EPSRC

www.epsrc.eu

10th Anniversary of the European Plastic Surgery Research Council

August 23–25, 2018
Hamburg/Germany

PROGRAM

Table of Contents

Welcome Note of the President of the EPSRC

Welcome friends and colleagues,

I am delighted to welcome you to the 10th Anniversary Meeting of the European Plastic Surgery Research Council which will be held in the Harbor of Hamburg, Germany. After recent EPSRC meetings in Bucharest (2017) and Brussels (2016), which was the first joint meeting with the EURAPS, we are returning to the original EPSRC meeting site of the first meeting in Hamburg!

This years' program offers the opportunity to enjoy a world-class scientific conference in the beautiful setting of the harbor of Hamburg. We are honored and thankful for the support of the editor-in-chief, Rod Rohrich of the journal Plastic and Reconstructive Surgery (Global Open Access), for publication of the work presented at our conference. The journal became an official organ of the European Plastic Surgery Research Council (EPSRC) in 2013 and we are quite grateful for their commitment to the international distribution of our proceedings.

The scientific interchange at the EPSRC, which fosters an informal atmosphere and free exchange of ideas, is an important strength of the meeting. In the last 10 years EPSRC has managed to become an established and well-recognized annual meeting for academic plastic surgery. This years' keynote lectures are by leaders in the international plastic surgery community combined with selected high quality scientific reports in abstract format from more than 30 countries. Our Scientific Program Committee has exerted tremendous judgment and effort in ensuring the finest quality in basic science and clinical outcome research, and in supporting junior plastic surgeons and scientists who hold the key to the future of our field.

The scientific meeting will formally begin on Friday, August 24, 2018. No concurrent sessions will take place at any stage of the meeting. ePosters will be presented in the late afternoon on each day of the conference allow presenters to discuss their work in a casual and productive atmosphere.

It is truly a great honor for me and the organizing committee to have participated in the organization of the European Plastic Research Council for the past 10 years. This has been a team effort, and I gratefully acknowledge the current chairman Rene Largo (Houston, USA) and the previous chairmen Ion Zegrea (Bukarest) and Benoit Hendrickx (Belgium) and especially Sandra Gottschalg from the organizing agency Conventus. I am looking forward to an outstanding 2018 scientific meeting and am hopeful that you all will enjoy 3 days in Hamburg!

Last but not least, I want to thank our sponsors and exhibitors who make an enormous contribute to the success of this meeting and have enabled this 10 year anniversary of the EPSRC Annual Meeting! I hope that you will enjoy this 2018 meeting and do your best to contribute to our goals to improve both clinical and research elements of plastic surgery. With your efforts, the European Plastic Surgery Research Council will continue to prosper and contribute to the future of international plastic surgery for the betterment of clinical care for our well deserving patients!

Christine Radtke, MD, MBA, FEBOPRAS

Welcome Note of the Chairman of the EPSRC

Dear colleagues, dear friends,

It is a great pleasure and honor for me to welcome you to the 10th Anniversary Meeting of the European Plastic Surgery Research Council (EPSRC) held in Hamburg from August 23–25, 2018. Following the successful joint EPSRC meeting with the European Association of Plastic Surgery (EURAPS) in Brussels in 2016 and last year's stellar EPSRC conference in Bukarest, we come home to Hamburg, the gateway to the world and the city that never sleeps. The EPSRC was founded in Hamburg in 2009 by former president Professor Lars Steinstraesser as a non-profit organization for the benefit of the young plastic and reconstructive surgery research community in Europe. It was Lars Steinstraesser's great idea to gather surgeons, researchers, and scientists from not only Europe, but also from all over the world, on the boat Cap San Diego in an informal and friendly setting to discuss challenges in clinical and basic science research.

The EPSRC meeting provides high quality interactions on evidence-based studies and translational research in all disciplines of plastic and reconstructive surgery, and related fields. Distinguished faculty from all over the world come to this meeting as keynote speakers, moderators, and panelists at their own expense to encourage young researchers. We are especially grateful for this contribution. The small size and informal, interactive format uniquely distinguish this meeting as a means of disseminating information and ideas in a way that cannot be achieved through more conventional channels, such as publications and presentations at large scientific meetings.

After reviewing over 166 submitted abstracts from 26 countries world-wide, the scientific committee has selected 46 long oral and 34 short oral presentations, which will represent an outstanding scientific program, addressing topics in Reconstructive microsurgery, Breast, Head and neck, Tissue engineering, Angiogenesis and ischemia, Stem cells, Burns and scars, Wound healing, Education and technology, Transplantation and Aesthetics. We are very fortunate to have strong support from the medical industrial community, including S&T® Microsurgical Instruments, Leica Microsystems, TapMed Medizintechnik Handels GmbH, RESORBA Medical GmbH, Caromed surgical garments, DCI-GmbH and Minerva KG. Their generosity in support of our conference is very much appreciated.

We will start our 10th Anniversary Meeting with the Welcome Reception in the 20up Bar of the hotel Empire Riverside at 19:30 on Thursday, August 23, 2018. This year, we will hold the conference in the "Pearl in the Port" Hotel Hafen Hamburg, the maritime hotel located directly above the famous St. Pauli "Landungsbrücken". The conference room Elbkuppel offers a magnificent view of the port and the River Elbe.

The scientific part of the conference will start at 08:15 on Friday, August 24, 2018 and will end around 19:30 on Saturday, August 25, 2018. On both evenings, on Friday and Saturday, we included an entertaining social program, including the “Rock the harbor with S&T” adventure, which will take place on a boat right in front of the hotel. This will certainly bring back some of the memories from the good old Cap San Diego times.

Again this year, a scientific committee will award the three best oral presentations and posters. The best oral presentation winners will be granted the opportunity to present their work at the 2019 American Plastic Surgery Research Council in Baltimore, Maryland. In addition, the Plastic and Reconstructive Surgery Global Open journal and its editor Dr. Rod Rohrich have bestowed upon us the honor of publishing the abstracts of the accepted long oral presentations as a supplement.

I would like to take this opportunity to express my deepest appreciation and thanks to my dear friend Christine Radtke for her tireless efforts, who helped to advance the goals of the EPSRC to achieve outstanding recognition in the scientific-arena in Plastic and Reconstructive Surgery. Last but not least, I would like to acknowledge the scientific committee, the EPSRC execute board and Sandra Gottschalg, Elena Speier and Katrin Liebing from Conventus conference organization for their ongoing support, review work and invaluable suggestions, which were pivotal for the organization of this exciting meeting.

I cannot wait to welcome you all back in Hamburg to celebrate our 10th anniversary. I look forward to another exceptional meeting to discuss unpublished research with leaders in the field, to meet new friends, and to establish new pan-European, pan-Asian and transatlantic collaborations.

Rene D. Largo, M.D.
EPSRC Captain 2018
The University of Texas MD Anderson Cancer Center,
Houston, Texas

Organization and Imprint

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Assistant Professor
The University of Texas MD Anderson Cancer Center
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Professor and Chairman Division of Plastic and Reconstructive Surgery
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Medical University of Vienna
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Scientific Board
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D. Duscher (Munich/DE)
A. Mericli (Houston, TX/US)
F. Papprotka (Marbella/ES)
C. Radtke (Vienna/AT)

Announcement
11th European Plastic Surgery Research Council
Technical University of Munich
August 22–24, 2019 • Munich/Germany

Organization on site
Conventus Congressmanagement & Marketing GmbH
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Hotel Hafen Hamburg
Seewartenstraße 9 • 20459 Hamburg/Germany

Date
August 23–25, 2018

Homepage
For latest information please visit www.epsrc.eu.

Certification of Attendance
Certificates of attendance for registered participants will be available at the check-in.

General Assembly
The General Assembly of the European Plastic Surgery Research Council will take place on Saturday, August 25, 2018 at 19:30 hrs.

Abstract Publication
Abstracts of the long oral presentations (LOP01–46) will be published in the “Plastic and Reconstructive Surgery Global open”.

General Information

Membership

Membership application process

Applications for Resident, Active and Associate Membership will be considered when each of the items listed below is received by the Executive Office. Only Resident, Active and Associate Members have voting privileges.

Membership requirements

1. The completed application form (see www.epsrc.eu)
2. A copy of your curriculum vitae.

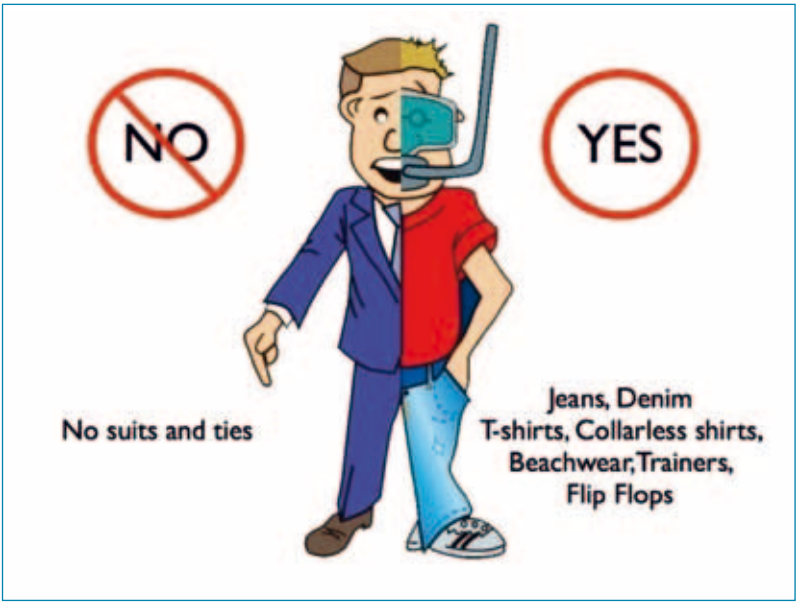
Attendance at a European Plastic Surgery Research Council Annual Meeting is also required. (This may include the meeting in the year in which your application is submitted for vote.)

Payment

Active/Associate/Senior	50 EUR
Resident	25 EUR

Please visit the website www.epsrc.eu.

Dress code for attendees and industry partners



Smoking

Smoking is not allowed inside the congress venue or at other venues for the social functions. Smokers are required to smoke outdoors and in the designated smoking areas.

Technical Information

Please prepare your presentation in 4:3 aspect ratio.
A presentation notebook with a PDF reader and MS Office PowerPoint 2016 will be provided. The use of personal notebooks is possible upon agreement. However, it may interrupt the flow of the program in the lecture hall. Please provide an adapter for VGA if necessary.

A notebook, presenter and laser pointer are available at the speaker's podium in the lecture hall. A technical supervisor can help you.

Guidelines for long oral presentations: Your presentation should not exceed 8 minutes. Should you exceed your time limit, your presentation will automatically stop. Two minutes of discussion is planned after each long oral presentation.

Guidelines for short oral presentations (ePoster Sessions): Your presentation should not exceed more than 3 slides. Should you exceed your time limit of 3 minutes, your presentation will automatically be stopped.

Please note: Certain encodings for video and audio files could lead to problems. Please visit our media check-in.

Should you wish to use non-digital equipment, please contact us. We can be reached at www.epsrc.eu.

Submitting your Presentation

Please submit your presentation at the media check-in in the lecture hall on the day before your presentation, but not later than 2 hours before the presentation should begin. You may view and/or edit your presentation.

For submission, please use a USB flash drive, CD or DVD. It should not be protected with software.

Speaking Time

Please prepare your presentation for the allotted amount of time. Should you exceed your time limit, your presentation will automatically be stopped. Speaking time is assigned as follows (speaking + discussion time):

Keynote Lecture	12 minutes
Long oral presentation (LOP)	10 minutes (incl. 2 min discussion)
Short oral presentation (SOP)	3 minutes

Prizes and Bursaries

Best oral presentation	500 EUR
Poster prize	250 EUR

08:15–08:30
Opening Ceremony
p. 12

08:30–08:42
Keynote Lecture I
Homo Technicum – the sense of science in plastic and reconstructive surgery p. 12

08:45–09:25
Session I – Flaps and tissue transplantation
p. 12

09:30–09:42
Keynote Lecture II
The evolution of microsurgical instruments
p. 12

09:42–10:30
Microsurgical Corner/Coffee Break
p. 12

10:30–10:42
Keynote Lecture III
The effect of the BRCA mutation on adipose derived stem cells p. 13

10:45–11:25
Session II – Adipose tissue and fat graftin
p. 13

11:30–11:42
Keynote Lecture IV
Intraoperative imaging in perforator flap surgery
p. 13

11:45–12:30
Panel
Virtual surgical planning in head and neck reconstruction
p. 13

12:30–12:42
Keynote Lecture V
Pelvic and perineal reconstruction in previously irradiated cancer resectional defects p. 14

12:45–14:00
Microsurgical Corner/Lunch
p. 14

14:00–14:12
Keynote Lecture VI
Innovation in plastic surgery – corneal neurotization
p. 14

14:13–14:43
Session III – Angiogenesis and ischemia
p. 14

14:43–14:55
Keynote Lecture VII
Biomedical entrepreneurship in academic medicine?
p. 14

14:55–15:30
PSRC Highlight Session
p. 14

15:30–16:00
Microsurgical Corner/Coffee Break
p. 15

16:00–16:12
Keynote Lecture VIII
Hybrid reconstruction combined with dermal substitute applying the tissue regeneration concept p. 15

16:15–17:05
Session IV – Burns and scars
p. 15

17:10–17:22
Keynote Lecture IX
Clinical translation of tissue engineered cartilage and bone
p. 16

17:25–18:05
Session V – Tissue engineering
p. 16

18:05–18:30
Break

18:30–19:30
ePoster Session I
p. 16

08:00–08:40
Session VI – Wound healing
p. 17

08:45–08:57
Keynote Lecture X
Immune tolerance to vascularized composite allografts: Where do we stand? p. 17

09:00–09:40
Session VII – Transplantation
p. 17

09:45–09:57
Keynote Lecture XI
Monozygotic twin transplant of bipedicled DIEP/SIEA for total back reconstruction after resection of plexiform malignant histiocytic fibrosarcoma p. 18

10:00–10:30
Microsurgical Corner/Coffee Break
p. 18

10:30–10:42
Keynote Lecture XII
Biofabrication in plastic surgery – from cells and blood to implantable functional tissue p. 18

10:45–11:15
Session VIII – Stem cells
p. 18

11:15–11:27
Keynote Lecture XIII
Regenerative peripheral nerve interfaces for prosthetic control in humans p. 18

11:30–12:00
Session IX – Nerve regeneration
p. 19

12:00–12:12
Keynote Lecture XIV
Nerve gap reconstruction
p. 19

12:15–13:15
Microsurgical Corner/Lunch

13:15–13:27
Keynote Lecture XV
Microsurgery – from developing a skill to building a practice and where future research should be focused p. 19

13:30–13:50
Session X – Education and technology
p. 19

13:55–14:07
Keynote Lecture XVI
DIEP flap under 2 hours
p. 20

14:10–14:50
Session XI – Breast
p. 20

14:50–15:20
Microsurgical Corner/Coffee Break
p. 20

15:20–15:32
Keynote Lecture XVII
Attraction research – why is beautiful considered beautiful
p. 20

15:35–16:35
Session XII – Aesthetics
p. 21

16:40–16:52
Keynote Lecture XVIII
Art and science in craniofacial surgery
p. 21

17:00–17:45
Business Meeting (members only)

18:15–19:30
ePoster Session II
p. 21

19:30–20:00
General Assembly
p. 21

08:15–08:30 **Opening Ceremony**
Welcome from the EPSRC President
C. Radtke (Vienna/AT)

Welcome from the EPSRC Founding President
L. Steinstraesser (Quakenbrück/DE)

Welcome from the EPSRC Chairman
R. D. Largo (Houston, TX/US)

08:30–08:42 **Keynote Lecture I**
Homo Technicum – the sense of science in plastic and reconstructive surgery
J. J. Vranckx (Leuven/BE)

08:45–09:25 **Session I – Flaps and tissue transfer**
Chairs G. Germann (Heidelberg/DE), A. Rodriguez Lorenzo (Uppsala/SE)
J. Disa (New York, NY/US)

08:45 LOP01 Dorsal double perforator "super-thin" free flap – a new choice for scar contractures in the head and neck area
V. Q. Vinh (Hanoi/VN), T. V. Anh, T. T. Hai, H. T. Tuan, H. Hyakusoku
R. Ogawa (Tokyo/JP)

08:55 LOP02 Lateral thoracic vascularized lymph node flap for lymphedema: Outcomes and technical modifications
M. V. Schaverien, C. J. Coroneos, F. C. Wong (Houston, TX/US)

09:05 LOP03 Treatment outcome of infected total knee arthroplasty with severe soft-tissue damage
R. Osinga, P. Ochsner, D. J. Schaefer, M. Clauss (Basel/CH)

09:15 LOP04 The free fibula flap for restoration of spinal stability after oncologic verte-brectomy
A. F. Mericli, S. Boukovalas, E. I. Chang, L. D. Rhines
M. M. Hanasono (Houston, TX/US)

09:30–09:42 **Keynote Lecture II**
The evolution of microsurgical instruments
M. Spingler (S&T, Neuhausen/CH)

09:42–10:30 **Microsurgical Corner/Coffee Break**
G. Perez-Abadia (Louisville, KY/US), J. P. Beier (Aachen/DE)

10:30–10:42 **Keynote Lecture III**
The effect of the BRCA mutation on adipose derived stem cells
S. Hollenbeck (Durham, NC/US)

10:45–11:25 **Session II – Adipose tissue and fat grafting**
Chairs D. Schaefer (Basel/CH), B. Hendrickx (Brussels/BE)
S. Hollenbeck (Durham, NC/US)

10:45 LOP05
Adipose derived stem cells enhance the angiogenesis and tissue integration of nanocomposite polyurethane cartilage replacements
M. Griffin, N. Naderi, A. M. Seifialian, D. Kalaskar, P. E. Butler (London/GB)

10:55 LOP06
The influence of hyperbaric oxygen therapy on the biology of adipose tissue mesenchymal stem cells
Y. Yoshinoya, B.-S. Kim, A. H. Böcker, T. Ruhl, J. P. Beier (Aachen/DE)

11:05 LOP07
Improved adipocyte viability in autologous fat grafting with ascorbic acid supplemented tumescence solution
A. Lunger, T. Ismail, A. Todorov, J. Buergin, F. Lunger, I. Oberhauser
M. Haug, D. Kalbermatten, R. D. Largo, I. Martin, A. Scherberich
D. J. Schaefer (Basel/CH)

11:15 LOP08
A prospective time-and-motion pilot study comparing rate of processing techniques in autologous fat grafting
S. E. Hanson, P. B. Garvey, E. I. Chang, G. Reece, J. Liu
C. E. Butler (Houston, TX/US)

11:30–11:42 **Keynote Lecture IV**
Intraoperative imaging in perforator flap surgery
J. P. Beier (Aachen/DE)

11:45–12:30 **Panel: Virtual surgical planning in head and neck reconstruction**
Chair J. J. Vranckx (Leuven/BE)

11:45
Technological advances in maxillary reconstruction (then and now)
J. Disa (New York, NY/US)

11:55
Virtual surgical planning for mandible reconstruction – pearls and pitfalls
P. B. Garvey (Houston, TX/US)

12:05
Virtual surgical planning in head and neck reconstruction – thinking beyond the bone
A. Rodriguez Lorenzo (Uppsala/SE)

12:30–12:42 **Keynote Lecture V**
Pelvic and perineal reconstruction in previously irradiated cancer resectional defects
R. E. Horch (Erlangen/DE)

12:45–14:00 **Microsurgical Corner/Lunch**
G. Perez-Abadia (Louisville, KY/US), A. Rodriguez Lorenzo (Uppsula/SE)
V. Q. Vinh (Hanoi/VN)

14:00–14:12 **Keynote Lecture VI**
Innovation in plastic surgery – corneal neurotization
G. Borschel (Toronto/CA)

14:13–14:43 **Session III – Angiogenesis and ischemia**
Chairs R. E. Horch (Erlangen/DE), J. P. Beier (Aachen/DE)
D. M. Adelman (Houston, TX/US)

14:13 LOP09
Encapsulation of mesenchymal stem cells improves vascularization of alginate-based scaffolds
A. Peddi, D. Steiner, A. Weigand, L. Lingens, L. Fischer, K. Köhn, R. Detsch
A. R. Boccaccini, T. Fey, P. Greil, C. Weis, J. P. Beier, R. E. Horch
A. Arkudas (Erlangen/DE, Stuttgart/DE, Aachen/DE)

14:23 LOP10
Short-term delivery of fibrin-bound VEGF protein in osteogenic grafts ensures both increased vascularization and efficient bone formation
M. G. Burger, A. Grosso, V. Sacchi, R. D. Largo, M. Heberer, A. Scherberich
I. Martin, J. A. Hubbell, D. J. Schaefer, A. Banfi, N. Di Maggio (Basel/CH)

14:33 LOP11
Gene therapy induced surgical revascularization of cryopreserved allogenic bone – in a Yucatan minipig model
E. Rezaie, N. J. Visser, A. Y. Shin, A. T. Bishop (Rochester, NY/US)

14:43–14:55 **Keynote Lecture VII**
Biomedical entrepreneurship in academic medicine?
J. Sacks (Baltimore, MD/US)

14:55–15:30 **PSRC 2018 Highlight Session**
Chair T. King (Birmingham/GB), J. Sacks (Baltimore, MD/US)
G. Borschel (Toronto/CA)

14:55 Announcement PSRC 2019
J. Sacks (Baltimore, MD/US)

15:00
Snyder Award
Corneal neurotization improves ocular surface health and prevents corneal scarring in a rat model of neurotrophic keratopathy
J. Catapano, K. Antonyshyn, G. Borschel (Toronto/CA)

15:10
Gingrass Award
Beyond antibiotics – local doxycycline administration reduces scarrin and improves wound healing by modulating scarring fibroblast behavior
H. E. des Jardins-Park, A. L. Moore, S. Mascharak, B. A. Duoto
M. P. Murphy, D. M. Irizarry, D. S. Foster, R. E. Jones, L. A. Barnes
C. D. Marshall, R. C. Ransom, G. Wernig
M. T. Longaker (Stanford, CA/US, Boston, MA/US)

15:20
Shenaq Award
Malpractice litigation in plastic surgery – Can we identify patterns?
S. Sarmiento, M. Cheah, C. Wen, S. Lee, G. Rosson (Baltimore, MD/US)

15:30–16:00
Microsurgical Corner/Coffee Break
G. Perez-Abadia (Louisville, KY/US), S. O. P. Hofer (Toronto/CA)

16:00–16:12
Keynote Lecture VIII
Hybrid reonstruction combined with dermal substitute applying the tissue regeneration concept
L. Larcher (Bressanone/IT)

16:15–17:05
Session IV – Burns and scars
Chairs
J. A. Plock (Zurich/CH), N. Ghetu (Iasi/RO), D. Duscher (Munich/DE)

16:15
LOP12
Attempted suicide by self-conflicted burns – a retrospective study
C. Freystaetter, A. Fochtmann-Frana, G. Ihra, S. Nickl, T. Rath
C. Radtke (Vienna/AT)

16:25
LOP13
Development of stable FGF2 enriched biopolymer nanostructured dermal substitute: Ex ovo and in vivo study
M. Knoz, L. Vojtova, B. Lipovy, J. Holoubek, J. Babrnakova, V. Pavlinakova
L. Vistejnova, V. Stepankova, E. Filova, Z. Pavlovsky, M. Faldyna, E. Gopfert
J. Damborsky, V. Hearnden (Brno/CZ; Sheffield/GB)

16:35
LOP14
Evaluation of negative prognostic factors in severe burns-strategy
A. Grosu-Bularda, M. C. Andrei, A. Stoian, O. Vermesan, S. A. Popescu
A. Chivu, I. Lascar (Bucharest/RO)

16:45
LOP15
Do hypertrophic dermal fibroblasts have vascular potential? Expression of the ETS family transcription factor ERG and its role in incisional hypertrophic scarring
B. Way, S. Brown, N. Bulstrode, R. O'Shaughnessy (London/GB)

16:55 LOP16
Verapamil-containing silicone gel shows improved therapeutic effect on hypertrophic scar
J. Choi, J. T. Cho, Y. N. Han, E. Y. Rha, S.-N. Jung
J. W. Rhie (Gyeonggi-do/KR)

17:10–17:22 **Keynote Lecture IX**
Clinical translation of tissue engineered cartilage and bone
D. J. Schaefer (Basel/CH)

17:25–18:05 **Session V – Tissue engineering**
Chairs
P. Vogt (Hanover/DE), J. C. Lee (Los Angeles, CA/US)
A. Arkudas (Erlangen/DE)

17:25 LOP17
Bilayered, non-cross-linked collagen matrix for regeneration of facial defects after skin cancer removal – a new perspective for biomaterial-based tissue reconstruction
S. Ghanaati (Frankfurt/DE)

17:35 LOP18
Axially vascularized, hypertrophic cartilage derived bone scaffolds: a treatment option for complex bone defects
T. Ismail, A. Haumer, C. Epple, A. Lunger, I. Martin, A. Scherberich
D. J. Schaefer (Basel/CH)

17:45 LOP19
Intrinsic vascularization of recombinant eADF4(C16) spider silk fibrous matrices in the arteriovenous loop model
S. Heltmann-Meyer, D. Steiner, G. Lang, S. Winkler, L. Fischer, T. Fey
P. Greil, T. Scheibel, R. E. Horch, A. Arkudas (Erlangen/DE)

17:55 LOP20
Effective vascularization and robust bone formation in osteogenic grafts requires VEGF dose control
N. Di Maggio, A. Lunger, A. Grosso, M. G. Burger, F. Mai, J. A. Hubbell
P. S. Briquez, V. Sacchi, D. J. Schaefer, A. Banfi (Basel/CH; Chicago, IL/US)

18:05–18:30 **Break**

18:30–19:30 **ePoster Session I**
(see page 22)

20:15 Boat cruise “Rock to harbor with S&T”
For further information please see page 31.

