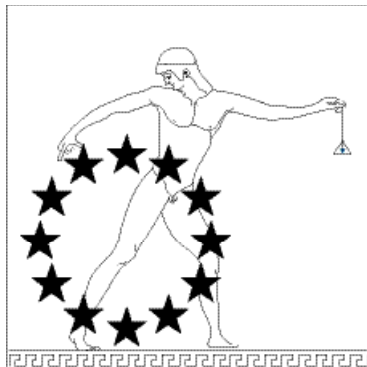


EURAPS  
EUROPEAN ASSOCIATION  
OF PLASTIC SURGEONS



THIRTIETH ANNUAL MEETING  
23-25 MAY 2019

FINLANDIA HALL  
HELSINKI, FINLAND

PROGRAM

EURAPS  
EUROPEAN ASSOCIATION OF PLASTIC SURGEONS

OFFICERS 2018-2019



**Norbert PALLUA**  
Aachen, Germany  
President 2018-2019

**President**

Norbert PALLUA  
Aachen, Germany

**President-Elect**

Milomir NINKOVIC  
Munich, Germany

**Secretary General**

Fabio SANTANELLI DI POMPEO  
Rome, Italy

**Treasurer**

Esther VÖGELIN  
Bern, Switzerland

**Executive Council**

Austria: Gerhard PIERER

Belgium: Laurence BOON

Finland: Outi KAARELA

France: Eric ARNAUD

Germany: Christoph HEITMANN

Greece: Nikolaos PAPADOPOULOS

Italy: Corrado RUBINO

The Netherlands: Rene VAN DER HULST

Spain: Jaume MASIA

Sweden: Åsa EDSANDER-NORD

Switzerland: Daniel KALBERMATTEN

Turkey: Ali Riza ERCOCEN

United Kingdom: Ken STEWART

**EURAPS CENTRAL OFFICE**

*Chair of Plastic Surgery*

*Sapienza University of Rome*

*Azienda Ospedaliera Sant'Andrea*

*Via di Grottarossa 1035, 00189 - Rome, Italy*

*office@euraps.org*

*www.euraps.org*

EURAPS  
- SPECIAL APPOINTMENTS -

HISTORIAN

Riccardo MAZZOLA - Milan, Italy

COMMITTEES 2017-2018

**Scientific Program Committee**

**Ex Officio**

Norbert PALLUA, President

Sinikka SUOMINEN, Local Host

Fabio SANTANELLI DI POMPEO, Secretary General

**Reviewers**

General Fabrizio SCHONAUER - Naples, Italy  
Bulent SACAK - Istanbul, Turkey  
Martin HALLE - Stockholm, Sweden

Microsurgery Jan VRANCKX - Leuven, Belgium  
Juan BARRET - Barcelona, Spain  
Jyrki VUOLA - Helsinki, Finland

Hand/Nerve Matthias RAB - Klagenfurt, Austria  
Dietmar ULRICH - Nijmegen, The Netherlands  
Holger ENGEL - Kassel, Germany

Cleft/Cranio Nigel MERCER - Bristol, United Kingdom  
Alexandre MARCHAC - Paris, France  
Irene MATHIJSEN - Rotterdam, The Netherlands

Research Nicole LINDENBLATT - Zurich, Switzerland  
Andrew HART - Glasgow, United Kingdom  
Guy MAGALON - Marseille, France

Aesthetics Moshe KON - Amsterdam, The Netherlands  
Efterpi DEMIRI - Thessaloniki, Greece  
Marwan ABOUD - Brussels, Belgium

**New Members Evaluation Committee**

Milomir NINKOVIC, Chair – Munich, Germany

Gennaro SELVAGGI – Gothenburg, Sweden

Catherine BRUANT-RODIER – Strasbourg, France

Jian FARHADI – London, United Kingdom

Jan VRANCKX – Leuven, Belgium

*Ex-Officio: Fabio SANTANELLI DI POMPEO – Rome, Italy*

**Nominating Committee**

Beatriz BERENGUER – Madrid, Spain

Georg NOEVER – Zurich, Switzerland

Manfred FREY – Vienna, Austria

Pietro GIOVANOLI – Zurich, Switzerland

Marc VANDEVOORT – Gent, Belgium

*Ex-Officio: Fabio SANTANELLI DI POMPEO – Rome, Italy*

**Young Plastic Surgeons Scholarship Evaluation Committee**

**AAPS/EURAPS Fellowship Evaluation Committee**

**AAPS/EURAPS Academic Scholarship Evaluation Committee**

Kenneth STEWART – Edinburgh, United Kingdom

Ahmet BOZKURT – Frankfurt, Germany

Nicholas Vedder – Seattle, Usa

*Ex-Officio: Fabio SANTANELLI DI POMPEO - Rome, Italy*

**Hans Anderl Award Committee**

Gottfried WECHSELBERGER - Salzburg, Austria (Chair)

Georg NOEVER – Zurich, Switzerland

Corrado RUBINO – Salerno, Italy

Jan VRANCKX – Leuven, Belgium

Hans-Günther MACHENS – Munich, Germany

**By-Laws Revision Committee**

Norbert PALLUA - Aachen, Germany

Eric ARNAUD - Paris, France

Hans-Günther MACHENS – Munich, Germany

*Ex-Officio: Fabio SANTANELLI DI POMPEO - Rome, Italy*

**Alternative Source of Income Committee**

*Georg Noever - Zurich, Switzerland*

*Fabio SANTANELLI DI POMPEO - Rome, Italy*

*Esther VÖGELIN - Bern, Switzerland*

*Moustapha HAMDI - Brussels, Belgium*

**Website Revision Committee**

*Beatriz BERENGUER -Madrid,Spain*

*Nathalie ROCHE - Gent, Belgium*

*Neil BULSTRODE - London,United Kingdom*

*Alexandre MARCHAC - Paris, France*

*Ex-Officio: Fabio SANTANELLI DI POMPEO - Rome, Italy*

**EURAPS**  
- GENERAL INFORMATION -

**ORIGINS**

Date of Constitution: May 23, 1989 - Paris, France  
First Business Meeting: September 5, 1989 - Istanbul, Turkey  
First Scientific Meeting: June 7-9, 1990 - Strasbourg, France

**OBJECTIVES OF THE ASSOCIATION**

- To promote the excellence of Plastic Surgery in Europe;
- To furnish an annual forum for a selection of the best scientific works presented at the National Societies;
- To stimulate research and investigation at a European level, as well as to coordinate various forms of teaching;
- To preserve the unity of Plastic Surgery by illustrating its different aspects.

**PAST PRESIDENTS**

1989-90 Hans ANDERL - Innsbruck, Austria  
1990-91 Mike HACKETT † - London, United Kingdom  
Paolo SANTONI RUGIU † - Pisa, Italy  
1991-92 Kob WINTSCH - Aarau, Switzerland  
1992-93 Ron PIGOTT - Bristol, United Kingdom  
1993-94 Jacques VAN DER MEULEN - Rotterdam, The Netherlands  
1994-95 Madeleine LEJOUR - Brussels, Belgium  
1995-96 Alfred BERGER - Hannover, Germany  
1996-97 Sirpa ASKO-SELJAVAARA - Helsinki, Finland  
1997-98 Hans HOLMSTRÖM - Göteborg, Sweden  
1998-99 Daniel MARCHAC † - Paris, France  
1999-00 Rafael DE LA PLAZA - Madrid, Spain  
2000-01 Martyn WEBSTER - Glasgow, United Kingdom  
2001-02 Gusztáv GULYÁS - Budapest, Hungary  
2002-03 Wolfgang MÜHLBAUER - Munich, Germany  
2003-04 Denys MONTANDON - Geneva, Switzerland  
2004-05 Zoran ARNEZ - Ljubljana, Slovenia  
2005-06 Riccardo MAZZOLA - Milan, Italy  
2006-07 Jürgen HOLLE - Vienna, Austria  
2007-08 Françoise FIRMIN - Paris, France  
2008-09 David SOUTAR - Glasgow, United Kingdom  
2009-10 Erkki TUKIAINEN - Helsinki, Finland  
2010-11 Julia K. TERZIS - Norfolk, VA, USA  
2011-12 Andrej BANIC - Bern, Switzerland  
2012-13 Stan MONSTREY - Ghent, Belgium  
2013-14 Grazia SALIMBENI - Pisa, Italy  
2014-15 Moshe KON - Utrecht, The Netherlands  
2015-16 Manfred FREY - Vienna, Austria  
2016-17 Beatriz Berenguer - Madrid, Spain  
2017-18 Georg Noever - Zurich, Switzerland

**PAST SECRETARY-GENERALS**

1989-95 Daniel MARCHAC † - Paris, France  
1995-01 Riccardo MAZZOLA - Milan, Italy  
2001-07 Stan MONSTREY - Ghent, Belgium  
2007-11 Moshe KON - Utrecht, The Netherlands  
2011-14 Manfred FREY - Vienna, Austria

**- ANNUAL MEETINGS -  
DATES, LOCATIONS AND LOCAL HOSTS**

Past Meetings

1 <sup>st</sup>	7-9/6, 1990	STRASBOURG, France	Daniel MARCHAC
2 <sup>nd</sup>	2-4/5, 1991	STRASBOURG, France	Daniel MARCHAC
3 <sup>rd</sup>	14-16/5, 1992	PISA, Italy	Paolo SANTONI RUGIU
4 <sup>th</sup>	29/4-1/5, 1993	STRASBOURG, France	Daniel MARCHAC
5 <sup>th</sup>	12-14/5, 1994	GENEVA, Switzerland	Denys MONTANDON
6 <sup>th</sup>	11-13/5, 1995	STRASBOURG, France	Daniel MARCHAC
7 <sup>th</sup>	16-18/5, 1996	INNSBRUCK, Austria	Hans ANDERL
8 <sup>th</sup>	15-17/5, 1997	AMSTERDAM, NL	Moshe KON
9 <sup>th</sup>	28-30/5, 1998	VERONA, Italy	Gino RIGOTTI
10 <sup>th</sup>	20-22/5, 1999	MADRID, Spain	Rafael DE LA PLAZA
11 <sup>th</sup>	1-3/6, 2000	BERLIN, Germany	Rolf-Rüdiger OLBRISCH
12 <sup>th</sup>	31/5-2/6, 2001	HELSINKI, Finland	S. ASKO-SELJAVAARA
13 <sup>th</sup>	31/5-1/6, 2002	CRETE, Greece	John IOANNOVICH†
14 <sup>th</sup>	29-31/5, 2003	VIENNA, Austria	Manfred FREY
15 <sup>th</sup>	27-29/5, 2004	GENOA, Italy	Pietro BERRINO
16 <sup>th</sup>	26-28/5, 2005	MARSEILLE, France	Guy MAGALON
17 <sup>th</sup>	25-27/5, 2006	ISTANBUL, Turkey	Onur EROL
18 <sup>th</sup>	24-26/5, 2007	GHENT, Belgium	Stan MONSTREY
19 <sup>th</sup>	29-31/5, 2008	MADEIRA, Portugal	Horacio COSTA
20 <sup>th</sup>	28-30/5, 2009	BARCELONA, Spain	Juan BARRET
21 <sup>st</sup>	27-29/5, 2010	MANCHESTER, UK	Angus McGROUTHER
22 <sup>nd</sup>	2-4/6, 2011	MYKONOS, Greece	Othon PAPADOPOULOS
23 <sup>rd</sup>	24-26/5, 2012	MUNICH, Germany	Milomir NINKOVIC
24 <sup>th</sup>	23-25/5, 2013	ANTALYA, Turkey	Sühan AYHAN
25 <sup>th</sup>	29-31/5, 2014	ISCHIA, Italy	Fabio SANTANELLI DI POMPEO
26 <sup>th</sup>	28-30/5, 2015	EDINBURGH, UK	Ken STEWART
27 <sup>th</sup>	27-28/5, 2016	BRUSSELS, Belgium	Moustapha HAMDJ
28 <sup>th</sup>	25-27/5, 2017	PISA, Italy	Grazia SALIMBENI
29 <sup>th</sup>	17-19/5, 2018	MADRID, Spain	Bernardo HONTANILLA

Future Meetings

31 <sup>st</sup>	28-30/5, 2020	Athens, GREECE	Nikolas PAPADOPOULOS
32 <sup>nd</sup>	27-29/5, 2021	Naples, ITALY	Corrado RUBINO

## NEW MEMBERS

Andrés RODRIGUEZ - Uppsala, Sweden  
Benoit HENDRICKX - Brussels, Belgium  
Charles FILIP - Oslo, Norway  
Enrico DI VAIO - San Paolo, Brazil  
Methap KARAMESE - Konya, Turkey  
Paul HARRIS - London, United Kingdom  
Radu OLARIU - Bern, Switzerland  
Ramon LLULL - Palma de Mallorca, Spain  
Salvatore GIORDANO - Turku, Finland

## EURAPS LECTURERS

1996 Jeffrey MORGAN - Boston, MA, USA  
1997 Umberto VERONESI - Milano, Italy  
1998 Per-Ingvar BRÅNEMARK - Göteborg, Sweden  
1999 Daniel MARCHAK - Baltimore, MD, USA  
2000 Mark GORNEY - San Francisco, CA, USA  
2001 Robin WEBSTER - Aberdeen, United Kingdom  
2002 István SZABÓ - Budapest, Hungary

## DANIEL MARCHAC LECTURE

2014 Françoise FIRMIN – Paris, France  
2017 Riccardo MAZZOLA – Milan, Italy

## MARCHAC CLINICIAN OF THE YEAR PRIZE & LECTURE

2018 Hans HÖLMSTROM - Gothenburg, Sweden

## WINNERS OF THE EURAPS BEST PAPER

1991 Charles B. TURLEY – London, United Kingdom  
1992 Jan JERNBECK – Stockholm, Sweden  
1993 Rika DERAEMAECCKER – Brussels, Belgium  
1994 Stan MONSTREY – Ghent, Belgium  
1995 Claudia MEULI-SIMMEN – Zurich, Switzerland (Research)  
Françoise FIRMIN – Paris, France (Clinical)  
1996 Rajiv GROVER – Northwood, United Kingdom (Research)  
Koenraad VAN LANDUYT – Ghent, Belgium (Clinical)  
1997 Nadija SINSEL – Leuven, Belgium (Research)  
Milomir NINKOVIC – Innsbruck, Austria (Clinical)  
1998 Esther VÖGELIN – Bern, Switzerland (Research)  
Håkan BRORSON – Malmö, Sweden (Clinical)  
1999 Rajiv GROVER – Northwood, United Kingdom (Research)  
Phillip BLONDEEL – Ghent, Belgium (Clinical)  
2000 Benoît LENGELÉ – Brussels, Belgium (Clinical)  
Olivier HEYMANS – Liège, Belgium (Research)  
2001 Dennis von HEIMBURG – Aachen, Germany (Research)  
Ingrid SCHLENZ – Vienna, Austria (Clinical)  
2002 Pari-Naz MOHANNA – London, United Kingdom  
2003 Patrick TONNARD – Ghent, Belgium  
2004 Claes LAURITZEN – Göteborg, Sweden  
2005 Mihai CONSTANTINESCU – Bern, Switzerland  
2006 Eric ARNAUD – Paris, France  
2007 Benoît LENGELÉ – Brussels, Belgium  
2008 Pietro BERRINO – Genoa, Italy  
2009 Laurent LANTIERI – Créteil, France  
2010 Roger KHOURI – Miami, FL, USA  
2011 Jan J. VRANCKX – Leuven, Belgium  
2012 Beatriz BERENGUER – Madrid, Spain  
2013 Jan J. VRANCKX – Leuven, Belgium  
2014 Oskar ASZMANN – Vienna, Austria  
2015 Sinikka SUOMINEN – Helsinki, Finland  
2016 Fabio SANTANELLI DI POMPEO – Rome, Italy  
2017 Françoise FIRMIN - Paris, France  
2018 Martin HALLE - Stockholm, Sweden

AMERICAN ASSOCIATION OF PLASTIC SURGEONS  
AAPS

- Information -

In 1997 EURAPS and AAPS voted to establish a formal affiliation to share their cultural and scientific experiences.

Information concerning the AAPS organization:

**2018/2019 Officers**

President: Donald R. Mackay, M.D.  
President-Elect: Linda G. Phillips, M.D.  
Vice President: Robert J. Havlik, M.D.  
Secretary: W. P. Andrew Lee, M.D.  
Treasurer: Paul Cederna, M.D.  
Historian: Arun K. Gosain, M.D.

**Trustees**

Mark B. Constantian, M.D.  
Gregory R. D. Evans, M.D.  
Joseph M. Serletti, M.D.  
Steve Buchman, M.D.  
Sheri Slezak, M.D.

**Date and location of future AAPS Annual Meeting**

99<sup>th</sup> Annual Meeting  
May 2-5, 2019  
Palmer House Hotel  
Chicago, IL

**Annual Meeting participation**

Registration forms are available at the AAPS Central Office or on the AAPS website at [www.aaps1921.org](http://www.aaps1921.org). Participation at the meeting is strictly by invitation; however, members of each Association may attend the meeting of the other Association without the need for a formal invitation.

**AAPS Central Office**

Aurelie M. ALGER, JD, Executive Director  
American Association of Plastic Surgeons  
500 Cummings Center, Suite 4400 Beverly, MA 01915.  
phone: +1 978 927 8330  
fax: +1 978 524 0461  
[www.aaps1921.org](http://www.aaps1921.org)

- 1999 Julia TERZIS - Norfolk, VA  
Peter CORDEIRO - New York, NY
- 2000 Robert FOSTER - San Francisco, CA
- 2001 Warren BREIDENBACH - Louisville, KY
- 2002 Eric STELNICKI - Hollywood, FL
- 2003 Ralph T. MANKTELOW - Toronto, ON
- 2004 Steven KRONOWITZ - Houston, TX
- 2005 John REINISCH - Los Angeles, CA
- 2006 Robert WALTON Jr - Chicago, IL
- 2007 Joseph UPTON III - Chestnut Hill, MA
- 2008 Frederick J. MENICK - Tucson, AZ
- 2009 Andrew P. TRUSSLER - Dallas, TX
- 2010 Christopher PANNUCCI - Ann Arbor, MI
- 2011 Amy S. COLWELL - Boston, MA
- 2012 Christopher J. PANNUCCI - Ann Arbor, MI
- 2013 Benjamin LEVI - Ann Arbor, MI
- 2014 John REINISCH - Beverly Hills, CA
- 2015 Mark CLEMENS - Houston, TX
- 2016 Christopher PANNUCCI - Salt Lake City, UT
- 2017 Sarah KARINJA - New York, NY
- 2018 W. P. Andrew LEE - Dallas, TE

## EURAPS RESEARCH COUNCIL

The ECSAPS (European Congress of Scientists and Plastic Surgeons) has been conceived in May 1997 in Amsterdam during the Annual Meeting of EURAPS in order to provide a working environment where scientists and plastic surgeons with a specific interest in research can meet. The ECSAPS met annually under the aegis of EURAPS.

Founding members are Alfred BERGER (Germany), Willy BOECKX (Belgium) and Roy SANDERS (UK). The first Meeting took place under the Presidency of A. BERGER in Hannover in October 1997.

In 1998, EURAPS voted to establish a formal affiliation with the ECSAPS and agreed that a prize is given for the best presentation and that the winning paper is invited for the next EURAPS Meeting. To strengthen this affiliation, EURAPS decided in 2011 that the name of its research wing should be changed to EURAPS Research Council and the meetings of both associations should be organized in sequence at the same place. A combined scientific session is the first scientific session of the EURAPS Annual Meeting and is including the five best papers presented at the EURAPS Research Council meeting the year before.

