous, subcutaneous or fascial contracture, b. Tendon contracture, c. Ligament contracture and d. Muscle contracture. Many of burn scar contractures are classified into cutaneous/subcutaneous contracture. If tendon, ligament, and muscle contracture were diagnosed, these replacement/reconstruction methods should be considered in addition to releasing scar contractures. **2. Assessment and Classification of Post-Burn Contractures:** "Scar contractures" are diagnosed by abnormal resting position of anatomical structures or movement disturbance of joints and other tissues. To decide the treatment of scar contractures, careful assessment and classification of contractures by site are needed. Shape and depth of scars should be diagnosed pre- and/or intra-operatively. Post-operative assessment is also important to evaluate the selected methods.

P-25 Small-Wave Incision Method for Hypertrophic Scar Reconstruction

Chenyu Huang, Shimpei Ono, Hiko Hyakusoku, Rei Ogawa

Department of Plastic, Reconstructive and Aesthetic Surgery, Nippon Medical School, Tokyo, Japan

E-mail: r.ogawa@nms.ac.jp (Rei Ogawa)

Background: Many hypertrophic scar reconstruction methods have been devised, including linear incision and various Z- and W-plasties. However, they can leave noticeable scars and can involve excessive normal skin excision, particularly in long linear hypertrophic scars. Thus, we invented the small-wave incision method, where the scar is excised by an incision consisting of two highly wavy lines composed of approximately 1cm-long waves. **Methods:** In 2000-2010, patients with linear hypertrophic scars longer than 10cm underwent linear (n=20) or small-wave incision surgery (n=20). During the 18-month postoperative follow-up period, postoperative scar size and recurrence were evaluated. The small-wave incision method was also compared at the mathematical level to multiple linear incision, Z-plasty, planimetric Z-plasty, and W-plasty. **Results:** For the linear and small-wave groups, 40% and 15% exhibited postoperative recurrence, respectively (p=0.77). The main risk factor for recurrence was postoperative size (p=0.043). Mathematical comparisons with the other methods revealed that the small-wave method can achieve the same release of tension with the least normal skin excision while irregularizing the scar *via* an accordion effect. The full width of the flap, adequate wound contact length, and dispersed separation force can also reduce the risk of complications. **Conclusions:** The small-wave method can meet the functional requirements of long linear hypertrophic scar reconstruction as it breaks up scars and disperses tension. Moreover, it effectively irregularizes the scar, thereby producing a satisfactory cosmetic result with inconspicuous and fluid wave-shaped postoperative scar. Complication risks such as dehiscence and tip necrosis can also be reduced.

P-26 Influence of dexterity on requirement for scar therapy

Naghm Darhouse

Anne Alexander John Radcliffe Hospital, Oxford, UK

E-mail: darhousen@yahoo.com

Background: Patients with palmar wound scars frequently require scar therapy for scar tenderness, thickness, stiffness and discomfort. The influence of dexterity on the need for scar therapy is reviewed. **Methods:** A retrospective study of scar therapy requirement in 300 patients following standard carpal tunnel decompression surgery over a 12 month period. The influence of dexterity on this requirement was analyzed. **Results:** Scar therapy was required more frequently in scars of the dominant palm. Results were statistically significant. **Conclusions:** The importance of physiotherapy and mobilization on scars near or over joints is highlighted by our findings. Patients need to be informed of the influence of dexterity and mobilization on the recovery and outcome.

Sponsors of International Scar Meeting in Tokyo 2010 with The 5th Japan Scar Workshop

科研製薬株式会社
KAKEN PHARMACEUTICAL CO.,LTD
キュテラ株式会社
CUTERA K.K.
ケーシーアイ株式会社
KCI K.K.
ジョンソン・エンド・ジョンソン株式会社
Johnson&Johnson K.K.
メンリッケヘルスケア株式会社
Mölnlycke Health Care
ゲンゼ株式会社
Gunze Limited
アステラス製薬株式会社
Astellas Pharma Inc
大塚製薬株式会社
Otsuka Pharmaceutical Co.,Ltd.
キッセイ薬品工業株式会社
Kissei Pharmaceutical Co., Ltd.
クラシエ薬品株式会社
Kracie Pharmaceutical, Ltd.
コンバテックジャパン株式会社
ConvaTec, Inc.
サイノシュアー株式会社
Cynosure KK
第一三共株式会社
DAIICHI SANKYO COMPANY, LIMITED
エーザイ株式会社
Eisai Co., Ltd.
キッセイ薬品株式会社
Kissei Pharmaceutical Co., Ltd.
田辺三菱製薬株式会社
Mitsubishi Tanabe Pharma Corporation
マルホ株式会社
Maruho Co., Ltd.
明治製菓株式会社
MEIJI SEIKA KAISHA, LTD.

康麗会越谷誠和病院
Koureikai Koshigaya-Seiwa Hospital
全仁会高木病院
Takagi Hosoiat
会津中央病院
Audu Chuo Hospital
協友会船橋総合病院
Funabashi General Hospital
橘会飯能中央病院
Hanno Chuo Hospital
小山記念病院
Koyama Memorial Hospital
石川病院
Ishikawa Hospital
エルクリニック
EL CLINIC
大浜第一病院
Ohama 1st Hospital
神栖済生会病院
Kamisu Saiseikai Hospital
健貢会東京クリニック
Tokyo Clinic
スキンケア上野クリニック
Skin Care Ueno Clinic
博慈会記念総合病院
Hakujikai Memorial Hospital
江戸川台皮膚科クリニック
Edogawadai Dermatology Clinic
聖仁会西部総合病院
Seibu General Hospital
育生会横浜病院
Ikuseikai Yokohama Byouin
高裕会深川立川病院
Fukagawa Tachikawa Hospital
中山医院
Nakayama Clinic
東戸塚記念病院
Higashi Totsuka Memorial Hospital
晴山会平山病院
Hirayama Hospital
ゆずクリニック
Yuzu Clinic

Secretariat



Rei Ogawa, M.D., Ph.D.

Department of Plastic, Reconstructive and Aesthetic Surgery,
Nippon Medical School,
1-1-5 Sendagi, Bunkyo-ku,
Tokyo 113-8603, Japan
Tel: +81-3-5814-6208
Fax: +81-3-5685-3076
URL: <http://y7.net/r.ogawa/en>
E-mail: r.ogawa@nms.ac.jp



Sadanori Akita, M.D., Ph.D.

Division of Plastic Surgery,
Department of Developmental and Reconstructive Medicine,
Graduate School of Biomedical Sciences,
Nagasaki University,
1-7-1 Sakamoto, Nagasaki 852-8501, Japan
Tel: +81-95-819-7327
Fax: +81-95-819-7330
E-mail: akitas@hf.rim.or.jp



Satoshi Akaishi, M.D., Ph.D.

Department of Plastic, Reconstructive and Aesthetic Surgery,
Nippon Medical School,
1-1-5 Sendagi, Bunkyo-ku,
Tokyo 113-8603, Japan
Tel: +81-3-5814-6208
Fax: +81-3-5685-3076
E-mail: redstoneprs@gmail.com