08:00–08:40 **Session VI – Wound healing**
Chairs
L. Larcher (Brissone/IT), J. Choi (Gyeonggi-do/SKR)
M. Maricevich (Houston, TX/US)

08:00
LOP21
Adipose matrix deriveed hydrogels incubated with released paracrine factors by adipose derived stromal cells – a novel allogenic treatment for wound healing
J. A. van Dongen, V. Getova, L. A. Brouwer, G. Liguori, P. Sharma
H. P. Stevens, B. van der Lei, M. C. Harmsen (Groningen/NL)

08:10
LOP22
The efficacy of the MolecuLight i:X™ wound intelligence device in the outpatient wound care clinic – a pilot study
C. M. Hurley, P. McClusky, R. Sugrue, A. J. Clover, E. J. Kelly (Cork/IE)

08:20
LOP23
Uncovering the wound healing process of split skin donor sites – an in vitro study on the influence of wound fluid
F. Wu, A. T. Bauer, D. Schmauss (Munich/DE; Lugano/CH)

08:30
LOP24
Evaluation of fetomaternal microchimeric cell potential on maternal wound healing by creating an amniotic fluid environment in a randomized-controlled murine model – postulating an overlooked paradigm on maternal wounds
K. Ozer, O. Bulut, O. Atan, A. S. Oguz Erdogan, R. G. Kocer, M. Gursel
A. Terzioglu, I. Gursel (Ankara/TR)

08:45–08:57 **Keynote Lecture X**
Immune tolerance to vascularized composite allografts – Where do we stand?
D. Mathes (Denver, CO/US)

09:00–09:40 **Session VII – Transplantation**
Chair
D. Mathes (Denver, CO/US), S. Giordano (Turku/FI)
J. Kagimoto (Yokohama/JP)

09:00
LOP25
The role of lymph nodes' transfer and lymphangiogenesis in vascularized composite allotransplantation
I. Lese, C. Tsai, M. Abd El Hafez, A. Taddeo, E. Vogelin
M. A. Constantinescu, R. Olariul (Bern/CH)

09:10
LOP26
Evaluation of the effects of Ischemia-reperfusion injury in rat isogenic and allogeneic solitary muscle and skin transplant models
F. Ceran, S. Basat, I. Ersin, D. Filinte, O. Pilanci, M. Bozkurt (Istanbul/TR)

09:20 LOP27
Differential conformation dependent C reactive protein mediated activation of monocyte subsets regulates the early phase of immune rejection in allogeneic transplantation
J. Kiefer, S. Kreuzaler, I. Hörbrand, F. Lang, E. Deiss, G. B. Stark S. U. Eisenhardt (Freiburg/DE)

09:30 LOP28
Adipose-derived stem cell-based immunomodulatory therapy in a translational porcine limb transplant model
M. Waldner, D. Kim, F. Egro, W. Zhang, M. Solari, K. Washington, K. Marra J. P. Rubin (Pittsburgh, PA/US; Zurich/CH)

09:45–09:57 Keynote Lecture XI
Monozygotic twin transplant of bipedicled DIEP/SIEA for total back reconstruction after resection of plexiform malignant histiocytic fibrosarcoma
J. C. Selber (Houston, TX/US)

10:00–10:30 Microsurgical Corner/Coffee Break
G. Perez-Abadia (Louisville, KY/US), J. A. Plock (Zurich/CH)

10:30–10:42 Keynote Lecture XII
Biofabrication in plastic surgery – from cells and blood to implantable functional tissue
P. Vogt (Hanover/DE)

10:45–11:15 Session VIII – Stem cells
Chairs
L. Steinstraesser (Oldenburg/DE), J. Sacks (Baltimore, MD/US) S. Ghanaati (Frankfurt/DE)

10:45 LOP29
Adipose derived stem cells versus fibroblasts in a model of preferential metastasis
E. Brett, M. Sauter, M. M. Aitzetmueller, H.-G. Machens D. Duscher (Munich/DE)

10:55 LOP30
Pre-clinical study: To control autologous elastic cartilage regeneration using monkey auricular cartilage progenitor cells
S. Kagimoto, J. Maegawa (Yokohama/JP)

11:05 LOP31
Human macrophages preferentially infiltrate the superficial adipose tissue
E. M. Morandi, G. Cappellano, J. Rainer, P. Grubwieser, K. Heinz D.Wolfram, D. Bernhard, S. Lobenwein, G. Pierer, C. Ploner (Innsbruck, AT)

11:15–11:27 Keynote Lecture XIII
Regenerative peripheral nerve interfaces for prosthetic control in humans
P. S. Cederna (Ann Arbor, MI/US)

11:30–12:00 **Session IX – Nerve regeneration**
Chairs
P. S. Cederna (Ann Arbor, MI/US), C. Radtke (Vienna/AT)
D. Kalbermatten (Basel/CH)

11:30
LOP32
Isolation and characterization of extracellular vesicles for peripheral nerve regeneration
M. Schauper, C. Radtke (Vienna, AT)

11:40
LOP33
Prophylactic regenerative peripheral nerve interface (RPNIs) to prevent postoperative pain
T. A. Kung, C. A. Kubiak, S. W. P. Kemp, P. S. Cederna (Ann Arbor, MI/US)

11:50
LOP34
Enhanced peripheral nerve regeneration with unpurified autologous adipose tissue
C. A. Kubiak, S. W. Sabbagh, V. Thieu, F. Walocko, R. Khouri, T. A. Kung
P. S. Cederna, S. W. P. Kemp (Ann Arbor, MI/US)

12:00–12:12 **Keynote Lecture XIV**
Nerve gap reconstruction
D. Kalbermatten (Basel/CH)

12:15–13:15 **Microsurgical Corner/Lunch Break**
G. Perez-Abadia (Louisville, KY/US), D. J. Schaefer (Basel/CH)
M. Villa (Houston, TX/US)

13:15–13:27 **Keynote Lecture XV**
Microsurgery – from developing a skill to building a practice and where future research should be focused
S. O. P. Hofer (Toronto/CA)

13:30–13:50 **Session X – Education and technology**
Chairs
G. Borschel (Toronto/CA), E. M. Rüegg (Geneva/CH)
D. Murariu (Pittsburgh, PA/US)

13:30
LOP35
The "microsurgery interactive video learning modules" – drawing a balance after 2 years online
L. Geishauser, A. Testa, P. M. Vogt, L. P. Jiga
M. Ionac (Hanover/DE; TMedCare/IT; Oldenburg/DE; Timisoara/RO)

13:40
LOP36
Microsurgical skills training course – the effect on microsurgery trainees' confidence and workload
A. T. Mohan, A. M. Abdelrahman, W. J. Anding, B. R. Lowndes, R. C. Blocker
M. S. Hallbeck, K. Bakri, S. L. Moran, S. Mardini (Rochester, MN/US)

13:55–14:07 **Keynote Lecture XVI**
DIEP flap under 2 hours
J. Farhadi (London/GB; Zurich/CH)

14:10–14:50 **Session XI – Breast**
Chairs J. Farhadi (London/GB; Zurich/CH), S. O. P. Hofer (Toronto/CA)
T. L. Huston (Stony Brook, NY/US)

14:10 LOP37
Improving post-operative monitoring of autologous breast reconstruction – a novel, oxygen-sensing liquid bandage first-in-human trial
M. Malyar, A. Chen, A. Bucknor, P. Kamali, H. Marks, E. Roussakis N. Nowell, B. Lee, C. Evans, S. Lin (Boston, MA/US)

14:20 LOP38
Breast reconstruction in stage IV cancer – selection and outcomes
C. Chu, A. Weiss, E. Mecham, D. P. Baumann, I. Bedrosian, G. Babiera P. B. Garvey (Houston, TX/US)

14:30 LOP39
Comparative operative outcomes in second stage delayed vs radiated tissue expander in breast reconstruction
G. Mercier-Couture, A. Xue, B. P. Phillips, M. V. Schaverien, P. B. Garvey E. Strom, D. P. Baumann, C. E. Butler, R. D. Largo (Houston, TX/US)

14:40 LOP40
Acellular dermal matrix sterility – does it affect microbial and clinical outcomes following implantation for breast reconstruction
G. M. Klein, J. Marquez, G. Singh, M. Gebre, R. Barry, M. Trostler T. L. Huston, J. C. Ganz, S. U. Khan, A. B. Dagum D. T. Bui (Stony Brook, NY/US)

14:50–15:20 **Microsurgical Corner/Coffee Break**
G. Perez-Abadia (Louisville, KY/US), J. Farhadi (London/GB; Zurich/CH)

15:20–15:32 **Keynote Lecture XVII**
Attraction research – why is beautiful considered beautiful
G. Germann (Heidelberg, DE)

15:35–16:35 **Session XII – Aesthetics**
Chairs I. Zegrea (Bucharest/RO), S. Winocour (Houston, TX/US)
O. Wolf (Tel Aviv/IL)

15:35 DFP & HIF-1 alpha – the new frontier of skin rejuvenation
LOP41 A. Pagani, M. M. Aitzetmueller, H.-G. Machens, D. Duscher (Munich/DE)

15:45 Correction and prevention of the pixie ear deformity – a combined technique
LOP42 F. J. Paprottka, K. O. Kaye (Marbella/ES)

15:55 Buttock augmentation with gluteal implants by sub-muscular safe (SMS) technique
LOP43 E. Sabri, F. Petit (Paris/FR)

16:05 Lipo-abdominoplasty versus abdominoplasty in massive weight loss patients – a comparative study
LOP44 S. Giordano, I. Koskivuo, E. Verajankorva, N. Bruk, T. Niemi (Turku/FI)

16:15 Evaluating outcomes in venous thromboembolism (VTE) prophylax is: a comparison of two regimens in abdominal body contouring surgery
LOP45 V. Vasilakis, J. Marquez, G. M. Klein, M. Trostler, M. Mukit, D. Restle A. B. Dagum, C. J. Pannucci, S. U. Khan (Stony Brook, NY/US)

16:25 Surgical strategies for median and paramedian craniofacial dysplasia
LOP46 E. M. Rüegg, A. Bartoli, B. Rilliet, P. Scolozzi, D. Montandon B. Pittet-Cuénod (Geneva/CH)

16:40–16:52 **Keynote Lecture XVIII**
Art and science in craniofacial surgery
J. C. Lee (Los Angeles, CA/US)

17:00–17:45 **Business Meeting (members only)**

18:15–19:30 **ePoster Session II**
(see page 24)

19:30–20:00 **General Assembly**
Elbkuppel, Hotel Hafen Hamburg

20:00 **Social Evening**
Elbkuppel, Hotel Hafen Hamburg
For further information please see page 31.

18:30–19:30 ePoster Session I

18:30 SOP01
A head to head comparison of the vascular basis of the TMG, PAP and FCI flaps – an anatomical study
M. Zaussinger, I. E. Tinhofer, U. Hamscha, S. Meng
W. J. Weninger (Vienna/AT), M. S. Pollhammer (Poelten/AT)
G. M. Huemer, M. Schmidt (Linz/AT)

18:33 SOP02
Utilization of the accessory saphenous vein in free profunda artery perforator (PAP) flap transfer
T. Iida, K. Kanayama, M. Okazaki (Tokyo/JP)

18:36 SOP03
Postoperative Free Flap Monitoring Practices of Microsurgeons in USA
T. Boyko, M. Burke (Buffalo, NY/US)

18:39 SOP4
Can surgical mask wearing influence the physiological tremor while performing microsurgical maneuvers?
A. Stoian, A. Grosu-Bularda, D. Zahiu, D. Zamfirescu (Bucharest/RO)

18:42 Questions

18:45 SOP05
A systematic review of complications in prepectoral implant-based breast reconstruction
S. Winocour, R. D. Wagner, T. L. Braun, H. Zhu (Houston, TX/US)

18:48 SOP06
Considerations and surgical alternatives in breast reconstruction after mastectomy
Y. Zayakova, T. Dimitrova, M. Argirova (Sofia/BG)

18:51 SOP07
The effect of surgery to radiation interval on locoregional recurrence and Survival in patients receiving post-mastectomy radiation treatments
A. Rosenthal, L. Heller, M. Ben-David, O. Wolf (Tel Aviv/IL)

18:54 SOP08
Mastectomy skin flap necrosis – a systematic review of necrosis rates and definitions
C. Gu, B. T. Phillips (Durham/GB)

18:57 Questions

19:00 SOP9
A novel method for perineal hernia repair and pelvic reconstruction using biological mesh and bilateral “hemi-stacked” S-GAP propeller flaps – a case report
I. Panchulidze (Lebach/DE)

19:03 SOP10
Bioprosthetic versus synthetic mesh – analysis of tissue adherence and revascularization in an experimental animal model
D. M. Adelman, K. Cornwell (Houston, TX/US)

19:06 SOP11
The use of autologous, de-epithelialized dermal grafts for abdominal wall hernia repair – indications and clinical outcome in two cases
T. Schweizer, R. Osinga, R. F. Staerkle, E Mujagic, D. J. Schaefer
I. Fulco (Basel/CH)

19:09
Questions

19:12 SOP12
The influence of spider silk fibers on Schwann cell migration and proliferation
F. Millesi, T. Weiss, A. Mann, C. Radtke (Vienna/AT)

19:15 SOP13
Microsurgical decompression of the mental nerve after road traffic accidents
Z. Unluer, Y. Al-Ajam, A. El Kazzaz, H. Osman, M. Mohamed
S. Al-Benna (Abu Dhabi/AE)

19:18 SOP14
Neurotization for functional reconstruction of shoulder abduction in brachial plexus avulsion injuries
Z. Unluer, Y. Al-Ajam, A. El Kazzaz, H. Osman, M. Mohamed
S. Al-Benna (Hampstead/GB; Abu Dhabi/AE)

19:21 SOP15
Ethical approach on animal based research in the field of peripheral nerve surgery
T. Kornfeld, C. Radtke (Vienna/AT)

19:24
Questions

18:15–19:30 ePoster Session II

18:15
SOP16
Seasonal impact on surgical-site infections in body contouring surgery
M. M. Aitzetmueller, D. Duscher, D. Kiesl, R. Wenny, K. Schableger
C. J. Staud, M. S. Pollhammer, A. Shamiyeh
G. M. Huemer (Munich/DE; Poelten/AT, Linz/AT)

18:18
SOP17
Vitamin B12 and folic acid deficiency vs wound healing complications after body contouring surgery
F. Sokullu, A. Niepel, Ö. Özdemir, F. Kömürcü (Vienna/AT; Wesseling/DE)

18:21
SOP18
Bilateral reduction mammaplasty facilitates subsequent weight loss in obese patients (BMI ≥30)
D. Groves, L. Pamen, K. Kapadia, J. Marquez, M. Trostler, C. Medrano
H. Scott, T. L. Huston (Stony Brook, NY/US)

18:24
SOP19
Aesthetic breast augmentation and quality of life
E. Sarantopoulos (Munich/DE)

18:27
Questions

18:30
SOP20
The Spare-parts technique – a safe and efficient single-stage nipple areolar reconstruction
C. Legarda, J. Liu, S. J. Kronowitz, O. Wolf (Tel Aviv/IL)

18:33
SOP21
Secondary intention healing after Mohs surgical excision as an alternative to surgical repair – evaluation of wound characteristics and cosmetic outcomes
K. Liu, J. Marquez, B. Silvestri, T. L. Huston (Stony Brook, NY/US)

18:36
SOP22
Google trends study: Analysis of variations in skin cancer search terms
T. McHugh, P. Sullivan, J. Dorairaj (Dublin/IE)

18:39
SOP23
Case report: When a horse turns out to be a zebra in disguise
N. Wilssens, M. Den Hondt, J. Duponselle, D. Hompes
T. Nevens (Leuven/BE)

18:42
Questions

18:45
SOP24
Closed Lift- 1.5cm temporal incision to complete extended Midface
A. Nunes (Brasilia/BR)

18:48
SOP25
Instagram for plastic surgeons – Do´s and Dont´s
M.-L. Klietz (Tegernsee/DE), M. M. Aitzetmueller (Munich/DE)

18:51 SOP26
Efficacy and safety of gluteal augmentation with autologous fat grafting – a systematic review
C. M. Oranges, Y. Harder, M. Haug, D. Kalbermatten
D. J. Schaefer (Basel/CH)

18:54 SOP27
Low cost 3-D printed patient specific skull models in surgical counseling and education of parents of Craniosynostsis patients – a comparison with the conventional visual explanation modalities
T. Alhumsi, F. Alshomer, F. Alfaqeeh (Riyadh/SA)

18:57
Questions

19:00 SOP28
Standardized concept and optimized approach in surgical treatment of lymphedema – case series
C. Hofsepian, C. Radtke (Vienna/AU)

19:03 SOP29
Botulinum toxin augmented free gracilis flap and local peroneus brevis flap for chronic ulcers in a patient with systemic sclerosis and secondary Raynaud syndrome – a case report
N. Menzi, D. Kalbermatten (Basel/CH)

19:06 SOP30
Optimization of the decellularization process of human skeletal muscle by using flexor Digitorum Superficialis
A. Naik, M. F. Griffin, M. Szarko, P. E. Butler (London/GB)

19:09
Questions

19:12 SOP31
Fetal ECM – the origin of scarless healing
P. Nessbach, M. M. Aitzetmueller, C. Mayer, T. Fraass, P. Oppelt
H.-G. Machens, D. Duscher (Munich/DE, Erlangen/DE; Linz/AT)

19:15 SOP32
Hyperbaric oxygen therapy promotes wound closure and perfusion in ischemic and hyperglycemic conditions, independently of myofibroblast differentiation
D. André-Lévigne, A. Modarressi, E. M. Rüegg, R. Pignel, M.-L. Bochaton-Piallat
B. Pittet-Cuénod (Geneva/CH)

19:18 SOP33
Screening of HLA sensitization during acute burn care
H. J. Klein, F. Lehner, R. Schweizer, B. Rüsi-Elsener, J. Nilsson
J. A. Plock (Zurich/CH)

19:21 SOP34
Application of osmotic tissue expanders in reconstruction of burn scars in children
M. Argirova, T. Dimitrova, Y. Zayakova (Sofia/BG)

19:24
Questions

EPSRC Lighthouse Endowment Fund

The missions of the EPSRC Lighthouse Endowment Fund are the delivery of high-quality patient care through the contribution to innovations in medicine through basic and translational research and clinical outcome studies, and the education of medical students, postgraduate trainees, residents and consultants to insure an adequate supply of academic plastic surgeons for the future. This Society is a non-profit organization managed by and for the benefit of the young plastic, reconstructive and aesthetic surgery research community. The annual EPSRC meeting will offer an exciting opportunity for young plastic surgery researchers to discuss their latest work and future challenges in a uniquely informal, interactive format for basic science and clinical outcome research. The EPSRC meeting will provide a valuable means of disseminating information and ideas in a way that cannot be achieved through the usual channels of communication – publications and presentations at large scientific meetings.

This year we continue with securing the financial stability of the European Plastic Surgery Research Council with the help of the EPSRC Lighthouse Endowment Fund. EPSRC Lighthouse Fund Donors have committed themselves to the ongoing support of your new generation of Plastic Surgeon Scientists in Europe.

The Executive Board of the EPSRC hereby asks professionals, industrial partners and patients for financial support of this research organization to translate innovation from the bench to the bedside for the patients' benefit. EPSRC is very grateful to the EPSRC Lighthouse Fund Donors for their active support to keep this research endeavor going.

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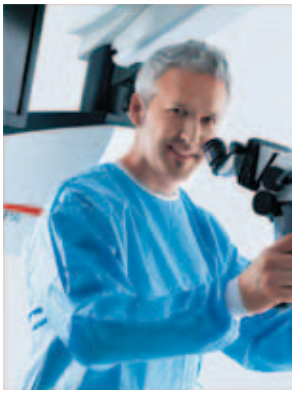

The microsurgical corner contains one workstation with a fully-equipped Leica M525 F50 microscope, bringing the fascinating world of microsurgery up, close and personal for all EPSRC attendees. Young colleagues, willing to experience microsurgery „live“, will have the chance to perform microvascular sutures on gloves and microvascular anastomosis using ex-vivo models (chicken legs) throughout the meeting. Working with top-quality microscopes (Leica), microsurgical instruments and sutures (S&T AG), everyone interested to learn microsurgical techniques is invited to participate. Dr. Gustavo Perez-Abadia from the University of Louisville will lead the microsurgical corner. Our international faculty will support him with their microsurgical expertise. The instructor from Leica, S&T AG and TapMed as well as our faculty will provide you all the information needed regarding microscopes, instrumentation, microsurgical sutures and so on. Through the kind support of our sponsor, Synovis Micro Companies Alliance Inc., the microsurgical work-stations will be provided with the GEM Microvascular Anastomotic CouplerTM and the proper instrumentation to exercise mechanical microvascular anastomosis, an ever-evolving technique which has become a standard technique in reconstructive microsurgery.