### Date and Location of the EURAPS Research Council Meetings

2012	23-24 May, Munich, Germany Hans-Günther MACHENS, Arndt SCHILLING
2013	22-23 May, Antalya, Turkey Selahattin ÖZMEN, Arndt SCHILLING
2014	28-29 May, Ischia, Italy Benedetto LONGO
2015	27-28 May, Edinburgh, Scotland Andrew HART
2016	25-26 May, Brussels, Belgium Benoit HENDRICKX
2017	24-25 May, Pisa, Italy Francesca DE LORENZI
2018	16-17 May, Madrid, Spain Alvaro CABELLO
2019	22-23 May, Helsinki, Finland Susanna KAUKHANEN and Virve KOLJONEN

Information on the EURAPS Research Council and abstract submission for future annual meetings at the new and permanent EURAPS Research Council website: [www.research-council.euraps.org](http://www.research-council.euraps.org)

## EURAPS RESEARCH COUNCIL BEST PAPERS PRESENTED AT EURAPS MEETINGS

1998	Irene MATHIJSEN - Rotterdam, The Netherlands
1999	Dennis VON HEIMBURG - Aachen, Germany
2000	Neil BULSTRODE - Northwood, United Kingdom Laurence BOON - Brussels, Belgium
2001	Joy ODILI - Northwood, United Kingdom
2002	Dolores WOLFRAM - Innsbruck, Austria
2003	Brigitte PITTET-CUÉNOD - Geneva, Switzerland
2004	Yves HARDER - Bern, Switzerland
2005	Bran SIVAKUMAR - London, United Kingdom
2006	Karsten HEMMRICH - Aachen, Germany
2007	Nicole LINDENBLATT - Zurich, Switzerland
2008	Sophie DANN - Middlesex, United Kingdom
2009	David SIMONS - Aachen, Germany
2010	Pietro G. DI SUMMA - Lausanne, Switzerland
2011	Warren R.L. CAIRNS - Venice, Italy Tomás EGANA - Munich, Germany Gerrit GRIEB - Aachen, Germany Tim NIJHUIS - Rotterdam, The Netherlands Thilo SCHENCK - Munich, Germany Miao TONG - Rotterdam, The Netherlands
2012	Yves HARDER - Munich, Germany Peter NELSON - Munich, Germany Eva PLACHETA - Vienna, Austria Ann J. RECKJENRICH - Munich, Germany Farid REZAEIAN - Munich, Germany Rohit SETH - London, UK Jennifer VERHOEKX - London, UK
2013	Pawel SZYCHTA - Livingston, UK Mayuran SATHTHIANATHAN - Sydney, Australia Ersoy KONAS - Ankara, Turkey Dominik LÉVIGNE - Geneva, Switzerland
2014	Ahmet BOZKURT - Frankfurt, Germany Arndt SCHILLING - Munich, Germany Elisabeth KAPPOS - Basel, Switzerland
2015	Aadil KHAN - London, United Kingdom Aidan ROSE - Dundee, United Kingdom Christopher WEST - Edinburgh, United Kingdom
2016	Margot DEN HONDT - Leuven, Belgium
2017	Jérôme DUISIT - Woluwe-Saint-Lambert, Belgium
2018	Ursula KRANEBURG - Munich, Germany



**Scope of the scholarship**

There are five scholarships available in order to foster and encourage the training in Plastic Surgery in Europe, through a one or three month scholarship in a European Centre of Plastic Surgery (see Institutes) or in a department run by a EURAPS member.

**Eligibility**

Candidates must be European citizens (Eastern European Countries included) and have obtained the speciality in Plastic Surgery (or Board). The maximum age is 37 years. Evidence that the candidate has not had his/her 38<sup>th</sup> birthday must be submitted (photocopy of the passport).

**Application**

The following documents must be sent to office@euraps.org by December 1<sup>st</sup>, each year:

1. Letter written by the candidate indicating the purpose, length and centre of choice of the visit.
2. C.V. + proof of thesis (ISBN-code, if available)
3. Letter of recommendation from a EURAPS member.

**Selection**

A four-Member EURAPS Committee, appointed by the General Assembly, will consider and select the most worthy applications.

**Conditions**

The scholarships must be used up before the end of the following year. There will be one-month and three-month scholarships available. The amount is € 1.500 for the one-month scholarships and € 3.500 for the three-month scholarships. The scholarships will be paid in two distinct phases: half before the commencement of the scholarship and the other half upon receipt of a report (2.000 words approximately) written by the host of the Institute to the EURAPS Secretary General at the end of the visit and considered satisfactory. In the case of a negative report, the second part of the scholarship will not be paid. Notification of the winners will be sent to the sponsor and the candidate before March 15<sup>th</sup> of the following year. The EURAPS Secretary General will write to the head of the Institute(s) to be visited, recommending the successful applicant(s).

**Supervision**

Recipient(s) of the EURAPS scholarship will be supervised by the head of the Institute who will prepare a confidential report about the candidates' attendance and interest on the Institute's activity, to be sent to the Secretary General of EURAPS at the completion of the scholarship. A copy of this report will be forwarded to the recipient sponsor.

- 1997 G. L. CAMPIGLIO - Milano, Italy - Sponsor: A. Grisotti  
A. SCHWABEGGER - Innsbruck, Austria - Sponsor: M. Ninkovic
- 1998 R. HIERNER - Hannover, Germany - Sponsor: A. Berger  
A. SARAY - Ankara, Turkey - Sponsor: N. Kostakoglu
- 1999 D. CASANOVA - Marseille, France - Sponsor: G. Magalou  
F. LORENZETTI - Pisa, Italy - Sponsor: S. Asko-Seljavaara
- 2000 D. von HEIMBURG - Aachen, Germany - Sponsor: N. Pallua  
B. BERENQUER - Madrid, Spain - Sponsor: R. de la Plaza  
O. IVAN - Cluj-Napoca, Romania - Sponsor: J.Ph. Nicolai
- 2002 N. CELIK - Istanbul, Turkey - Sponsor: O. Erol  
Ch. HEITMANN - Ludwigshafen, Germany - Sponsor: G. Germann  
F. SCHONAUER - Naples, Italy - Sponsor: F. Santanelli
- 2003 S. OZMEN - Ankara, Turkey - Sponsor: G. Özcan  
M. PIGNATTI - Verona, Italy - Sponsor: G. Rigotti
- 2004 D. KALBERMATTEN- Basel, Switzerland - Sponsor: A. McGrouther  
I. MATTHIJSSSEN - Rotterdam, The Netherlands - Sponsor: S. Hovius  
G. ÖZGENEL - Bursa, Turkey - Sponsor: M. Özcan
- 2005 Y. DEMIRTAŞ - Ankara, Turkey - Sponsor: S. Ayhan  
A. MENDERES - Izmir, Turkey - Sponsor: O. Erol  
C. MORRISON - Belfast, United Kingdom - Sponsor: S. Monstrey  
Ö. ÖZKAN - Antalya, Turkey - Sponsor: H. E. Özgentas  
E. GARCIA TUTOR - Pamplona, Spain - Sponsor: J. M. Palacin
- 2006 O. ACARTURK - Adana, Turkey - Sponsor: M. Özcan  
S. D'ARPA - Palermo, Italy - Sponsor: G. Salimbeni  
A. GRAVANIS - Athens, Greece - Sponsor: O. Papadopoulos  
G. SELVAGGI - Bari, Italy - Sponsor: S. Monstrey  
C. UNAL - Istanbul, Turkey - Sponsor: G. Özcan
- 2007 C. DEMIRDOVER - Izmir, Turkey - Sponsor: M. Özcan  
D. MASÌÀ - Sassari, Italy - Sponsor: F. Santanelli  
S. SEREL - Ankara, Turkey - Sponsor: S. Ayhan
- 2009 A. BOROYAN - Yerevan, Armenia - Sponsor: F. Santanelli  
K. BOZIKOV - Ljubljana, Slovenia - Sponsor: Z. Arnez  
V. LEMAIRE - Liège, Belgium - Sponsor: J. Fissette  
M. SHAFIGHI - Chelmsford, United Kingdom - Sponsor: A. Banic  
S. TUNCER - Ankara, Turkey - Sponsor: S. Ayhan  
D. ULRICH - Aachen, Germany - Sponsor: N. Pallua
- 2010 C. AUBA - Pamplona, Spain - Sponsor: B. Berenguer  
C. NURDAN ÖZTURK - Istanbul, Turkey - Sponsor: S. Ayhan  
R. SGARZANI - Bologna, Italy - Sponsor: R. Cipriani  
G. TETIK MENEVSE - Ankara, Turkey - Sponsor: H. E. Özgentas
- 2011 F. BORIANI - Bristol, United Kingdom - Sponsor: R. Cipriani  
A. BOZKURT - Aachen, Germany - Sponsor: N. Pallua  
D. KOSUTIC - Ptuj, Slovenia - Sponsor: J. Masià  
E. KYRIOPOULOS - Athens, Greece - Sponsor: O. Papadopoulos  
S. J. LO - Glasgow, United Kingdom - Sponsor: J. Boorman



- U.M. RIEGER - Innsbruck, Austria - Sponsor: L. Kovacs  
 I.S. WHITAKER - Cheshire, United Kingdom - Sponsor: M. Kon
- 2012 Kemal FINDIKCIOGLU - Ankara, Turkey - Sponsor: S. Ayhan  
 Vasu KARRI - Essex, United Kingdom - Sponsor: L. Kangesu  
 Jörn LOHMEYER - Munich, Germany - Sponsor: H-G. Machens  
 Özlenen ÖZKAN - Antalya, Turkey - Sponsor: H. E. Özgentas  
 İlker YAZICI - Kirikkale, Turkey - Sponsor: S. Ayhan
- 2013 Thomas Jan BIEGEN - Cambridge, UK - Sponsor: Françoise Firmin  
 Avni Tolga ERYILMAZ - Ankara, Turkey - Sponsor: Selahattin Özmen  
 Antonio IODICE - Lyon, France - Sponsor: Catherine Bruant-Rodier  
 Monika MATTESICH - Innsbruck, Austria - Sponsor: Gerhard Pierer  
 Enrique Olivares PARDO - Madrid, Spain - Sponsor: Bernardo Hontanilla  
 Bülent SACAK - Istanbul, Turkey - Sponsor: Sühan Ayhan
- 2014 Argine AZATYAN - Yerevan, Armenia - Sponsor: Gerhard Pierer  
 Björn BEHR - Bochum, Germany - Sponsor: Hisham Fansa  
 Beniamino BRUNETTI - Rome, Italy - Sponsor: Paolo Persichetti  
 Piyush DURANI - Manchester, UK - Sponsor: Angus McGrouther  
 Lars H. EVERS - Lübeck, Germany - Sponsor: Erkki Tukiainen  
 Sarah L. VERSNEL - Rotterdam, The Netherlands - Sponsor: Irene Mathijssen
- 2015 Rosaria LAPORTA - Rome, Italy - Sponsor: Fabio Santanelli di Pompeo  
 Luca LANCEROTTO - Padua, Italy - Sponsor: Franco Bassetto  
 Francesca TOIA - Palermo, Italy - Sponsor: Adriana Cordova  
 Candemir CERAN - Ankara, Turkey - Sponsor: Sühan Ayhan  
 Burak ERSOY - Istanbul, Turkey - Sponsor: Ali Rıza Erçöçen  
 Maximilian EDER - Munich, Germany - Sponsor: Hans-Günther Machens  
 Halduan KAMBUROGLU - Ankara, Turkey - Sponsor: Ibrahim Vargel
- 2016 Elisabeth KAPPOS – Basel, Switzerland – Sponsor: Daniel Kalbermatten  
 Evangelos SARANTOPOULOS – Munich, Germany – Sponsor:  
 Nikolaos Papadopoulos  
 Gabriel DJEDOVIC – Innsbruck, Austria – Sponsor: Stan Monstrey  
 Domagoj ELJUGA – Zagreb, Croatia – Sponsor: Zdenko Stanec  
 Nihal DURMUS KOCAASLAN – Istanbul, Turkey – Sponsor:  
 Sühan Ayhan  
 Guilherme CARDINALI – Sao Paulo, Brazil – Sponsor: Milomir Ninkovic  
 Osman KELAHEMETOGLU – Istanbul, Turkey – Sponsor: Yener Demirtas
- 2017 Zeynep AKDENİZ – Ankara, Istanbul – Sponsor: S. Ayhan  
 Ahmet BIÇER – Ankara, Istanbul – Sponsor: S. Ayhan  
 Roisin DOLAN – Dublin, Ireland – Sponsor: P. Blondeel  
 Maximilian NEUWIRTH – Klagenfurt, Austria – Sponsor: M. Rab  
 Antonios TSIMPONIS – Thessaloniki, Greece – Sponsor: E. Demiri
- 2018 Mauro BARONE - Rome, Italy - Sponsor: P. Persichetti  
 Anil DEMİRÖZ - Istanbul, Turkey - Sponsor: S. Ayhan  
 Sedat TATAR - Istanbul, Turkey - Sponsor: S. Özmen  
 Mustafa HANCI - Doha, Katar - Sponsor: F. E. Karabekmez  
 Hakan TEYMUR - Ankara, Turkey - Sponsor: A.R. Ercocen  
 Erich FABBRI - Bologna, Italy - Sponsor: R. Cipriani  
 Randy DE BAERDEMAECKER - Brussels, Belgium - Sponsor: M. Hamdi

### Scope of the fellowship

To foster the relationship between EURAPS (European Association of Plastic Surgeons) and AAPS (American Association of Plastic Surgeons), EURAPS voted to award two 1-month fellowships to two European Plastic Surgeons to improve their mastery in plastic surgery by visiting one or two selected American Plastic Surgery Centers.

### Eligibility

Candidates must be fully accredited (EC) and actively practising plastic surgery in Europe for less than 10 years. They must be able to communicate well in both written and spoken English.

### Application

The following documents must be sent to [office@euraps.org](mailto:office@euraps.org) by December 1<sup>st</sup>, each year:

1. C.V.
2. A letter from the candidate describing his proposed program and motivation.
3. The names of the institutes of choice. The candidate may propose only two institutes but may state a preference.
4. A letter of acceptance from the welcoming Institute.
5. The names of two EURAPS sponsors.

### Selection and Conditions

A selection Committee appointed by the EURAPS General Assembly will consider the applications and choose the best.

Two fellowships will be awarded every year to two candidates (one each). The fellowship must be completed before the end of the following year. A forfeit allowance of €3.000 for each candidate, will be granted to cover all expenses for the duration of 1 month.

The Secretary General of EURAPS will give notification of the winner to the Head of the host Institute and to the Candidates before March 15th of the following year.

### WINNERS OF THE EURAPS/AAPS FELLOWSHIP

- 2002 F. GRAEWE - Munich, Germany - *Sponsor:* W. Mühlbauer  
 2003 G. SELVAGGI - Rome, Italy - *Sponsor:* S. Monstrey  
 2004 M. HAMDİ - Ghent, Belgium - *Sponsor:* S. Monstrey  
 2005 D. ULRICH - Aachen, Germany - *Sponsor:* N. Pallua  
 2006 Ch. HEITMANN - Ludwigshafen, Germany - *Sponsor:* G. Germann  
 2009 A. GRAVANIS - Athens, Greece - *Sponsor:* Ph. Blondeel  
 2010 B. DEL FRARI - Innsbruck, Austria - *Sponsor:* A. Schwabegger  
 2012 J. PLOCK - Zurich, Switzerland - *Sponsor:* P. Giovanoli  
 2013 U. RIEGER - Innsbruck, Austria - *Sponsor:* G. Pierer  
 2014 B. LONGO - Rome, Italy - *Sponsor:* J.J. Pribaz, F. Santanelli di Pompeo  
 2017 G. GIATSIDIS - Padua, Rome - *Sponsor:* P. Garvey, B. Berenguer  
 K. MEGERLE - Munich, Germany - *Sponsor:* P. Cordeiro, H.G. Machens  
 2018 H. KLEIN - Zurich, Switzerland - *Sponsor:* P. Giovanoli, J. Plock

Hans Anderl, founding member and former President of EURAPS donated a large sum of money to the European Association of Plastic Surgeons, through EURAPS Austria, in 2005. This allows EURAPS to attribute the annual Hans Anderl Award of around € 4.000. The Award is exclusively aimed at those European countries which are represented in EURAPS.

### Aims of the Award

1. Promotion of excellence in the field of Plastic Surgery in Europe.
2. Recognition of outstanding (pioneer) achievements in the field of Plastic, Reconstructive and Aesthetic Surgery.

### Conditions for Competing

1. Candidates must be active members of EURAPS or must have presented at least one paper at a EURAPS Meeting and be sponsored by two EURAPS members (one from his/her own country and one from another country).
2. There is an age limit of 50 years.
3. Candidates must submit - in six fold - their CV, and all their (as first author) peer reviewed papers, written in English and published in the five years (January 1<sup>st</sup> till December 31<sup>st</sup>) prior to year of the upcoming EURAPS Meeting, before 31<sup>st</sup> December each year. At least one paper has to be published in the year before this meeting.

### Executive Board

The Executive Board consists of the Managing Directors and the Board of Curators, who are responsible for the selection of the winning candidates for the Hans Anderl Award.

#### 1. Managing Directors

The Secretary General and the Treasurer of EURAPS and the directors of EURAPS Austria are the Managing Directors during their periods of office. The Managing Directors send the papers to the Board of Curators.

#### 2. Board of Curators

Its task is to nominate the prize winner(s).

- a) Members: five, four from different European countries and one from Austria.
- b) The members of the board are appointed for a two-year period and cannot serve more than two consecutive terms.
- c) Election: a recommendation is made by the Executive Council of EURAPS and affirmed by its National Representatives.
- d) Election of the Chair: The Chair is elected by secret ballot among the five Members every two years.
- e) Task of the Chair: He is in charge of the nomination of the prize winner, and conveys the decision to the Secretary General and then to the President of EURAPS, who awards the prize. The prize is awarded at the next Annual Meeting by the President.

- 2005 Phillip BLONDEEL, Moustapha HAMDJ and Koenraad VAN LANDUYT - Ghent, Belgium
- 2006 Nikolaos PAPANIKOLAOS - Munich, Germany
- 2007 Eric ARNAUD - Paris, France
- 2009 Benoît LENGELÉ - Brussels, Belgium
- 2011 Moustapha HAMDJ - Brussels, Belgium
- 2012 Oskar ASZMANN - Vienna, Austria
- 2013 Ahmet BOZKURT - Aachen, Germany
- 2014 Bernardo HONTANILLA - Pamplona, Spain
- 2015 Benedetto LONGO - Rome, Italy
- 2016 Jan Jeroen VRANCKX - Leuven, Belgium
- 2017 N/A
- 2018 Juan BARRET - Barcelona, Spain

The American Association of Plastic Surgeons (AAPS) Academic Scholar Program together with the European Association of Plastic Surgeons (EURAPS) is offering a two-year faculty research scholarship to American or European surgeons entering academic careers in Plastic and Reconstructive Surgery. The AAPS-EURAPS Academic Scholarship is meant to reinforce the ties between American and European Institutes. Applicants should submit a research proposal based on a program, which can be executed on both continents. Both European and American plastic surgeons can apply for the Academic Scholarship. If the award is given to an American specialist, the next scholarship will be awarded to a European colleague and vice versa. It is agreed upon by the Boards of the AAPS and EURAPS however that the first AAPS-EURAPS Academic Scholarship will be awarded to a European plastic surgeon if the number and quality of the European applications suffice.

Because it is difficult for young specialists to leave their academic position for a full period of two years, a combined research program on the two continents with short periods of leave will make this less problematic. Therefore the Scholar will be able to alternate between the different sponsoring institutes during the two-year period for variable length, short visits facilitated by, and in consultation with the Mentor of the project. The scholarship is to assist the recipient in the establishment of a new combined research program between Europe and the United States. The award money covers travel expenses, the costs of accommodation in a foreign country and some of the research program costs. Application for additional grants will be necessary.

The scholarship will support the candidates in achieving a successful academic career as experience has shown with former AAPS scholarships. Applicants should have demonstrated their potential to work as independent investigators.

The AAPS-EURAPS Scholarship will be awarded every two years without overlap.

**The scholarship award is \$30,000 per year (paid in equal amounts by AAPS and EURAPS). Funding of the award began September 1, 2014. The recipient of the AAPS/EURAPS Academic Scholarship 2017-2019 will be from the United States. Deadline for receipt of applications is January 1, 2018. For detailed instructions for application and the application forms, please see the web-sites of both organisations:**

[www.aaps1921.org](http://www.aaps1921.org)  
[www.euraps.org](http://www.euraps.org)

## WINNERS OF THE AAPS/EURAPS ACADEMIC SCHOLARSHIP

2014-16 Jan PLOCK - Zurich, Switzerland

### VENUE & ORGANIZATION

Filandia Hall – Mannerheimintie 13e

Contact: [info@concreator.com](mailto:info@concreator.com)

### ADMISSION REQUIREMENTS

Admission to Sessions, Scientific Exhibition, Lunches and Social Program is by badge only. Badges are given at the time of registration, according to the following coding:

Green: EURAPS & EURAPS Research Council  
 Blue: EURAPS only  
 Red: EURAPS Research Council only

### REGISTRATION - EURAPS SECRETARIAT

The EURAPS Secretariat will be located in the Congress Centre.

### REGISTRATION HOURS

Wednesday 22 May 2019 8:00-09:00  
 Thursday 23 May 2019 8:00-18:00  
 Friday 24 May 2019 7:30-17:00  
 Saturday 25 May 2019 8:00-12:00

### SPEAKER READY ROOM

For the 30th EURAPS Annual Meeting, all presentations must be prepared in PowerPoint or Keynote format and given to the Slide Centre at latest two hours prior to the session. The use of personal laptops is not permitted. In case of any videos embedded within the presentations, authors are requested to bring the original source files in addition to their presentation. The slides should be prepared in 16:9 format, and EURAPS recommends the use of the International System of Units (SI) as the official measurement system. Should you have any further queries, please contact: [info@concreator.com](mailto:info@concreator.com).