Important

1. This is not a practical course but only a booth offering a unique hands-on experience in performing microvascular anastomosis. No diplomas of any kind will be issued.

2. Places will be distributed on the “first come, first served” basis for all EPSRC attendees interested to experience microvascular anastomosis.

3. The microsurgical corner will be only available during the official congress breaks.

Registration

For registration, please sign in at the registration desk.

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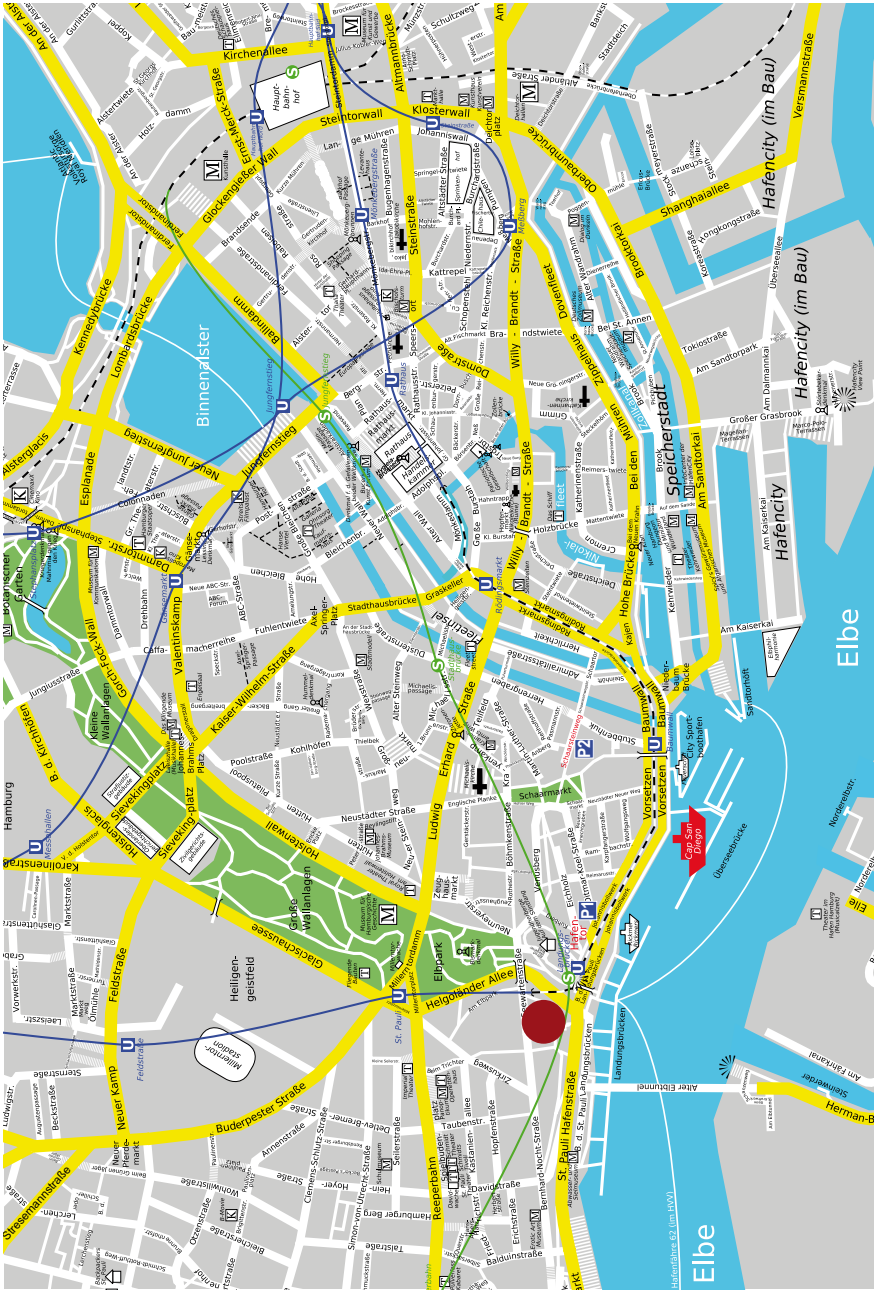

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Welcome Reception

EPSRC invites you to kick off the Annual Meeting on Thursday, August 23, 2018 with the Welcome Reception at the Skyline Bar 20up of the Hotel Empire Riverside overlooking the harbor of Hamburg. Join us for a casual Meet and Greet overlooking the beautiful harbor of Hamburg.

Date	Thursday, August 23, 2018
Time	19:00–22:00
Venue	Skyline Bar 20up of the Hotel Empire Riverside
Costs	Included for participants, 50 EUR for accompanying persons

Social Dinner

You are invited to round off the scientific program in casual atmosphere. Take some time to refresh contacts or even to make new contacts! Food and beverages are provided.

Date	Friday, August 24, 2018
Time	19:00–20:00
Venue	Elbkuppel, Hotel Hafen Hamburg
Costs	Included for participants, 35 EUR for accompanying persons

Date	Friday, August 24, 2018
Time	20:30–22:30
Venue	Boat Cruise
Costs	Included for participants, 35 EUR for accompanying persons

Date	Saturday, August 25, 2018
Time	19:30–22:00
Venue	Elbkuppel, Hotel Hafen Hamburg
Costs	Included for participants, 35 EUR for accompanying persons

Program after the Social Dinner*

Date	Saturday, August 25, 2018
Time	22:30
Venue	Hans-Albers-Eck Hans-Albers-Platz 20, 20359 Hamburg
Costs	Not included for participants and accompanying persons

Farewell Brunch

Finally, we will start our day with a farewell brunch before we say “Goodbye & see you again!”

Date	Sunday, August 26, 2018
Time	08:30
Venue	Restaurant Port, Hotel Hafen Hamburg
Costs	Included for participants, 20 EUR for accompanying persons

*Please note this is not an official program event. Those interested should ask at the check-in desk.

Cultural Program

Boat cruise “Rock the harbor with S&T”

Do not miss the boat cruise on the beautiful river Elbe organized by Markus Spingler and Juerg Pfeiffer with S&T. This will certainly bring back some of the memories from the good old times when we were on the Cap San Diego. The boat will be ready to board at the Ladungsbruecken 7–10, which is right in front of the hotel Hafen Hamburg, starting at 20:00h. The boat will leave exactly at 20:30h.

Date	Friday, August 24, 2018
Time	20:30–22:30
Venue	Boat MS Concordia
Costs	Included for participants, 35 EUR for accompanying persons

Insider Tip – Hamburg Fish Market*

Fish, fruits, flowers, clothing and souvenirs, you can find almost anything at the Hamburg Fish Market, an institution since 1703. Every Sunday morning, early birds and night owls unite along the shores of the Elbe to barter over fresh fish, regain their spirits over a coffee or simply to enjoy the lively atmosphere.

Date	Sunday, August 26, 2018
Time	05:30–09:00
Venue	St. Pauli Fish Market/Große Elbstrasse

*Please note this is not an official program event. Those interested should ask at the check-in desk.

LOP01

Dorsal double perforator "super-thin" free flap – a new choice for scar contractures in the head and neck area

V. Q. Vinh[1], T. V. Anh[1], T. T. Hai[1], H. T. Tuan[1], H. Hyakusoku[2], R. Ogawa[2]

[1] Department of Plastic and Reconstructive Surgery, Vietnam National Institute of Burns, Thanh-Tri, Hanoi, Vietnam

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

Background: Perforator supercharge super-thin flap was introduced in 1994 by Hyakusoku and Gao. The super-thin flap is a distinctively thin flap primary thinned to the layer where the subdermal vascular network can be seen through minimal fat layer. For the reconstruction of severely disfigured neck and face, large and thin flap such as the occipito-cervico-dorsal (OCD) "super-thin flap" should be harvested from the dorsal region with surpercharging of the circumflex scapular vessels. Recently, we applied dorsal double perforators "super-thin" free flap for reconstruction of half face and whole chin-neck severe scar contracture.

Method: 35 dorsal double perforator free flaps were designed in the dorsal. 9 flaps designed for whole chin and neck reconstruction include the perforator of circumflex scapular vessels and sixth or seventh contralateral posterior intercostals perforator artery. One flap designed for half face reconstruction include the perforator of circumflex scapular vessels and sixth or seventh ipsilateral posterior intercostals perforator artery. Recipient are superficial temporal artery and contralateral or ipsilateral facial artery. The fate tissue between two pedicles was thinned before pedicles dividing. Flap maximum we can elevated is 35x15cm.

Results: The most of flap survived completely. The donor site was closed by using split full-thickness skin graft or primary suture. The patients were satisfied with both cosmetically and functionally.

Conclusion: Dorsal double perforators super thin free flap is new choosing in severe neck contracture scar reconstruction.

LOP02

Lateral thoracic vascularized lymph node flap for lymphedema – outcomes and technical modifications

M. V. Schaverien[1], C. J. Coroneos, F. C. Wong[2]

[1] Department of Plastic Surgery, The University of Texas MD Anderson Cancer Center

[2] Department of Nuclear Medicine, The University of Texas MD Anderson Cancer Center

Background and Objectives: There have been few studies of the use of the lateral thoracic vascularized lymph node (LTVLN) flap for lymphedema. This article reports outcomes and technical modifications for the LTVLN flap.

Methods: 25 consecutive patients with lymphedema that underwent LTVLN transfer were included in the study; 16 upper extremity (UE) and 9 lower extremity (LE). Mean age was 50.6(±14.6) years and average BMI was 28.4(±4.9). Mean duration of lymphedema was 5.2(±5) years and patients had prominently ICG stage III (n=12) and IV (n=11) lymphedema. Patients underwent complete decongestive therapy preoperatively. Limb volume change (LVC) using perometer, LDex, and patient reported outcomes, were measured every 3 months.

Results: At 6 months postoperatively, mean LVC was-9.7% and mean LDex change was-33.5%. For the UE, when transferred to the axilla, mean LVC was-2.1%, and LDex change was-56.9%; and to the forearm, mean LVC was-21.5% and LDex change was-21.7%. Only two of 12 patients with recurrent cellulitis preoperatively had a single episode following surgery. Mean reduction for the LLIS was 15.3, and for the QuickDASH was 15. There were no total flap losses, and two patients had partial necrosis of the skin paddle only. No patient developed lymphedema of the donor extremity by symptoms or perometer. Mean follow-up was 10.4(±5.5) months.
Conclusions: The LTVLN flap is effective and versatile for the treatment of lymphedema, with a low complication rate.

LOP03
Treatment outcome of infected total knee arthroplasty with severe soft-tissue damage

R. Osinga[1], P. Ochsner[2], D. J. Schaefer[1], M. Clauss[2,3]

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Introduction: Periprosthetic joint infections (PJI) are challenging complications after total knee arthroplasty (TKA). To ensure preservation of a pain-free, functional joint, management of PJI requires rapid assessment of the infection and consequent application of a valid treatment algorithm. In case of severe soft-tissue damage close cooperation between orthopaedic and plastic surgeons is mandatory. The aim of this study was to assess all infected TKA at the University Hospital of Basel between 2000 and 2018 in need for a combined ortho-plastic procedure.
Material and methods: All patient charts from 2000 to 2018 plus additional in-house databases were scrutinized for the keywords 'implant', 'prosthesis', 'infection' and 'flap'. Furthermore, charts were screened for orthopaedic (kind of implant, number of surgeries), plastic surgical (type of flap, local wound complications), infectiological (germ, antibiotic treatment) and patient-specific (gender, age, immunosuppression, obesity, diabetes, other chronic diseases, dermatological affections, smoking and drinking habits) parameters.
Results: During study period, 175 patients suffered from infected TKA of which 36 needed a total of 44 plastic-surgical soft-tissue reconstruction procedures (6 x 2 flaps, 1 x 3 flaps). Six flap complications were seen (5 in local/regional flaps and 1 in a free flap). 9 Patients had a debridement, antibiotics and implant retention (DAIR) procedure due to early wound breakdown, 8 had a one-stage and 21 a two-stage procedure (two patients with DAIR / one-stage procedure respectively, before two-stage procedure). Six patients ended in knee arthrodesis, one in above knee amputation and one with knee pseudarthrosis after implant removal. In 5 patients with a two-stage procedure the flap was applied at time of removal of the prosthesis, in 1 at time of re-implantation and in 15 patients in between. Infections were caused by S. aureus (6/36), S. epidermidis and coagulase negative staphylococci (5/36 each), Propionibacterium acnes (4/36) and others (16/36). In 32 patients infection control was achieved.
Conclusion: Close cooperation between orthopaedic and plastic surgeons improves outcome in case of PJI after TKA. Analysis of the procedures let us formulate the following ortho-plastic key points: (i) immediate plastic-surgical reconstruction of a periprosthetic soft-tissue defect can prevent the exchange of the prosthesis. (ii) in case of severely damaged periprosthetic soft

tissue, removal of the prosthesis, insertion of a spacer or fixateur externe is indicated followed by soft-tissue reconstruction. At the earliest, re-implantation of the prosthesis is performed 6-8 weeks later. (iii) possibly critical soft-tissue should be replaced by well vascularized soft-tissue before implantation of the prosthesis.

LOP04

The free fibula flap for restoration of spinal stability after oncologic vertebrectomy

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Introduction: Nonvascular bone grafts (BG) >4 cm have a 50% failure rate in spine surgery. Vascular bone flaps are clearly superior to BG in head and neck and extremity applications; their utility in spine surgery has not been fully elucidated. We hypothesize that the addition of a free fibula flap (FFF) after oncologic vertebrectomy is safe and effective, resulting in a high boney union rate and good functional outcomes.

Methods: We performed a retrospective review of all patients who received a FFF for restoration of spinal stability after vertebrectomy at MD Anderson Cancer Center from 1997-2017. Patients who received BG alone served as the control. Major complications included hardware failure, nonunion, flap loss, and major infection; skin dehiscence, cellulitis, seroma, and hematoma were considered minor complications. Functional outcomes included ability to ambulate and return to work.

Results: There were 15 FFF patients and 33 in the BG group. BG patients were significantly older (43.9 vs. 60.2 years; $p<0.001$), more likely to be palliative (78.8% vs. 0%; $p<0.001$), had a higher mortality rate (78.8% vs. 13.3%; $p<0.001$), and a shorter mean follow up (15 vs. 29.7 months; $p=0.07$). FFF patients were more likely to have a multi-level (as opposed to single-level) vertebrectomy (60% vs. 24.2%; $p=0.02$). All FFF were single-barrel and spanned the resected vertebral bodies; the mean flap length was 6.4 cm (4.2-9 cm). There was one hardware failure in each group. Although not statistically significant, the BG group had more major (21.2% vs. 13.3%; $p=0.41$) and minor (27.3% vs. 13.3%; $p=0.25$) complications; there were no flap losses. FFF patients were ambulatory at a median of 3 days, achieved union at a median of 106 days, and all regained preoperative functional status.

Conclusions: Despite larger resections and a longer construct length, FFF patients had a low hardware failure rate, low complication rate, and excellent functional outcomes. FFF should be considered in young spinal tumor patients with a good oncologic prognosis.

LOP05

Adipose derived stem cells enhance the angiogenesis and tissue integration of polyurethane implants

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Introduction: Synthetic cartilage implants are used to restore facial defects following cancer resection and congenital diseases. However, following implantation their ability to support angiogenesis is limited causing extrusion and infection. The aim of this study was to assess the effect of platelet rich plasma (PRP) and adipose derived stem cells (ADSCs) angiogenesis of synthetic cartilage implants.

Methods: Non-biodegradable polyurethane implants (NPU) were manufactured to mimic human cartilage and modified with plasma surface modification (PM). Donor rats were then used to extract ADSCs and PRP to modify the implants further. Implants with and without PM were modified with and without ADSCS and PRP and subcutaneously implanted in the dorsum of rats for 3 months (n=6). After 6 and 12 weeks the six-implant variations were excised and the degree of tissue integration, angiogenesis and immune response was examined using immunohistochemistry and RT-qPCR.

Results: The two implants, which showed the greatest integration by H&E staining were PM+PRP+ADSC and PM+ADSC, but there was no significant difference between the two implants ($p<0.05$) Masson Trichome staining confirmed the elevated tissue integration, with greater collagen staining with PM+PRP+ADSC and PM+ADSC implants ($p<0.05$). PM+PRP+ADSC and PM+ADSC implants showed the greatest vessel formation by CD31 staining ($p < 0.05$). The immune response as shown by CD45 and CD68 staining was similar between the implants over 12 weeks.

Conclusion: ADSCs modification can improve the tissue integration and angiogenesis of synthetic cartilage replacement implants but PRP has no effect. The clinical application of ADSCs should be explored to improve the outcome of synthetic cartilage implants.

LOP06

The influence of hyperbaric oxygen therapy on the biology of adipose tissue mesenchymal stem cells

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Introduction: The treatment of chronic wounds is a great challenge in Plastic and Reconstructive Surgery. For some years, hyperbaric oxygen therapy (HBOT)- the exposure to 100% O2 at increased atmospheric pressure (ATM)- is discussed as a measure to promote wound healing. One cell

type that has rapidly gained interest in wound repair due to their secretome and multilineage differentiation capacity is the mesenchymal stem cell (MSC). In the present study, we examined the hitherto unknown effect of HBOT on MSCs isolated from adipose tissue in an in vitro setting.
Material and Methods: Primary adipose-derived MSC cultures from healthy donors were treated in a HBO chamber for a period of five days with either two or three ATM. Metabolic activity was measured before and 90 min after HBOT by PrestoBlue®. Proliferation was determined by Crystal violet staining. Furthermore, the effect of HBOT on adipogenic, chondrogenic and osteogenic differentiation was measured by Oil Red O, Alizarin Red and Alcian-PAS staining, respectively. Finally, cell media were tested for cytokine content by ELISA.
Results: Three ATM elevated the metabolic activity immediately and increased cell proliferation after five days of HBOT when compared to the two ATM and the untreated control group. Metabolic activity levels, however, normalized 24 hours after HBOT. HBOT significantly increased adipogenic differentiation, but did not influence osteogenic or chondrogenic differentiation. HBOT also increased secretion of TGF-β.
Conclusion: HBOT influences MSC biology, which may contribute to beneficial effects on wound healing processes while 3 ATM appears to be more effective than 2 ATM.

LOP07
Improved adipocyte viability in autologous fat grafting with ascorbic acid supplemented tumescent solution

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Introduction: In reconstructive surgery, fat volume augmentation is often necessary for aesthetic or functional reasons. As an alternative to synthetic and xenogeneic materials, autologous fat grafting (AFG) based on liposuction is gaining popularity, yet successful transplantation and long-term volume maintenance are difficult. Standard tumescent solution formulations neglect adipocyte and stromal vascular fraction (SVF) cell survival during extraction, as well as SVF differentiation into adipocytes thereafter, all of which are crucial for the success of AFG. Here we hypothesized that addition of ascorbic acid (AA) to the tumescent solution could prevent liposuction-induced cell damage.
Material and Methods: The effect of 0.1 mmol/l ascorbic acid in tumescent solution was investigated in a previously described ex vivo model of AFG. Briefly, excision fat was infiltrated with tumescent solution, with or without AA, and incubated for 20 minutes at 37°C. Hand-assisted liposuction was then performed with a blunt cannula. Total cell viability, clonogenicity and differentiation capacity of the SVF cells were assessed.
Results: With AA, 10.3% more cells and in particular 14.9% more adipocytes survived liposuction. Clonogenicity, adipocyte and osteoblast differentiation by SVF cells remained unchanged.
Conclusion: Addition of AA successfully improved survival of adipocytes during liposuction without affecting SVF growth and differentiation. This study therefore identified a useful supplement to the tumescent solution which may lead to improving AFG success.

LOP08

A prospective time-and-motion pilot study comparing rate of processing techniques in autologous fat grafting

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Introduction: Autologous fat grafting (AFG) is increasing in popularity to address a variety of defects. As the procedural volume increases, there is interest in developing techniques to harvest, process and inject fat which should improve clinical outcomes as well as operative efficiency. The purpose of this pilot study is to compare the rate of graft processing of two commercially available systems for graft preparation.
Methods: We prospectively observed 40 AFG procedures using either a passive washing and filtration system (system–PF) or an active washing and filtration system (system–AF). The primary outcome measure was rate of adipose tissue processed, defined as milliliters per minute.
Results: Twenty consecutive cases using system–AF were observed followed by 20 consecutive cases using system–PF. There were no significant differences in patient characteristics or demographics between the two groups. Overall, the rate of adipose tissue preparation was significantly higher with the active system–AF compared to the passive system–PF (19.8 versus 5.3 ml/min, $p \leq 0.0001$). The resulting percent of graftable fat was approximately 40% for both systems (system-AF=41% versus system–PF=42%, $p=0.83$).
Conclusions: Time-and-motion studies such as this provide a means to systematically document each of the steps involved in fat grafting in a reliable fashion. The results of this study indicate that an active fat graft processing system appears to be more time efficient than a passive fat graft processing system. Further large-scale studies of the efficacy and cost analysis of autologous fat grafting are a necessary component of determining best practices in the field.

LOP09

Encapsulation of mesenchymal stem cells improves vascularization of alginate-based scaffolds

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Introduction: Vascularization of bioartificial tissues can be significantly enhanced by the generation of an arterio-venous (AV) loop. Besides the surgical vascularization, the choice of the scaffold and the applied cells are indispensable cofactors. The combination of alginate dialdehyde and

gelatin (ADA-GEL) and mesenchymal stem cells (MSCs) is a promising approach with regards to biocompatibility, biodegradation as well as de novo tissue formation. This study aims at investigating the impact of MSCs on vascularization, biocompatibility and biodegradation of ADA-GEL microcapsules in the AV loop model.

Materials and Methods: A Teflon chamber filled with ADA-GEL microcapsules was placed in the groin of Lewis rats and an AV loop was placed into the chamber. In group A the ADA-GEL was implanted without MSCs whereas group B contained 2 x 106 DiI-labeled MSCs/mL ADA-GEL. 4 weeks postoperatively tissue formation and vascularization were investigated by histology and µCT.

Results: We were able to prove vascularization originating from the AV loop in both groups with statistically significant more vessels in group B containing MSCs. Moreover, encapsulated MSCs promoted biodegradation of the ADA-GEL microcapsules and ADA-GEL displayed a good biocompatibility.

Conclusion: In the present study we were able to demonstrate for the first time, the successful vascularization of ADA-GEL microcapsules by means of the AV loop. According to our results, ADA-GEL and upon further modification such as combining it with different cell types or growth factors, it seems to be a suitable material for engineering of vascularized bioartificial tissues for regenerative purposes.

LOP10

Short-Term delivery of fibrin-bound vegf protein in osteogenic grafts ensures both increased vascularization and efficient bone formation

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Spontaneous vascularization of large osteogenic constructs based on bone marrow-derived mesenchymal stem cells (BMSC) is too slow for progenitor survival in vivo. We found that sustained over-expression of vascular endothelial growth factor-A (VEGF) by genetically modified human BMSC effectively improved osteogenic graft vascularization, but also impaired bone formation through excessive osteoclast recruitment. Here we hypothesized that short-term delivery of VEGF protein, immobilized in fibrin gels, may improve graft vascularization without impairing bone formation.

Recombinant VEGF was engineered with a transglutaminase substrate sequence (TG-VEGF) allowing covalent cross-linking into fibrin hydrogels. Human BMSC were embedded in the fibrin gels and seeded on apatite granules. Bone formation and vascularization were assessed 1, 4 and 8 weeks after orthotopic implantation in nude rats. Retrovirally transduced BMSC stably

expressing VEGF were used as control.
At all times, constructs containing fibrin-bound TG-VEGF with naive BMSC or VEGF-expressing BMSC displayed increased vascularization compared to the controls with naive BMSC only. After 4 weeks fibrin gels were completely degraded in all conditions. However, while bone formation at 8 weeks was severely impaired with VEGF-expressing BMSC as expected, fibrin-bound recombinant TG-VEGF allowed the formation of bone tissue as efficiently as naive BMSC alone. Interestingly, TG-VEGF improved the bone formation kinetics, as TG-VEGF constructs contained more bone than even naïve controls after 4 weeks.
In conclusion, VEGF effects on promoting vascularization and bone resorption can be uncoupled by short-term delivery of recombinant VEGF protein, providing an attractive and clinically applicable strategy to ensure both robust vascularization and bone formation.

LOP11
Gene therapy induced surgical revascularization of cryopreserved allogenic bone: in a Yucatan minipig model

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Introduction: Current surgical treatment options for segmental bone often include the use of cryopreserved allogeneic bone. Structural allografts provide immediate stability, but remain largely necrotic with time. Restoring the vitality of allograft bone may resolve many of these complications. We have tested a means to accomplish this goal in a Yucatan minipig segmental tibial defect model.
Material and Methods: Segmental defects of 3.5 cm were created in 16 Yucatan minipig tibias, and restored using cryopreserved allogeneic bone. In all 16 pigs the anterior tibial artery and vein were ligated distally and cut. This was placed within the medullary canal. In 8 of the pigs the AV-bundle was transfected with VEGF and PDGF. The other 8 pigs had no growth factors added. After 20 weeks the pigs were sacrificed. Vascular volume was calculated using micro-CT. We measured osteoblasts as well as osteoid-covered surface as well as osteoclasts, and eroded surfaces using Sandersons rapid bone stains.
Results: The vascular volume in the growth factor treated group was significantly higher compared to the control group (p=0,003). The inner cortex showed significantly more bone remodeling in the VEGF and PDGF treated group compared to the control group (p=0,013). The Sanderson's rapid bone stains showed significant higher numbers for osteoblasts in the inner cortex compared to the control group (p=0.007), osteoid surface (p=0.015) and eroded surface (p=0.015), but not for osteoclast number (p=0.800).
Conclusion: Revascularization of cryopreserved segmental tibia through placement of an AV-bundle intramedullary and adding VEGF and PDGF results in increased neoangiogenesis and bone formation in a Yucatan minipig model.

LOP12

Attempted suicide by self-inflicted burns – a retrospective study

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Introduction: Survivors of attempted suicide by self-inflicted burns often suffer severe burns injuries. It follows that these patients often require intensive medical care. The number of patients with self-inflicted burns represents a not negligible proportion of the total treated in Burns Intensive Care Units (BICU). Frequently, this patient cohort shows demographic similarities and associated psychiatric disorders. The aim of the present study is to investigate association factors, social and demographic correlations within this cohort, but also differences between the pattern of burns from attempted suicides and patients with accidental burn injuries as exhibited by patients treated in the General Hospital in Vienna.

Methods: Medical files of all patients treated in the Burns Intensive Care Unit in the General Hospital in Vienna during 2014, 2015 and 2016 were evaluated. The criteria for inclusion were: the need of intensive care, an Abbreviated Burn Severity Index (ABSI) ≥ 4, and an age of ≥ 13 years. A total of 154 burns patients have been included in the study.

Results: During the observation period, attempted suicide by self-inflicted burns was the third most common cause of admission on the BICU, with 9.7% (15/154) of total cases. The most common cause of admission, with 72.7% (112/154), were non-work-related accidental burns, followed by burns due to work-related-injuries with 16.2% (25/154).

Attempting suicide by self-dousing with combustible fluids was, with 66.7% (10/15), the most frequent cause of burns, followed by the igniting of clothing, in 13.3% (2/15), and self-initiated explosions, in 6.7% (1/15) of cases.

Patients with self-inflicted burns exhibited psychiatric disorders significantly more frequently than patients in the reference group (Table). The psychiatric disorders observed in patients with self-inflicted burns were depression (33.3% (5/15)), past suicide attempt or self-mutilation (26.6% (4/15)), affective spectrum disorders (13.3% (2/15)) and schizophrenia (13.3% (2/15)).

The distributions of gender, age and body mass index (BMI) showed no differences as between those who had attempted suicide (group I) and the patients in the reference group (group II) (Table).

Patients in Group I (Table) exhibited a significantly higher percentage of total burned surface area (TBSA), incidence of burned trunk and lower extremities, inhalation injuries and full-thickness burns.

No significant differences were found in the ratios of palliative and curative treatment given to patients in the two groups. Furthermore, lethality did not evince any significant differences neither in general nor with respect to gender.

Conclusion: Despite patients with burns arising from attempted suicide frequently exhibiting higher percentages of TBSA, more frequent inhalation injuries and full-thickness burns than the control group, lethality did not materially differ between the two groups of patients.

Multidisciplinary cooperation between intensive medicine and surgery can ensure survival of these patients; in combination with intensive psychiatric therapy, they may be given a second opportunity of living.

LOP13

Development of stable FGF2 enriched biopolymer nanostructured dermal substitute: ex ovo and in vivo study

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Introduction: The 21st century has become a time of progressive research and development in the field of nanotechnology. Together with the increasing demands on the quality of treatment in the field of burn and plastic surgery, there is the possibility of applying new technological solutions in the treatment of defects with full loss of skin thickness. The goal of current treatment is not just mere survival of the patient, but also preservation or improvement of quality of life after devastating injuries, optimization of acute treatment and subsequent rehabilitation. Artificial skin replacements provide the properties of improved controlled maturation of the scars while maintaining the viscoelastic properties of the newly formed skin.
Material and Methods: The resorbable skin substitute consists of two layers. The lower layer (dermis substitution) was prepared from a biopolymerized nanostructured porous foam with highly stable FGF2. The upper thinner layer (basal membrane substitution) forms amphiphilic polymeric nanofibres to ensure optimal adhesion of the dermoepidermal graft. The skin substitute and its biological activity has been tested in several steps: 1) in vitro testing of biocompatibility by colonization of 3T3 lines of mouse fibroblasts, 2) ex-ovo testing of neovascularization using a Chick Chorioallantoic Membrane assay, 3) an in vivo experiment on an animal model of a pig including histological, biomolecular analysis and cutometry.
Results: In-vitro assays performed on mouse 3T3 fibroblasts did not proof cytotoxicity of bilateral skin substitution. Collagen foams containing chitosan showed increased viability and DNA levels, unlike non-modified foams. The Ex ovo CAM test confirmed significant neovascularization in both non-modified and FGF2 modified 3D collagen foams. Biocompatibility and significant neovascularization of the two-layered collagen-chitosan implant with FGF2 was confirmed by an in vivo experiment where the implant was inserted into the newly created full skin thickness defect of the experimental porcine model and covered with a thin dermoepidermal graft.
Conclusion: Histological and immunohistological samples taken on the 14th postoperative day confirmed the resorption of the two-layer biopolymer skin substitute, creation of neodermis and wound healing throughout the defect, particularly in FGF2 containing samples. The samples

exhibited neoformation of fibrous tissue without the presence of foreign bodies cells. The tested 3D bilayer biomaterial thus demonstrated optimal properties of application into skin defects, resistance to infection and biocompatibility. Increased elasticity of neodermis was demonstrated by cutometric measurements.

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LOP14

Evaluation of negative prognostic factors in severe burns-strategy

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Introduction: Severe burn injuries represent a major challenge to the entire healthcare team. Several specific burn outcome prognostic scores were developed to predict mortality in burned patients, to enable comparative research and to facilitate decision-making. Multiple predictive factors may influence the prognosis of burn patients and a careful management of those parameters will decrease the morbidity and mortality and will determine an improvement in patient's final functional outcome.

Material and Methods: We present a two years study regarding the burn patients hospitalized in our institution. A total of 355 burned patients were hospitalized, 210(59%) of them being addmited in Critical Care Burn Unit.A detailed analysis was performed on those 210 patients in order to determine the parameters that aggravate the prognosis of burn injuries.

A large panel of data were taken into consideration regarding burn severity, mechanism of injury, patient characteristics, associated illnesses, promptitude in hospitalize the patient in the burn center; prognostic scores was used to evaluate the mortality risk, burn injury-associated complications were noted and analyzed.

Results and Discussion: We highlighted a series of parameters regarding therapeutic management that influence the outcome of the patient after severe burn injury: an adequate hydro-electrolytic resuscitation in acute phase, further support of vital functions, early excision and grafting of burn eschars, comorbidities treatment and adherence to rehabilitation and follow-up program. ABSI Score is an important tool in the assessment of mortality in burn patients. Multiple complications were encountered in our patients: infections, pulmonary, cardiac, renal, thrombo-embolic, hematologic, digestive and neurologic disorders.

Conclusion: A clear understanding of the physiopathology of burn injuries and their complications is essential for providing an adequate prompt treatment to reduce morbidity and mortality. Patient mortality still represents the primary outcome measure for burn care. Scoring systems aim to use the most predictive patient and injury-related factors to yield an expected mortality for a given patient. Early excision of the devitalized tissue and subsequent grafting reduce the local and systemic effects of the mediators released from burned tissue avoiding the progressive inflammatory chain. Early recognition and treatment of burns complications, especially severe infections represent an important prevention strategy, improving survival after these severe injuries.

LOP15

Do hypertrophic dermal fibroblasts have vascular potential? Expression of the ETS family transcription factor ERG and its role in incisional hypertrophic scarring

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Introduction: Hypertrophic scarring research is often limited by a lack of site-matched control tissue and variations in wound mechanisms. We examined patients undergoing autologous ear reconstruction, providing site-matched, age-matched, internally controlled unscarred skin and subsequent scar tissue, to identify predictive biomarkers of hypertrophic scarring.
Methods: Fibroblasts from 30 unwounded patients and their subsequent normal (n=23) and hypertrophic (n=7) scars were examined for motiltity (scratch assay) and proliferative rates (WST-1), expression of key TGFβ signalling proteins, and myofibroblastic differentiation after exposure to TGFβ. Cells from the clinically best and worst hypertrophic scars underwent RNA sequencing (n=12) for full gene expression profiles. Findings were correlated with clinical scar assessment by SIAscopy.
Results: No significant differences in motility, proliferation, signalling protein expression, or TGFβ response were detected in the unscarred fibroblast groups. However, RNAseq indicated that unscarred fibroblasts from hypertrophic subjects have a distinct gene expression signature, with expression levels of the pro-angiogenic transcription factor ERG correlating with scar severity. immunofluorescence and western blotting showed significantly increased expressions of ERG in unscarred fibroblasts from hypertrophic subjects. These fibroblasts also demonstrated greater vasculogenic potential by matrigel tubule assay with HUVEC controls.
Conclusions: RNAseq analysis using this model has identified novel markers of hypertrophic scarring. ERG expression in normal skin may indicate a tendancy to hypertrophic scarring and offer a future target for therapy.

LOP16

Verapamil-containing silicone gel shows improved therapeutic effect on hypertrophic scar

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Introduction: Hypertrophic scar is a common dermal dysmorphia caused by abnormal fibroproliferative reaction following surgical incision or trauma. Various topical treatment methods such as onion extract, vitamin E, and silicone is popular. Among newly suggested pharmacologic agents for scar treatment, calcium channel blocker (Verapamil) is showing promising results. We devised an enhanced version of topical silicone by embedding Verapamil inside semisolid silicone gel. Mixture of two agents showed superior effect compared to conventional silicone-only gel due to the added effect of Verapamil.
Methods:
Animal preparation
Ten male New Zealand White rabbits were used in this experiment. Five punch wounds (diameter

= 8 mm) were created on the ventral side of each ear using skin biopsy punch (10 wounds/rabbit, total 100 wounds). Wounds were managed with transparent polyurethane dressings. After four weeks of management, five identical hypertrophic scar was evident in each ear of all animal subjects.

Silicone gel preparation, and application

Four versions of silicone gel, containing different concentrations of verapamil (0, 0.1, 1, 10 mg/g) was produced. Same amount of these drugs were applied daily to each of the four scars that were created earlier. One remaining scar was observed without any manipulation.

Analysis: Changes of scar color and hypertrophy was observed daily, and was documented with weekly gross photography. Scar elevation index (ratio of hypertrophy compared to the unwounded normal dermis), fibroblast count, and capillary count were measured with H&E stained histology sections. Statistical analysis was performed to examine significance.

Results: On gross morphology, scar groups that were treated with verapamil-included silicone gel showed superior scar quality compared to non-treatment group or silicone-only group.

On histologic examination, decrease of scar elevation index was observed in correlation to the increased concentration of verapamil. Fibroblast count showed inverse correlation with increasing verapamil concentration inside the silicone gel. Capillary count did not show significant difference among treatment groups.

Conclusion: Although numerous options for treating hypertrophic scar already exist, enhancing the treatment outcome of hypertrophic scar is an ever-persistent task for clinicians in the field of surgery. Through this experiment, we showed that inclusion of verapamil in silicone gel can lead to a better cosmetic result compared to conventional silicone.

LOP17

Bilayered, non-cross-linked collagen matrix for regeneration of facial defects after skin cancer removal – a new perspective for biomaterial-based tissue reconstruction

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Introduction: Skin cancer resection results in a skin defect of different dimensions. In the reconstructive surgery skin transplants are considered as the gold standard. However, this intervention is accompanied by various disadvantages such as extended operation time, additional wound and pain. The aim of this case series was to evaluate the biomaterial-based skin regeneration using a three-dimensional collagen matrix of porcine origin.

Methods: The three-dimensional bilayered collagen matrix was originally developed for intraoral applications. In the course of a translational research series, the matrix was first evaluated during a preclinical study. The membrane was subcutaneously implanted in CD-1 mice for 60 days to evaluate the cellular reaction using histological and specific immunohistochemical methods to identify the inflammatory pattern. In a second step the matrix was evaluated in two independent clinical studies with different indications i.e. tooth recession coverage and vestibulopathy. These studies included histological evaluation of the treated region. Finally, the matrix was used for the regeneration of skin defects (up to 8 cm), which was resulted from skin cancer resection (basal cell carcinoma and malignant melanoma; n=30). The regeneration process was photo documented

and analyzed using specific visual scores (three independent surgeons). Biopsied from 10 patients were evaluated histologically and the cases were followed for three years.
Results: Preclinical: the matrix gets integrated into the implantation area and preserved its integrity over 60 days without any signs of a foreign body reaction.
Clinical intraoral application: tooth resection coverage was achieved in all cases and vestibulopathy was successful without adverse events. In extraoral application
Clinical extraoral application: defect regeneration was achieved in all cases and the original contour and texture of the skin was reconstructed to a large extent. Histological biopsies of the intra- and extraoral application shows the integration of the membrane as a scaffold to guide the newly formed tissue to regenerate the defect.
Conclusion: The translational preclinical and clinical results showed that the three-dimensional collagen matrix is sufficient to achieve biomaterial-based regeneration of the skin in intra- and extraoral defects as an alternative to autologous transplants.

Ghanaati et al 2012 Biomed Mater. Feb;6:015010.
Lorenz et al 2017 Clin Oral Investig. May;21:1103-11.
Ghanaati et al 2017 J Cell Commun Signal. Mar;10:3-15.

LOP18
Axially vascularized, hypertrophic cartilage derived bone scaffolds – a treatment option for complex bone defects

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Introduction: Complex bone defects represent challenging clinical scenarios. Autologous vascularized bone is typically used for reconstruction, but entails several bottlenecks. Here, we thus aimed at ectopically prefabricating a pedicled bone graft surrogate.
Material and Methods: An outer shell of devitalized bone was used to define a space, which was filled with vital or devitalized pellets of engineered hypertrophic cartilage as bone-inducing material, in combination or not with stromal vascular fraction (SVF) of adipose tissue as source of osteoprogenitors and endothelial cells. Vascularization of the space was targeted through axial insertion of an arterio-venous (AV) bundle. Constructs were subcutaneously implanted in nude rats for 12 weeks and analyzed for bone formation and vascularization by histology and microtomography.
Results: Retrieved constructs were efficiently vascularized in all conditions, with vessels sprouting from the AV bundle and reaching a higher density in the axially central volume. Human ALU+ cells were present after 12 weeks in the devitalized SVF+ group. Bone could be found not only in the SVF-seeded devitalized pellets groups, but remarkably also in the unseeded, devitalized constructs.
Conclusion: This study demonstrates feasibility to prefabricate large, pedicled, bone grafts in predefined shapes. The combination of an AV bundle with engineered hypertrophic cartilage provided a germ for the coupled processes of vascularization and bone formation. The demonstrated osteoinductivity of devitalized hypertrophic cartilage offers the opportunity of implementing the proposed regenerative surgery strategy through off-the-shelf materials.

LOP19

Intrinsic vascularization of recombinant eADF4(C16) spider silk fibrous matrices in the arteriovenous loop model

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Introduction: The reconstruction of large tissue defects with autologous tissue is often associated with donor site morbidity. Tissue Engineering is a promising strategy to solve this problem. For vascularization and cell survival an arteriovenous (AV) loop is a powerful tool. Spider silk is a biomaterial with a good biocompatibility and slow biodegradation. In this study we investigated the vascularization and de novo tissue formation of engineered spider silk in a rat AV loop model.
Material and Methods: Using the engineered spider silk protein eADF4(C16), fibrous matrices were produced by wet- (WS) or electrospinning (ES). The matrices and the AV loop were placed into a Teflon chamber in the groin of Lewis rats. After 4 weeks we performed µCT and histological analyses.
Results: We were able to prove partial degradation of both matrices with a higher rate in the ES group. Furthermore, a higher vascularization rate was found in the ES group. In the WS group a higher thrombosis rate of the loop vessels was noticeable, which might be a result of insufficient HFIP removal of the thicker wetspun fibers (44 vs. 1.6 µm) during processing or represent a technical failure during microsurgery. In the histological analysis, macrophages were observed between the newly formed tissue and the spider silk matrices without any signs of severe immunoreaction.
Conclusion: This study demonstrates the successful vascularization of eADF4(C16) fibrous matrices by means of the AV loop. Both fibers displayed a good biocompatibility. The thinner fibers allowed faster biodegradation and vascularization. The use of engineered spider silks enables new possibilities to optimize vascularization of bioartificial tissues based on the adjustment of the fiber diameter.

LOP20

Effective vascularization and robust bone formation in osteogenic grafts requires VEGF dose control

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Spontaneous vascularization of large-size bone grafts based on bone marrow-derived mesenchymal stem cells (BMSC) is insufficient to ensure progenitor survival and bone formation. Recently, we found that short-term delivery of Vascular Endothelial Growth Factor-A (VEGF) protein ensured

increased vascularization while preventing excessive osteoclast recruitment. Here we investigated the role of VEGF dose on the coupling of angiogenesis and bone formation, in order to define a VEGF therapeutic window for vascularized bone grafts.
Recombinant VEGF was engineered with a transglutaminase substrate sequence (TG-VEGF) to allow covalent cross-linking into fibrin hydrogels. Osteogenic constructs were prepared with human BMSC and hydroxyapatite granules in a fibrin hydrogel containing different TG-VEGF concentrations and implanted subcutaneously in nude mice.
All TG-VEGF doses increased vessels density up to 5-fold already after 1 week. However, vessel invasion was negatively affected by VEGF dose, reaching 30% of the graft area with 0.1 µg/ml of TG-VEGF, whereas higher doses were significantly less invaded. After 4 and 8 weeks, 0.1 µg/ml of TG-VEGF enabled bone tissue development as efficiently as with BMSC alone, yielding also significantly more mature bone tissue. In contrast, higher VEGF doses progressively impaired bone formation, together with increased osteoclast recruitment.
These data suggest that VEGF effects on promoting vascularization and bone resorption are dose-dependent and a therapeutic window exists that enables both rapid vascularization and efficient bone formation. This provides a clinically applicable strategy, which allows homogeneous factor doses and controllable duration of factor delivery.

LOP21

Adipose matrix derived hydrogels incubated with released paracrine factors by adipose derived stromal cells – a novel allogenic treatment for wound healing

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Introduction: Nowadays, autologous fat grafting is widely used for regenerative purposes, such as to promote wound healing. The clinical efficacy of fat grafting is often ascribed to single cell populations such as adipose tissue-derived stromal cells (ASC). However, the extracellular matrix, which is often considered no more than the base of tissue architecture, also dictates fate and function of adhered cells, and retains paracrine factors but is poorly investigated for its potential role in regenerative therapy. In this study, we studied and comparedin vitro the uptake and release of ASC secreted paracrine factors by human non-diabetic and diabetic adipose tissue-derived extracellular matrix (ECM) hydrogels. This novel therapeutic modality is intended for wound healing purposes.
Material and Methods: Lipoaspirates were obtained from non-diabetic (n=5) and diabetic (n=5) donors and processed by the use of the fractionation of adipose tissue procedure and subsequently decellularization. Acellular ECM was evaluated for cell remainders by histological staining and DNA content measurement. Acellular ECM was digested with pepsin and formed a hydrogel

at 37°C. Physical properties of the hydrogels were investigated by measuring the viscoelastic relaxation properties. The hydrogels were loaded with ASC-secreted paracrine factors for 24h. Uptake and release of ASC-secreted paracrine factors by the ECM-derived hydrogels were measured with a Luminex immune multiplex assay. The influence of released paracrine factors by the ECM-hydrogels was assessed with a fibroblast proliferation and migration assay as well as an endothelial angiogenesis assay.
Results: Acellular ECM contained no detectable cell remainders and negligible DNA contents after decellularization. Non-diabetic and diabetic-derived hydrogels had large differences in structural integrity. In fact, the viscoelastic relaxation measurements yielded no data for diabetic-derived hydrogels due to gel instability. The luminex assay showed a release of several ASC-secreted paracrine factors concurrently, with no difference between non-diabetic and diabetic derived hydrogels. These paracrine factors were released in a sustained mode for at least 96h. Functionally, these released factors stimulated fibroblast proliferation and migration as well as angiogenesis. No differences were shown between released paracrine factors from non-diabetic and diabetic derived hydrogels, albeit that the inter-donor variation was large.
Conclusion: Adipose tissue extracellular matrix derived hydrogels incubated with paracrine factors secreted by ASC are a promising new therapeutic modality to promote several important wound healing related processes such as fibroblast proliferation and migration as well as angiogenesis. Paracrine factors are released in a controlled way and thus the clinical effects of the hydrogel can be sustained over time.

LOP22

The efficacy of the MolecuLight i:X™ wound intelligence device in the outpatient wound care clinic – a pilot study

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Introduction: Current practice in the outpatient setting for diagnosing wound infections is limited to clinical assessment of signs and symptoms. Subsurface bacterial burden can be missed during standard wound examination protocols. The MolecuLight i:X™ visualizes the presence of potentially harmful levels of bacteria through endogenous auto-fluorescence without the need for contrast agents or contact with the patient. The intended use of the device is to assist with the management of patients with wounds by enabling real-time visualization of potentially harmful bacteria.
Method: A single-centre prospective observational study was conducted in Cork University Hospital in an outpatient plastic surgery wound care clinic. Patients had their wounds photographed under white and autofluorescent light with the MolecuLight i:X device™. Autofluorescent images were compared to the microbiological swab results.
Results: 33 patients and 52 swabs were included. 95.4% (n=41) were positive for bacteria growth. Staphylococcus aureus was the most common bacterial species identified. The MolecuLight i:X™ device had a sensitivity of 100% and specificity of 78% at identifying pathological bacteria presence in wounds on FL-imaging. The positive predictive value was 95.4%. The negative predictive value was 100%. It demonstrated a sensitivity and specificity of 100% at detecting the presence of Pseudomonas species on FL-imaging.
Conclusion: The MolecuLight i:X™ device is a safe, effective, accurate and easy-to-use auto-fluorescent

device which improves the assessment of wounds in the outpatient clinic setting. In conjunction with best clinical practice, the device can be used to guide clinicians with the use of antibiotics and specialized dressings.