Authors are invited to come to the slide centre as soon as they arrive, to check the functioning of the presentation and videos upfront, avoiding unnecessary time pressure.

### MESSAGE CENTRE

Messages may be obtained at the Registration desk. Operating hours are listed above.

### SESSIONS

All sessions will be held at the Finlandia Hall.

### EXHIBITION AREA

The Exhibition area will be located at the Finlandia Hall.

Attendees are kindly invited to visit the booths of the Exhibitors.

## SOCIAL PROGRAM

### THURSDAY 23 MAY 2019

- 18:02-19:00 **Opening Ceremony** at the Finlandia Hall
- 18:00 Sinikka Suominen, 2019, Local Host - Welcome Remarks
- 18:15 Norbert Pallua, 2018-2019 President  
Welcome Address
- 18:30 Fabio Santanelli di Pompeo, Secretary General  
Marchac Clinician of the year - Nomination & Lecture  
Introduction of New Members
- 19:00 **Welcome Reception**  
Helsinki City Hall, Pohjoisesplanadi 11-13

### FRIDAY 24 MAY 2019

- 20:30-00:00 **EURAPS Dinner**  
Old Student House, Mannerheimintie 3  
*Dress Code: Black Tie or Dark Suit*
- Fabio Santanelli di Pompeo, Secretary General  
Introduction of 2019 Award Winners
- Norbert Pallua, President 2018-2019  
Introduction of President 2019-2020

### SATURDAY 25 MAY 2019

- 20:30 **Farewell Party**  
Restaurant Saaristo, Klippan Island, Olympiaranta 1  
*Dress Code: Smart Casual*

## PROGRAM AT A GLANCE

### THURSDAY 23 MAY 2019

- 14:00-16:00 Session 1 – RESEARCH**
- Moderators: Virve KOLJONEN, Helsinki, FINLAND  
Dietmar ULRICH, Nijmegen, THE NETHERLANDS
- 14:00 CONTRALATERAL VASCULARIZED LYMPH NODE TRANSFER: A MORE PRECISE MICE MODEL EXPERIENCE**  
Giulia Virginia VOTTERO – Liège, BELGIUM
- 14:08 EFFECT OF ADIPOSE-DERIVED STEM CELL AND PLATELET- RICH PLASMA FOR PREVENTION OF ALOPECIA AND SKIN COMPLICATIONS OF RADIOTHERAPY**  
Nuh EVIN - Konya, TURKEY
- 14:16 NANOPARTICLE LABELLING TO FACILITATE HIGH-RESOLUTION TRACKING OF THERAPEUTIC STEM CELLS**  
Higgins GILLIAN – Glasgow, UNITED KINGDOM
- 14:24 COMPARING EFFECTS OF: BLASTEMA OF AXOLOTL, PLATELET RICH PLASMA OF AXOLOTL AND PLATELET RICH PLASMA OF RAT ON SCALDED INJURY**  
Hasan CELIK – Istanbul, TURKEY
- 14:32 PRE-ADIPOCYTES IN IRRADIATED SKIN STIMULATE THE MIGRATION OF FIBROBLASTS AND AID WOUND HEALING**  
Lucy TREVOR - Bradford, UNITED KINGDOM
- 14:40 CELL-ENRICHED FAT GRAFTING IMPROVES GRAFT RETENTION IN A PORCINE MODEL: A DOSE-RESPONSE STUDY OF ADIPOSE- DERIVED STEM CELLS VERSUS STROMAL VASCULAR FRACTION**  
Bo Sonnich RASMUSSEN – Copenhagen, DENMARK
- 14:48 MIF FAMILY MEMBERS IN ADIPOSE TISSUE INFLAMMATION AND WOUND REPAIR**  
Kim BONG-SUNG – Zurich, SWITZERLAND
- 14:56 REVERSE ENGINEERING BREAST CANCER EXTRACELLULAR MATRIX IN VITRO, ANALYZING THE PROPERTIES, AND REVEALING AN ONCOGENIC CELL RESPONSE**  
Elizabeth BRETT – Munich, GERMANY

- 15:04**    **COMPARISON OF SMOOTH, TEXTURED AND POLYURETHANE SURFACE IMPLANTS FROM THE PERSPECTIVE OF BIOFILM AND CAPSULE FORMATION UNDER LOCAL ANTIBIOTHERAPY**  
Safa MANAV – Ankara, TURKEY
- 15:12**    **NANOPARTICLES: A NOVEL TREATMENT MODALITY TO REDUCE SEROMA FORMATION**  
Ioana LESE – Bern, SWITZERLAND
- 15:20**    **THE DEVELOPMENT OF A CUSTOMIZED 3D-PRINTED NANOCOMPOSITE POLYURETHANE IMPLANT FOR AURICULAR CARTILAGE RECONSTRUCTION**  
Michelle GRIFFIN – London, UNITED KINGDOM
- 15:28**    **BIOACTIVE FIBRIN CONDUITS FOR LONG GAP PERIPHERAL NERVE REGENERATION**  
Katharina Minh Anh PRAUTSCH – Basel, SWITZERLAND
- 15:36**    **PROTECTIVE EFFECTS OF IMMUNOSUPPRESSIVE DRUGS ON CHRONIC NERVE COMPRESSION**  
Lucas DEGRUGILLIER – Basel, SWITZERLAND
- 15:44**    **QQ-CULTURED MNC IMPROVE THE FAT GRAFT VASCULARIZATION AND SURVIVAL**  
Maxim GEEROMS – Tokyo, JAPAN; Brussels, BELGIUM
- 15:52**    **2018 EURAPS Research Council Best Paper - CULTURE IN HUMAN SERUM AFFECTS TLR-MEDIATED ADIPOKINE RELEASE OF HUMAN ADIPOSE TISSUE-DERIVED STROMAL CELLS**  
Ursula KRANEBURG - Munich, GERMANY

**16:00-16:30**    **Coffee Break – Visit to the Exhibitors**

**16:30-17:58**    **Session 2 – HEAD & NECK RECONSTRUCTION**

Moderators:    Brigitte PITTET-CUENOD, Geneve, SWITZERLAND  
Bulent SAÇAK, Istanbul, TURKEY

**16:30**    **LESSONS LEARNED IN NASAL RECONSTRUCTION: 53 MICROVASCULAR FOREARM LINING FLAPS IN 51 PATIENTS OVER 18 YEARS**  
Frederick MENICK - Tucson, USA

**16:42**    **FORTY FREE FLAPS FROM THE EAR - MORE THAN JUST THE HELIX**  
Jyrki VUOLA - Helsinki, FINLAND

**16:50**    **NASAL RECONSTRUCTION IN NOMA PATIENTS**  
Eva RÜEGG - Geneva, SWITZERLAND

**17:02**    **ENDOSCOPIC ASSISTED INSET OF FREE FLAPS IN ANTERIOR SKULL BASE RECONSTRUCTION: A NOVEL APPROACH**  
Lorenzo Andres RODRIGUEZ - Uppsala, SWEDEN

**17:10**    **EVALUATING THE FREE RADIAL FOREARM FLAP VERSUS THE PEDICLED PECTORALIS MAJOR MYOCUTANEOUS FLAP FOR OESOPHAGO-PHARYNGEAL RECONSTRUCTION: DECISION MAKING AND OUTCOME**  
Athanasios KARONIDIS - Athens, GREECE

**17:18**    **RISK FACTORS FOR GASTRIC-TUBE DEPENDENCE AFTER TONGUE RECONSTRUCTION: A RETROSPECTIVE AND MULTICENTER ANALYSIS OF 582 PATIENTS IN 31 INSTITUTIONS**  
Jun ARAKI - Shizuoka, JAPAN

**17:26**    **THE SCIP FLAP IN THE EUROPEAN POPULATION: QUANTIFYING THE ANATOMY AND ITS CLINICAL APPLICATION IN HEAD AND NECK RECONSTRUCTION**  
Radu OLARIU - Bern, SWITZERLAND

**17:34**    **COMPLICATIONS AND QUALITY OF LIFE IN HEAD AND NECK SURGERY**  
Outi KAARELA - Oulu, FINLAND

**17:46**    **THE SECOND HELSINKI BIMAXILLARY FULL FACE TRANSPLANT**  
Patrik LASSUS - Helsinki, FINLAND

**18:00-19:00**    **Opening Ceremony**  
*Finlandia Hall*

**19:00**    **Welcome Reception**  
*Helsinki City Hall, Pohjoisesplanadi 11-13*

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FRIDAY 18 MAY 2018

**8:00-10:00 Session 3 – CRANIOFACIAL SURGERY**

Moderators: Alexander MARGULIS, Jerusalem, ISRAEL  
Eric ARNAUD, Paris, FRANCE

- 8:00 THE COMING OF AGE OF IMMERSIVE VIRTUAL REALITY SYSTEM (IVRS) FOR CRANIOMAXILLOFACIAL SURGERY**  
Lee ALKUREISHI - Chicago, USA
- 8:08 EARLY SECONDARY ALVEOLAR CLEFT BONE GRAFTING : AIMS AND RESULTS**  
Caroline DISSAUX - Strasbourg, FRANCE
- 8:16 EFFECT OF HYPEREXTENSION OF THE HEAD ON CEREBRAL BLOOD OXYGENATION IN PATIENTS WHO UNDERWENT CLEFT PALATE SURGERY: PROSPECTIVE COHORT STUDY USING NEAR-INFRARED SPECTROSCOPY**  
Corstiaan BREUGEM - Amsterdam, THE NETHERLANDS
- 8:28 EARLY POSTOPERATIVE COMPLICATION IN PRIMARY CLEFT LIP AND PALATE**  
Isik CEMIL - Konya, TURKEY
- 8:36 PIERRE ROBIN SEQUENCE: INCIDENCE OF SPEECH-CORRECTING SURGERIES AND FISTULA FORMATION**  
Charlotta GUSTAFSSON - Helsinki, FINLAND
- 8:48 LONG-TERM QUALITY OF LIFE AND COMPLICATIONS IN SYNDROMIC CRANIOSYNOSTOSIS**  
Yoshiaki SAKAMOTO - Tokyo, JAPAN
- 8:56 COMPARISON OF BLACK-BONE MRI AND 3D-CT IN THE PREOPERATIVE EVALUATION OF PATIENTS WITH CRANIOSYNOSTOSIS**  
Anne SAARIKKO - Helsinki, FINLAND
- 9:08 ORTHOGNATHIC SURGERY IN THE DIGITAL AGE: LESSONS LEARNED IN THE EVOLUTION OF VECTOR-GUIDED 3D PRINTED TITANIUM FIXATION SYSTEM**  
Patel PRAVIN - Chicago, USA
- 9:20 IMPROVEMENT OF SLEEP APNEA BY FRONTOFACIAL MONOBLOC IN FACIOCRANIOSYNOSTOTIC CHILDREN**  
Eric ARNAUD - Paris, FRANCE

- 9:32 FORCE MEASUREMENTS DURING POSTERIOR CALVARIAL VAULT OSTEODISTRACTION: FUTURE ASPECTS IN CRANIOFACIAL OSTEODISTRACTION**  
Mikko SAVOLAINEN - Helsinki, FINLAND
- 9:40 ADDITIONAL SQUAMOSAL SUTURE SYNOSTOSIS AND SEGMENTED INTRACRANIAL VOLUME IN PATIENTS WITH NON-SYNDROMIC SAGITTAL SYNOSTOSIS**  
Junnu LEIKOLA - Helsinki, FINLAND
- 9:48 LONG-TERM FOLLOW-UP OF REPAIR OF MICROTIA USING CULTURED AUTOLOGOUS HUMAN AURICULAR CHONDROCYTES**  
Keisuke IMAI - Osaka, JAPAN
- 10:00-10:30 Coffee Break - Visit to the Exhibitors**
- 10:30 Introduction to the AAPS Best Paper 2018**  
Donald MACKAY, AAPS President 2018-2019 – Hershey, USA
- 10:32 AAPS Best Paper 2018**  
**COMPLICATION OF HAND TRANSPLANTATION: THE JOHNS HOPKINS - PITTSBURGH EXPERIENCE**  
W.P. Andrew LEE – Dallas, USA
- 10:42-12:38 Session 4 – UPPER & LOWER EXTREMITIES**
- Moderators: Efsthios LYKOUDIS, Ioannina, GREECE  
Erkki TUKIANEN, Helsinki, FINLAND
- 10:42 DISTAL BRACHIAL ARTERY PERFORATOR (DBAP) FLAP: A NEW CHIMERIC OPTION FOR COMPLEX DEFECTS OF HAND AND DIGITS**  
Pietro DI SUMMA - Lausanne, SWITZERLAND
- 10:50 DIGIT RECONSTRUCTION WITH THIN PROXIMAL ULNAR PERFORATOR FREE FLAP - A FOUR CASE REPORT**  
Tommaso BARONI - Varese, ITALY
- 10:58 ULNAR PARAMETACARPAL FLAP: PROPELLAR FLAP CONCEPT**  
Ahmed GAD - Cairo, EGYPT
- 11:06 THIN AND SUPER-THIN PERFORATOR FLAPS DIRECT ELEVATION BY PREOPERATIVE ULTRA-HIGH FREQUENCY ULTRASOUND PLANNING: INSIGHTS ON MICROVASCULAR ANATOMY**  
Giuseppe VISCONTI - Rome, ITALY



- 11:14 FASCIA IS NOT REQUIRED FOR LOWER LIMB FASCIOCUTANEOUS FLAPS - A PROOF OF PRINCIPLE STUDY**  
Andrew HART - Glasgow, UNITED KINGDOM
- 11:22 COMPARATIVE EFFECTIVENESS ANALYSIS OF COMPLEX LOWER EXTREMITY RECONSTRUCTION: OUTCOMES AND COSTS FOR BIOLOGIC-BASED, LOCAL TISSUE REARRANGEMENT, AND FREE FLAP RECONSTRUCTION**  
Geoffrey KOZAK - Philadelphia, USA
- 11:34 PUSHING THE LIMITS; A REPORT ON FUNCTIONAL LIMB SALVAGE OF THE LOWER EXTREMITY IN A METASTATIC LEFT THIGH SYNOVIAL SARCOMA AFTER A PROXIMAL FEMORAL MODULAR ONCOLOGY HEMIARTHROPLASTY AND CADAVERIC NERVE GRAFT**  
Hamidian Jahromi ALIREZA - Memphis, USA
- 11:42 A SYSTEMATIC REVIEW AND META-ANALYSIS OF ULCERATION AFTER MICROSURGICAL RECONSTRUCTION OF THE WEIGHT- BEARING FOOT**  
Oren LAPID - Amsterdam, THE NETHERLANDS
- 11:54 EVALUATION OF FLUORESCENCE BIOMODULATION IN THE REAL- LIFE MANAGEMENT OF CHRONIC WOUNDS**  
Franco BASSETTO - Padua, ITALY
- 12:02 THE USE OF MEDIAL FEMORAL CONDYLE FLAPS IN THE PEDIATRIC POPULATION IS SAFE AND EFFECTIVE**  
David COLEN - Philadelphia, USA
- 12:10 FLAP RECONSTRUCTION FOR DEEP STERNAL WOUND INFECTIONS FOLLOWING CARDIOTHORACIC SURGERY: FACTORS INFLUENCING MORBIDITY AND MORTALITY**  
Shelby L. NATHAN - Philadelphia, USA
- 12:22 FREE STERNUM TURNOVER FLAP FOR CORRECTION OF PECTUS EXCAVATUM DEFORMITY**  
Arian REZAI - Munich, GERMANY
- 12:30 MODIFIED INTERNAL MAMMARY ARTERY PERFORATOR (IMAP) FLAP IN TREATMENT OF STERNAL WOUND COMPLICATIONS**  
Heidi MYLLYKANGAS - Kuopio, FINLAND
- 12:40 -14:00 Lunch - Visit to the Exhibitors**
- 13:00 - 13:40 MOTIVA EDUCATIONAL PRESENTATION: BREAST IMPLANT SURFACE UPDATE**  
Erik VÖGELENZANG - ESTABLISHMENT LABS

**14:00-16:00 Session 5 – BREAST**

Moderators: Francesca DE LORENZI, Milan, ITALY;  
Thomas SCHOELLER, Stuttgart, GERMANY

- 14:00 THE USE OF ABSORBABLE MESH IN IMPLANT-BASED BREAST RECONSTRUCTION: A 7-YEAR REVIEW**  
William AUSTEN - Boston, USA
- 14:08 ONCOLOGICAL OUTCOME OF FAT GRAFTING FOR BREAST RECONSTRUCTION AFTER CANCER**  
Vincenzo VINDIGNI - Padua, ITALY
- 14:16 COMPARATIVE STUDY OF LONG-TERM EFFECTS ON SHOULDER FUNCTION AND PATIENT'S SATISFACTION FOLLOWING PEDICLED ISLANDED LATISSIMUS DORSI (PILD) FLAP IN DELAYED BREAST RECONSTRUCTION**  
Stefania TENNA - Rome, ITALY
- 14:24 A COMPARISON OF SHOULDER FUNCTIONAL RECOVERY PATTERNS AFTER EXTENDED LATISSIMUS DORSI FLAP AND THORACODORSAL ARTERY PERFORATOR FLAP BREAST RECONSTRUCTION**  
Kamuran ZEYNEP - Istanbul, TURKEY
- 14:32 ENHANCED RECOVERY AFTER BREAST RECONSTRUCTION USING AN LD FLAP**  
Christian BONDE - Copenhagen, DENMARK
- 14:40 A NOVEL APPROACH IN BREAST RECONSTRUCTION: THE THORACODORSAL FLIP-OVER FLAP WITH LOOPS AND LIPOFILLING (TD.F.O.L.L.)**  
Nicolas ABBOUD - Bruxelles, BELGIUM
- 14:48 THE CONSEQUENCES OF MASTECTOMY AND ALLOPLASTIC BREAST RECONSTRUCTION ON THE SENSIBILITY OF THE BREAST: A CROSS-SECTIONAL STUDY**  
Ennie BIJKERK - Maastricht, THE NETHERLANDS
- 14:56 PERFUSION DYNAMICS IN ABDOMINAL SKIN AFTER FREE ABDOMINAL FLAP BREAST RECONSTRUCTION USING INTERNAL MAMMARY VESSELS AS RECIPIENT VESSELS. A CLINICAL STUDY USING DYNAMIC INFRARED THERMOGRAPHY**  
Nergaard SOLVEIG - Tromsø, NORWAY
- 15:08 COMPARING THE LUMBAR ARTERY PERFORATOR FLAP TO THE GOLD STANDARD: FLAP PROPERTIES AND SECONDARY CORRECTIONS**  
Dries OPSOMER - Gent, BELGIUM

- 15:16 **PATIENT REPORTED OUTCOMES OF MIXED TIMING MICROVASCULAR BREAST RECONSTRUCTION: A PROSPECTIVE LONG-TERM OUTCOME STUDY**  
Harma MAIJU - Toronto, CANADA
- 15:28 **DELAYED TWO-STAGE NIPPLE SPARING MASTECTOMY AND SIMULTANEOUS EXPANDER TO IMPLANT RECONSTRUCTION OF THE LARGE AND PTOTIC BREAST**  
Thierry TONDU - Antwerp, BELGIUM
- 15:36 **SERRATUS FASCIA FLAP IN IMMEDIATE BREAST RECONSTRUCTION WITH TISSUE EXPANDER: ALL THAT GLITTERS IS GOLD?**  
Mario FAENZA - Naples, ITALY
- 15:44 **SWEDISH NATIONAL LONG-TERM SURVEY ON OUTCOMES OF MASTECTOMY AND BREAST RECONSTRUCTION: PART 2. QUALITY OF LIFE**  
Rojda GUMUSCU - Uppsala, SWEDEN
- 15:52 **CHARACTERISTICS AND OUTCOMES OF PRIMARY INTERPOSITION VASCULAR GRAFTS IN FREE FLAP BREAST RECONSTRUCTION**  
Ayush KAPILA - Chelmsford, UNITED KINGDOM

16:00-16:30 **Coffee Break – Visit to the Exhibitors**

16:30-17:42 **Session 6 – MISCELLANEOUS**

Moderators: Giovanni DI BENEDETTO, Ancona, ITALY  
Damir KOSUTIC, Manchester, UNITED KINGDOM

- 16:30 **ARE CLINICIANS PERFORMING SHAVE BIOPSIES PUTTING PATIENTS AT RISK OF UNDERTREATING MALIGNANT MELANOMA?**  
Monica-Paraschiva MARCEAN - Manchester, UNITED KINGDOM
- 16:38 **WOUND CLOSURE BY REGENERATIVE SURGERY**  
Roger KHOURI - Miami, USA
- 16:46 **A SYSTEMATIC REVIEW AND META-ANALYSIS EVALUATING INCISIONAL NEGATIVE PRESSURE WOUND THERAPY FOR THE PREVENTION OF POSTOPERATIVE WOUND COMPLICATIONS**  
Pieter ZWANENBURG - Amsterdam, THE NETHERLANDS
- 16:54 **CONGENITAL TUFTED ANGIOMA: A MULTICENTER RETROSPECTIVE STUDY OF 30 CASES**  
Beatriz BERENQUER - Madrid, SPAIN