LOP23

Uncovering the wound healing process of split skin donor sites – an in vitro study on the influence of wound fluid

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Introduction: The constituents of wound fluid are frequently used as indicators of events arising at a molecular level in the wound surrounding. Wound fluid is produced and kept underneath the occlusive wound dressing of split skin donor sites, providing a stable and reduplicative resource for discovering the wound healing process.

Material and Methods: Wound fluid was collected from eight patients undergoing split-thickness skin grafting. A proteome profiler array was performed to study the variety of proteins present. The selected angiogenic factors were quantified by ELISA. To inspect the angiogenic potency of wound fluid, a tube formation assay and scratch assay were performed by using human umbilical vein endothelial cells.

Results: By screening angiogenesis-related proteins in wound fluid from different samples, we found accordant protein composition regarding angiogenic properties. As indicated by the proteomics array, angiogenic factors such as Thrombospindin-1, Angiogenin and Platelet factor-4 were highly expressed. Wound fluid accelerated both migration and angiogenesis of endothelial cells in vitro.

Conclusion: Our study starts to unravel the composition of wound fluid harvested from split skin donor sites and demonstrates how wound fluid positively promotes wound healing processes by upregulating angiogenesis and other mechanisms in vitro.

LOP24

Evaluation of fetomaternal microchimeric cell potential on maternal wound healing by creating an amniotic fluid environment in a randomizedcontrolled murine model – postulating an overlooked paradigm on maternal wounds

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Introduction: Fetomaternal cell trafficking probably occurs in all pregnancies in which some fetal progenitor cells migrate into the mother throughout pregnancy and persist for decades as normal mother cells, which raises questions over their potential clinical implications. It was reported that microchimeric cells can modify immunological recognition or tolerance, affect the course and outcome of various diseases and demonstrate stern cell-like or regenerative potential As known in fetuses, a scarless tissue regeneration takes place in the amniotic environment involving various cell types and mechanisms that have not yet been fully elucidated. We postulate that these allogenic fetomaternal microchimeric cells (FMCs) might have beneficial effects in the adult maternal wound environment. Further insight into the FMC may lead to newly advanced hypotheses in wound healing based on capacity to repair maternal skin injury.
Material and Methods: 20 virgin and 20 post-partum female mice were exposed to the wounding with 6 mm punch biopsy to make two distinct skin defects on their dorsum and ring splints were performed on all wounds. Each wound on right side of all virgin and mother mice was treated with topical amniotic fluid in every other day and the left side with topical physiologic saline in same days. In every two days, 5 mice were executed for examination. Topographical daily wound area was examined and histopathology, immunohistochemistry, flow cytometry analysis were performed to examine FMCs in skin, blood and internal organs.
Results: It was observed that amniotic fluid application contributed to wound healing as well, both in the mother and the virgins, but this difference was more evident in the mothers. Flow cytometric analyses showed that, only in mothers, amniotic fluid increased regulatory T cells and M2 macrophages both of which are known to facilitate wound repair. Y-chromosome and wound healing parameters were also observed to support this.
Conclusion: Our study showed that FMCs might have potential in wound healing process which may pioneer an overlooked stem cell-like research area on maternal wounds.

LOP25

The role of lymph nodes' transfer and lymphangiogenesis in vascularized composite allotransplantation

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Background: The lymphatic system plays an important role in modulating inflammation, autoimmune disease and organ immune-rejection processes. The lymph node (LN) is the first site of contact between donor and recipient immune cells and is thought to play an important role in inducing peripheral tolerance after transplantation. The aim of this study is to assess the impact of regional donor LNs and lymphangiogenesis on graft survival after vascularized composite allotransplantat (VCA).
Material and Methods: A total of 18 Brown-Norway to Lewis rats hind-limb transplantations were performed, with 9 receiving grafts containing popliteal and inguinal LNs (Group LN+) and 9 receiving grafts depleted of all LNs (Group LN-). To assess lymphangiogenesis, rats received daily lymphography after injection of Indocyanine Green into the transplanted limb starting on post-operative day 2. Rejection was evaluated macroscopically and graded 0-3. Rats were sacrificed on day of Grade 3 rejection, and various samples were collected to assess donor/recipient lymphocyte composition.

Results: There was a trend towards better graft survival in the LN+ group compared to the LN- group. There was also a trend towards more overall regulatory T-cells as well as donor-specific regulatory T-cells in the blood of the LN+ group. Lymphangiogenesis occurred earlier in the LN+ group compared to the LN- group (3.5 vs 5 days, respectively).
Conclusion: Hind-limb transplantations with LNs showed increased level of regulatory T cells and chimerism in the recipient. Moreover, survival was improved and lymphangeogenesis occurred earlier. These results underline the potential of specifically targeting lymphatic vessels and LNs to influence VCA rejection.

LOP26

Evaluation of the effects of ischemia-reperfusion injury in rat isogenic and allogeneic solitary muscle and skin transplant models

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Introduction: Composite tissue transplantations(CTA) such as extremities, face, abdominal wall are now in clinical practice. The success of CTA depends on the availability of many systemic and local factors affecting microcirculation as well as surgical technique and skill. The long duration of operations leads to the resulting in ischemia-reperfusion injury(IR) and an immunological reaction, which leads to the activation of mechanisms that trigger acute and chronic rejection. The aim of this study is to evaluate the effects of IR in isogenic(I) and allogeneic(A) solitary muscle(MT) and skin(ST) transplantation models.
Material and Methods: Four groups were formed using 48 inbred Lewis and 16 inbred Brown-Norway rats: Group 1: I/ST (Recipient: Lewis(n: 8), Donor: Lewis(n: 8)), Group 2: I/MT (Recipient: Lewis(n: 8), Donor: Lewis(n: 8)), Group 3: A/ST (Recipient: Lewis(n: 8), Donor: Brown-Norway(n: 8)), Group 4: A/MT (Recipient: Lewis(n: 8), Donor: Brown-Norway(n: 8)). As a model of ST, groin flap was used, and Gastrocnemius muscle flap was used as MT model. Cyclosporin was used for immunosuppression in allogenic groups. STs were clinically observed in terms of findings such as erythema, hair loss, edema, and circulation was followed by laser doppler. At the end of the study, blood flow in the anastomotic line was measured with doppler, markers of oxidative damage, superoxide dismutase(SOD) and malondialdehyde(MDA) levels were measured, chimerism was determined by flow cytometry in peripheral blood and by PCR in the tissue, MiRNA 21 and 205 levels were measured from plasma and tissue both, and biopsies were taken for histopathological evaluation from the flap and anastomosis lines.
Results: There was no total loss of flaps. A statistically significant decrease in blood flow was observed in allogeneic groups after the Doppler evaluation. At the end of the study, there was no statistically significant difference in SOD and MDA levels in all groups. Significant levels of chimerism were detected in all cell lines, mainly CD4 cells, in the A/ST. In particular, the formation of chimerism in the A/MT cautioned. Determination of chimerism by PCR; In the A/ST, chimerism was observed in the entire reticuloendothelial system, while in the A/MT group only 3 rats had chimerism in the lymph node. Plasma MiRNA 21 and 205 levels were statistically increased in allogeneic transplantation groups. Significant increase in the amount of MiRNA 205 was observed, particularly in the A/MT group. The tissue-related MiRNA results were similar to the

plasma miRNA results. Histopathologically significant perivascular inflammation was observed in allogeneic groups. There was no difference in the number of functional muscle units in isogenic and allogeneic groups.
Conclusions: It should be kept in mind that in allogeneic transplantation, intense inflammation in the perivascular area may cause blood flow reduction in the anastomotic lines. Risks of rejection should be kept in mind, especially with high chimerism levels in organ transplantation with skin. We think that chimerism should be considered following the process after muscle transplantation. MiRNA 205 can be used following transplantation involving muscle tissue.

LOP27

Differential conformation dependent C reactive protein mediated activation of monocyte subsets regulates the early phase of immune rejection in allogeneic transplantation

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Introduction: Recently, it has been shown that innate recognition of allogeneic non-self by monocytes contributes to graft rejection in allogeneic transplantation. In light of the growing field of Vascularized Composite Allotransplantation in reconstructive microsurgery, we investigated the regulation of innate allorecognition by C-reactive protein (CRP), which has been identified to contribute to tissue injury after a conformational change of its circulating pentameric isoform.
Materials and Methods: We performed allogeneic and autologous hind limb transplantations in the rat with and without the additional administration of human CRP. Postoperatively, animals were clinically assessed for signs of allograft rejection. Blood and tissue samples were obtained and tested for monocyte subset infiltration, activation, and tissue distribution. Samples were obtained from both the transplanted and native hind limb.
Results: The administration of CRP significantly accelerated clinical allograft rejection. We found the conformational change of CRP to lead to increased systemic activation and localized transmigration of non-classical monocytes. In contrast, molecular stabilization of administered CRP abrogated its immunomodulatory effects and consequently inhibited aggravation of the acute transplant rejection.
Conclusion: Our data support the hypothesis of non-classical monocytes contributing to acute graft rejection. The tissue damage-induced conformational change of CRP strongly aggravates allogeneic immune response, thus potentially linking acute inflammation with increased acute and chronic allograft rejection.

LOP28

Adipose-derived stem cell-based immunomodulatory therapy in a translational porcine limb transplant model

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Background: Mesenchymal stem cells deriving from bone marrow and adipose tissue have immunomodulatory effects and low immunogenicity. Cell therapy using donor-derived bone marrow cells has already being used clinically and has reduced the burden of immunosuppressive therapy in vascularized composite allotransplantation (VCA) patients. However, the quantity of donor-derived bone marrow cells that can be effectively harvested from an individual donor is limited. Adipose-derived stem cells (ASCs) represent another clinically useful source of cell therapy for allotransplantation. This study was designed to investigate whether ASCs treatment could prolong graft survival across a full MHC mismatch barrier in a porcine large animal model.
Methods: Full-major histocompatibility complex (MHC) mismatched heterotopic hind-limb transplantations were performed in MGH mini-swine. Animals receiving no therapy and animals treated with tacrolimus for the initial 30 days served as control and standard therapy group, respectively. Experimental animals were treated with a standard immunosuppressive protocol including tacrolimus for 30 days, followed by ASC therapy (donor-derived ASCs [1.0x10^6 cells/kg] administered intravenously at post-operative day 7). Allograft survival and was compared across the different treatment protocols.
Results: Six allogenic hind limb transplantations in the mini-swine were performed in three groups. The control group reached Banff grade 4 acute rejection by an average of 7.5 days after transplantation. Allografts treated with ASCs demonstrated grade 4 rejection on day 119 and demonstrated rejection-free survival over 200 days postoperatively, which was longer than the standard therapy group. The long-term survivor of the ASCs therapy group showed donor-specific unresponsiveness and regulatory T cells upregulation.
Conclusion: Results of ongoing in vivo experimentation show promising results of ASC therapy in prolonging acute rejection-free VCA survival across a full MHC mismatch. Achieved immune tolerance by cellular immunomodulation is considered to prolong allograft survival.

LOP29

Adipose derived stem cells versus fibroblasts in a model of preferential metastasis

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Fat grafting as a reconstruction technique for mastectomy patients generates safety concerns, specifically regarding stimulation of remaining cancer cells. The baseline argument is that fat grafting results in addition of healthy adipose tissue to a zone which may contain remaining cancer cells- a dangerous clinically-made scenario. This perception of danger is amplified by cell assisted

lipotransfer (CAL); enhancing fat graft tissue with the patient's own adipose derived stem cell (ASC) population. Much of the scientific evidence against the safety of ASCs in vivo uses a basic co-culture set up, using 2 cell types and a semi-permeable transwell insert. However, we have designed different co-culture set ups which allow us to observe the true migratory nature of cancer cells, ASCs, and fibroblasts when cultured together. Counterintuitively, a wound healing assay shows that a 500um gap is closed significantly faster between cancer and fibroblasts compared to cancer and ASCs ($p < 0.05$). We have also clearly observed translocation of cancer cells to an unmoving fibroblast population. Meanwhile, the dynamic differs between ASCs and cancer cells, with a clear massive migration of ASCs towards a static cancer population. The stimulation of ASC movement is dependent on quantity of distantly seeded cancer cells. This can be directly clinically correlated to larger numbers of remaining cancer cells stimulating greater migration of ASCs.
These mechanics of cell movement in vitro have not yet been described in such detail, and may help further the understanding of cell attraction in a fat grafted breast, which harbors minimal residual disease. Moreover, these data demonstrate that the pro-migratory, pro-metabolic behavior of cancer cells is not only stimulated by ASCs, but also by fibroblasts. This consideration is important when assessing the literature; that despite the fear of CAL in breast cancer reconstruction, there is currently zero evidence of recurrence being stimulated by this procedure. As such, this project seeks to understand the recurrence risk by CAL in breast cancer lipofilling.

LOP30

Pre-clinical study – to control autologous elastic cartilage regeneration using monkey auricular cartilage progenitor cells

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Introduction: We recently identified a promising regenerative method based on the xenotransplantation of human auricular cartilage progenitor cells to immunodeficient animals (Kobayashi, Takebe et al, PNAS, 2011) and the autotransplantation of monkey auricular cartilage progenitor cells to immunocompetent individuals (Kagimoto et al, Cell Transplant. 2016) to reconstruct self-renewing elastic cartilage, which may potentially be applied to patients with craniofacial injuries and abnormalities. Today I will introduce our modified autotransplantation regenerative approach to control the shape and volume of regenerative cartilage before transplantation.
Material and Methods: The experimental animal protocols were approved by the Animal Welfare and Animal Care Committee of the National Institute of Biomedical Innovation (Osaka, Japan) (approval ID: DS25-32). We used 9 monkeys (Macaca fascicularis) using the two-stage method or the rotating wall vessel bioreactor method. We monitored the transferred tissue using non-invasive magnetic resonance imaging (MRI), assessed it histologically, and measured the glycosaminoglycan (GAG) levels.
Results: No complications such as inflammation or tumorigenesis were observed in all cases. The shape and volume of the transferred tissue remained, and also detected by MRI images. The harvested tissue were histologically assessed as elastic cartilage. The GAG levels were similar to those of the primary auricular cartilage.
Conclusion: These modified methods could control the shape and volume of regenerative cartilage with no complication. Using autologous cartilage progenitor cells provide a highly promising treatment for craniofacial deformities.

LOP31

Human macrophages preferentially infiltrate the superficial adipose tissue

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Introduction: Human abdominal subcutaneous adipose tissue consists of two individual layers, the superficial adipose tissue (SAT) and deep adipose tissue (DAT) that are separated by the Scarpa's fascia. The study focuses on the analysis of morphological and immunological differences of primary adipocytes, adipose derived stem cells (ASC) and tissue infiltrating immune cells found in SAT and DAT.
Material and Methods: Adipocytes and stromal vascular fraction (SVF) cells were isolated from human SAT and DAT specimen and phenotypically characterized by in-vitro assays. Ex-vivo analysis of infiltrating immune cells was performed by flow cytometry.
Results: Primary adipocytes from SAT are larger in size but do not significantly differ in cytokine levels of LEPTIN, ADIPOQ, RBP4, CHEMERIN, DEFB1, VISFATIN, MCP1 or MSCF. ASC isolated from SAT proliferate faster and exhibit a higher differentiation potential than those isolated from DAT. Flow cytometry analysis indicated no specific differences in the relative numbers of ASC, epithelial progenitor cells (EPC), or CD3+ T-cells, but showed higher numbers of tissue infiltrating macrophages in SAT compared to DAT.
Conclusion: Our findings suggest that ASC isolated from SAT have a higher regenerative potential than DAT-ASC. Moreover, spatial proximity to skin microbiota might promote macrophage infiltration in SAT.

LOP32

Isolation and characterization of extracellular vesicles for peripheral nerv regeneration

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Introduction: Cell transplantation of Schwann cells or mesenchymal stem cells (MSC) can facilitate peripheral nerve regeneration. Enhancement of axonal regeneration by Schwann cell-derived extracellular vesicles (EV) in vivo was reported; however, such an autologous approach has the inherent need to sacrifice a functional nerve. Here, the isolation and characterization of EV derived by MSC are investigated.

Methods: Adipose-derived stem cells (ASC) from adult Sprague Dawley rats are isolated and characterized. ASC are grown to confluency and cultured conditions and time points for EV isolation were tested. The collected supernatant was subjected to two different ultra-centrifugation protocols. Particle concentration and particle size are evaluated using the Nanoparticle Tracking Analysis (NTA).
Results: In order to obtain EV derived from ASC, the medium containing FBS should be ultra-centrifuged for 12h to remove all EV derived from FBS. Cell behaviour and cell proliferation was not affected by this ultra-centrifuged media. The adjusted parameters were identified for the NTA analysis to obtain reducible parameters. Particles ≥ 150 nm could be removed in order to obtain the smallest sub-population of EV, which have regenerative capacities.
Conclusion: Harnessing EV for clinical applications requires optimized, standardized isolation and characterization protocols. Here, we compared isolation procedures to obtain the smallest EV subpopulation. EV play a pivotal role in physiological and pathological conditions and are ideal vehicle for therapeutic molecules delivery, however the detailed mechanism have not been completely explored.

LOP33
Prophylactic regenerative peripheral nerve interface (RPNIs) to prevent postoperative pain

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Background: Symptomatic neuromas occur in approximately 12-50% of individuals after limb loss and phantom limb pain affects 70-85% of these patients. Regenerative peripheral nerve interfaces (RPNIs) can be used to treat symptomatic neuromas that develop after major limb amputation. We investigate the potential of prophylactic RPNIs to prevent the formation of symptomatic neuromas and mitigate the experience of phantom limb pain following major limb amputation.
Methods: Patients who underwent major limb amputation with and without prophylactic RPNIs between August 2013 and August 2017 were identified through review of medical records. The control patient group underwent surgical treatment with standard amputation techniques while the study group underwent amputation and creation of RPNIs on major peripheral nerves. RPNIs were performed during the time of amputation by implanting transected peripheral nerve ends into free muscle grafts harvested from the amputated limb. Patient groups were matched for age, sex, level of amputation, and mean duration of follow up. A retrospective chart review was performed to ascertain patient demographics, indication and level of amputation, and postoperative complications. Documentation of any symptomatic neuromas and phantom limb pain was noted for each patient.
Results: Postoperative outcomes were evaluated in a total of 100 patients undergoing primary limb amputation during the study period. Fifty patients underwent RPNI implantation at the time of primary limb amputation and 50 control patients underwent standard amputation without prophylactic RPNIs. Six (12%) of the control patients developed symptomatic neuromas in the postoperative period compared to zero patients (0%) in the prophylactic RPNI group ($p=0.0297$). Twenty-three RPNI patients (46%) reported phantom limb pain during their postoperative course compared to 43 patients (86%) in the control group ($p<0.001$).

Conclusions: Prophylactic RPNIs in major limb amputees resulted in a significantly lower incidence of both symptomatic neuromas and phantom limb pain as compared to a control group of patients undergoing amputation without RPNIs. These findings suggest that prevention of peripheral neuromas following major limb amputation may also diminish the central pain mechanisms that lead to phantom limb pain.

LOP34

Enhanced peripheral nerve regeneration with unpurified autologous adipose tissue

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Introduction: Over 200,000 trauma-related peripheral nerve injuries occur in the United States each year. For nerve injuries resulting in segmental defects, autologous nerve grafting is considered the gold standard of therapy, but this approach still yields suboptimal clinical outcomes with impaired motor function, sensory deficits and overall decreased quality of life. Adipose-derived stem cells (ASCs) have been previously shown to enhance peripheral nerve regeneration, though ASC processing leads to both clinical and regulatory burdens. Conversely, unpurified cells are approved for use by the FDA and may be a source of ASC to help enhance neural regeneration. The purpose of the present study was to investigate the effect of unpurified adipose tissue on peripheral nerve regeneration through long (30 and 40 mm) autografts in the rat.
Materials and Methods: A total of twenty-four F344 rats were randomly assigned to one of four experimental groups: (1) 30 mm autograft; (2) 30 mm autograft + unpurified adipose tissue; (3) 40 mm autograft, and (4) 40 mm autograft + unpurified adipose tissue. Common peroneal nerve defects were reconstructed with either 30 or 40mm nerve autograft according to experimental group. Autologous fat harvested from inguinal fat pads of genetically identical rats, was minced, and was washed with normal saline before it was injected along the length of each autograft in unpurified fat groups. All animals were tested at baseline and followed serially for 12 weeks. Outcome measures included weekly sensorimotor (walking track) and sensory pain assessments (von Frey). EMG (compound muscle action potentials) and muscle force (maximum twitch and tetanic force) measurements were performed 12 weeks postoperatively.
Results: Animals in both the 30 and 40 mm autograft + unpurified fat group displayed enhanced peripheral regeneration compared to the non-fat administered autograft groups. Specifically, these animals displayed increased maximum tetanic isometric force, maximum twitch force, and CMAP amplitude at study endpoint. Furthermore, animals demonstrated enhanced functional recovery as measured by the peroneal functional index at several time points throughout the study.

LOP35
The "Microsurgery interactive video learning modules" – drawing a balance after 2 years online

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Introduction: The „Microsurgery Interactive Video Learning Modules", one of the most extensive video-based learning tools for Microsurgery, are available online at www.microsurgery.video as of September 2016. The presentation aims to introduce the learning tool itself, the usage statistics obtained to date as well as their interpretation and to encourage a discourse about ways to further optimize and implicate the tool.
Materials and methods: During a total of 12 basic 4-day Microsurgery Courses being held at the „Pius Branzeu Center for Flap Surgery and Microsurgery", Timisoara, Romania between 2007 and 2013, we observed common pitfalls in the execution of standardized training models on latex gloves, cold preserved chicken thighs and anesthetized rats. We developed potential solutions to facilitate microsurgical tasks, conducted a literature search to find existing video based learning tools for Microsurgery to compare models and concepts and finally filmed our own videos primarily to serve as an update of existing learning tools. Starting with the publication online, statistics were obtained to document worldwide use and to draw conclusions about usage behavior and the quality of the learning module as a whole and the 63 single videos it comprises.
Results: The „Microsurgery Interactive Video Learning Modules" are being used worldwide and increasingly, however only a part of the videos have been watched completely and systematically.
Conclusion: Regardless of apparently good use of the learning tool and first hints at ways to optimize its contents, before revising the modules a thorough content validation, user feedback, especially regarding modalities and limitations of use, and individual constructive criticism are necessary.