- 17:02 **SENTINEL NODE BIOPSY IN PATIENTS WITH THIN MELANOMA - A CASE-CONTROL STUDY**  
Ilkka KOSKIVUO - Turku, FINLAND
- 17:10 **THORACOSCOPIC VIDEO-ASSISTED SYMPATHICOTOMY FOR THE TREATMENT OF HYPERHIDROSIS: SINGLE-ACCESS, MINIMALLY INVASIVE TECHNIQUE**  
Gianluigi LAGO - Galliera Veneta, ITALY
- 17:18 **GENDER AFFIRMATION SURGERY FOR GENDER DYSPHORIA: SYSTEMATIC REVIEW ON BENEFITS AND RISKS**  
Konstantinos GEORGAS - Gothenburg, SWEDEN
- 17:26 **IS THE LICOX® PTO2 SYSTEM RELIABLE FOR MONITORING OF FREE FLAPS? COMPARISON BETWEEN 2 COHORTS OF PATIENTS**  
Chiara STOCCO - Trieste, ITALY
- 17:34 **ANTERIOR COMPONENT SEPARATION DECREASES HERNIA RECURRENCE RATES IN ABDOMINAL WALL RECONSTRUCTION WITH BIOLOGIC MESH REINFORCEMENT: A PROPENSITY SCORE ANALYSIS**  
Salvatore GIORDANO - Turku, Finland

17:42-19:15 **General Assembly - EURAPS Members Only**

20:30 **EURAPS Social Dinner – Old Student House, Mannerheimintie 3 Dress Code: Black Tie or Dark Suit**

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8:30-10:26 **Session 7 – NERVE**

Moderators: Oskar ASZMANN, Vienna, AUSTRIA  
Hans Guenter MACHENS, Munich, GERMANY

- 8:30 **BILATERAL VOCAL FOLD PARALYSIS. A CASE OF LARYNGEAL REINNERVATION USING ANSA CERVICALIS AND VASCULARIZED SURAL NERVE GRAFT**  
Rossella ELIA - Bari, ITALY
- 8:38 **THE CURRENT UK EXPERIENCE OF TARGETED MUSCLE REINNERVATION: 40 CASES AND COUNTING**  
Norbert KANG - London, UNITED KINGDOM
- 8:50 **PATIENT EXPERIENCE IN NERVE-TO-MASSETER DRIVEN SMILE REANIMATION**  
Martinus VAN VEEN - Groningen, THE NETHERLANDS
- 8:58 **FREE FUNCTIONAL PLATYSMA TRANSFER FOR REANIMATION OF THE PARALYSED EYE**  
Adrian O. GROBBELAAR - London, UNITED KINGDOM
- 9:10 **THE CHALLENGE OF FACIAL REANIMATION FOLLOWING PREVIOUS FAILED FREE FLAPS AND OTHER COMPLEXITIES**  
Stephen MORLEY - Glasgow, UNITED KINGDOM
- 9:22 **ANATOMICAL STUDY OF A NEW ENDOSCOPIC- ASSISTED APPROACH OF THE AXILLARY NERVE**  
Andres A. MALDONADO - Frankfurt, GERMANY
- 9:34 **SEVERELY INJURED C5, C6 “SPINAL NERVE-IN-CONTINUITY” CAUSING INTRAOPERATIVE DIAGNOSTIC DILEMMA DURING MICRO RECONSTRUCTIVE BRACHIAL PLEXUS SURGERY: A CASE REPORT**  
Jenny Yun Jen YEOW - Taoyuan City, TAIWAN
- 9:42 **NOVEL NEUROVASCULAR DECOMPRESSION TECHNIQUE TO TREAT OCCIPITAL MIGRAINES: LONG-TERM RESULTS FROM THE FIRST 15 PATIENTS**  
Saja SCHERER - Lausanne, SWITZERLAND
- 9:54 **7-YEARS’ EXPERIENCE OF MINIMALLY INVASIVE AND ENDOSCOPIC TECHNIQUE IN MIGRAINE SURGERY**  
Edoardo RAPOSIO - Parma, ITALY

- 10:06 **OCCIPITAL NEURALGIA/ MIGRAINE: INTRA- OPERATIVE EVIDENCE FOR EXTRACRANIAL PATHOLOGY**  
Lisa GFRENERER - Boston, USA
- 10:14 **MINIMALLY INVASIVE NEUROVASCULAR APPROACH FOR THE TREATMENT OF TEMPORAL MIGRAINE HEADACHES: LONG TERM RESULTS FROM 85 PATIENTS**  
Giorgio PIETRAMAGGIORI - Lausanne, SWITZERLAND
- 10:26-10:56 **Coffee Break – Visit to the Exhibitors**
- 10:56-12:56 **Session 8 – BREAST & LYMPHEDEMA**
- Moderators: Philip BLONDEEL, Gent, BELGIUM  
Maria MANI, Uppsala, SWEDEN
- 10:56 **DOES A LONGER ISCHEMIC TIME IN BREAST RECONSTRUCTION WITH A FREE DEEP INFERIOR EPIGASTRIC PERFORATOR FLAP (DIEP) INCREASE THE RISK OF MAJOR COMPLICATIONS?**  
Nadine HILLBERG - Maastricht, THE NETHERLANDS
- 11:04 **LAPAROSCOPIC ASSISTED DIEP FLAP HARVEST IMPROVES BREAST RECONSTRUCTION OUTCOMES**  
Sameer SHAKIR - Philadelphia, USA
- 11:12 **PERFORATOR MAPPING IN DIEP BREAST RECONSTRUCTION WITH DYNAMIC INFRARED THERMOGRAPHY, LASER FLUORESCENCE ANGIOGRAPHY OF INDOCYANINE GREEN, ULTRASOUND DOPPLER AND CT ANGIOGRAPHY: A COMPARATIVE STUDY**  
Muiz Akram CHAUDHRY - Tromsø, NORWAY
- 11:20 **AUGMENTED REALITY IN BREAST RECONSTRUCTIVE SURGERY - PROJECTING THE PRE-OPERATIVE DIEP FLAP PLANNING ONTO PATIENTS IN A RANDOMIZED CONTROLLED TRIAL**  
Stefan HUMMELINK - Nijmegen, THE NETHERLANDS
- 11:28 **THE EFFECT OF PREVIOUS ABDOMINAL SURGERIES ON DEEP INFERIOR EPIGASTRIC PERFORATORS**  
Chiara GELATI - Bologna, ITALY
- 11:36 **DOES PREGNANCY PREDICT INCISIONAL HERNIA REPAIR AFTER ABDOMINALLY-BASED AUTOLOGOUS BREAST RECONSTRUCTION? A RETROSPECTIVE REVIEW OF 890 FREE FLAPS**  
Joseph M. SERLETTI - Philadelphia, USA

- 11:44** **DIEP FLAP MONITORING WITH MICRODIALYSIS VS DOPPLER MONITORING**  
Fabio SANTANELLI DI POMPEO - Rome, ITALY
- 11:52** **PREOPERATIVE PLANNING OF LYMPHATICOVENULAR ANASTOMOSIS IN IODINE ALLERGY PATIENTS: A MULTICENTRIC EXPERIENCE**  
Alessandro BIANCHI - Rome, ITALY
- 12:00** **PARTNERS' PERCEPTIONS OF WOMEN'S BODY IMAGE PROBLEMS, SEXUALITY, AND SATISFACTION OF BREAST RECONSTRUCTION LONG-TERM AFTER RISK-REDUCING MASTECTOMY AND IMMEDIATE BREAST RECONSTRUCTION**  
Lucy BAI - Stockholm, SWEDEN
- 12:08** **TREATING LYMPHEDEMA WITH A PEDICLE VASCULARIZED LYMPH NODE TRANSFER COMBINED WITH NANOFIBRILLAR COLLAGEN SCAFFOLDS**  
Dimitrios DIONYSIOU - Thessaloniki, GREECE
- 12:16** **LYMPHO-VEIN ANASTOMOSIS AS RECONSTRUCTIVE TREATMENT FOR CHRONIC LYMPHOCELE AND THORACIC DUCT LESIONS**  
Nicole LINDENBLATT - Zurich, SWITZERLAND
- 12:24** **PHASE 1 LYMFACIN® STUDY: SAFETY OF COMBINED ADENOVIRAL VEGF-C AND LYMPH NODE TRANSFER TREATMENT FOR UPPER EXTREMITY LYMPHEDEMA**  
Pauliina HARTIALA - Turku, FINLAND
- 12:36** **DECREASING DONOR SITE MORBIDITY AFTER HARVESTING THE GROIN VASCULARISED LYMPH NODE FLAP WITH LESSONS LEARNED DURING 12-YEAR EXPERIENCE: A CASE SERIES AND REVIEW OF THE LITERATURE**  
Lisa RAMAUT - Jette, BELGIUM
- 12:48** **QUALITY OF LIFE AFTER LYMPH NODE TRANSFER FOR THE TREATMENT OF CHRONIC LYMPHEDEMA – A PROSPECTIVE STUDY**  
Nikolaos PAPAPOULOS - Athens & Alexandroupoli, GREECE; Munich, GERMANY
- 12:56 -14:10** **Lunch – Visit to the Exhibitors**
- 14:10-15:45** **Session 9 – PRESIDENTIAL PANEL**  
**LATEST ADVANCES IN AUTOLOGOUS FAT TRANSFER - WHAT IS TRENDSETTING IN REGENERATIVE PLASTIC SURGERY?** Chair: Norbert PALLUA

- 14:10** **Introduction**  
Norbert PALLUA – Aachen, GERMANY, EURAPS President 2018-19
- 14:15** **FEMALE AND MALE INTIMATE SURGERY BY LIPOGRAFTING**  
Sylvie ABRAHAM – Paris, FRANCE
- 14:30** **THE HYPE ABOUT GLUTEAL FAT GRAFTING**  
Daniel DEL VECCHIO – Boston, USA
- 14:45** **IS LIPOGRAFTING AN ALTERNATIVE TO FLAP SURGERY IN PROBLEM WOUNDS?**  
Kim BONG-SUNG - Zurich, SWITZERLAND
- 15:00** **FAT GRAFTING TO THE FACE: HOW CAN WE GET A PERFECT REGENERATION OF THE SKIN?**  
Ramon LLULL - Palma De Mallorca, SPAIN
- 15:15** **PITFALLS AND RISKS OF LIPOGRAFTING - AN ALGORITHM**  
Riccardo MAZZOLA - Milan, ITALY
- 15:30** **Panel Discussion**
- 15:45-16:15** **Coffee Break – Visit to the Exhibitors**
- 16:15-18:27** **Session 10 – AESTHETIC PLASTIC SURGERY**  
Moderators: Charles FILIP, Oslo, NORWAY  
Kenneth J. STEWART, Edinburgh, UNITED KINGDOM
- 16:15** **GENDER-ORIENTED RHINOPLASTY: DEFINITION OF “GENDER ANGLE” IN 1774 PATIENTS**  
Paolo PERSICHETTI - Rome, ITALY
- 16:27** **ROLE OF SPREADER FLAPS IN RHINOPLASTY: ANALYSIS OF PATIENTS UNDERGOING CORRECTION FOR SEVERE SEPTAL DEVIATION WITH LONG-TERM FOLLOW UP**  
Mauro BARONE - Rome, ITALY
- 16:39** **PIEZOELECTRIC INSTRUMENTATION VS. CONVENTIONAL INSTRUMENTS. IS THERE A BENEFIT IN RHINOPLASTY SURGERY?**  
Marion SAN NICOLO - Munich, GERMANY
- 16:47** **DEFINING A NEW VARIABLE THAT MAY IMPACT LONG TERM POSTOPERATIVE NASAL TIP SUPPORT: THE BIOMECHANICAL PROPERTIES OF THE COLUMELLAR STRUT GRAFT**  
Billur SEZGIN - Istanbul, TURKEY

- 16:59**      **A NOVEL TECHNIQUE IN TIP CONTOURING**  
 Mariam ISMAIL - Cairo, EGYPT
- 17:07**      **PREGNANCY AND BIRTH AFTER LOWER BODY  
 CONTOURING SURGERY**  
 Susanna PAJULA - Helsinki, FINLAND
- 17:19**      **META-ANALYSIS ON THE COMPARATIVE EFFICACY  
 OF DRAINS, PROGRESSIVE TENSION SUTURES AND  
 SUBSCARPAL FAT PRESERVATION IN REDUCING  
 COMPLICATIONS FROM ABDOMINOPLASTY**  
 Ho WEIGUANG - Belfast, UNITED KINGDOM
- 17:31**      **IS IT NECESSARY TO USE DRAINS IN BREAST  
 REDUCTION SURGERIES ?**  
 Alli İPEK - Ankara, TURKEY
- 17:43**      **SHORT SCAR AUGMENTATION MASTOPEXY WITH  
 IMPLANTS IN MASSIVE WEIGHT LOSS PATIENTS**  
 Marzia SALGARELLO - Rome, ITALY
- 17:51**      **A TEN-YEAR EXPERIENCE OF SURGICAL CORRECTION  
 OF GYNAECOMASTIA; TREATMENT ALGORITHM  
 BASED ON A SINGLE INSTITUTIONS EXPERIENCE**  
 Paulien HILVEN - London, UNITED KINGDOM
- 18:03**      **REFINING THE TECHNIQUE OF POWER -  
 ASSISTED GLUTEAL AUGMENTATION USING  
 BARBED SUTURES**  
 Karl WAKED - Jette, BELGIUM
- 18:15**      **OUTCOMES OF MEDIAL THIGH LIFT AFTER  
 MASSIVE WEIGHT LOSS - A 13-YEARS REVIEW**  
 Jan PLOCK - Zurich, SWITZERLAND
- 18:27**      **ADJOURNMENT**
- 20:30**      **Farewell Party**  
 Restaurant Saaristo, Klippan Island, Olympiaranta 1

THURSDAY 23 MAY 2019

**Session 1**

**14:00-16:00**

***RESEARCH***

*Moderators*

Virve KOLJONEN, Helsinki, FINLAND

Dietmar ULRICH, Nijmegen, THE NETHERLANDS



**14:00            CONTRALATERAL    VASCULARIZED    LYMPH    NODE  
TRANSFER: A MORE PRECISE MICE MODEL EXPERIENCE**

Giulia Virginia VOTTERO, Florent Morfoisse, Agnès Noël,  
Jean-Luc Nizet  
*CHU of Liège, Liège, BELGIUM*

**Introduction**

Vascularized lymph node transfer (VLNT) is one of the surgical options in the treatment of lymphedema, but the unpredictable clinical results limit its popularity. The aim of this study is to analyze the consequences on the microenvironment and lymph clearance using a mice model of VLNT with the donor paw opposite to the recipient one (inguinal to inguinal) instead of ipsilateral (inguinal to popliteal) as previously described in literature. As in humans the VLNT donor site is usually far from the recipient site, choosing an untouched donor site can provide a more precise VLNT mice model experience.

**Materials & Methods**

A long lasting lymphedema was induced on the left posterior paw by radiation and surgery in four experimental groups (n = 8). Two weeks later, group 1 was the sham one, group 2 underwent a VLNT from the right inguinal region to the left, in group 3 a VEGF-C sponge was placed alone in the left inguinal region and in group 4 a VEGF-C sponge was associated to the VLNT. The 32 mice were followed during 3 months. Outcomes included the volume of the paws (caliper and micro RMI), the severity of skin ulcers (visual assessment score) and the lymphatic clearance (micro RMI and PDE). Immunohistochemistry was employed to quantify lymph vessel density (LYVE-1), skin fibrosis and thickness (Masson's trichrome staining) and inflammation (F4/80 and CD45 staining).

**Results**

Group 4 displayed significant higher ( $p < 0.05$ ) lymphedema regression by decreased left paw volume, lower skin thickening and no skin ulcer development compared to the other three groups, associated with increased lymphangiogenesis and reduced immune cell infiltration.

**Conclusions**

These results help to better understand the physiopathology of lymphedema and its evolution after VLNT relating on the microenvironment modification induced by the synergy between the graft and the perinodal presence of VEGF-C.

**14:08 EFFECT OF ADIPOSE-DERIVED STEM CELL AND PLATELET- RICH PLASMA FOR PREVENTION OF ALOPECIA AND SKIN COMPLICATIONS OF RADIOTHERAPY**

Nuh EVİN, Osman Akdağ, Tahsin Murad Aktan, Selçuk Duman, İsmail Harmankaya, Güler Yavaş, Zekeriya Tosun  
*KONYA TRAINING AND RESEARCH HOSPITALI, Konya, TURKEY*

**Introduction**

Radiotherapy is an important part of oncological treatment protocols in head and neck malignancies. Many side effects of the radiotherapy have been reported in the literature. The aim of this study is to evaluate the efficacy of adipose-derived stem cells(ASCs) and platelet- rich plasma(PRP) in the prevention of radiotherapy induced skin side effects.

**Materials and Methods**

Human follicular units including epidermis, dermis, hair, erector-pili muscle and sweat glands, as a mini organ, were transplanted into 24 immunodeficient nude mice. When these follicles were transformed to the anagen phase, 10 Gy radiotherapy was applied to the transplanted area. After radiotherapy, mice were randomly divided into 4 groups. Saline, human PRP, human ASCs and ASCs+PRP were locally applied to the transplanted area of group 1,2,3,4, respectively. Before and after RT, epithelization of the biopsy sites, root lengths and body elongation of follicular hair were evaluated macroscopically. Dystrophic changes, inflammation, degeneration of the hair follicle and epidermal atrophy, fibrosis, keratinization degrees of surrounding skin were evaluated microscopically. Cell proliferation (Ki-67), anti- apoptosis (Bcl-2), cellular differentiation-signaling ( $\beta$ -catenin) of follicular units and surrounding skin were evaluated by immunohistochemical examinations.

**Results**

When compared to pre-RT periods, the most similar epithelization time, root lengths and weekly elongation of the hair follicle were obtained in the post-RT ASCs+PRP group and it was statistically significant. Increasing of the dystrophic changes, inflammation, degeneration and decreasing of the proliferation, anti-apoptosis, cellular differentiation-signaling in the follicular units was highest in the saline group and the lowest in the ASCs+PRP group. Increasing of the atrophy, fibrosis, keratinization and decreasing of proliferation, anti- apoptosis, cellular differentiation-signaling in the skin was highest in the saline group and the lowest in the ASCs+PRP group.

**Conclusions**

ASCs and PRP are an effective to prevent RT induced skin side effects. When ASCs and PRP are combined, protective effects of ASCs are potentiated by the PRP.

**14:16 NANOPARTICLE LABELLING TO FACILITATE HIGH-RESOLUTION TRACKING OF THERAPEUTIC STEM CELLS**

Gillian HIGGINS, Suzanne Emma Thomson, Marie Kearns, Sara Hosseinzadeh, Ewan Ross, Catherine Berry, John Riddell, Robert Wallace, Mathis Riehle, Andrew Hart  
*Canniesburn Unit of Plastic and Reconstruction Surgery, Glasgow, UNITED KINGDOM*

**Introduction**

Peripheral nerve injuries are common and alternatives to nerve grafting are being sought, to improve morbidity and outcomes. Human Adipose Derived Stem Cells (ADSC) labelled with Super-Paramagnetic Iron Oxide Nanoparticles (SPION), as part of a nerve conduit used to repair 15mm sciatic nerve injuries in Sprague Dawley rats, have been successfully traced ex vivo using 3D rendered micro computerised tomography ( $\mu$ CT). To facilitate bench to bedside translation of stem cell therapies, this study differentiated ADSC to Schwann cell phenotype (dADSC) and investigated whether they maintain differentiation after labelling with SPIONs.

**Materials & Methods**

The ADSC were extracted from human adipose tissue, in keeping with the Human Tissue Act (2004) and Biobank ethical approval. Established differentiation protocol was utilised (Kingham et al 2007) and ADSC were labelled with green, 200nm SPIONs at 0.01mg/ml and 0.1mg/ml concentration. Morphology was assessed, ADSC stemness was assessed by flow cytometry, th5- ethyl-2-deoxyuridine assay was utilised to assess proliferation and immunohistochemistry for neuromarkers illustrated phenotype after 3 days of culture with and without nanoparticles.

**Results**

98% and 96.4% of ADSC and dADSC exhibited uptake of nanoparticles, respectively. ADSC retained markers of stemness (CD90, CD73 and CD105) and their morphology, regardless of SPION labelling. ADSC and dADSC proliferated more on day 3 than day 1 ( $p < 0.05$ ) 0mg/ml vs 0.01mg/ml, t-test). dADSC stained positively for neural markers s100, p75 and GFAP (ADSC controls were negative for s100 and p75) in the absence and presence of SPION.