LOP36
Microsurgical skills training course – the effect on microsurgery trainees' confidence and workload

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Introduction: Microsurgery demands advanced technical skills and proficiency. Simulation training provides a safe environment for advanced skills acquisition. Our objective is to measure an intensive microsurgery training course impact of on trainees' confidence and workload.
Methods: Between July and September 2017, participants completed 5-day intensive microsurgery training course in our training center within a large teaching medical center. The course provided microvascular anastomosis training, using end-to-end and end-to-side techniques on rats' femoral vessels. Demographic questions and microsurgery experience question (Yes/No) were completed before the course. Confidence and workload of the participants assessed after

the first and last days of the course. Confidence was assessed in 5 dimensions on 5-points visual analogue scales (VAS): anastomosis performance, vessels preparation, knot tying, training effectiveness, microsurgery as career. Workload was assessed using the validated NASA Task Load Index subscales (6, 20-points VAS). T-tests were used as appropriate with α level of 0.05.
Results: 31 participants completed the study with seventeen (55%) reported previous microsurgery experience. All confidence dimensions improved significantly after completing the microsurgery course regardless of previous microsurgery experience ($p<0.01$, Figure 1). The experienced group started and finished the course at significantly higher confidence levels in anastomosis performance and vessels preparation than the non-experienced group ($p<0.05$, Figure 1). The non-experienced group had a significantly larger improvement of confidence in anastomosis performance and knot tying than experienced group ($p<0.05$). All candidates expressed greater confidence that simulation training would improve their performance and skills by day 5 ($p<0.01$). Workload scores showed a general downward trend by the end of the course, but this was not statistically significant.
Conclusion: An intensive microsurgery training course improves microsurgery trainees' confidence regardless of previous microsurgery experience, with more confidence improvement among non-experienced trainees. The 5-day Microsurgery Course however did not significantly impact trainee workload.

Figure 1.

Confidence Dimension	Experience	Start	End	p-values within groups
anastomosis performance	All	2.53 ± 1.38	4.23 ± 0.82	**<0.01**
	Experienced	3.18 ± 1.33	4.53 ± 0.72	

LOP37

Improving post-operative monitoring of autologous breast reconstruction – a novel, oxygen-sensing liquid bandage first-in-human trial

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Introduction: Autologous free flaps may be used to reconstruct defects arising in a variety of contexts, including trauma and cancer. With improving microsurgical techniques flap failure rates are decreasing; however, this devastating complication may still occur in up to 5% of cases. In this study, we present results of a first in-human trial of a new, non-invasive, optical oxygen-sensing liquid bandage (OSLB) formulation in post-operative monitoring of tissue perfusion.
Material and Methods: Four women undergoing mastectomy and deep inferior epigastric artery perforator (DIEP) flap reconstruction were prospectively enrolled from February-June 2017. In addition to standard post-operative monitoring with near-infrared spectroscopy tissue oximetry

(ViOptix), the OSLB was painted on the flap skin paddle. The formulation consists of New-Skin™ liquid bandage, incorporating an oxygen-sensing metallo-porphyrin exhibiting bright red phosphorescence and the green-fluorescing reference dye: fluorescein. Using a custom-modified camera with red and green filters, we captured phosphorescence and fluorescence, respectively, at regular time periods for 48 hours post-operatively. The relative phosphorescence intensity was calculated.

Results: Three Caucasian and one African American woman took part. Two cases were bilateral, producing a total of six breasts. When comparing the OSLB red/green ratio with the ViOptix, an inverse correlation was observed, as expected. Notably, this persisted for an African American patient with Fitzpatrick Type V skin. No complications or flap losses occurred.

Conclusion: The success of attempted flap salvage is highly reliant on early identification of flap compromise and prompt re-exploration. Results show that OSLB phosphorescence intensity correlates well with the stO2 values provided by our current gold standard of care, the ViOptix. The OSLB proved easy to apply and remove, was well-tolerated, and enabled visualization of flap skin due to its intrinsic transparency. Moreover, we demonstrated successful use of the OSLB in a patient with Fitzpatrick type V skin. This oxygen-sensing liquid bandage offers reproducible, accurate detection of tissue oxygenation. Further research is needed to validate this technology on a larger scale.

LOP38

Breast reconstruction in stage IV cancer – selection and outcomes

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Background: Breast reconstruction in patients with stage IV cancer remains controversial with a paucity of uniform approaches and practice guidelines. However, the life expectancy of patients with metastatic disease continues to grow with medical treatment advances. This study aims to characterize the reconstructive selection, procedures, and outcomes undertaken in patients with metastatic breast cancer at a high-volume cancer center.

Method: A retrospective cohort analysis was conducted using a prospectively maintained database at a single NCI-designated, university-affiliated cancer center. Patients with stage IV breast cancer who underwent mastectomy between 1997-2016 with or without immediate or delayed reconstruction were reviewed for selection practices and reconstructive outcomes.

Results: 356 patients with stage IV breast cancer underwent total or segmental mastectomy. Reconstruction of the chest wall or breast was undertaken in 66 patients (18.5%). 79 index reconstructive procedures performed including 13 bilateral cases. Mean age of the reconstruction cohort was 49.4 years versus 52.4 years in the non-reconstruction group (p=0.07). The groups were statistically similar in tumor size, nodal status, and hormone receptor status. 60 cases were performed in the immediate setting (76%), while 19 cases (24%) underwent delayed reconstruction. Expanders were the most common initial reconstructive method (34%), followed by latissimus dorsi (30%) and abdominal flaps (28%). Overall complication rate was 22%, with the most

common being delayed wound healing. Major complications requiring reoperation occurred in 14% of cases. Reconstruction was completed in 97%, with 2 cases of reconstructive failure. 7.6% of patients postponed radiation predominantly due to delayed healing, while no patients required delay of chemotherapy. All of patients achieved return to intended oncologic therapies. With median follow up of 4.2 years, median overall survival in the reconstruction group was 16.7 years, compared with 6.6 years in the no-reconstruction group ($p<0.001$).
Conclusions: In well-selected patients with stage IV cancer, breast reconstruction may be safely performed with acceptable complication profiles and without significant compromise of systemic or adjuvant therapy delivery. Reconstructive access and options should be provided to appropriate patients with metastatic disease for individualized treatment planning. Further studies are necessary to refine selection criteria.

LOP39

Comparative operative outcomes in second stage delayed vs radiated tissue expander in breast reconstruction

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Introduction: Reconstruction after post-mastectomy radiation therapy (PMRT) in breast cancer patients represents a significant challenge. This study aims to compare outcomes of microvascular breast reconstruction in the delayed immediate versus delayed setting.
Material and Methods: Two hundred forty-one patients (244 breasts) underwent mastectomy and received radiation therapy at a single center from 2006 to 2016. One hundred thirty-one patients had delayed free flap breast reconstruction (non-TE group) and 113 patients underwent delayed immediate free flap reconstruction after previous irradiated tissue expansion (TE group). Mean follow up was 48.9 months. Patient characteristics, intra- and post-operative complications, radiation-related complications, as well as time delay in cancer treatment were evaluated.
Results: The non-TE group had more smokers and more patients with advanced tumor stages. Duration of radiation was significantly longer in the TE group ($p=0.041$) although the radiation dosage was not significantly different between the two groups ($p=0.765$). The TE group demonstrated more radiation-related complications ($p=0.019$) and showed a higher incidence of intra-operative complications during free flap reconstruction ($0=0.012$). Major postoperative complications were not different between the two study groups ($p=0.50$). Overall, TE patients had shorter time interval from mastectomy to free flap reconstruction ($p<0.001$).
Conclusion: The benefit of delayed immediate reconstruction with interval TE placement remains in that it palliates soft tissue deficit before final reconstruction, but this advantage comes with its complications that should not be underestimated.

LOP40

Acellular dermal matrix sterility – does it affect microbial and clinical outcomes following implantation for breast reconstruction

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Introduction: There has been much debate regarding Acellular Dermal Matrices (ADM) and the risk for postoperative infections in breast reconstruction. Our previous work on microbiologic profile of sterile and aseptic ADM showed no significant difference between products immediately out of the package. In this study, we investigate the microbial profiles of these agents after implantation.
Methods: In this prospective study, ADMs implanted during stage I of tissue expander based immediate breast reconstruction were excised during the stage II expander-implant exchange, incubated and cultured for 48 hours in tryptic soy broth. Samples with growth were further cultured on tryptic soy broth and blood agar plates. Patient records were analyzed to determine if ADM sterilization and microbial growth correlated any infectious complications.
Results: Fifty-one samples of ADM were collected from 32 patients. Six samples were aseptic ADM (Alloderm), 27 were ADM sterilized to 10^-3 (Alloderm RTU), and 18 samples were products sterilized to 10^-6 (Allomax). None demonstrated bacterial growth. Only 3 patients experienced postoperative cellulitis between the initial implantation of ADM and stage II, of which 2 developed deep space infections. There was no statistically significant correlation between the ADM used and the degree of ADM sterility.
Conclusions: Our findings showed no difference in microbial presence and clinical outcomes when comparing degrees of ADM sterility. Patients experiencing postoperative infections did not show bacterial growth in ADM culture samples. Our study did not demonstrate a clinical microbial difference between aseptic or sterile ADM products when used for tissue expander based breast reconstruction.

LOP41

DFP & HIF-1 alpha – the new frontier of skin rejuvenation

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Introduction: The HIF-1 alpha pathway is a key network involved in the prevention and healing of chronic wounds in the immunosuppressed mouse. To date, HIF-1α has been identified as an oxygen-dependent factor able to regulate tissue homeostasis and regeneration. In addition to the absences of oxygen, also reduced concentrations of iron are able to activate the HIF-1α pathway. Therefore, we analyzed the effects of an iron-chelating molecule, named as Deferiprone (DFP), in order to obtain a strong and durable anti-aging effect.
Materials and Methods: The effects of different concentrations of DFP (0.03- 0.01%) were analyzed in vitro on skin fibroblasts. The metabolic activity, the cell proliferation and viability, and

gene expression were quantified. Additionally, different fluorescence stainings were carried out. To drive this research towards a translational approach, we formulated a DFP-carrying crème and performed a clinical study with 33 patients. After six weeks of treatment, effects induced by Deferiprone were clinically evaluated.
Results: In vitro administration of iron-chelation therapy (DFP 0.03125 µg/ml- 0.0156 µg/ml) on old fibroblasts resulted in a sensitive activation of the anti-aging mechanisms involved in different degenerative processes of the skin. Regarding the clinical study, the treatment with Deferiprone has significantly improved skin rejuvenation.

LOP42
Correction and prevention of the pixie ear deformity – a combined technique

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Background: Ear and earlobe deformities after surgical rhytidectomy are common and can significantly diminish the aesthetic outcome. The main causes of ear/earlobe distortion are skin over-resection, an imbalance between vertical/horizontal skin-lift vectors, and tractional distortions through SMAS tension.
Objective: To demonstrate a new method for earlobe suturing and ear fixation that would prevent aesthetics-related complications after facelift surgery.
Methods: A total of 105 primary SMAS facelift surgeries were performed between 2015 and 2016 by the first author. A combination technique consisting of a posterior earlobe rotation flap (PERF) and a concha-mastoid suspension suture (CMSS) was executed bilaterally within each facelift procedure (n=210). A retrospective data analysis was conducted (preoperatively and one year postoperatively) using our HIS and a photometric data analysis to assess auricular displacement, earlobe distortion, and hypertrophic scarring.
Results: Pseudoptosis of the earlobe was noted in two cases, and auricular displacement was observed in four cases. Bilateral mild hypertrophic scarring was seen in one patient. The postoperative photometric analysis showed a natural ptosis grade I/II in all the patients, with a statistically significantly reduced postoperative earlobe size ($p<0.05$). The total rate of aesthetics-related complications was 4% in our cohort (earlobe distortion with pseudoptosis: 1%; auricular displacement: 2%; hypertrophic scarring: 1%).
Conclusions: Our modification of the facial flap anchoring at the ear base in combination with a CMSS stabilizes the natural position of the ear and prevents distortion while allowing better control over the earlobe's aesthetic shaping. This novel method reduces the incidence of ear/earlobe deformities and hypertrophic scarring at the ear base after rhytidectomy and, therefore, promises to be a valuable advancement.

LOP43
Buttock augmentation with gluteal implants by sub-muscular safe (SMS) technique

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Introduction: Buttock augmentation is a growing request in the plastic surgery practice. Gluteal implants provide the best results, but the procedure still faces strong resistance from patients, as well as surgeons, due to unpredictable results and frightened complications. We present a new surgical technique where gluteal implants are positioned under the gluteus maximus muscle.
Materials and methods: We conducted a prospective study with 90 patients (average age 34-years) undergoing the SMS technique performed by the same surgical team. The implants were all inserted in a virtual avascular submuscular pocket through blunt dissection under general anesthesia. The satisfaction rate was evaluated by a subjective scale at least 3 months postoperatively.
Results: Patients underwent followups for 1.6years (range, 1-3 years). All patients rated the shape as very good. 80% of the patients (72 patients) rated the volume as very good. Three patients (3%) did not like the scar. Complications occurred in 12% (11 patients). Complications consisted of one case of infection, who had a composite augmentation which was treated with oral antibiotics. Three cases suffered from sciatica which resolved spontaneously within a few days. One patient reported of delayed wound healing at the incision. One patient presented with hematoma not requiring surgery, and six patients experienced an implant malrotation which was treated manually in the office without reoperation.
Conclusion: The SMS technique is a safe, easy performed technique of inserting gluteal implants with low risk of complications and high rate of patients' satisfaction.

LOP44
Lipo-Abdominoplasty versus abdominoplasty in massive weight loss patients – a comparative study

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Introduction: Body contouring involving abdominoplasty and/or liposuction is a common procedure after massive weight loss. However, safety of single-staged lipoabdominoplasty is still unclear for those patients. We compared our outcomes of lipoabdominoplasty versus traditional abdominoplasty.
Methods: This was a retrospective study including 98 consecutive patients who underwent abdominoplasty or lipoabdominoplasty after massive weight loss. Bodylifts, panniculectomies, and secondary operations were excluded.
The study group (n=29) underwent abdominoplasty with liposuction of the abdominal flap. The control group (n=69) underwent traditional abdominoplasty with wide undermining. Fifty-six percent of patients had a previous bariatric surgery procedure. Patients received a follow-up for an average of 29.6 months.
Results: Demographics were similar between the two groups with respect of age (42 vs 43 years, p=0.87), body mass index (29 vs 28 kg/m2, p=0.21), comorbidities (46.4% vs 62.1%, p=0.156),

and weight loss (38.0 vs 40.5 kg, p=0.61). Similar resection weights (1759.6 vs 1973.1g, p=0.37), while mean volume liposuction was 560cc (range 180-1600cc) in the lipoabdominoplasty group. Operative time was significantly longer when lipoabdominoplasty was performed (150.1 vs 140.1 minutes, p=0.001). We did not observe any significant difference among any complications, seroma rates (42.9% vs 26.1%, p=0.11), infections (13.8% vs 8.7%, p=0.45), wound dehiscence (6.9% vs 7.2%, p=0.95), nor other specific complications. Multivariate analysis for any complication did not reveal any significant predictive factor.
Conclusions: Lipoabdominoplasty was not associated with significantly higher complication rates than abdominoplasty in massive weight loss, although seroma occurrence was slightly higher when liposuction was performed. Lipoabdominoplasty can be safely performed in massive weight loss patients.

LOP45

Evaluating outcomes in venous thromboembolism (VTE) prophylaxis – a comparison of two regimens in abdominal body contouring surgery

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Introduction: Few studies in the literature examine the outcomes of outpatient postoperative VTE chemoprophylaxis in body contouring surgery. The aim of this study is to evaluate the safety of prescribing outpatient VTE chemoprophylaxis after abdominal contouring surgery.
Methods: A single-center retrospective chart review of all abdominal body contouring procedures performed by the senior author from 2007 to 2018 was conducted. Four procedures were included: traditional panniculectomy, abdominoplasty, fleur-de-lis panniculectomy, and body contouring liposuction. Patients in Group I received a single dose of 5000 Units of subcutaneous heparin in the immediate preoperative period. Group II patients received 40 mg of subcutaneous enoxaparin, both in the immediate preoperative period and for seven days postoperatively (extended-duration regimen). Data collection included demographics, pre-operative risk factors and Caprini scores. Complications included bleeding/hematoma, infection, skin dehiscence/necrosis, and VTE.
Results: A total of 194 patients were included in the study, 66 in Group I and 128 in Group II. In terms of demographics and risk factors, the only statistically significant difference was in the smoking status, where more patients in Group II were former smokers, 37.5% versus 18.2%, and less without a smoking history, 56.3% versus 75.8% (p=0.019). The two most common procedures in Group I were traditional panniculectomy (42.4%) and liposuction (28.8%), whereas in Group II it was abdominoplasty (31.3%) and fleur-de-lis panniculectomy (28.1%). The reoperation rates were significantly higher in patients who received heparin (22.7% versus 10.9%, p=0.029), with a trend toward higher readmission rates compared to the extended-duration enoxaparin group (4.5% vs. 0.8%, p=0.082). There were no differences with regards to the incidence of infection, seroma, bleeding/hematoma, wound complications or deep venous thrombosis/pulmonary embolism between the two cohorts. When comparing complication rates by surgical procedure, fleur-de-lis and traditional panniculectomies were associated with significantly higher wound

complication rates compared to abdominoplasty and liposuction (41.0% and 27.4% versus 17.5% and 13.5% respectively, p=0.041).
Conclusions: The use of extended-duration postoperative enoxaparin for VTE chemoprophylaxis in abdominal contouring surgery is safe. Incorporation of this regimen in practice, especially in high-risk patients where post-discharge chemoprophylaxis is recommended, should be strongly considered.

LOP46
Surgical strategies for median and paramedian craniofacial dysplasias

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Introduction: Median and paramedian craniofacial dysplasias are associated to hypertelorism, anterior encephalocele, positional abnormalities of the maxilla, and nasal deformity. Cleft lip and palate, coloboma of eyelids and widow's peak are frequently present.
Methods: We present a series of 30 patients (mean age 5.8 years, range 4 months – 18 years) operated between 1986 and 2017 with median or paramedian craniofacial dysplasias with different degrees of severity. The malformations of the different anatomic units and their surgical treatment were assessed and complication rate analysed.
Results: All patients presented nasal malformations and either telecanthus or hypertelorism. Most patients (n=23) had anterior encephalocele. All patients had nasal corrections and most had medial canthopexy (n=24). Excision of encephalocele was associated with fronto-orbital remodelling. Medialization of orbits was performed in 11 patients, mostly by box shift (n=9). Patients from abroad (n=23) were operated at older age compared to the native patient group. Due to staged reconstruction 13 patients had more than one operation. Surgical complications included three infections and one expander exposition. One patient had bony resorption of a frontal bone flap. Nasal correction needed more than one procedure in 5 patients and medial canthopexy was repeated in 7 patients. Aesthetic results were satisfying, permitting social integration.
Conclusion: Median and paramedian craniofacial dysplasias present with highly variable degrees and need adapted and carefully planned corrections, respecting growth of anatomic units. The quality of the medial canthal and nasal reconstruction is to a large extent responsible for the overall result.

Abstracts

SOP01

A head to head comparison of the vascular basis of the TMG, PAP and FCI flaps – an anatomical study

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Background: Perforator flaps of the upper thigh or buttock provide a valuable secondary choice in modern autologous breast reconstruction. The purpose of this study was to compare the vascular territories and corresponding supplying vessels of the transverse myocutaneous gracilis (TMG) flap, the profunda artery perforator (PAP) flap and the fasciocutaneous infragluteal (FCI) flap.
Material and Methods: In total, 26 lower limbs from 13 fresh specimens (8 females) were investigated. All of the flaps´ pedicles were identified and selectively injected with methylene blue, eosin red or green ink. The pedicles´ external diameters, their lengths and locations were measured and recorded in a coordinate system. The dimensions of displayed angiosomes, their intra- and inter-individual correlations and their relations to anatomical landmarks were analysed.
Results: The PAP pedicle had the greatest mean external diameter with 3.6 0.7 mm, followed by the TMG and FCI pedicles with 2.9 ± 0.6 mm and 2.9 ± 0.7 mm, respectively. The FCI pedicle was longest with a mean length of 12.5 ± 1.5 cm, whereas the PAP and TMG pedicles had lengths of 8.8 ± 1.0 cm and 6.7 ± 1 cm on average. The PAP angiosome provided the largest size, with a mean size of 98.5 26.7 cm2, followed by the FCI angiosome (77.2 ± 9.0 cm2) and the TMG angiosome (74.1 32.1 cm2).
Conclusion: Our anatomical findings about the TMG, PAP and FCI territories provide clinically valuable data for flap selection in breast reconstruction if an abdominal flap is not feasible.

SOP02

Utilization of the accessory saphenous vein in free profunda artery perforator (PAP) flap transfer

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Introduction: The profunda artery perforator (PAP) flap has recently been widely used not only in breast, but also in head and neck reconstruction. Although this flap has various advantages including concealed donor site, abundant soft tissue and less postoperative pain, its vascular pedicle is relatively small and short. The accessory saphenous vein (ASV) is a branch of the great saphenous vein. The ASV runs in the posteromedial aspect of the thigh and can be included in the flap. We present its feasibility and anatomical characteristics of the ASV in the PAP flap.
Patients and Methods: From June 2017 to May 2018, nine cases of free PAP flap transfer were performed. The purposes of it use were head and neck reconstruction in 7 cases, breast reconstruction

in 1 case and scar contracture release in 1 case. Flaps were designed as a vertical style in all cases and the ASV were explored in the cranial part of the flap. After flap elevation, flap perfusion was confirmed by ICG angiography by clamping the vena comitans, leaving the ASV as the sole drainage route. The diameter, length and location of the ASV were noted.
Results: In 8 cases, the ASV could be included in the flap. ICG angiography showed that flap drainage was sufficient solely by the ASV. Mean length of the ASV was 8.6cm and mean diameter was 3.0mm. All flaps survived completely and postoperative courses were uneventful. Donor-site complications such as gait disturbance and lymphedema were not observed.
Conclusions: Although the PAP flap has many advantages, its pedicle is relatively short and small which may hinder its popularity. The use of the ASV can be an effective option to solve this problem and may widen its application in various types of reconstructive surgery.

SOP03
Postoperative free flap monitoring practices of microsurgeons in USA

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Introduction: Thousands of free flap surgeries are performed yearly to achieve successful reconstruction following deforming wound infection, trauma, and cancer-operations. There is a wide variation in the practice of microsurgeons including use of postoperative free flap monitoring. We seek to assess the current practices of US Microsurgeons.
Methods: We performed a question survey of microsurgeons who are members of the American Society of Plastic Surgeons in the United States. Out of 740 surveys received, 169 were filled out (response rate of 23%). We analyzed the results, using the student T-test to find significance in trends between microsurgeons with varying experience in terms of years, number of surgeries performed and whether they were fellowship trained.
Results: Postoperative monitoring for non-buried flaps consists mostly of Surface Doppler (43.17%), followed by Implantable Doppler (18.71%), visual exam only (12.95%), Vioptix (9.35%), Laser Doppler (2.88%). Surgeons performing >50 flaps per year are less likely to use visual exam only (0% vs 23%) and are those with >5 flaps a year are more likely to use Implantable Doppler (75% vs 32%). Length of post-operative flap monitoring included 1-3 days (43.88%), 3-7 days (33.09%), until discharge (22.3%) and <1 day (0.72%).
Conclusion: The current standard practice of US Microsurgeons includes post-operative free flap monitoring with Surface Doppler if not buried, and Implantable Doppler if buried. Adequate length of monitoring is considered to be 1-3 days.