**Conclusions**

This preliminary study suggests SPION labelling that can enable tracking of therapeutic stem cells do not impair positive biological features of ADSC in culture and therefore remain attractive candidates for in vivo and clinical use.

**14:24            COMPARING EFFECTS OF: BLASTEMA OF AXOLOTL,  
PLATELET RICH PLASMA OF AXOLOTL AND PLATELET  
RICH PLASMA OF RAT ON SCALDED INJURY**

Hasan CELIK, Mustafa Sutcu, Mustafa Hanci, Bircan Kolbasi, Turan Demircan, Mustafa Keskin, Naci Karacaoglan, Ilknur Keskin  
*Istanbul Medipol University, Istanbul, TURKEY*

**Introduction**

Burns are commonly seen in children and the most common cause is scalding. Wound healing of the axolotls is scarless and their tissues regeneration is perfect. This suggests that axolotls can be effective in the healing of burns. Therefore, we wanted to investigate the efficacy of axolotls blastema and PRP.

**Materials & Methods**

40 rats were used for the burn model. 10 *Ambystoma Mexicanum* axolotl were used for Blastema and PRP production. The extremities of the axolotls were amputated to obtain blastema 7 days before burn. PRP was prepared from the same axolotls. Rat PRP was prepared with the same protocol too. In all rats, scald burn was formed by contacting 100 °C water for 10 seconds and randomly divided into 5 groups.

1. Group-Control; no application
2. Group-Sham; topical silver-sulfadiazine was applied.
3. Group-Rat PRP injected
4. Group-Axolotl PRP injected
5. Group 5-Aksololt Blastema injected

Macroscopic evaluation was performed with "Image J" program.

For microscopic evaluation, "distance measurement between wound" and "scores" was performed.

Immunohistochemical evaluation revealed VEGF-alpha, IL6, TNF-alpha and Collagen I values in the tissue.

**Results**

In macroscopic evaluation; the highest decrease (2,84 cm<sup>2</sup>) and the highest score (10,8) was detected in the blastema group. The "closure distance" was shortest in the Blastema Group (644,133 µm). All cytokines in immuno-histochemical evaluation were found in favor of blastema group. Epithelisation was very rapid in the Blastema group.

**Conclusions**

It is the first study in the literature where the tissues and cells of the Axolotls are used in the mammals. Axolotl PRP and Axolotl Blastema were first investigated in the treatment of burn. The best result in burn healing was seen in the blastema group; this result is statistically significant. Blastema and PRP obtainment protocols are described. We think that axolotl welded

**14:32 PRE-ADIPOCYTES IN IRRADIATED SKIN STIMULATE THE MIGRATION OF FIBROBLASTS AND AID WOUND HEALING**

Lucy TREVOR, Margaret Julie Thornton, Kevin McElwee, Ajay Liladhar Mahajan  
Plastic Surgery and Burns Research Unit, Bradford, UK

**Introduction**

Compromised wound healing in irradiated tissue is a significant clinical problem. This can potentially be improved by stromal vascular fraction (SVF), a heterogeneous cell population derived from subcutaneous adipose tissue. We have established a procedure to isolate and characterise cells from the SVF. Since murine wound healing studies have shown that pre-adipocytes stimulate migration of dermal fibroblasts into the wound bed, we sought to determine whether these cells secrete paracrine factors that improve migration of irradiated breast dermal fibroblasts.

**Materials and Methods**

Irradiated skin from breast reconstruction surgery was used to generate dermal fibroblasts and cells from the SVF. Subcutaneous adipose tissue was digested with collagenase II, sifted and centrifuged to produce a SVF cell pellet, which was re-suspended in pre-adipocyte medium and cultured for two weeks. Cells were characterised by immunocytochemistry using a panel of pre-adipocyte markers and compared to commercially purchased pre-adipocytes (Promocell). Conditioned medium was collected from the SVF cells and commercial pre-adipocytes to assess the effect of secreted factors on dermal fibroblast migration (n=3 donors) in a scratch-wound assay.

**Results**

Purchased pre-adipocytes demonstrated 100% expression of pre-adipocyte markers CD105, CD73, CD10 and the absence of CD45. The cells obtained from the SVF of irradiated breast skin expressed these markers in the following proportions: CD105: 100%, CD73: 93% and CD10: 58% and the absence of CD45, suggesting a high percentage were pre-adipocytes. Conditioned media from both the SVF cells and the pre-adipocytes similarly stimulated an increase in the rate of migration of irradiated breast dermal fibroblasts in a scratch-wound assay.

**Conclusions**

SVF containing pre-adipocytes was successfully isolated from irradiated breast skin. Cells cultured from both SVF and commercial pre-adipocytes secrete soluble factors which stimulate migration of irradiated dermal fibroblasts. This has promising implications in aiding wound healing in problematic wounds in irradiated tissue.

**14:40 CELL-ENRICHED FAT GRAFTING IMPROVES GRAFT RETENTION IN A PORCINE MODEL: A DOSE-RESPONSE STUDY OF ADIPOSE- DERIVED STEM CELLS VERSUS STROMAL VASCULAR FRACTION**

Bo Sonnich RASMUSSEN, Celine Lykke sørensen, Sorel Kubergovic, Mathias Ørholt, Maj-Lis Møller Talman, Mikkel Herly, Christian Bressen Pipper, Stig-Frederik Trojahn Kølle, Filip Rangatchew, Rikke Holmgaard, Peter Vester-Glowinski, Anne Fischer-Nielsen, Krzysztof Drzewiecki  
*Dept of Plastic Surgery, Breast Surgery and Burns, University Hospital of Copenhagen, Rigshospitalet, DENMARK*

**Introduction**

Cell-enrichment of fat grafts has produced encouraging results, but the optimal concentrations and types of added cells are unknown. We therefor investigated for the first time the effects of enrichment with various concentrations of ex vivo-expanded adipose-derived stem/stromal cells (ASCs) and stromal vascular fraction (SVF) on graft retention in a porcine model.

**Materials & Methods**

ASCs were culture-expanded, and six fat grafts (30 mL) were prepared for each minipig (n=13). We investigated grafts enriched with  $2.5 \times 10^6$ - $20 \times 10^6$  ASCs/mL and SVF as well as nonenriched control grafts. Each pig served as its own control. Magnetic resonance imaging (MRI) was performed immediately after grafting and 120 days postoperatively before the pigs were euthanized, and histological samples were collected.

**Results**

We recorded an enhanced relative graft retention rate of 41% in a pool of all cell-enriched grafts compared to the nonenriched control (13.0% vs 9.2%,  $p=0.0045$ ). A comparison of all individual groups showed significantly higher graft retention in the  $10 \times 10^6$  ASCs/mL group compared to control ( $p=0.022$ ). No significant differences were observed between the cell-enriched groups ( $p=0.66$ ). All fat grafts showed a significantly better resemblance to normal fat tissue in the periphery than in the center ( $p<0.009$ ), but no differences in overall graft morphology were observed between groups ( $p>0.17$ ).

**Conclusions**

Cell-enriched fat grafting improved graft retention and was feasible in this porcine model. No significant differences in graft retention were observed among the various ASC concentrations or between ASC and SVF enrichment. Future studies using this model can help improve our understanding of the role of ASCs in cell-enriched fat grafting.



**14:48 MIF FAMILY MEMBERS IN ADIPOSE TISSUE INFLAMMATION AND WOUND REPAIR**

Kim BONG-SUNG, Jürgen Bernhagen, Richard Bucala, Norbert Pallua  
*RWTH Aachen University - Department of Plastic Surgery, Aachen, GERMANY*

**Introduction**

The understanding of adipose tissue in inflammatory processes and wound repair as found in non-healing wounds is limited but highly relevant for Plastic and Reconstructive Surgery. Subcutaneous adipose tissue in immediate proximity to the wound plays a hitherto underappreciated role as it participates in wound healing through mobilization of cells and secretion of soluble factors. The pro-inflammatory cytokine macrophage migration inhibitory factor (MIF) and its homolog D-dopachrome tautomerase (DDT) are adipokines that are both expressed in adipose tissue and involved in inflammatory processes. In the present work, the authors characterized subcutaneous adipose tissue adjacent to non-healing wounds and investigated the role of MIF, DDT and its receptors in wound healing.

**Materials & Methods**

Subcutaneous adipose tissue samples were collected from healthy subjects (n=45) and patients with non-healing wounds (n=45). The samples were characterized for adipose-derived stem cell (ASC) and macrophage content. MIF, DDT and their receptors CXCR2, CXCR4 and CD74 were measured followed by functional in vitro migration and wound healing assays. Additional in vivo experiments in MIF and DDT knockout mice in an LPS shock model for evaluation of MIF/DDT dependant macrophage migration and phagocytosis were performed.

**Results**

Human adipose tissue adjacent to non-healing wounds generally showed a decrease of ASCs and an increase of pro-inflammatory cytokines as well as pro-inflammatory M1-macrophages. Adipose tissue samples of non-healing wounds showed MIF up-regulation and an unexpected inverse DDT down-regulation. MIF in particular promoted macrophage migration through its receptors CXCR2 and CXCR4 in vivo. In murine tissue, the increase of MIF and decrease of DDT jointly skewed macrophages towards the M1 phenotype with diminished phagocytotic activity and impaired wound healing.

**Conclusions**

Macrophages and ASCs are significantly altered in subcutaneous adipose of non-healing wounds which may be partially mediated by reciprocally regulated MIF and DDT.

**14:56 REVERSE ENGINEERING BREAST CANCER  
EXTRACELLULAR MATRIX IN VITRO, ANALYZING  
THE PROPERTIES, AND REVEALING AN  
ONCOGENIC CELL RESPONSE**

Elizabeth BRETT, Matthias Sauter, Lilia Chtcheglova, Christina Müller,  
Peter Hinterdorfer, Hans-Günther Machens, Dominik Duscher  
*Technische Universitaet Muenchen, Munich, GERMANY*

**Introduction**

Breast cancer (BC) affects one in eight women. The recurrence of the disease has been quoted at 40%, independent of reconstruction. As BC is diagnosed and treated as a cellular disease, the extracellular matrix (ECM) is not of massive diagnostic or therapeutic importance. However, through reverse engineering of a breast cancer ECM in vitro, we are able to appreciate structural differences and significant cell responses to the decellularized protein.

**Materials & Methods**

Briefly, combinations of cell types were made in vitro; a healthy group (fibroblasts and ASCs) and a cancer group (fibroblasts, ASCs, MDA-MB-231 triple negative breast cancer cells). After five days culture with ascorbic acid, the underlying ECM was decellularized using 20mM NH<sub>4</sub>OH in 1% Triton X. MDA-MB-231 cells were seeded on the decellularized matrix to evaluate influence of ECM on cancer behavior.

**Results**

Protein quantification by BCA reveals a significantly higher concentration of protein deposited in the healthy group compared to the cancer group ( $p < 0.05$ ). Using SEM, an appreciable difference in matrix morphology is present between healthy and cancer groups. The evaluation of ECM topography by atomic force microscopy (AFM) and cross sectional analysis indicates a noticeable difference in the filaments organization, and thickness of the immobilized ECM. When MDA-MB-231 cells are reseeded onto the healthy decellularized ECM, a normal cell monolayer grows. However, when reseeded onto the cancer decellularized ECM, road-like structures are formed, implying a mechanical influence of the ECM on the MDA-MB-231 cells.

**Conclusions**

The nature of the cancer-formed ECM, and this unique migratory response of reseeded cultured cells creates promising research routes for the role of ECM in breast cancer progression and recurrence.

**15:04            COMPARISON OF SMOOTH, TEXTURED AND  
POLYURETHANE SURFACE IMPLANTS FROM  
THE PERSPECTIVE OF BIOFILM AND CAPSULE  
FORMATION UNDER LOCAL ANTIBIOTHERAPY**

Safa MANAV, Suhan Ayhan, Deniz Erkan, Cigdem Elmas, Meltem Yalinay  
*GAZI UNIVERSITY FACULTY OF MEDICINE, Ankara, TURKEY*

**Introduction**

Capsule contracture is not a rare complication after breast augmentation. Biofilm formation and implant surface structure seem to have a role in etiology. Although capsular contracture around implants with different surfaces have been studied, the impact of surface structure on biofilm formation has not yet been clarified. In this study, we compared biofilm formation on breast implants with different surfaces, after standardized bacterial contamination and also effect of local antibiotic use on biofilm formation on different surfaces.

**Materials and Methods**

Twenty-four Long Evans rats were used. Rats were divided into four groups. Mini implants (Polytech/Germany) with three different surfaces (smooth, textured and polyurethane-coated) were placed on the dorsum of each rat.

Group-1: Sterile implants placed directly in pockets

Group-2: Implants were incubated in Staphylococcus epidermidis medium before implantation. Group-3: Implants were incubated in Staphylococcus epidermidis medium and inserted in Rifamycin solution before implantation.

Group-4: Sterile implants were inserted in Rifamycin solution before implantation

All rats were sacrificed at three months. Clinical (Baker scoring), microbiological (scanning electron microscopy, microtiter plate), histological (capsule thickness, inflammatory cell density) and immunohistochemical (actin protein amount / sequence) evaluations were performed.

**Results**

Capsule contracture developed only on infected textured implants. Textured and PU implants showed more biofilm formation than smooth implants. Capsule thickness, inflammatory cell density and actin accumulation were highest on textured implants. Actin sequence was parallel and concentric on textured; but in irregular array on PU implants.

**Conclusions**

In presence of bacterial contamination, textured implants have the most propensity of developing capsular contracture comparing to smooth and PU implants at three months after implantation. Biofilm formation is less on smooth implants. Despite high bacterial load and biofilm formation, PU implants are resistant to CC, probably due to irregular actin array. Use of local antibiotics reduced biofilm formation on all surfaces, but didn't prevent capsular contracture on textured surface.

**15:12          NANOPARTICLES: A NOVEL TREATMENT  
MODALITY TO REDUCE SEROMA FORMATION**

Ioana LESE, Inge Herrmann, Adriaan Grobbelaar, Mihai Constantinescu,  
Radu Olariu  
*Department of Plastic, Reconstructive and Aesthetic Surgery, Inselspital, University  
Hospital, Bern, SWITZERLAND*

**Introduction**

Seroma formation is a well-recognized postoperative complication for many plastic and general surgical procedures. Although various tissue adhesives and substances have been used in an effort to treat and prevent seroma formation, no single treatment modality has been 100% successful. We investigated a novel tissue engineering technique to reduce seroma formation. Nano bridging is a well-established technique to facilitate tissue adhesion and we investigated the role and treatment potential of this technique for the treatment of seroma formation.

**Materials & Methods**

We used ten Lewis rats as our experimental model. They underwent bilateral axillary lymphadenectomy, latissimus dorsi and cutaneous maximus muscle excision, and disruption of dermal lymphatics in order to create a seroma. On postoperative day (POD) 7, the seroma was aspirated on both sides. 1 ml of Zinc-doped Strontium-substituted Bioglass/Ceria nanoparticle suspension was injected in the right side, while the left side was left untreated and acted in each animal as its own control. On POD 14, the seroma collections were aspirated and quantified, while seroma capsule and tissue flaps, as well as organs were sent for histologic analysis.

**Results**

On POD 7, the left and right sides had a median seroma value of 1 and 1.2 ml, respectively ( $p > 0.05$ ). On POD 14, the control side had a median seroma volume of 0.25 ml, whereas the nanoparticle-treated side recorded a median of 0 ml ( $p < 0.05$ ). Histologic analysis revealed mild inflammation consistent with postoperative changes locally while there was no evidence of nanoparticle deposition to the distant organs.

**Conclusions**

Zinc-doped Strontium-substituted Bioglass/Ceria nanoparticles significantly reduce seroma formation in this specially developed rat model while having no measurable systemic adverse effects. Tissue engineering techniques may provide surgeons in the future with a safe option to reduce potential surgical complications.

**15:20 THE DEVELOPMENT OF A CUSTOMIZED 3D-PRINTED NANOCOMPOSITE POLYURETHANE IMPLANT FOR AURICULAR CARTILAGE RECONSTRUCTION**

Michelle GRIFFIN, Peter Butler  
*Royal Free Hospital, London, UK*

**Introduction**

Children born with a small or absent ear undergo surgical reconstruction to create a suitable replacement using rib cartilage. To overcome the donor site morbidity and long-term pain of harvesting rib cartilage, synthetic materials can be used. Medpor, is the currently used material but unfortunately it has high levels infection and extrusion, making it an unsuitable replacement. The development of alternative biocompatible biomaterials for auricular reconstruction is needed. Herein, we fabricate polyurethanes auricular cartilage replacements using 3D-printing to provide an alternative approach.

**Materials & Methods**

Customized nanocomposites polyurethane auricular implants (3D-PU) were designed and 3D- printed. The in vitro and in vivo response of 3D-PU was compared to Medpor implants. The adhesion, proliferation, formation of extracellular matrix of human dermal fibroblasts (HDFs) and endothelial cells (ECs) was compared in vitro over 14-days using RT-qPCR and immunocytochemistry. Both materials were implanted into the rat dorsum and explanted after 6-months (n=6) to assess for tissue integration, angiogenesis and immune response.

**Results**

3D-PU enhanced the adhesion and proliferation of HDFs and ECs compared Medpor over 14- days(p<0.05). 3D-PU upregulated the protein and gene expression of collagen type I, elastin and fibronectin of HDFs compared to Medpor over 14-days(p<0.05). 3D-PU enhanced the protein and gene expression of vascular endothelial-cadherin and von Willebrand factor by the ECs compared to Medpor over 14-days(p<0.05). 3D-PU showed significantly greater tissue integration after implantation compared to Medpor using H&E and collagen staining (90%vs75%,p=0.034). Vessel formation by CD31 staining of CD31 and  $\alpha$ -SMA was also enhanced with 3D-PU than Medpor (14 $\pm$ 3vs5 $\pm$ 2,p=0.03). Both implants did not cause any immune response over the 6-months as shown by CD45 and CD68 staining.

**Conclusions**

3D-PU is a biocompatible and safe alternative for replacing auricular cartilage for microtia reconstruction. 3D-printed polyurethane implants can overcome the infection and extrusion complications of current available alloplastic materials

**15:28 BIOACTIVE FIBRIN CONDUITS FOR LONG GAP PERIPHERAL NERVE REGENERATION**

Katharina Minh Anh PRAUTSCH, Lucas Degrugillier, Dirk Schaefer, Raphael Guzman, Srinivas Madduri, Daniel Kalbermatten  
*University Hospital Basel, Basel, SWITZERLAND*

**Introduction**

Adipose derived stem cells (AdSC) are known to enhance peripheral nerve regeneration when delivered in nerve conduits through distinct mechanisms. This study aimed at evaluating the synergistic effect of AdSC and nerve growth factor (NGF) in vitro and in vivo on axonal outgrowth.

**Materials & Methods**

AdSCs were pre-treated with NGF (AdSCNGF). Dorsal root ganglia (DRG) were cultured in conditioned medium (CM-AdSCNGF) obtained from AdSCNGF. Axonal outgrowth from DRG was visualized by immunostaining and evaluated by measuring the length and area of neurite outgrowth. For in vivo study, four rats per group were operated creating a 15mm gap on left sciatic nerve. AdSCNGF were either integrated into the wall of FC or injected into the conduit's lumen within a soft fibrin glue solution. Nerve ends were attached by a single suture to the conduit. Functional gait analyses were performed weekly. After four weeks, gastrocnemius muscles and sciatic nerves were explanted. Wet-weight of muscles was measured and nerve tissue was processed for immunostaining and microscopic analysis.

**Results**

The secretome contained in CM-AdSCNGF stimulated significant axonal outgrowth from DRG explants compared to controls. In vivo, all FC showed contraction. Muscle weight loss was comparable across all groups. Distal nerve cross sections in experimental groups indicate incomplete nerve regeneration, whereas proximal cross sections show an axonal count close to autografts.

**Conclusions**

The study revealed the synergistic effect of AdSC's derived secretome in the presence of NGF on axonal outgrowth in vitro. The suitability of FC for treating long nerve gaps is to be evaluated. Although the 15mm gap could not be crossed by regenerating axons within 4 weeks, the axonal count in the proximal part of the nerve and the reduced muscle weight loss indicate the potential of bioactive fibrin conduits for supporting axonal outgrowth over long gap injuries.



**15:36          PROTECTIVE EFFECTS OF IMMUNOSUPPRESSIVE  
DRUGS ON CHRONIC NERVE COMPRESSION**

*Lucas DEGRUGILLIER, Katharina Prautsch, Stefan Schaaeren, Srinivas Madduri,  
Daniel Kalbermatten  
University Hospital Basel, Basel, SWITZERLAND*

**Introduction**

Tacrolimus (FK506), Cyclosporine and Rapamycin represent a class of immunosuppressive drugs (ISD) called immunophilin ligands, which have shown potent neuroregenerative effect following nerve injuries, although this effect is poorly understood. This study evaluated the effect of widely used ISDs i.e., Cyclosporine, FK506 and Rapamycin in vitro and in vivo. Our in vitro model allowed the assessment of ISDs on neurite outgrowth in serum free medium. Controlled chronic compression of rat sciatic nerve was used for analysis of ISDs in vivo.

**Materials and Methods:**

Dorsal root ganglia (DRG) isolated from chicken embryos were treated with ISDs and cultured in multi-well plates for 48 hours under serum-free conditions. Different concentrations of FK506, Cyclosporine and Rapamycin were assessed. Neurites outgrowth of DRG was assessed by phase-contrast and fluorescence microscopy. These drugs were studied in rats by using sciatic nerve compression model. Chronic compression was controlled and was set for 250  $\mu\text{m}$  of internal lumen. Injury was maintained for two weeks before receiving biweekly intraperitoneal injections of ISD. After four weeks of treatment under compression, rat sciatic nerves, gastrocnemius and tibialis anterior muscles were explanted and processed for microscopy. Further, muscle wet-weight was analysed and behavioural recovery measured by using Catwalk (Noldus) XT.

**Results:**

The resulting data indicated that all three drugs have a positive dose-dependent response on neurite outgrowth and cell survival in vitro. All ISDs showed a significantly higher neurite outgrowth compared to controls. The in vivo study demonstrated a pro-regenerative effect of ISDs on nerve structures, target muscle tissue, and functional restoration.

**Conclusions:**

This study revealed a positive effect of ISD on neurite outgrowth of primary neurons in vitro and a preservative effect on chronic nerve compression. These results encourage us to continue investigating the potential use of ISD as a therapy for chronic nerve compression.

**15:44 QQ-CULTURED MNC IMPROVE THE FAT  
GRAFT VASCULARIZATION AND SURVIVAL**

*Maxim GEEROMS, Rica Tanaka, Emiko Aiba, Orgun Doruk, Arita Kayoko, Yukari Nakajima, Rie Ito-Hirano, Rie Kitamura, Senda Daiki, Satoshi Fujimura, Hiroshi Mizuno, Moustapha Hamdi*

*UZ Brussel, Brussels, Belgium and Tokyo, JAPAN*

**Introduction**

Fat grafting is a valuable technique in soft-tissue reconstruction. However, ischemia of the grafted tissue with subsequent necrosis and tissue loss impede us from having satisfying long-term results. Recently, the Quality and Quantity (QQ) culture has been established to increase the vasculogenic potential of endothelial progenitor cells (EPC) in peripheral blood-derived mononuclear cells (PBMNC). Our experiment was designed to test whether QQ-cultured MNC (MNC-QQ) can contribute to vasculogenesis in the human fat graft and decrease the tissue loss.

**Materials & Methods**

Adipose tissue and peripheral blood were harvested from healthy human subjects. Fat grafts were created with human PBMNC (N=16), MNC-QQ (N=16) and stromal vascular fraction (N=16) before grafting in BALB/c nude mice, and compared to non-enriched control fat grafts (N=16). Grafts were explanted after 1 and 7 weeks, and analyzed by weight persistence, immunohistochemistry and qPCR.

**Results**

Weight persistence after 7 weeks was significantly higher in the MNC-QQ-group ( $89.8 \pm 3.5\%$ ) and SVF-group ( $90.1 \pm 4.2$ ) compared to control ( $70.4 \pm 6.3\%$ ). With  $96.6 \pm 6.5$  vessels/ $\text{mm}^2$ , grafts in the MNC-QQ-group had the most dense vessel network and scored significantly better than control ( $70.4 \pm 5.6$  vessels/ $\text{mm}^2$ ). MNC-QQ exerted a direct effect on vasculogenesis by integrating in vessels, and a paracrine VEGF-mediated effect. Tissue consisting of fibrosis and perilipin-positive adipocytes was unchanged among all groups.

**Conclusions**

QQ-cultured MNC containing EPC stimulate the formation of a blood vessel network in the fat graft and enhance the graft survival, indicating its potential for clinical fat grafting.

**Session 2**

**16:30-17:58**

***HEAD & NECK RECONSTRUCTION***

*Moderators*

JBrigitte PITTET-CUENOD, Geneve, SWITZERLAND

Bulent SAÇAK, Istanbul, TURKEY

**16:30 LESSONS LEARNED IN NASAL RECONSTRUCTION:  
53 MICROVASCULAR FOREARM LINING  
FLAPS IN 51 PATIENTS OVER 18 YEARS**

Frederick MENICK, Arthur Salibian  
Tucson, USA

**Introduction**

Large full-thickness and intranasal lining only, defects, especially complicated by radiation and adjacent cheek and lip loss, preclude traditional methods using local/regional flaps, necessitating microvascular distal tissue transfer for nasal lining and, infrequently, for cover. Most reports describe small patient numbers with limited follow-up.

**Materials and Methods**

The records/photographs of 48 patients, repaired using 50 forearm microvascular transfers, were categorized by the site, size, anatomic injury, etiology, h/o radiation, adjacent injury, prior repairs to identify complications, treatment and results.

**Results**

48 patients 10–78 years old, average follow-up 6 years  
 Defect Classification: Total - 5, subtotal - 25, hemi-nasal - 2, tip and ala - 7. Primary intranasal lining loss only 7 (with columella or alar full-thickness injury -2) Etiology: Intranasal/maxillary/skin cancer - 20  
 Cocaine/Wegener's disease - 15  
 Trauma/rhinoplasty necrosis - 8  
 Congenital - 4  
 Infection - 1  
 Prior history: Irradiation - 19  
 Failed prior repairs forehead flaps - 16 microvascular flaps - 8  
 Technical method of repair:  
 Full-thickness defects—  
 1 or 2 fold forearm lining flap with 3 stage forehead flap and late revision - 1  
 33 Non-folded radial lining flap with temporary external skin graft - 1  
 Primary intranasal lining only defects—  
 Circumferential radial lining flap - 9  
 Complications: Total Microvascular Flap Loss - 3 (salvaged with 2nd RFF - 2, forehead flaps for cover and lining - 1)  
 Partial radial flap loss requiring additional MV transfer - 0  
 Partial forehead flap necrosis - 3  
 Infection requiring cartilage replacement - 7  
 Overall results:  
 In progress -3  
 Completed  
 Excellent - Good - 38 (84%)  
 Fair - 2  
 Poor - 3  
 Failed - 2

**Conclusions**

Lining, of the vault, columella, and floor can be replaced effectively utilizing a folded MV forearm flap and staged forehead flap for full-thickness defects or a circumferential flap for intranasal lining loss only. Techniques, complications, and results are presented.

**16:50 NASAL RECONSTRUCTION IN NOMA PATIENTS**

Eva RÜEGG, Brigitte Pittet-Cuenod  
*Hopitaux Universitaires de Genève, Genève, Switzerland*

**Introduction**

Large central facial defects occur often in survivors of noma disease as sequelae after necrosis and have dramatic functional and social consequences for patients. We report our surgical strategy for total nasal reconstruction in these young patients and long-term outcome.

**Materials & Methods**

This retrospective study includes a review of the medical charts and photographs of 29 patients with total destruction of the nose due to noma sequelae, operated between 1993 and 2016 in our unit. The different surgical steps were assessed as well as complication and reoperation rate.

**Results**

Mean age at first surgery was 14 years (range, 4-37 years). Surgery was adapted to the defect: maxillary reconstruction by vascularized calvarium flap (9 patients) and soft tissue reconstruction of the midface by free flaps (11 patients) was first performed when needed. Nasal reconstruction included pre-expanded hemi-frontal flap in all patients and hinge flaps for the lining which were first delayed 0-2 time. Bony framework was reconstructed by osseocartilaginous rib grafts (n=28) or calvarium bone graft (n=7). All calvarium flap survived successfully and among 11 free flaps, microsurgical revision was performed successfully in 1 case and 1 flap was lost. Regarding nasal reconstructions, infections occurred in 10 patients. Follow-up ranged between 2 and 25 years. Secondary bone grafting was performed in 5 patients and 4 patients had total secondary nasal reconstruction using contralateral pre-expanded hemi-frontal flap. Of these 9 patients, 8 patients had their first reconstruction very early, with a mean age of 6 years (range, 4 - 8 years) and 6 patients had a history of infection. Aesthetic results were mostly satisfying, allowing social integration.

**Conclusions**

A well-vascularized reconstruction of the lining is of paramount importance to prevent infection. The quality of nasal reconstruction in complex facial reconstruction is of great importance for overall aesthetical and functional outcome.

**17:02            ENDOSCOPIC ASSISTED INSET OF  
FREE FLAPS IN ANTERIOR SKULL BASE  
RECONSTRUCTION: A NOVEL APPROACH**

Lorenzo Andres RODRIGUEZ, Caroline Driessen, Maria Mani, Adnan Lidian,  
Olafur Gudjonsson, Jerker Stigare  
*Department of Plastic and Maxillofacial Surgery, Uppsala University Hospital, Uppsala,  
SWEDEN*

**Introduction**

One of the goals in reconstruction of anterior skull base tumors is to seal the brain from the nasopharyngeal cavity to avoid lethal intracranial infections. In selected cases, free vascularized tissue transfers can provide a more robust reconstruction for stable separation of the sinonasal and intracranial cavities than local options. We report our experience, the technical nuances and outcomes of endoscopic inset of free flaps in complex anterior skull base reconstructions.

**Materials & Methods**

Between 2016 and 2018, endoscopic inseting of six free flaps for reconstruction of anterior skull base defects after tumor resection was performed in five patients. The tumors were resected by means of endoscopic surgery. A transmaxillary approach was performed through a mucosal incision inside the upper sulcus. An anterior and medial maxillotomy was performed. The flaps were placed with the tip in the sphenoidal sinus. The flaps were inserted through the maxillary sinus via a peri-operative opening and the vessels were tunneled through the cheek to reach the facial vessels.

**Results**

The patients were 4 men and 1 woman with a mean age of 54.4 years old (range 20-72 years). Six free flaps were performed in five patients including four vastus lateralis, one adipofascial anterolateral thigh flap and one adipofascial radial forearm flap. In all cases, separation of intracranial and sinonasal spaces was confirmed by radiological and endoscopic examinations. Two cases had infectious complications, but there was no flap failure. The mean follow-up of the patients was 13.8 months.

**Conclusions**

A multidisciplinary approach with an experienced endoscopic surgeon and an experienced microsurgeon in addition to the neurosurgical competence is mandatory for innovative techniques in skull base surgery. The vastus lateralis free flap is a suitable and versatile donor site to perform an endoscopic reconstruction sealing the brain from the nasopharyngeal cavity.



**17:10 EVALUATING THE FREE RADIAL FOREARM FLAP VERSUS THE PEDICLED PECTORALIS MAJOR MYOCUTANEOUS FLAP FOR OESOPHAGO-PHARYNGEAL RECONSTRUCTION: DECISION MAKING AND OUTCOME**

Athanasios KARONIDIS, Othon Papadopoulos, Dimosthenis Tsoutsos  
*General Hospital of Athens "G. GENNIMMATAS", Athens, GREECE*

**Introduction**

The free Radial Forearm Flap (RFF) and the pedicled Pectoralis Major (PM) myocutaneous flap have been used for oesophago-pharyngeal reconstruction. We evaluated the factors that influence the decision making and outcome of oesophago-pharyngeal reconstruction using the RFF or PM flap, with an emphasis on flap selection, complications and functional outcome.

**Materials and Methods**

From 2013 to 2018, fifteen patients underwent immediate or delayed post-laryngo- hypopharyngectomy reconstruction of oesophago-pharyngeal defects. 9 patients (Group A) underwent reconstruction with RFF and 6 patients (Group B) with PM flap. The successful outcome was associated with oral alimentation, good uncomplicated swallowing and quality of speech. Demographics, defect of circumference (circum%), T/N (TNM), stage, time of reconstruction, fistula, stricture and swallowing complications were recorded. Pearson Chi- Square, Fisher's Exact Test, Linear-by-Linear Association and other tests were used for analysis.

**Results**

Patients' age, defect of circumference (circum%), T and N were not statistically associated with fistula (pcircum%=0.590, pT=0.692, pN=0.473), stricture (pcircum%=0.290, pT=0.229, pN=0.152) and swallowing dysfunction (pcircum%=0.219, pT=0.229, pN=0.152) respectively for both groups. The stage of the disease was statistically significant associated with the type of flap (p=0.002), with the Group A for stages III-IV and larger defects, and the Group B for stage II. However the stage was not associated with fistula (pFist=0.473), stricture and swallowing dysfunction (pStrict/Swall=0.152) regardless the flap. Overall complication rates, fistula, and especially stricture and swallowing dysfunction were found higher in Group B, but not statistically significant (pFist=1.000, pStrict/Swall=0.143 respectively). Furthermore the delayed PM reconstructions of Group B had non-statistically significant even higher fistula and swallowing dysfunction rates (p=0.400). Both groups reported equal good results in terms of oral alimentation and speech.

**Conclusions**

The RFF and PM flap both provide comparable functional outcomes in oesophago-pharyngeal reconstruction. The RFF is better reserved for advanced disease (stages III-IV) and larger defects, and is associated with better swallowing and fewer complications.

**17:18 RISK FACTORS FOR GASTRIC-TUBE DEPENDENCE AFTER TONGUE RECONSTRUCTION: A RETROSPECTIVE AND MULTICENTER ANALYSIS OF 582 PATIENTS IN 31 INSTITUTIONS**

Jun ARAKI, Junichi Nakao, Yoshihiro Kimata, Minoru Sakuraba, Tetsuro Onitsuka, Masahiro Nakagawa  
*Shizuoka Cancer Center, Shizuoka, JAPAN*

**Introduction**

Postoperative dysphagia is not uncommon following significant glossectomy with laryngeal preservation. To develop effective treatments for this patient population, risk factors for postoperative dysphagia must be accurately identified. The objective of this retrospective study was to identify independent risk factors for dysphagia after microvascular tongue reconstruction.

**Materials and Methods**

We performed a retrospective chart review of 582 patients who had undergone microvascular tongue reconstruction after significant glossectomy with laryngeal preservation. The variables examined were age, sex, preoperative TNM classification, albumin level (ALB) and hemoglobin (Hb) in blood, performance status (PS), smoking, alcohol drinking, past medical history, extent of the tongue defect, reconstructive procedure, operative duration, the shape of reconstructed tongue, and oral environment. Postoperative dysphagia was defined as gastric- tube dependence for nutrition at the time of evaluation. Possible risk factors for gastric-tube dependence were subjected to univariate analysis and multivariate logistic regression.

**Results**

A total of 68 patients (11.7 %) had dysphagia at the time of evaluation. Multivariate logistic regression analysis identified older age, advanced T and N classification, lower ALB, lower PS, hypertension and cerebral dysfunction history, larger tongue defect, longer operative duration, and dentate patients as significant risk factors for gastric-tube dependence after tongue reconstruction.

**Conclusions**

The present study has identified some risk factors for gastric-tube dependence after tongue reconstruction. These factors should be considered when selecting treatments for patients with advanced oral and oropharyngeal cancers.

**17:26 THE SCIP FLAP IN THE EUROPEAN POPULATION:  
QUANTIFYING THE ANATOMY AND ITS CLINICAL  
APPLICATION IN HEAD AND NECK RECONSTRUCTION**

Radu OLARIU, Cedric Zubler, Adriaan O. Grobbelaar, Roland Giger, Mihai A. Constantinescu  
*Clinic of Plastic and Hand Surgery, Bern, SWITZERLAND*

**Introduction**

A thin skin flap is often desirable in surgical reconstruction of various body regions. SCIP flaps based on either the superficial or deep branch of the superficial circumflex iliac artery (SCIA) have been used for this purpose mainly in the Asian population but have yet to gain acceptance in Europe due to lack of thorough anatomical studies quantifying the vascular pedicle and surface area of the flap.

**Materials & Methods**

We performed an anatomical study on 21 cadavers and used the knowledge gained in a series of Head and Neck reconstructions. In the anatomical study wide areas were harvested subfascially from the groin of Thiel-fixated cadavers and both deep and superficial branches of the SCIA were dissected and injected with microAngiofil. CT-imaging and superficial plane dissections with perforator markings were performed. In the clinical study we performed 7 SCIP flaps for Head and Neck Reconstruction and correlated the clinical findings with our experimental study.

**Results**

The deep and superficial branch (present in each specimen) provided each more than 3 perforators. However the deep branch provided a longer pedicle (9.1 vs 6.6 cm,  $p < 0.01$ ), larger perfused area (202 vs. 112 cm<sup>2</sup>,  $p < 0.01$ ) and thinner flap (8.6 vs. 9.7 mm,  $p < 0.01$ ). In seven clinical cases the mean length and width of the flaps were 15.8 and 7 cm respectively and the pedicle was in average 6.9 cm long. All flaps survived with one partial necrosis needing surgical revision and secondary closure. Excellent functional results could be obtained in all patients.

**Conclusions**

This study proves the anatomical reliability of the SCIP flap and its use in a clinical series. It provides an alternative to radial forearm or ALT flap if a thin pliable fasciocutaneous flap is required. Our anatomical studies indicate that the deep branch based SCIP flaps cutaneous territory is reliable and easy to raise.

**17:34            COMPLICATIONS AND QUALITY OF LIFE  
IN HEAD AND NECK SURGERY**

*Outi KAARELA, Sanna Lahtinen, Petri Koivunen, Tero Ala-Kokko, Päivi LAurila, JAnne Liisanantti  
Oulu University Hospital, Oulu, FINLAND*

**Introduction:**

Postoperative complications are frequent after free flap surgery for cancer of the head and neck.

**Materials and Methods:**

Retrospectively 136 patients with free flap reconstruction for cancer of the head and neck were studied to evaluate complications, assess factors associated with them, and analyse their impact on outcome. Quality of life (QOL) in patients were assessed with and without postoperative complications. QOL evaluated using RAND-36, EORTC-C30 and H&N-35, and UW- QOL questionnaires.

**Results:**

A total of 86 (63%) patients had complications. Compared with those who did not, they had a higher rate of alcohol abuse ( $p=0.039$ ), longer operations ( $p < 0.001$ ), and greater intraoperative loss of blood ( $p = 0.042$ ). Complications were more common in patients who had fibular flaps and T4 disease ( $p = 0.010$ ;  $p = 0.015$ , respectively). Those who had complications also stayed in hospital longer (median (IQR) 9 (7–12) compared with 15 (10–21) days,  $p < 0.001$ ). Cumulative mortality was higher in patients with late complications (61% compared with 36%,  $p = 0.004$ ). Of 53 assessed patients, 29 (54.7%) had at least one complication. Those with medical complications ( $n = 12$ , 22.6%) had significantly lower QOL in all domains of RAND- 36 except emotional well-being. They also reported lower scores in EORTC-C30 domains of financial difficulties, pain, and insomnia and UW-QOL domains of pain, activity, and recreation. The QOL for patients without complications was comparable to the general population.

**Conclusions:**

In conclusion, complications in more than half the patients were related to alcohol abuse, a more complicated intraoperative course, and fibular flaps. Complications were associated with a longer hospital stay, and survival was higher in those who did not have late complications than in those who did. QOL after free flap surgery for cancer of the head and neck is reduced in patients with postoperative medical complications.

**17:46 THE SECOND HELSINKI BIMAXILLARY  
FULL FACE TRANSPLANT**

Patrik LASSUS, Andrew Lindford, Jyrki Vuola, Sinikka Suominen, Tuija Ylä-Kotola, Erkki Tukiainen, Hannu Kuokkanen  
Helsinki University Hospital, Helsinki, FINLAND

**Introduction**

We herein present our second face transplant which was done in Helsinki in March 2018. We will also present the 3 year follow-up data on our first face transplant performed in 2016.

**Materials & Methods**

The patient had suffered several years before a major ballistic facial injury. After several conventional operations, the patient had a midfacial collapse, poor quality maxilla and mandible, and he had severe intraoral scarring. The patient had problems with drooling, speaking, swallowing, breathing, and with lower lids. The patient was tracheostomized.

The face transplant included full face soft tissues, LeFort II maxilla, mandible angle-to-angle, anterior tongue and floor of the mouth muscles, and all oral mucosa.

**Results**

The patient had uneventful early recovery period. Tracheostomy was removed at 3 months. Motor recovery was first seen in the muscles innervated by hypoglossal nerve at 3 months and facial nerve at 4 months. At 8 months, the patient has gained lip occlusion, can move all his mimic muscles and has full sensory recovery.

The immunosuppression used has been induction with Thymoglobulin and Tacrolimus based triple therapy. The patient has not had any immunosuppression side effects. The postoperative surgical problems include lower lid ectropium, a fistula in the palatum, and mandibular displacement. There have been no signs of rejection. The patient has coped mentally well with the transplant.