SOP04
Can surgical mask wearing influence the physiological tremor while performing microsurgical maneuvers?

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Background: The physiologic tremor (PT) is characterized by an involuntary, rhythmical and

oscillatory movement of a certain body part. There is no consensus regarding the mechanism implicated in the genesis of PT, but most likely it is a combination of current theories. Previous studies highlighted that wearing the surgical mask (SM) is capable to increase the carbon dioxide (CO2) in the exhaled air. Furthermore, increased CO2 can reduce the amplitude of muscular contraction. The aim of this study was to investigate the effects of wearing surgical mask on physiologic tremor when performing microsurgical maneuvers.
Method: The protocol involved measuring the PT with hands under the microscope in two conditions: condition 1 (first measurement with SM and the second one without SM), condition 2 (both measurement without SM). Parameters used were acceleration and the coefficient of variation (COV) of PT. The recordings were carried out on 5 voluteers using an x,y,z accelerometer android application. CO2 in exhaled air was measure on 9 human subjects using a capnograph.
Results: Our results highlight a decrease of PT acceleration during wearing SM on X and Z axis ($p=0.025$, $p=0.003$), with an increase of COV on same axes ($p=0.0015$, $p<0.0001$). The partial pressure of CO2 increased during SM wearing ($p=0.01$, median=3 mmHG).
Conclusion: Far to be a certain fact, we found a link between surgical mask wearing, carbon dioxide and physiological tremor while performing microsurgical maneuvers.

SOP05
A systematic review of complications in prepectoral implant-based breast reconstruction

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Introduction: The use of implants for breast reconstruction began over four decades ago with implants initially placed in the prepectoral space. Concerns arose regarding the high incidence of capsular contracture and complication rates. With the introduction of acellular dermal matrix, Plastic Surgeons are again considering the advantages of prepectoral implant placement, however there is a lack of data comparing the complication profiles with and without ADM.
Materials and Methods: A systematic review of PubMed was performed from inception to March of 2017 to identify literature on prepectoral breast reconstruction with and without ADM. Study characteristics, complication rates, and outcomes were analyzed. Study quality was assessed using the Newcastle-Ottawa Scale and complication profiles were analyzed using the random-effects model.
Results: Twenty-seven studies met criteria for inclusion out of 550 identified for review. After analysis, 2 studies represented 3 of 9 stars on the Newcastle-Ottawa Scale, 12 studies represented 4 stars, 6 represented 5 stars, 4 represented 6 stars, and 3 represented 7 stars. Based on 1881 total breasts, the complication rate with ADM was 23.4% while the rate without additional material was 27.5%. The difference in the capsular contracture rate with and without ADM was 2.3% and 12.4% respectively.
Conclusion: The use of ADM in prepectoral breast reconstruction correlated with lower capsular contracture and overall complications rates, however results were variable across studies. In general, the quality of evidence reported was low and methodology for outcome assessment was inconsistent. There is a need for further investigation with comparative studies and standardized outcome reporting.

SOP06
Considerations and surgical alternatives in breast reconstruction after mastectomy

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Introduction: The purpose of breast reconstruction is achieving symmetry, good aesthetic shape of the breasts, and reconstruction of the nipple- areola complex after radical mastectomy. The techniques involve use of implants, autologous tissue or both.
Objective: We present our surgical experience and analyze the results as well as the appropriateness of the applied techniques for breast reconstruction.
Material: Overall 58 surgeries were performed in the period 2012-2017. The surgical technique involve 26 one stage and 32 delayed procedures. The treatments included the use of expanders, implants and pedicled flaps.
Results: The achieved early and late results are analyzed, as well as the appropriate choice of the applied techniques for female breast reconstruction.
Conclusion: Based on our clinical data and literature, we can conclude that each of the used reconstructive techniques can lead to a good aesthetic outcome as long as the type of mastectomy and the individual anatomical features are taken into account.

SOP07
The effect of surgery to radiation interval on loco-regional recurrence and survival in patients receiving post-mastectomy radiation treatments

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Background: The critical interval from surgery to radiation has yet to be determined for patients who receive mastectomy.
Hypothesis: We hypothesized that loco-regional, distant recurrence rates and overall survival didn't differ between patients who received radiation treatments after mastectomy- whether surgery to radiation interval was shorter or longer.
Methods: We conducted a retrospective cohort study which included women who have undergone mastectomy and received adjuvant radiation treatment between 2006-2011. The study outcomes were determined as either local, regional and/or distant disease recurrence within a follow up period of at least 5 years. Recurrences were defined based on clinical, radiological or biopsy-proven evidence. Subjects were separated into 2 groups- patients receiving upfront mastectomy followed by chemotherapy and radiation versus patients who have undergone Neo-adjuvant chemotherapy followed by mastectomy which required radiation after surgery. A univariate and multi-variate cox-regression analysis were used to determine the association between surgery to radiation interval and study outcomes.
Results: The study included 157 women eligible for inclusion. The mean age at the time of mastectomy was 48.8 (SD=11.4). Ninety seven (61.8%) of all subjects received neo-adjuvant

chemotherapy. Among this group, the median interval from surgery to initiation of radiation was 11.9 weeks. Twenty women (26.6%) of those who received neo-adjuvant chemotherapy were diagnosed with an adverse outcome during our follow-up. When separating these patients into those whose surgery to radiation interval was less then 10 weeks versus those with a longer interval - no difference in adverse outcomes was noticed. Similarly, the group which received adjuvant chemotherapy didn't demostrate any difference in outcomes- yet it comprised of only 3 subjects- therefore wasn't analyzed through

Conclusion: Our study didn't demonstrate any significant differences in recurrence and survival rates between patients who have undergone early versus late post-mastectomy radiation in either neo-adjuvant or upfront mastectomy groups. The existing convention promoting prompt initiation of radiation after mastectomy often at the expense of reconstruction efforts, and at times, also inhibits physicians from planning their patients cancer treatments in settings of challenged availability or access to health resources - such as radiation centers. Our study didn't support this convention, which warrants further studying in order to elucidate this valid clinical question.

SOP08

Mastectomy skin flap necrosis – a systematic review of necrosis rates and definitions

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Introduction: Mastectomy skin flap necrosis (MSFN) is a common complication occurring in breast reconstruction procedures. Despite the prevalence of MSFN, there are no consistent definitions or interventions, limiting objective assessment of the actual rate of MSFN. The aim of this study is to review the literature to examine MSFN rates and definitions to further highlight the lack of standardized outcome measures in breast reconstruction.

Material and Methods: A systematic review of the literature was performed for articles between 1976 – 2017 using PUBMED and Cochrane database search term "Mastectomy skin flap necrosis". Inclusion criteria was broad and included studies reporting both a definition of MSFN and a percentage of necrosis following breast reconstruction. Case reports and other reviews were excluded.

Results: We included 59 studies reporting MSFN rates and definitions with a total of 14,361 patients and 18,615 reconstructions. The MSFN rate varied between 2%-41% and definitions varied across articles. Common definitions used were based on the intervention required and the extent of necrosis and even within these two categories, studies based their definitions on different treatment modalities and measurement units. We excluded 75 articles who reported outcomes of MSFN but failed to specify their definition. Due to the lack of universal MSFN definitions and reporting requirements, it is difficult to assess true MSFN rates and group them by reconstruction type or other characteristics across studies.

Conclusion: MSFN continues to be a challenge in reconstructive procedures. A standardized definition of MSFN should be utilized to accurately assess risk factors, intraoperative diagnosis, outcomes, and treatment.

SOP09

A novel method for perineal hernia repair and pelvic reconstruction using biological mesh and bilateral "hemi-stacked" S-GAP propeller flaps – a case report

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Introduction: Perineal hernia and defect repair after extralevator abdominoperineal excision is a challenging procedure. We present the case of a 53-year-old man who developed a perineal hernia after laparoscopic-assisted extralevator abdomino-perineal excision (ELAPE) with simultaneous bilateral myocutaneous flap coverage from the gluteal region.

Case Report: A 53-year-old presented to our department because of painless saccular bulge with marked thinning of the scar tissue in perineal region. 2 years ago, the patient was diagnosed with Buschke-Loewenstein tumor of the anal region, which was initially treated with radiotherapy. Because of the local recurrence after one year, the ELAPE with simultaneous myocutaneous flap coverage from both sides was carried out through a general surgeon. Postoperatively it came to a wound failure, which was initially managed through negative-pressure wound therapy with subsequent secondary wound healing intention. The control MRI demonstrated that the small bowel was herniated in perineal space.

After the radical scar tissue excision and debridement, pelvic floor was reconstructed using Tutomesh, (RTI Surgical). The pelvic defect was closed using s-GAP propeller flaps in the manner of 90° rotation. To fill up the dead space, the medial part of the flaps was deepithelized and brought into the space in a "hemi-stacked" manner. All flaps survived without partial or total loss. No hernia recurrence was observed in the 5-month postop follow up.

Conclusion: We conclude that composite reconstruction using propeller "hemi-stacked" s-GAP flaps with biological mesh could serve as a valuable alternative in perineal reconstruction, especially if the other options are not available or are not desired from patient.

SOP10

Bioprosthetic versus synthetic mesh – analysis of tissue adherence and revascularization in an experimental animal model

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Introduction: Both synthetic and bioprosthetic meshes play important roles in surgical procedures such as ventral hernia repair. Although sometimes used interchangeably, these devices have inherently different properties. We therefore sought to better understand how these materials interact with the host environment to optimize surgical techniques and to improve outcomes.

Material and Methods: Synthetic mesh (polypropylene, Prolene) or bioprosthetic mesh (acellular fetal/neonatal bovine dermis, SurgiMend) was implanted intraperitoneally into rats lateral to a ventral incision in a novel intra-abdominal implant model. Two variables were modified with each material: (1) tight or loose tissue apposition, altered by modifiying suture placement; and (2) abdominal wall injury, altered by selective abrasion of the peritoneal lining. After 5 weeks,

the meshes and abominal wall were evaluated grossly and histologically. The analysis focused on the degree of inflammatory response, neovascularization, and mesh adherence to the surrounding tissues.
Results: Synthetic mesh adhered to the abdominal wall and visceral organs, regardless of the degree of apposition or tissue injury, due to a foreign body-mediated inflammatory reaction. In areas of non-injured peritoneal lining, SurgiMend was adherent perisuture placement. Neovascularization entered the mesh from these apposition points and spread outward. In areas of denuded peritoneal lining, the adherent and vascularized areas were significantly greater and not merely coincident with suture placement.
Conclusion: The inflammatory and wound healing responses with bioprosthetic mesh seem fundamentally different from synthetic mesh. Understanding these differences may lead to varied outcomes in adherence and vascularization of the materials, and ultimately the efficacy of hernia repair. Additionally, these mesh differences highlight the need for further basic research to optimize mesh selection and materials surgical technique.

SOP11

The use of autologous, de-epithelialized dermal grafts for abdominal wall hernia repair: indications and clinical outcome in two cases

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Introduction: The current standard of practice for the treatment of abdominal wall hernia repair is the use of non-absorbable mesh. However, mesh-related complications such as infection, delayed wound healing, bulging, fistula formation and foreign body sensation by the patient are significant problems. The use of autologous dermal mesh instead of a synthetic mesh may decrease complications and could be an alternative, especially in immunodeficient patients. The clinical course of two patients is presented.
Material and Methods: Patient1 presented with an increasing abdominal swelling 6 months after kidney transplantation. Computed tomography revealed an abdmonial wall hernia with a defect of 20x10cm with a torqued, herniated kidney surrounded by 7 liters of seroma. The operating field was accessed through extension of the pre-existing scar as for standard abdominoplasty. The dermal abdominal flap was raised, the seroma capsula excised, the kidney freed and repositioned and the abdominal wall hernia closed through direct suture. The fascia of the external abdominal oblique muscle was reinforced by an autologous, de-epithelialized dermal graft of 12 x 24cm in onlay position, generated from the de-epithelialized excess skin of the abominoplasty. Patient2 was diagnosed with umbilical hernia with a fascial defect of 2cm. The patient psychologically never adapted to the idea of having a foreign body underneath the abominal skin and preferred a complete autologous graft for hernia repair. After elevation of the dermal flap, the umbilical hernia was directly closed and the fascia reinforced with an autologous de-epithelialized dermal graft of 10 x 12cm as described for patient1.
Results: Both patients had an uneventful postoperative course. There were no signs of hernia recurrence neither clinically nor radiologically.

Conclusion: Autologous, de-epithelialized dermal grafts are a useful alternative to synthetic mesh grafts in selected patients for abdominal wall hernia repair.

SOP12
The influence of spider silk fibers on schwann cell migration and proliferation

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Introduction: The spider dragline silk from the spider Nephila edulis has crucial unique characteristics advantageous for nerve regeneration. It is easily harvested, non-immunogenic, long-term degradable and demonstrated to encourage axonal outgrowth and locomotor function. Since the current gold standard in nerve reconstruction, nerve autografts, show disadvantages like longer operating time, a second incision and loss of function at the donor site, nerve conduits filled with spider silk fibers could be a readily available alternative that avoid donor site morbidity.
Material and Methods: In this study, we cultured primary rat Schwann cells on spider silk and performed live cell imaging to assess their migratory potential by tracking the cells using ImageJ. In addition, combined SC-and proliferation-marker expression was implemented by establishing a multicolor immunofluorescence panel.
Results: The results showed that spider silk serves as a favorable adhesive for SC as they were able to attach to the silk within an hour. Furthermore, live cell imaging demonstrated SC movement as well as the velocity and distance covered by the cells. Multicolor images of SCs stained for S100 in combination with vimentin, and Sox10 or Sox2 visualized a culture purity over 90%. In addition, SCs cultured on spider silk had a similar proliferation rate as SCs cultured on PLL/Laminin coated culture dishes.
Conclusion: As of now, nerve conduits are still inferior to nerve autografts likely because they lack neurotrophic factors and endoneurial microstructure as well as viable Schwann cells. Our results showed that spider dragline silk serves as a favorable adhesive for SCs allowing attachment, migration and proliferation, which supports the use of spider silk as valuable guiding material in nerve conduits

SOP13
Microsurgical decompression of the mental nerve after road traffic accidents

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Introduction: Road traffic accident injury is a frequent cause of injury to and sensory disturbance in the distribution of the mental nerve. Symptoms that follow injury to the mental nerve include hypoesthesia, dysesthesia, hyperesthesia, anesthesia, and pain affecting ipsilateral lower lip, chin, and labial gingivae of the mandibular anterior teeth and the premolars. These can undermine quality of life by affecting speech, chewing, and social interaction. Treatment of these complications can be difficult and includes observation or surgical decompression of the involved nerve to relieve the patient's symptoms and improve sensory recovery. The aim of this study is to show the outcome of patients with mental nerve injury treated with nerve decompression.

Materials and Methods: Patients who presented with pain in the distribution of the mental nerve following a road traffic collision from 2013 to 2018, were included. Subgroup analysis of patients who had scar release and nerve decompression was performed.
Results: Thirty nine patients were referred with pain in the area supplied by the mental nerve. The mean age of patients was 27±7 years. Eighteen patients underwent scar release and nerve decompression. 89% of the patients affected by pain before surgery experienced complete or partial amelioration of symptoms. In two patients the operation was unsuccessful.
Discussion: Pain following mental nerve injury may be addressed by surgery. Scar release and nerve decompression are effective in patients experiencing severe pain. Surgery should be performed within 12 months postoperatively, ideally during the first few weeks after symptom onset.

SOP14

Neurotization for functional reconstruction of shoulder abduction in brachial plexus avulsion injuries

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Introduction: The double shoulder nerve transfer includes the combination of spinal accessory to suprascapular nerve and medial triceps branch of radial nerve to the axillary nerve. This nerve transfer combination is commonly utilized together for patients without shoulder function and with available donor nerves. The triceps to axillary nerve transfer specifically innervates the deltoid and teres minor. The accessory to suprascapular nerve transfer is additionally performed to stabilize the humerus during its range-of-motion in these patients. The aim of this study was to determine the outcome of the double shoulder nerve transfer in brachial plexus avulsion injuries.
Materials and Methods: Patients who presented for treatment of traumatic brachial plexus injury over a five year period. Subgroup analysis of patients who had nerve transfers for restoration of shoulder abduction performed.
Results: Seventeen patients underwent double shoulder nerve transfers. The mean age of patients was 23±5 years. The mean degree of shoulder abduction attained was 87 degrees following double-nerve transfers, of which nine cases were C5-C7 root avulsion and eight cases were C5-T1 root avulsion brachial plexus injuries. Eight of the former group and four of the latter group achieved >90°shoulder abduction.
Conclusions: This study shows that the technique of double neurotization from the spinal accessory nerve to the suprascapular nerve and medial triceps branch of radial nerve to the axillary nerve provides favourable results in restoring shoulder abduction in avulsion brachial plexus injuries.

SOP15
Ethical approach on animal based research in the field of peripheral nerve surgery

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The murine animal is the most used research model worldwide. In 2016, 2.8 million animals were used during research experiments in the federal republic of Germany. 181.668 animals were examined to approach scientific issues in fundamental research with questions regarding the central or peripheral nervous system. Overall goal is to reduce the use of animals in research. Until this is achievable effective and efficient experimental models are needed. Over the last years the use of murine animals in peripheral nerve surgery research was highly criticized due to limitations in experimental designs. The murine animal model is highly limited for translational approaches in peripheral nerve reconstruction due to issues of scale. A critical nerve gap in the murine animal is considered to be 2.0cm in length. Whereas the ovine animal seems to face all demands to be a favorable model in peripheral nerve surgery for translational approaches. Sciatic nerves are easily accessible and defect models extending 6.0cm in length can be realized. Nerve regeneration can be controlled by visional evaluation and electrophysiology. This scientific contribution should give additional information on methodology approaches in fundamental research in the ovine animal model on peripheral nerve surgery research.

SOP16
Seasonal impact on surgical-site infections in body contouring surgery

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Introduction: Postoperative Surgical Site Infections (SSI) are severe complications following body-contouring-surgery (BCS). Here we evaluate if SSI rates are influenced by higher temperatures during the summer season.
Patients and Methods: We enrolled 602 patients who underwent BCS between 2009 and 2015 in a retrospective cohort study. Data collected included demographics, surgical data and postoperative outcome. BCS procedures included lower and upper-bodylift, abdominoplasty, breast-reduction, mastopexy, brachioplasty and thigh-lift. Infection rates were calculated on a seasonal basis and compared using Fisher's-exact test and logistic-regression-analysis.
Results: There were 136 patients (125 women; 11 men) in the warm season (June-August; with an average temperature of 67.622°F (19.79°C) and 466 patients (438 women; 28 men) in the cold seasons group (September-May; with an average temperature of 45.45 °F (7.47°C)). The composition of the study cohorts was comparable. Average age was 40 years and average body mass index was 27. From a total of 602 patients we observed 33 SSIs, representing a rate of 5.48%. A statistically

significant rise of postoperative SSIs could be detected during summer (10.29% vs. 4.08%, p=0.0071) representing an increase of 150%. Additionally, a logistic regression analysis determined 'season' as the strongest predictor for SSIs with a risk exaltation of 2.693 times in the warm season.
Conclusion: BCS are elective procedures making careful risk consideration an absolute prerequisite. We demonstrate a significantly increased infection risk during summer and establish a causal link between the warm season and SSI accumulation. Consequently, preoperative patient information and operative planning should be adjusted accordingly.

SOP17
Vitamin B12 and folic acid deficiency vs wound healing complications after body contouring surgery

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Introduction: Defiencies in micronutritions are well known to compromise regular wound healing. The aim of this study is to demonstrate the correlation between defiencies in vitamin B12 and folic acid with wound healing complications in massive weight loss patients after body contouring surgery. We hypothesized that subjects with vitamin B12 and folic acid below normal reference level will show more wound healing complications than subjects with normal levels.
Methods: We examined 81 patients which underwent body contouring surgery (abdominoplasty) after massive weight loss (>50 kg) through bariatric operations. Pre-operative levels of vitamin B12 and folic acid were obtained through blood sample testing. Reference levels of vitamin B12 were 188-1059 pg/ml and for folic acid 5.3 – 14.2 ng/ml. Post-operative complications in wound healing (seromas, wound dehiscences) were recorded until stable wound closure.
Results: We observed wound healing disorders in 11 out of 81 patients (13.6 %). 7 out of these 11 subjects (63.6%) suffered from folic acid or vitamin B12 deficiencies. In total, vitamin B12 levels were below reference in 4 out of 81 subjects (4.9%), whereas 26 out of 81 subjects (32.1%) showed a lowered folic acid level. Out of 70 subjects with complication free wound healing, 21 subjects (30 %) showed deficiencies in vitamin B12 or folic acid.
Conclusion: Below average levels of vitamin B12 or folic acid are associated with a higher risk of wound healing complications after body contouring surgery. Especially patients with prior bariatric operations, which may have difficulties in resorption of micronutritions (depending on the surgical methods being used), are at a higher risk. Pre-operative investigation of vitamin B12 and folic acid levels with consecutive supplement may prevent possible wound healing complications.

SOP18
Bilateral reduction mammaplasty facilitates subsequent weight loss in obese patients (BMI ≥30)

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Background: Macromastia is defined by enlarged breasts, due to glandular hypertrophy and excess fatty tissue. Patients exhibit low exercise tolerance leading to further breast enlargement. Half of patients demonstrate an elevated body mass index (BMI) ≥30 suggesting a correlation

with obesity. A common benefit of reduction mammaplasty is the potential for weight loss. Our study aims to identify clinical factors associated with subsequent post-op changes in weight.
Method: A retrospective chart review was performed of patients who underwent bilateral reduction mammaplasty for symptomatic macromastia at a single academic institution between January 1, 2000 and January 1, 2016. Patients had ≥12 months follow-up to track resultant post-op weight. Statistical analyses were performed.
Results: Two-hundred and sixty-nine patients were stratified into two groups based on pre-op BMI. Group 1 consisted of 117 patients (43%) with BMI <30 (non-obese); Group 2 consisted of 152 patients (57%) with BMI ≥30 (obese). Group 1 had a mean pre-op BMI 26.28 and post-op BMI 26.84. Post-operatively, these patients demonstrated an overall mean BMI increase of 0.92. Group 2 had a mean pre-op BMI 35.13 and post-op BMI 34.19. Post-operatively, they demonstrated an overall mean BMI decrease of 0.30. The difference between pre- and post-op BMIs between the two groups was determined to be significant (p=0.0421).
Conclusion: Our results demonstrate patients with BMI ≥30 experience weight loss after undergoing bilateral reduction mammaplasty, with a mean BMI reduction of 0.30. As the desire for post-op weight loss and increased physical activity are common reasons to undergo reduction mammaplasty, this study adds valuable data to the discussion.