**Conclusions**

We present here very promising preliminary results of our second face transplant patient who could not have been any more helped with conventional surgery. We have also experienced good and steady results on our first face transplant patient.

FRIDAY 24 MAY 2019

**Session 3**

**8:00-10:00**

***CRANIOFACIAL SURGERY***

*Moderators*

Alexander MARGULIS, Jerusalem, ISRAEL

Eric ARNAUD, Paris, FRANCE



**8:00 THE COMING OF AGE OF IMMERSIVE VIRTUAL REALITY SYSTEM (IVRS) FOR CRANIOMAXILLOFACIAL SURGERY**

*Lee Alkureishi, Pravin Patel, Jia Luo, Linping Zhao, Prashant Banerjee, Mimis Cohen  
University of Illinois, Chicago, USA*

**Introduction**

For nearly half-a-century, craniofacial surgery planning has primarily utilized 2-dimensional photographs and radiographs, relying on the surgeon's eye and experience to integrate these into a "virtual" 3-dimensional image. The introduction of CT and particularly 3D-reconstructed CT has greatly improved the ability to visualize deformities, but true surgical simulation remains elusive; in part due to inability to visualize the third dimension on 2D flat-screen displays. With recent developments in immersive virtual-reality, augmented-reality and haptic feedback, true 3D surgical simulation has become a viable option for presurgical planning.

**Materials and Methods**

The CBCT/CT data is imported from DICOM files into a volume comprising a grid of scalar values in 3D-space. To visualize volume data vividly and smoothly, a graphics processing unit (GPU) based technique is designed to render the volume on a head-mounted display with ultra-fine resolution and fast frame-rate. The volume-rendering technique can be based on either a specified transfer function, or rendered as a polygon mesh, defining the surface of interest. Changes made to rendered volumes are updated in real-time and reflected immediately on the 3D-rendering. Discrete anatomical structures can be identified and segmented from source CT/CBCT data, and each segmentation can be converted into a polygon mesh. Surgical planning is conducted based on these meshes.

**Results**

Since February 2018, we have utilized VR planning in 35 orthognathic, 11 craniofacial, 42 trauma cases. This presentation will discuss currently accessible technology for practicing surgeons through a series of cases studies for patients who required various components of cranio-maxillofacial surgery. This includes pre- and post-processing of diagnostic 3D surface and skeletal records; integrated orthodontic-surgical planning, 3D-software for orthodontic and skeletal manipulation, and translation from VR to 3D-printed models and guides.

**Conclusions**

We will introduce the use of immersive VR environment as a tool for resident training to patient-specific planning for practicing surgeons.

**8:08 EARLY SECONDARY ALVEOLAR CLEFT BONE GRAFTING : AIMS AND RESULTS**

Caroline Dissaux, Bruno Grollemund, Isabelle Kauffmann, Jean-François Mattern, Catherine Bruant-Rodier  
*STRASBOURG UNIVERSITY HOSPITAL, STRASBOURG, FRANCE*

**Introduction**

Although alveolar cleft bone grafting is the most widely accepted approach, controversies remain on the operative timing. The authors study early bone graft results at 5 years and explain the reasons of this choice.

**Materials and Methods**

A consecutive retrospective series of 28 patients who received alveolar bone grafting was examined and divided in 2 groups depending on the age at the time of bone graft. Group A (14 patients) was operated at a mean age of 5.2 years [range, 4 to 7] and Group B (14 patients) at a mean age of 10 years [range, 8.5 to 13].

All the children were assessed clinically and by Cone Beam Computed Tomography (CBCT) before bone grafting and 6 months post-operatively. Cleft and bone graft dimensions, volumes were assessed using Osirix v.3.9.2. Residual bone graft coefficient (Bone Graft Volume on 6-months Postoperative CBCT / Alveolar Cleft Volume) was calculated. Complications, tooth movement or dental agenesis were also reported. A new evaluation on Group A concerned maxillary growth 5 years later by a new CBCT, Profile teleradiography and casts. Results were compared with growth of children at the same age without cleft. Stability of the graft was also assessed by CBCT.

**Results**

The sample was uniform within both groups, considering cleft forms, pre-surgical fistulas rate and cleft volume.

Residual bone graft coefficient reached 63.3% in Group A and 46.2% in Group B ( $p=0.012$ ). Results of residual bone graft are also influenced by tooth eruption through the graft ( $p=0.007$  in Group A and  $p=0.02$  in Group B). Early bone grafting performed at 5 years did not impair maxillary growth and remained stable.

**Conclusions**

Secondary alveolar bone grafting performed at 5 years has a higher success rate and allow early dentofacial orthopedics. Restoring early anatomy and function stands as a major benefit for the child growth and integration.

**8:16 EFFECT OF HYPEREXTENSION OF THE HEAD ON CEREBRAL BLOOD OXYGENATION IN PATIENTS WHO UNDERWENT CLEFT PALATE SURGERY: PROSPECTIVE COHORT STUDY USING NEAR-INFRARED SPECTROSCOPY**

Corstiaan BREUGEM, Bram Smarius, Jurgen de Graaf  
*Wilhelmina Childrens Hospital , Amsterdam, THE NETHERLANDS*

**Introduction**

To facilitate the best approach during cleft palate surgery, children are positioned with their head in slight hyperextension . Extensive head extension may induce intraoperative cerebral ischaemia if collateral flow is insufficient. To evaluate and monitor the effect of cerebral blood flow on cerebral tissue oxygenation, near-infrared spectroscopy has proved to be a valuable method. The aim of this study was to evaluate and quantify whether this hyperextension of the head affects the cerebral tissue oxygenation in children during cleft palate surgery.

**Materials and Methods**

This prospective study included children (ASA I and II) under the age of 3 years old who underwent cleft palate repair at the Wilhelmina Children's Hospital, in the Netherlands. Data were collected for sex, date of birth, cleft type, date of cleft repair and physiological parameters (MAP, saturation, heart rate, expiratory CO<sub>2</sub> and O<sub>2</sub>, temperature and cerebral blood oxygenation) during surgery. The cerebral blood oxygenation was measured with NIRS.

**Results**

A total of 34 children were included for cleft palate surgery during this study. The majority of the population was male (61.8%, n= 21). The mixed model analyses showed a significant drop at time of hyperextension of -4.25 (69-74 95% CI; p < 0.001) and -4.39 (69- 74 95% CI; p <0.001). Postoperatively, none of the children displayed any neurological disturbance.

**Conclusions**

This study suggests that hyperextension of the head during cleft palate surgery in children leads to a significant decrease in cerebral oxygenation. Severe cerebral desaturation events during surgery were uncommon and do not seem to be of clinical relevance in ASA I and II children.

**8:28 EARLY POSTOPERATIVE COMPLICATION IN PRIMARY CLEFT LIP AND PALATE**

Isik CEMIL, nuh evin, osman akdağ, zekeriya tosun  
*Selcuk Universty, Konya, TURKEY*

**Introduction**

Cleft lip and palate (CLP) surgery involve risks of anesthesia beside surgical complications because of its application in the pediatric period. Although most early complications are related to anesthesia and intubation, early diagnosis and treatment of these complications are important for plastic surgery practice.

**Materials and Methods**

Between 2012 and 2017, total of 328 operations were retrospectively reviewed in 271 primary cases where first surgery was performed due to CLP. 52 cases with complications and ages between 4 months and 70 month were identified within 3 days after the operation. Early complications were classified as hyperthermia, airway mechanical destruction, respiratory tract infection, localized circulation defect / dehiscence, bleeding. It was determined whether there was a relationship between these complications and anesthesia durations, operative patterns, and deformity patterns. All patients were divided into 2 groups with anesthesia duration of more than 180 minutes or less than 180 minutes. Primary palate repair were examined in 4 groups according to the operation procedures; V-Y pushback, Two flap phalatooplasty, Von langenbeck and others. Primer lip repair patients were divided into tenisson, millard, lip adhesion, cutting, and others to determine the complication rate. Chi-square test was used to investigate the relationship between these complications and anesthesia durations, operative patterns and deformity patterns.

**Results**

Mortality was not seen. Only 29 of 328 operations developed serious early complications. The rate of respiratory tract infection that requires treatment is 8.84%, which is compatible with the literature. It was observed that the complications were concentrated especially in cases that longer than 180 minutes. There was no relationship between early complication rates and deformity or surgical procedures.

**Conclusions**

Early complications in primary CLP repair are not related to direct surgery but are usually related to anesthesia. Experienced surgical team of CLP operated with of appropriate equipment and administration reduce the complications in central hospitals.

**8:36 PIERRE ROBIN SEQUENCE: INCIDENCE OF SPEECH-CORRECTING SURGERIES AND FISTULA FORMATION**

Charlotta GUSTAFSSON, Pia Vuola, unnu Leikola, Arja Heliövaara  
*Helsinki University Hospital, Helsinki, FINLAND*

**Introduction**

Velopharyngeal insufficiency (VPI) is common in children with corrected cleft palate. Pierre Robin sequence (PRS) is a rare condition in infants, comprising micrognathia, glossoptosis, and airway obstruction. It is often associated with a wide cleft palate. The study's purpose was to determine the long-term incidence of speech-correcting surgeries (SCS) and fistula rates in PRS after primary palatoplasty and the differences between affecting factors.

**Materials and Methods**

A retrospective single-center, observational chart review study. The cohort comprised 78 non-syndromic children with PRS (48 female) born between 1990 and 2009 and treated at a single center. Affecting factors compared included gender, surgeon, age at primary palatoplasty, surgical technique, airway obstruction in infancy, and cleft severity. The outcome was analyzed at age 8 years and at data retrieval.

**Results**

SCS were performed to 34 children (43.6%) by age 8, 6 (7.7%) of the 19 (24.4%) post-operative fistulas underwent closure. By data retrieval, 37 children (47.4%) had undergone SCS and 8 (10.3%) had a fistula closure. Median age at SCS was 6 years and at follow-up 14 years. The results showed no significant association for gender, surgeon, age at primary palatoplasty, surgical technique, cleft severity, or airway obstruction in infancy regarding incidence of SCS, fistulas, or repaired fistulas.

**Conclusions**

PRS in children is associated with a high incidence of SCS and fistula formation, which necessitates accurate clinical follow-up and observation of speech development. The development of VPI in PRS is complex and challenging to estimate at the time of primary surgery.

**8:48 LONG-TERM QUALITY OF LIFE AND COMPLICATIONS  
IN SYNDROMIC CRANIOSYNOSTOSIS**

Yoshiaki SAKAMOTO, Tomoru Miwa, Toshiki Takenouchi, Yuri Sakaguchi,  
Kazuo Kishi  
*Keio University School of Medicine, Tokyo, JAPAN*

**Introduction**

Although studies have analyzed long-term stability of cranioplasty and midface distraction in craniosynostosis, none have investigated long-term quality of life and complications in adults with syndromic craniosynostosis. The purpose of this study was to investigate the long-term quality of life in adult syndromic craniosynostosis.

**Materials and Methods**

This study included syndromic craniosynostosis patients, including those with Crouzon syndrome, Apert syndrome, and Pfeiffer syndrome. All patients had undergone cranioplasty and midface advancement and were over 20 years of age. We investigated inconveniences in daily life and current treatment, as well as marital status and whether the patient had offspring.

**Results**

Nine patients had Crouzon syndrome, 5 had Apert syndrome, and 4 had Pfeiffer syndrome. The patients were aged 22-48 years (mean  $31.4 \pm 9.2$  years). One patient with Crouzon syndrome was married and had a child. Four patients with Crouzon syndrome had a coronary artery disorder. In Apert syndrome, 2 cases had visual field contraction. One case with Pfeiffer syndrome had cataract. No dental problems were observed in any cases.

**Conclusions**

Only 1 patient was married, representing a small proportion, considering the average marriage age in Japan. Significantly, the high rate of orbital problems caused inconvenience in all cases. Even after completion of treatment, the importance of ophthalmological follow-up was suggested.

**8:56                    COMPARISON OF BLACK-BONE MRI AND 3D-CT IN  
THE PREOPERATIVE EVALUATION OF PATIENTS WITH  
CRANIOSYNOSTOSIS**

Anne SAARIKKO, Linda Kuusela, Atte Karppinen, Junnu Leikola, Pekka Virtanen, Nina Brandstack

*Helsinki University Hospital, Helsinki, FINLAND*

**Introduction**

Children are more sensitive to ionizing radiation than adults. Thus, whenever available, a non-ionizing imaging modality should be the imaging method of choice. Black-Bone (BB) magnetic resonance imaging (MRI) is a non-ionizing imaging method and a recent alternative to computed tomography (CT) in the examination of cranial deformities. The purpose of this study was to compare BB-MRI and routine 3D-CT in the preoperative evaluation of patients with craniosynostosis.

**Materials and Methods**

We have previously routinely performed preoperative CT of the skull and MRI of the brain for many patients with clinical suspicion of craniosynostosis. We recently changed our MRI protocol into one that includes sequences for evaluation of both brain anatomy and skull bone and sutures by BB-MRI. A semi-automatic skull segmentation algorithm was developed to facilitate the visualization. In nine patients with clinical craniosynostosis, both BB-MRI and 3D-CT were performed and the images were evaluated by two craniofacial surgeons, one pediatric neurosurgeon, and two neuroradiologists.

**Results**

We obtained informative 3D images using BB-MRI. Six (6/9, 66%) patients had scaphocephaly, 1 (1/9, 11%) patient had unicoronal synostosis, and 2 (2/9, 22%) patients had lambdoid synostosis. Affected synostotic sutures could be identified both by BB-MRI and 3D-CT in all patients. Intrarater and interrater reliability for rating the calvarial sutures was high. On the other hand, the reliability for rating the intracranial impressions was low by the both imaging methods.

**Conclusions**

Preoperative findings and diagnostic assessment on BB-MRI were consistent with findings on the 3D-CT in 9 patients with single suture synostosis. BB-MRI not only provides information on cranial sutures and intracranial impressions but also on brain structure in one imaging session. This method can replace ionizing radiation-based methods in analyzing skull deformities.



**9:08                    ORTHOGNATHIC SURGERY IN THE DIGITAL AGE:  
LESSONS LEARNED IN THE EVOLUTION OF VECTOR-  
GUIDED 3D PRINTED TITANIUM FIXATION SYSTEM**

Patel PRAVIN, Linping Zhao, Ronald Jacobson, Andy Christensen  
*University of Illinois, Chicago, USA*

**Introduction**

While advances in orthognathic surgery (OGS) focused on surgical planning, we became interested in the fixation system that we ultimately rely on to achieve the desired outcome. Perhaps not as exciting but the mundane work of engineering is of necessity. Conventional plate/screw fixation has relied on generic patterns of 'off-the-shelf' systems. The plates are adapted in-situ, and neither the geometry of the osteotomy nor the functional loads are included in the design. A decade ago, we developed an electron-beam melting plate designed integral to virtual planning and patient occlusal biomechanics, the 'smart-plate'. We review our experience with vector guided 3D printed titanium fixation system.

**Materials and Methods**

Records of a consecutive series of 100 OGS patients using 3D printed titanium plates were reviewed: images, dental records, CBCT scans at defined intervals. Outcome measures included operative time, skeletal and occlusal stability and complications. This group was compared to a consecutive sequence of 100 OGS patients with conventional plate fixation as a historical control. Follow-up: 3years-10years.

**Results**

Displacement at 1 year at the osteotomy ranged by 0.2 to 1.8mm in comparison to the VSP prediction, was less in the 3D printed plates compared to the control. The occlusal PAR Index varied from 6.8 to 14. The LeFort I operative time was reduced from 128 minutes to 72 minutes (mean) and was statistically significant. In contrast with mandibular BSSO procedure the operative time increased by 23 minutes. Predictive outcome was greater when using 3D printed vector-guided positional fixation system in facial asymmetry cases when compared to conventional approach. Further details to be presented.

**Conclusions**

There was a significant reduction in the operative time, less displacement at the osteotomy level, increased skeletal stability and predictive outcome in complex facial asymmetry cases in comparison to the conventional fixation system.

## 9:20 IMPROVEMENT OF SLEEP APNEA BY FRONTOFACIAL MONOBLOC IN FACIOCRANIOSYNOSTOTIC CHILDREN

Eric ARNAUD, Hossein Khonsari, Sam Haber, Junnu Leikola, Quentin Hennoq, Marie Paule Morisseau Durand, Brigitte Fauroux, Valerie Cormier-Daire, Philippe Meyer  
*Hopital Necker, Paris, FRANCE*

### Introduction

Faciocraniosynostosis (FCS) induces frequently sleep-apnea syndromes among other functional issues. Long-term effectiveness of Frontofacial Monobloc Advancement (FFMBA) on sleep apnea was analyzed.

### Materials and Methods

This is a monocentric prospective cohort study on 108 kids with FCS treated by FFMBA with 4 internal distractors and with a 5 months consolidation time. The primary outcome was achieving a normal Apnea Hypopnea Index (AHI) (less than 5/hour) on polysomnography (PSG) without additional surgery. Age at operation was  $47.7 \pm 36.6$  months. Mean follow-up was  $56.5 \pm 48.6$  months. Statistics were carried out with SPSS.

### Results

Sixty-nine children out of 108 (63.9%) achieved at least 50% improvement in AHI. Among them 39 (36.1%) normalized their AHI without additional surgery in  $28.3 \pm 28.3$  months while 16 others (14.8%) did so after additional surgery (ENT). 10 patients (9.3%) eventually relapsed in  $22.0 \pm 14.0$  months. Previous turbinectomy and tonsillectomy were associated with a better response rate, a faster response, a longer period before relapse, and less need for additional surgery ( $p < 0.05$ ). FGFR2 mutation, and previous posterior or lateral decompression or Ronnier H technique were all associated with less relapse, while previous fronto-orbital or facial advancement were associated with more relapse. Higher AHI at baseline was associated with secondary facial advancement (21 children, 19.4%). Age at operation was not significantly associated with treatment response and relapse. However, young age was associated with previous tracheotomy, higher AHI at baseline, Pfeiffer syndrome, use of transfacial Kirschner wires with external traction, and absence of previous turbinectomy and tonsillectomy, corresponding to greater severity.

### Conclusions

FFMBA is an effective procedure to correct or minimize OSAS in FCS. Turbinectomy, tonsillectomy and cranial vault expansion are indicated before FFMBA. Previous FOA or Lefort 3 before FFMBA are associated with earlier relapse.

**9:32            FORCE MEASUREMENTS DURING POSTERIOR CALVARIAL  
VAULT OSTEODISTRACTION: FUTURE ASPECTS IN  
CRANIOFACIAL OSTEODISTRACTION**

Mikko SAVOLAINEN, Antti Ritvanen, Daniel Nowinski, Daniel Saiepour, Erkki Tukiainen, Mervi Paulasto-Kröckel, Junnu Leikola  
*University of Eastern Finland, Helsinki, FINLAND*

**Introduction**

Ostedistraktion has become increasingly popular in the correction of craniosynostosis and other craniofacial congenital malformations in recent years. The main advantages of posterior calvarial vault osteodistraktion (PCVO) when compared with one-stage calvarial vault reconstruction includes shorter operation with lower risks. However, mechanical complications such as distractor breakage or footplate loosening are frequently reported.

To simultaneously reach bone advancement and bone regeneration, daily distraction distance from 0.5 mm to 2 mm is commonly used. Faster distraction protocols are suggested to reduce complications. Distraction protocols producing higher forces can increase complications. Biomechanical environment in craniofacial region is poorly understood. There is an urgent need to understand these forces, in order to improve distraction protocols and devices.

**Materials and Methods**

We developed a non-invasive force measurement method that can be used on craniofacial distraction devices. The torque required to turn the distractor arm was measured by digital screwdriver. By characterising the distractor performance in laboratory setting, we could establish the torque-force relationship. We measured forces for four syndromic craniosynostosis patients during PCVO.

**Results**

We present preliminary data about forces developed during PCVO. We observed a step wise force increase between the distraction sessions and linear trend between the force increase and the distraction distance. The mean maximum pre-distraction and end distraction force for one distractor was 20.4 N (Range 4.7 N to 37.5 N) and 57.6 N (Range 40.9 to 73.5 N), respectively. The distraction force relaxed rapidly shortly after every distraction sessions.

**Conclusions**

The observed forces were higher than expected that can explain mechanical complications. The data suggests that current treatment protocols might be re-evaluated to favor shorter distaction distances and more frequent distraction sessions. We have second phase study going on where forces are also measured in midface and mandibular Osteodistraktion. The target is to find optimal distraction protocols for different craniofacial regions.