SOP19
Aesthetic breast augmentation and quality of life

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Introduction: In recent years, there has been increasing interest in incorporating the concept of “Quality of Life” in the evaluation of medical interventions. With an increasing number of patients undergoing breast augmentation procedures, it is necessary to assess their ability to improve the quality of life.
Material and Methods: A retrospective study was performed on patients that underwent a breast augmentation between 2015 and 2017. The study was based on a series of questionnaires including demographic questionnaires, the FLZM questionnaire, the FPI-R questionnaire, the Rosenberg Self Esteem Skala (RES) and the Patient Health Questionnaire for Depression and Anxiety (PHQ-4). The evaluation of the questionnaires was based and compared to already existing data from the German population. Statistical analysis of the data was performed by the Software SPSS Version 25.0 for Windows (statistical significance, $p < 0,05$).
Results: A total of 358 patients were included in the study. Positive life changes as well as improvement of Quality of Life in general was observed in 76% of the patients. Improvement in terms of sexuality was documented in 71% of the patients whereas improvement of Quality of Life in daily routines was seen in 90% of the patients. More than 74% of the patients were satisfied with the aesthetic outcome of their operation and 68% of the participants are willing to suggest this kind of operative procedure to family and friends.
Conclusion: Patients undergoing breast augmentation procedures seem to have an improved Quality of Life as far as sexuality and daily routines are concerned as well as in general. They also seem to have an improvement in terms of self-esteem after the operation. The majority of the patients are also willing to suggest this kind of operative procedure to their family and friends.

SOP20
The spare-parts technique – a safe and efficient single-stage nipple areolar reconstruction

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Introduction: The authors hypothesized that optimization of nipple areolar reconstruction (NAR) using full-thickness skin graft and cartilage graft can be completed safely in a single stage procedure.
Materials and Methods: Complication rates were compared between patients who underwent NAR in a traditional staged procedure (tNAR) versus a single stage using the modified double-opposing tab (mDOT) flap technique (1) (ssNAR), after abdominal flap breast reconstruction. The ssNAR patients completed full-thickness skin graft from the abdominal standing-cone deformity at the time of revision surgery with or without incorporating costal cartilage into the nipple construct. The cartilage was removed at the time of flap procedure and temporarily banked between the flap and the breast skin.
Results: 1233 nipple reconstructions were reviewed, of which 113 procedures of 102 patients using the mDOT technique were analyzed. No significant differences in complication rates were found between the ssNAR and the tNAR, including the risk for total loss of reconstruction or delayed skin graft take. However, the risk for delayed wound healing of the nipple reconstruction was higher in the single stage group (17.5%).
Conclusion: Our study shows that optimizing NAR results by adding cartilage to the nipple construct and enhancing the areolar component by full-thickness skin grafting can be achieved safely in a single stage at the time of flap revision. This represents potential for better long-term nipple projection and better areolar texture mimicry of NAR for breast reconstruction patients.

1. Kroll SS, Reece GP, Miller MJ, et al. Comparison of nipple projection with the modified double-opposing tab and star flaps. Plast Reconstr Surg 1997;99:1602-1605

SOP21
Secondary intention healing after mohs surgical excision as an alternative to surgical repair: evaluation of wound characteristics and cosmetic outcomes

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Introduction: A multitude of reconstructive options exist after Mohs surgery including skin grafts, flaps and healing by secondary intention. The ability to predict cosmetic results based on wound characteristics can help in the decision between surgical repair and secondary intention healing. Our study focuses on secondary intention healing on the nasal area.

Methods: Chart review of 11 nasal reconstructions using secondary intention healing by a single surgeon over one-year was conducted. Wounds were graded by cosmetic outcome:
- Poor: clearly depressed or elevated scar, severe mismatch in skin color
- Acceptable: depressed or elevated scar, good color match or clear color mismatch, good edge contour
- Good: little mismatch edge contour, good color match or only mild hypopigmentation
- Excellent: scar, no mismatch in edge contour, a good color match or only mild hypopigmentation
- Superficial wound: largely limited to the dermis including only a small part of fatty subcutane ous tissue

-Deep wound: dermal layer and deeper layers such as muscle and cartilage

Results: The best cosmetic outcomes were associated with concave areas of the nose (i.e. ala and sidewall), and superficial wounds. Convex areas of the nose (i.e. nasal tip), did not heal as well by secondary intention. Patients with sebaceous skin had wounds showed more depression and scarring, and patients with poor adherence to proper wound management exhibited more scarring.

Conclusions: In conclusion, healing by secondary intention is a reasonable option for suitable wounds. With this technique, the wound is allowed to heal with only local wound care saving time, healthcare costs and is a viable option for patients who are not good surgical flap candidates.

SOP22

Google trends study: Analysis of variations in skin cancer search terms

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Aim: Goal of this study would be to analyse Irish population's internet search patterns for skin cancer terms using Google Trends software. Then, to see if any trends/patterns become apparent which could be utilized to promote skin protection advice as part of a public health initiative

Methods: Data was collected for the following search terms 'skin cancer', 'melanoma', 'basal cell carcinoma', 'sun screen'.

Data for these search terms was collected from 1st January 2004 to the present (August 2017)

Results: The interest in skin cancer search terms is greatly affected by the time of year. There is a peak of interest in the summer months (June, July, August), with a substantial drop in interest in the winter months (November, December, January, February).

There has been an overall gradual increase in amount of searches for 'sun screen' from 2004 to 2017. In the same period, there has not been an increase in searches for 'melanoma', 'skin cancer', 'basal cell carcinoma'.

Conclusions: Analysis of the data shows that there is an increase in skin cancer awareness during the summer months which is most likely due to longer daylight hours and increased sun exposure. There has been, however, no increase in the searches for skin cancer related terms. Overall, for the Google trends analysis, the summer would represent an optimum time for targeted public health messages about protecting the skin from harmful ultraviolet rays to prevent skin cancer.

SOP23
Case report: When a horse turns out to be a zebra in disguise

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Introduction: Angiosarcoma is a rare malignant neoplasm with a poor prognosis. For these types of tumors, outcome varies widely and is most impacted by site, size, and resectability. De novo angiosarcoma in the scalp region over five centimeters in size that are not eligible for surgical excision or chemotherapy are the least favorable cohort with regard to both local control and overall survival.
Material and Methods: An 88-year old woman was referred to our outpatient clinic by the dermatologists. We were asked to drain a presumably post-traumatic retro-auricular hematoma after local therapy had failed to resolve it.
Results: A punch biopsy nor an MRI-scan of the head & neck region could identify any signs of malignancy. Three months later a drainage and new biopsy of the significantly larger lesion were performed but only the third biopsy was able to suggest the presence of an angiosarcoma. Surgery at that time was no longer an option so radiotherapy was initiated. Unfortunately it did not prevent the lesion from growing. The patient died one month after establishing the diagnosis.
Conclusion: For angiosarcoma, an unusual clinical presentation is common in the head & neck region. Therefore a high level of vigilance in these cases is warranted. The diagnostic workup in case of suspicion should include a biopsy of the lesion and MRI of the affected area. However, this case has taught us that sensitivity of diagnostic procedures is never 100 percent. Permanent alertness is necessary, even when diagnoses are presumed unlikely and only a routine procedure is requested upon referral.

SOP24
Closed lift- 1.5cm temporal incision to complete extended midface

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Nowadays patients consider surgery involving excess skin removal to be undesirable, many are considering non-surgical alternatives. The author found a superior alternative: a midface technique, with extended detachment, incorporating treatment for wrinkles, sagging, and volume replacement, utilizing laser and ultrasonic technology.
The author employed a closed, non-endoscopic midface technique through a 1.5cm temporal incision with detachment extended to the malar region, including the retentive ligaments. The mid-central facial tissue is lifted vertically via a set of sutured threads, fixed in the temporal region. A fractional CO2 laser is applied all over the face, with a particular focus on the orbital region, and a subdermal ultrasonic probe UAl (Ultrasound Assisted Liposuction) is also applied. Where desirable, fat grafting is performed in the peri-orbital regions, naso-genial groove and mandible contour. The elevation achieved is extensive enough to treat the jawline, yet with no cervical skin being removed.

The sagging of soft tissues (midface); wrinkles, spots, blemishes, keratoses and palpebral flaccidity (laser); eyebrow ptosis and excess upper eyelid skin (browlift/laser); jawline (vaser/laser/extended midface); skin aging with loss of volume and sagging (fat graft/midface/skin renewal and collagen stimulation of laser)
The final result is a natural contour, with glowing skin and fewer wrinkles, and at less risk of motor and nerve damage compared to conventional rhytidoplasty.

SOP25
Instagram for plastic surgeons – do´s and dont´s

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Introduction: With a shift of modern society towards new ways of communication, also perspective of doctors regarding their presentation in the public has changed. Therefore, advertisement has shifted from print-media and print-advertising towards online-marketing and social-media. Among those, social media has become more and more important within the last years, especially in the aesthetic sector. Platforms like “Instagram”, “Facebook” or “Vero” have the potential to either give insights in the work of doctors, but on the other way also carry uncertainties and legal risks. While some doctors are still trying to avoid social media advertising, promotion strategies of others are based on detailed end extensive sharing of their work as well as private lives. Especially for aesthetic purposes, giving public insights into work has become an essential task.
Material and Methods: In a social experiment we established an Instagram platform, called “doctor.aesthetics”. Based on socio-psychological as well as basic marketing principles, we shared medical as well as private content.
Within two months and after 10 posts we gained 10k Followers, without treating any patient.
For evaluation purposes, we split our posts into 4 groups: diseases, aesthetic, personal content and science and critically evaluated response rate, total views, comments and private questions regarding to this topic.
Results: Hereby we present our findings and results. We are further giving guidelines on how to successfully gain followers and recruit patients. Additionally, we present easy and effective methods on how to reach greater impact by simultaneously avoiding public presentation of private details.
Conclusion: Although social media advertising has become an integral part of marketing strategies, many plastic surgeons do not know how to use the given tools effectively. In a social experiment we figured out the perfect content to ensure maximum advertising effect by simultaneos minimal effort.

SOP26

Efficacy and safety of gluteal augmentation with autologous fat grafting – a systematic review

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Introduction: Recent surveys from the American Society for Aesthetic Plastic Surgery indicated gluteal augmentation as the single most growing cosmetic surgery performed in the United States during the last decade. This procedure is usually performed with silicone implant placement or gluteal fat grafting. The combination of liposuction and gluteal fat grafting is especially recommended to achieve the ideal female waist to hip ratio of approximately 0.7, and, unlike implant placement, allows to reshape the lateral third of the buttocks, respecting different ethnic beauty ideals related to buttock fullness, lateral buttock and lateral thigh shapes. However, efficacy and safety of gluteal fat grafting were never comprehensively analyzed. We performed a systematic review of the literature to determine outcomes and complications, including patient satisfaction, associated with this technique.

Methods: The MEDLINE database was searched for clinical studies on autologous fat grafting to the gluteal region. There were no restrictions on time or language of publication. Resulting articles were screened using a priori criteria.

Results: Seventeen articles (four prospective and ten retrospective case series, and three case reports), representing 2607 treated patients, were included. No randomized controlled studies met final inclusion criteria. The overall complication rate was 10.9 percent (n = 284). The most common complications included seroma of the donor site (3.8 percent), major or minor irregularities including asymmetry (2.1 percent), infection (1.7 percent), and sciatic pain (1.3 percent). Four cases of fat embolism, one of which leaded to death, were reported. Patient satisfaction after surgery was scored as high by the majority of the studies, although different methods of evaluation among the articles prevented quantitative analysis.

Conclusions: The prevalence of complications in gluteal fat grafting compared favorably to implant-based gluteal augmentation, yielding high patient satisfaction. However, the level of evidence of the studies identified, mainly representing single surgeon experiences, was low. Importantly, injections should be limited to the subcutaneous and superficial intramuscular planes of the gluteal region to prevent fat embolism.

SOP27

Low cost 3-D printed patient specific skull models in surgical counseling and education of parents of craniosynostsis patients – a comparison with the conventional visual explanation modalities

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Craniosynostosis is a complex craniofacial deformity. Its management and care requires a multidisciplinary team in its approach. Weather syndromic, or non- syndromic, it is a rare deformity. To our knowledge, there have been no studies in Saudi Arabia tackling the deformity demographics,

Genetics, or comprehensive care. This is a prospective cross sectional study via a questionnaire to both parents aiming at collecting demographic data and family comprehension of the procedure and surgical planning.
Methods: We used 3D printed modeling on an office based 3D printer to create patient specific models after CT scan was done preoperatively for each patient. Validated questionnaires were used prior to surgery (using likert scale). They were handed out to both parents separately , once after conventional explanation using 3d CT scans, and the second after using the 3D model. Each parent was his own control.
Results: In regards to the cost of producing the 3D model, all costs were calculating including electricity and material cost. Our mean cost was 5.2 $. In regards to results, we found that there was statistical significance in the effect on families decision for surgery and understanding of complications between both methods of explaining the procedure.
Conclusion: desktop 3D printing is a a cheap model that is readily available and affordable and can provide valuable information to families.. The beneficial effect of using and patient specific 3D model was shown on parents education and decision-making process. When subjects were asked if others parents are to be counseled about the child condition and operative course 85.7% choose the 3D model explanation technique.

SOP28

Standardized concept and optimized approach in surgical treatment of lymphedema – case series

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Lymphedema is caused by damage done to the lymphatic drainage system, which consequently leads to an increased volume in the affected area. At first the fluid accumulation does take part in the interstitium, further the amount of fat und connective tissue proliferates in this region. Patients often present swelling and a feeling of heaviness in the affected extremity. Skin atrophy and repeated episodes of cellulitis do also occur.
200 million patients worldwide are suffering from lymphedema. Associated with lymphedema are complications like decreased limb functionality, lower self-esteem, infections, skin alterations and in some cases malignant changes.
Lymphedemas are classified into two groups: Primary and secondary lymphedema. Primary lymphedema is present from birth, while secondary lymphedema occur from trauma, malignancy, operations, radiation or inflammation. Lymphedemas of the upper extremity are among the most dreaded complications following breast cancer treatment. Psychological stress caused by the diagnosis of lymphedema can be compared to stress levels during the initial diagnosis of breast cancer. Furthermore significant higher medical expenses are related to patients suffering from lymphedema.
Meanwhile lymph node transfer and lymphovenous anastomosis are widespread methods for the treatment of chronic lymphedema. They were made possible with the concept of super micro-surgery, where surgical sutures in the range of 0,3 to 0,8 mm can be placed to suture thin vessles. The visualization of the lymphatics can be performed with indocyanine green.
Vascularized lymph node transfer (VLNT) is relatively new method to treat lymphedema.

Healthy lymph nodes are therefore transferred in the affected area where the lymphedema occurs. There they stimulate lymphangiogenesis through the release of growth factors.
Typically lymph nodes are being resected en-bloc with surrounding soft tissue and are connected to the recipient region using microsurgical anastomosis.
Our work presents the connection between published literature and our clinical approach with a high numbers of patients, as well as our operative long term results with modifications and optimization in a case study. Nearly all of our patients do show a postoperative volume reduction in the affected areas. Surveying their satisfaction a higher quality of life was stated among all patients.

SOP29

Botulinum toxin augmented free gracilis flap and local peroneus brevis flap for chronic ulcers in a patient with systemic sclerosis and secondary Raynaud syndrome – a case report

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Introduction: Raynaud syndrome is a disorder with abnormal vasoconstriction of the distal limb and cutaneous vessles in reaction to cold, stress or other stimuli. The underlying cause in our patient is systemic sclerosis, known as systemic illness of the connective tissue with fibrosis of the skin and inner organs as well as obliterating angiopathy. Several treatment methods had failed, resulting in the need for a complication-suceptible free and local tissue transfer. Since botulinum toxin effects autonomic and adrenergic nerves, the influence on vasomotor tone could potentially improve vascular patency.
The aim was to achieve wound closure with a microvascular free and local flap reconstruction after preoperative periarterial sympathectomy with botulinum toxin.
Materials and Methods: In a 58 year old female patient with Raynaud syndrome due to systemic sclerosis and subsequent chronic ulcers of the lower limbs, we performed a free gracilis and peroneus brevis flap. The donor and recipient site were pretreated with a total of 100E of botulinum toxin before surgery in order to prevent postoperative thromboembolic or vasospastic complications. Monitoring, anticoagulation and follow-up were identical to healthy patients.
Results: Long-term wound closure was achieved with a free gracilis and peroneus brevis flap after preoperative treatment with botulinum toxin.
Conclusion: This report describes the first successful case of a free gracilis flap in a patient with systemic sclerosis and Raynaud syndrome after influencing the microvascular environment with botulinum toxin. Periarterial sympathectomy may prevent complications in high-risk patients, encouraging free and local flap reconstruction despite the underlying disease.

SOP30

Optimization of the decellularization process of human skeletal muscle by using flexor digitorum superficialis

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Introduction: Conventional treatment for muscle deformities in plastic and reconstructive surgery depends on defect size, with lesions treated with local and distant flaps, and where possible, direct closure. There is still an unmet clinical need as this is not always possible, with surgeons admitting that certain tissues cannot be completely restored by current techniques. These challenges could potentially be addressed with the production of extracellular matrix (ECM) scaffolds composed of an ECM derived from decellularized human skeletal muscle.
The aim of this study was to find the optimal technique to decellularize a skeletal muscle. Using human cadaver specimen, human Flexor digitorum Superficialis (FDS) muscle was evaluated using three protocols.
Material and Methods: The first two protocols where based on a detergent only (DOT) and a detergent-enzymatic protocol (DET). The third protocol avoided the use of detergents and proteolytic enzymes (NDNET). Samples were evaluated using histological, immunofluorescence and quantitative techniques to asses, which was the optimized technique.
Results: The results demonstrated 1 and 2 cycles of the DOT consisting of 2% SDS for 4 hours was successfully at decellularizing human FDS, while still allowing the scaffold produced to maintain its microstructure and composition, with minimal disruption to the acellular ECM scaffolds. DET and NDNET protocols maintained the ECM but were unsuccessfull in removing all DNA content overt 2 cycles.
Conclusion: Decellurisation of skeletal muscle is a viable option for muscle reconstruction using a detergent only processing technique. Further exploration in vivo will explore its effectiveness for reconstructive surgery.

SOP31

Fetal ECM – the origin of scarless healing

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Introduction: Scarring and fibrosis following tissue injury represent an enormous medical burden leading to long lasting functional, cosmetic as well as psychological effects for patients.
In contrast to postnatal life, human skin prior 24th gestational week is characterized by unique wound healing capabilities, with an intrinsic ability to fully regenerate tissue rather than forming a scar. The composition of the extracellular matrix has shown to be a major factor for these unique abilities. Here we compare the different structure of the ECM of fetal and adult skin samples.
Material and Methods: Human adult and fetal skin samples were taken and their consisting ECM was examined. In a first step the samples were fixed with formaldehyde or shockfrozen with liquid nitrogen. They were cut in 7-10 µm slices for further immunohistochemical and histological stainings. The samples were compared regarding their composition and their collagen I to collagen III ratio. Furthermore, for comparison of fiber diameter and distribution a SEM was performed.
Results: The fetal group shows a significantly higher ratio between collagen I and collagen III compared to the adult group. Additionally, fetal skin shows a finer distribution of thinner fibers. Additionally we found significant differences in fiber arrangement between fetal and adult skin. But not only adult and fetal samples showed differences, we were also able to find significant differences between fetal samples very depending on the different gestational stages.
Conclusion: Human fetal ECM is associated with scarless wound healing. The ECM plays an important role in this unique capacity, either by a higher ration of collagen I to collagen III or by a different number and formation of fibers within the ECM. Mimicking these special structure, represents an excellent approach for the development of new wound dressings- either for chronic wounds or as aesthetic ones.

SOP32

Hyperbaric oxygen therapy promotes wound closure and perfusion in ischemic and hyperglycemic conditions, independently of myofibroblast differentiation

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Introduction: The treatment of chronic wounds remains inconsistent and empirical. Hyperbaric oxygen therapy (HBOT) is a promising method to improve wound repair but there is still a lack

of understanding of its mechanisms of action and its indications are not yet clearly defined.
Material and Methods: We studied the effects of HBOT in four different wound conditions by inflicting bilateral wounds on the dorsal aspect of the feet of nonischemic or ischemic limbs in normoglycemic or hyperglycemic rats. To create an ischemic condition, arterial resection was performed unilaterally. Forty-four animals received HBOT five times a week until complete wound closure. Wound repair was compared with 44 rats receiving standard dressing only.
Results: HBOT increased blood flow and accelerated wound closure in ischemic and hyperglycemic wounds, most significantly when the two conditions were combined. Wound contraction and reepithelialization were similarly stimulated by HBOT. The acceleration of wound contraction was not associated with increased myofibroblasts expression, nor fibroblast recruitment or higher cell count in the granulation tissue. Of note, we observed a significant increase in collagen deposition in early time points in ischemic wounds receiving HBOT.
Conclusion: This data emphasizes that an early application of HBOT might be crucial to its efficacy. We concluded that wounds where ischemia and hyperglycemia are combined, as it is often the case in diabetic patients, have the best chance to benefit from HBOT.

SOP33
Screening of HLA sensitization during acute burn care

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Background: Since the inception of clinical VCA almost two decades ago burn victims have been identified as immunologically complex patients due to preformed HLA antibodies. Yet it remains unclear whether detected HLA antibodies are the result of former alloantigenic events or if their de novoformation occurs during primary burn care.
Methods: Patients with burns >20% of total body surface area (TBSA) admitted to Zurich Burn Centre between May 2015 and September 2016 were screened for HLA antibodies at admission and 6 months post trauma. Influence of glycerol-preserved donor skin and red blood cell transfusion on HLA antibody formation was investigated.
Results: Thirty-seven patients (7 female, 30 male) with an average age of 45.2±19.1 years and average affected TBSA of 38.5%±18.9% were screened for HLA antibodies. Five patients (13.5%) showed preformed HLA antibodies at admission. Only 3 patients demonstrated verified de novosensitization during acute burn care. Six patients treated with donor skin and blood transfusions showed no occurrence of HLA antibodies after 6 months. One patient died after 2 weeks due to infectious and thromboembolic complications – though, HLA antibodies were already detected.
Conclusion: Formation of HLA antibodies during acute burn care might be lower than previously expected by using glycerol-preserved donor skin as well as restrictive administration of blood products. Modern concepts of burn care may contribute to a revised outlook on burn patients as potential candidates for VCA.

SOP34

Application of osmotic tissue expanders in reconstruction of burn scars in children

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Introduction: Soft-tissue expansion is effective approach in paediatric plastic surgery. Introduction of self-inflating tissue expanders in clinical practice offers their benefits to conventional ones for reconstruction in paediatric population. We analyse our experience in the treatment of burn scars using osmotic expanders in paediatric population.

Material and Methods: Between 2008 and 2017 twenty one children with burn scars and mean age 8.86 years were reconstructed using 23 rectangular osmedTM osmotic tissue expanders. Two children required 2 simultaneous implants. The children demographics, site of scars, operative data, number and volume of expanders inserted, explantation time and complications were reviewed.

Results: In all cases, the procedures of expander insertion were of short duration and uneventful. The average expansion period was 46.61 days. During that time, there were 3.87 follow-ups. Implant size ranged from 5 to 30 ml at placement. Eighteen expanders reach their predicted volume. Five complications were noted (incl. small necrotic areas in four implantation sites and wound dehiscence in one).

Conclusion: The osmotic expander is fast and simple to implant tool for scar reconstruction particularly for children. The careful preoperative planning and proper patient selection minimize complications.

Gronovich Y, Tuchman I, Binenboym R et all. Reconstruction with an osmotic tissue expander in pediatric patients. Plast Reconstr Surg 2012;129(5)

Lohana P, Moiemen N.S, Wilson Y.T: The use of OsmedTM tissue expanders in paediatric burns reconstruction. Ann Burns Fire Disasters, 2012, 25(1)

Chummun S et all: The osmotic tissue expander: a 5-year experience. Plast Reconstr Aesthet Surg. 2010,63

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Index of Keynote Speakers

Index of Abstract Authors