**9:40            ADDITIONAL SQUAMOSAL SUTURE SYNOSTOSIS  
AND SEGMENTED INTRACRANIAL VOLUME IN  
PATIENTS WITH NON-SYNDROMIC SAGITTAL  
SYNOSTOSIS**

Junnu LEIKOLA, Arja Heliövaara, Mika Koivikko, Virve Koljonen  
*Helsinki University Hospital, Helsinki, FINLAND*

**Introduction**

Squamosal suture is a minor lateral skull suture separating the parietal and squamous temporal bones. Recently the squamosal suture synostosis (SQS) has gained growing research and clinical interest . SQS is more common in patients with syndromic and complex craniosynostosis, increasing with increasing age. When present with a single major suture fusion, SQS has been most commonly associated with non-syndromic coronal synostosis. The aim of this study was to evaluate the incidence of SQS in children with non-syndromic sagittal synostosis. We also evaluated whether the additional squamosal suture synostosis affects the intracranial volume.

**Materials and Methods**

The study protocol was approved by Helsinki University Hospital. 34 non-syndromic sagittal synostosis patients with operated non-syndromic isolated sagittal synostosis were evaluated, 23 (68%) boys and 11 (32%) girls. Mean age at the pre-operative imaging was 0.48 (range 0.13-1.3) years. The pre-operative 64-slice scanner CT images were reviewed by experienced radiologist focusing specifically on squamosal sutures. The laterality of squamosal suture synostosis and the length of the synostosis was also recorded. Preoperative segmented intracranial volumes were calculated.

**Results**

Sagittal synostosis was combined with SQS in 4 children (11.7%). Additional SQS did not affect the ICV,  $p=0.285$ . The mean ICV in children without SQS was 907.80 cm<sup>3</sup> (SD 28.09), and the mean of those with SQS 832 cm<sup>3</sup> (SD 50.45). All synostoses were unilateral, two were located on the right and two on the left side. Lengths of the synostoses varied from 4 to 27 mm. Children with SQS had shorter sagittal suture synostosis length ratio than those without SQS,  $p=0.031$ . Patients with SQS were slightly younger (0.34 years, SD 0.11) than those without SQS (0.5 years, SD 0.05), but the difference was not significant ( $p=0.285$ ).

**Conclusions**

The incidence of SQS in nonsyndromic sagittal synostosis was 11.7 % but SQS did not affect the ICV.

**9:48                    LONG-TERM FOLLOW-UP OF REPAIR OF  
MICROTIA USING CULTURED AUTOLOGOUS HUMAN  
AURICULAR CHONDROCYTES**

Keisuke IMAI, Daisuke Sakahara, Takuya Fujimoto, Akira Yamada, Hiroko Yanaga

*Osaka City General Hospital, Osaka, JAPAN*

**Introduction**

The repair of microtia requires a large volume of reconstructive material. Therefore, the impact of surgical invasion and donor-site morbidity can be particularly severe in pediatric patients, and the collectable volume of autologous cartilage is limited. Since 2000, the authors have developed a new treatment method with cultured autologous human auricular chondrocytes that provides a sufficiently large volume of reconstructive material.

**Materials and Methods**

Approximately 1 cm<sup>2</sup> of auricular cartilage was collected from the auricular cartilage of the affected side. Isolated chondrocytes were cultured with autologous serum that accelerates cell proliferation. The cells were subcultured and formed a gel-form mass. In our two-stage implantation, the cultured chondrocytes are injection-implanted into the lower abdomen of the patient, where the cells grow into a large, newly generated cartilage with neoperichondrium in 6 months. This cartilage is harvested surgically, sculptured into an ear framework, and implanted subcutaneously into the position of the new ear. Absorption of cultured chondrocytes, complications, and clinical outcomes were assessed in long-term follow-up.

**Results**

Eight patients with microtia underwent surgery using cultured autologous auricular chondrocytes from 2002 to 2008. Ages of the patients ranged between 6 and 10 years. Follow-up period was ranging from 10 to 16 years. No patient experienced absorption of cultured chondrocytes after the second stage. Biopsy of the newly formed tissues showed that it was an elastic cartilage derived from the original tissue. Complications included 1 absorption and 1 allergic reaction at the first stage.

**Conclusions**

A small number of chondrocytes obtained from a 1-cm<sup>2</sup> auricular cartilage are successfully cultured into a large number of cells in a gel form. The authors' patients are the first successful cases of regenerative surgery for microtia using cultured chondrocytes. The benefits of the technique include minimal surgical invasion, lower donor-site morbidity, lessened chance of immunologic rejection, and implantation stability. No major complication occurred.

**10:32      AAPS Best Paper 2018**  
**COMPLICATION OF HAND TRANSPLANTATION: THE**  
**JOHNS HOPKINS - PITTSBURGH EXPERIENCE**

W. P. Andrew Lee, Jaimie T. Shores, Carisa M. Cooney, Stefan Schneeberger, Joseph E. Losee, Gerald Brandacher, Dallas, USA

**Introduction**

Since 1998, about 120 hand transplants have been performed worldwide. However, few systematic reports regarding complications exist. As hand transplant experiences accumulate, we report complications from our patient series in order to help inform future practice.

**Materials & Methods**

Following IRB approval, eligible candidates were transplanted using an immunomodulatory protocol involving donor bone marrow cell infusion, enabling minimum immunosuppression with tacrolimus monotherapy.

**Results**

Since 2009, 13 hand/arm transplants have been performed in 8 patients, including 5 bilateral transplants, at Johns Hopkins and University of Pittsburgh. Good-to-excellent function was achieved in all but one recipient. Infrequent rejection episodes were treated with topical clobetasol, tacrolimus dose adjustment, and/or IV solumedrol. Complications included:

- Intraoperative coagulopathy (n=2 patients) with significant bleeding
- Limited skin flap necrosis (n=3) requiring wound care and/or skin graft
- Bony nonunion (n=2) requiring revision
- Delayed DVT (n=2) requiring temporary systemic anticoagulation
- Systemic inflammation (n=4) leading to skin rejection episodes from thermal burn, cellulitis, appendicitis, periprosthetic forearm fracture
- Poor hand function (n=1) with poor therapy engagement
- Transient creatinine rise (n=4) which generally returned to normal range after tacrolimus adjustment. One recipient developed stage 3B chronic kidney disease.
- Non-compliance with medical regimen (n=2) following attainment of excellent function, resulting in allograft rejection and eventual explantation

**Conclusions**

Hand transplantation has restored motor/sensory function and body image in ways not achievable with prosthetics, leading to autonomous and productive lives in compliant patients. Recipients maintained on tacrolimus monotherapy encountered few adverse effects except one patient who developed stage 3B chronic kidney disease. This experience has focused efforts on pre-transplant psychosocial screening to select patients most likely to comply with medical regimen and hand therapy

**Session 4**

**10:42-12:38**

***UPPER & LOWER EXTREMITIES***

*Moderators*

Efstathios LYKOUDIS, Ioannina, GREECE

Erkki TUKIANEN, Helsinki, FINLAND



**10:42      DISTAL BRACHIAL ARTERY PERFORATOR (DBAP) FLAP:  
A NEW CHIMERIC OPTION FOR COMPLEX DEFECTS OF  
HAND AND DIGITS**

Pietro Di Summa, Thomas Reekie, David Leonard, Stefano Cotrufo, Jorg Dabernig, John Shaw Dunn, Andrew Hart

*Centre Hospitalier Universitaire Vaudois (CHUV), Lausanne, SWITZERLAND*

**Introduction**

Digital soft tissue reconstruction requires thin skin flaps to optimise functional outcome. Supermicrosurgery enables anastomosis within the digit. This report presents a novel distal brachial artery perforator (DBAp) free flap suitable for supermicrosurgical reconstruction of bone and soft tissue defects. Based upon the distal perforator of the brachial artery, it overlies the medial epicondyle.

**Materials and Methods**

Preclinical study: cadaveric dissection (N=5) plus high-frequency Doppler ultrasound study (N=20 volunteers, median age 38, range 25-51; 11 male & 9 female). Perforator locations and dimensions quantified.

Clinical proof of concept: finger reconstruction case series (N=3; 2 males, 1 female; median age 48, range 28-77) using free DBAP flaps for dorsal reconstruction after previous ring avulsion injury (revisionary tendon surgery), squamous cell carcinoma excision (arsenic poisoning), and for osseoplastic reconstruction after previous oblique amputation injury with preserved pulp.

**Results**

Preclinical: perforators (median 4) reliably arose from the posterior ulnar recurrent artery or descending ulnar collateral of the brachial artery, the largest lying in the proximo-medial quadrant.

Clinical: Pencil Doppler perforator localization on the ipsilateral limb then flaps (median area 31cm<sup>2</sup>, range 28-34cm<sup>2</sup>) were then raised in Scarpa's layer. Perforator arborisation (2-3 entering the dermal plexus) defined before proximal freestyle perforator dissection (pedicle: 1 artery, 1 vena comitans, 1 basilic vein tributary) and further thinning. In one case a chimeric bone flap of medial epicondyle was taken on a direct osseous branch. Anastomoses were within the dorsal hand (N=1; complicated by venous thrombosis requiring re-operation) or digit (N=2, no complication).

Mean follow-up 46 months. Radiological consolidation of the reconstructed phalanx was confirmed.

**Conclusions**

The DBAp flap provides pliable skin +/- vascularized bone from a well-hidden donor site with a pedicle suitable for supermicrosurgery. It is an additional free flap option for complex digital reconstruction, or propeller flap option in the elbow region.

**10:50      DIGIT RECONSTRUCTION WITH THIN PROXIMAL  
ULNAR PERFORATOR FREE FLAP - A FOUR CASE  
REPORT**

Tommaso Baroni, Mario Cherubino, Martina Corno, Davide Sallam, Luigi Valdatta

*University of Insubria, Varese, ITALY*

**Introduction**

*Hand trauma and tumor resections may create fingers degloving injuries leading to extensive and circumferential soft tissue defects that require a complex surgical management in terms of both skin coverage and functional outcomes. For this purpose several local or locoregional flaps have been advocated in literature. Although, good reconstructive results can be obtained by transferring soft tissue from the toes as well. Free tissue transfers are ordinarily indicated in case of major finger defects. Proximal ulnar perforator free flap represents a valid reconstructive option since it allows to avoid the most common drawbacks deriving from the use of the average free flaps.*

**Case Report**

*Methods: The authors report two different cases of patients showing extensive digit soft tissue defects and underlying exposed structures covered with pliable, sensitive and similar texture-matching skin harvested from the proximal volar forearm based on the proximal ulnar perforator. Case 1 was a squamous cell carcinoma of the thumb that required circumferential resection of the soft tissue of the distal phalanx and the interphalangeal joint. Case 2 was a partial fifth finger defect followed by avulsion trauma.*

*Results: In both cases, after a minimum follow-up of 16 months, no vascular complications, wound dehiscences or infections were observed. No cold intolerance was reported and partial fine tactile sensibility was obtained. The patients showed good mobility and no impairment in daily-life activities. The overall cosmetic result was satisfying.*

**Conclusions**

*Ulnar artery perforator free flap should be considered as a potentially superior alternative in digit reconstructive surgery. It can be harvested under single brachial plexus block, providing satisfactory functional and aesthetic results. Even though established microsurgical skills are required, the high reliability of its vascular anatomy and the low rate of neurovascular bundle injury during dissection make this flap feasible for the most hand surgeons.*

**10:58            ULNAR PARAMETACARPAL FLAP: PROPELLAR FLAP  
CONCEPT**

Ahmed Gad, Ahmed Hweidi  
*Plastic Surgery Department, Cairo, EGYPT*

**Introduction**

Defects of the little finger and adjacent areas are not uncommon. It could be a traumatic, post-burn or after contracture release. Different options could be used for resurfacing these defect, including skin grafts, local or regional flaps. Ulnar para-metacarpal flap described by Bakhach in 1995 based on the distal division of dorsal branch of ulnar artery considered a good option for that. In this work, we applied the concept of propeller flap for better mobilization and in-setting of the ulnar para-metacarpal flap.

**Materials and Methods**

The study included 15 cases with 4 females and 11 male patients. 10 of the patients had severe post-burn contractures of the little finger, and 5 had a post-traumatic little finger defect. Contractures were released and resulting soft tissue defects were reconstructed with propeller ulnar para-metacarpal artery flap. The flap based on two main perforators communicating with the palmar system, it was raised based on one of them depending on the extent of the defect and rotated 180 degrees after judicious dissection of the perforator.

**Results**

13 flaps survived completely, one of the cases developed partial skin loss, which healed by dressing, another flap was completely lost and covered later by a full thickness skin graft.

**Conclusions**

The ulnar para-metacarpal flap is a reliable option to resurface the little finger as well as adjacent areas. The application of the propeller flap concept based on whether the proximal or distal communicating branch makes the rotation and in-setting of the flap easier.

**11:06 THIN AND SUPER-THIN PERFORATOR FLAPS  
DIRECT ELEVATION BY PREOPERATIVE ULTRA-HIGH  
FREQUENCY ULTRASOUND PLANNING: INSIGHTS ON  
MICROVASCULAR ANATOMY**

Giuseppe Visconti, Akitatsu Hayashi, Alessandro Bianchi, Marzia Salgarello  
*Università Cattolica del Sacro Cuore, Rome, ITALY*

**Introduction**

The ability of direct harvesting thin perforator flaps without jeopardizing their vascularity depends also on knowledge of microsurgical vascular anatomy within subcutaneous tissue up to the dermis for each perforator. The aim of this work is to report our experience with ultra-high frequency ultrasound (UHF-US) in the preoperative planning of thin and super-thin flaps.

**Materials and Methods**

Between May 2017 and September 2018, perforators of 14 flap donor sites of 7 patients were preoperatively evaluated by both US using a 18 Mhz linear probe (Esaote My Lab 50 X-Vision, Genoa-Italy) and UHF-US (VevoMD, Fujifilm Visualsonics, Toronto-Canada) using 48 Mhz and 70 Mhz linear probes in color-doppler and B-mode. In 2 cases direct thin free flap (2 SCIP) and in 5 cases direct superthin free flaps (4 SCIP and 1 ALT) were raised for reconstruction of head&neck oncologic defects and lower limb traumatic defects. Intraoperative indocyanine green angiography was used to confirm flaps viability before transfer.

**Results**

Mean flap size was 6.5x15cm (ranging from 5x8 to 7.5x23 cm). All flaps were based on single superficial fascia (superthin) / Scarpa fascia (thin) perforator with a mean calibre of 0.7mm (ranging from 0.5 to 1.1 mm). Perforators were classified into 2 types according to their microvascular course within subcutaneous tissue till dermis. No complications were experienced and all flaps survived entirely. We found a 100% agreement between preoperative UHF-US and intraoperative findings relatively to perforator location, diameter and course. The reconstructive outcomes were satisfactory both for the surgeon and patients.

**Conclusions**

UHF-US was found advantageous in preoperative planning of thin and superthin free flaps as it allowed to precisely anticipate very superficial microvascular anatomy, aiding in perforator selection according to the intended superficial fascia layer of flap elevation. UHF-US may represent the next frontier in thin, superthin and pure skin perforator flap planning.

**11:14 FASCIA IS NOT REQUIRED FOR LOWER LIMB FASCIOCUTANEOUS FLAPS - A PROOF OF PRINCIPLE STUDY**

Andrew Hart, Elisabeth Zetlitz, Marie Kearns, Jorg Dabernig, John Scott  
*Canniesburn Plastic Surgery Unit, Glasgow Royal Infirmary, Glasgow, UNITED KINGDOM*

**Introduction**

Fasciocutaneous flaps retain indication for small-moderate defects, or when free flaps are contraindicated. Since Ponten's seminal paper, deep fascia has been considered vital for flap viability, conflicting with central perforator paradigm tenets and clinical evidence on thin flap safety at all other anatomical sites. Raising local flaps from the leg without fascia was therefore investigated.

**Materials and Methods**

Cadaveric: Suprafascial dissection of formalin fixed cadaveric lower limbs (n=22, caucasian) and selective cannulation of perforating arteries >0.5mm diameter. Latex injection and Spaltehotz clearance visualised the intra-flap vascular anatomy. India Ink injection enabled perforasomal territory estimation. Clinical proof of principle: reconstruction of oncological / trauma wounds (including open fractures and limb salvage cases unsuitable for free flaps) using local, islanded, adipocutaneous propeller / rotation / V-Y flaps (n=28) raised suprafascially, +/- thinning, assessed translational validity.

**Results**

Cadaveric: 231 perforators in 39 lower limbs suitable for clinical use. Mean 10 x 10cm perfusion territory. Perforator anatomy within deep and superficial fat, and sub-dermal plexus equivalent to other perforator flaps (ALT, etc.).

Clinical: 27 patients (24-86 years) underwent reconstruction of oncological / trauma wounds using local, islanded, adipocutaneous flaps raised above fascia (including limb salvage cases poorly suitable for free flaps). No complete flap failure occurred. Venous congestion (N=3) responded to elevation or leeching. Limited surgical debridement was performed in 4 cases. Partial failure requiring a second local flap arose in one case after neoadjuvant radiotherapy and highly unusual post-operative events. Donor site management was simplified and outcome enhanced. Delayed wound healing at skin grafted donor sites rare (n=2). Reconstruction goals achieved in all.

**Conclusions**

Small-moderate sized skin flaps in the leg do not require fascia for viability. Suprafascial flap dissection enables preservation of major veins and sensory nerves, while improving donor-site morbidity. Flaps can be thinned primarily, improving their reach and reconstructive characteristics. Safety and indications are discussed.

**11:22**      **COMPARATIVE EFFECTIVENESS ANALYSIS OF  
COMPLEX LOWER EXTREMITY RECONSTRUCTION:  
OUTCOMES AND COSTS FOR BIOLOGIC-BASED,  
LOCAL TISSUE REARRANGEMENT, AND FREE FLAP  
RECONSTRUCTION**

Geoffrey Kozak, Jesse Hsu, Robyn Broach, Catherine Calvert, JT Stranix,  
Sameer Shakir, Charles Messa, Stephen Kovach, John  
Fischer

University of Pennsylvania, Philadelphia, USA

**Introduction**

Various surgical techniques exist for lower extremity (LE) reconstruction, but limited high-quality data exist to inform treatment strategies and patient counseling. We aim to evaluate the effectiveness and cost of three common surgical reconstructive modalities for LE defects using a multi-institutional, longitudinal dataset and rigorous matching approach.

**Materials and Methods**

All adult patients with LE wounds who underwent biologic wound matrix (BWM), local tissue rearrangements (LTR), or free flap (FF) reconstruction were reviewed (2010-2017). Cardinality Matching balanced cohorts' comorbidities and wound characteristics. Success for BWM was defined as providing an adequate wound bed for Split-Thickness-Skin-Grafting, whereas, success for LTR and FF was defined as not needing an additional coverage procedure. Using conditional logistic regression models, simulations were performed to determine success of treatment in specific clinical scenarios.

**Results**

A total of 501 subjects (166 BWM, 190 LTR, and 145 FFs) were evaluated. Median wound size for BWM, LTR, and FF are as follows: 29.5, 30.0 and 120.0 cm<sup>2</sup> ( $p < 0.0001$ ), respectively. Matched subjects ( $n = 309$ ; 103/group) were analyzed. Median length of stay was 9 days longer for FF ( $p < 0.0001$ ). Reconstruction success at 180 days for BWM, LTR, and FF was 65.0%, 92.2%, and 93.2% and total costs per subject were \$26,018, \$35,323, and \$52,979, respectively. Readmissions (OR=0.29, 95% CL 0.19-0.46) and reoperations (OR=0.45, 95% CL 0.32-0.64) were significantly lower for LTR. Predicted probabilities for success demonstrated that LTR, if achievable, provides great success at low cost. FF was most effective with large, traumatic wounds but at higher costs and longer length of stay. BWM was least effective but successfully treated older, obese patients with atraumatic wounds.

**Conclusions**

LE reconstruction can be effectively performed using multiple modalities with varying degrees of success and costs in different clinical scenarios. After matching for confounding variables, we demonstrate that LTR and FF were more successful than BWM-based reconstruction, although more expensive.

**11:34      PUSHING THE LIMITS; A REPORT ON FUNCTIONAL LIMB SALVAGE OF THE LOWER EXTREMITY IN A METASTATIC LEFT THIGH SYNOVIAL SARCOMA AFTER A PROXIMAL FEMORAL MODULAR ONCOLOGY HEMIARTHROPLASTY AND CADAVERIC NERVE GRAFT**

Hamidian Jahromi Alireza, Amie Miller, Michael Neel, Petros Konofaos  
*UTHSC Memphis Plastic Surgery Department, Memphis, USA*

**Introduction**

Successful, midterm functional limb salvage of the lower extremity in a case with a large size sarcoma involving proximal femur, with neural and arterial involvement using a long cadaveric nerve graft along with femoral hemiarthroplasty has not been reported.

**Case Report**

A 17-year-old female was found to have a metastatic (lung) high-grade left thigh synovial sarcoma when initially presenting with left thigh pain and a groin mass. Initial MRI showed a 13.9x10.6x7.5 cm proximal left thigh mass as well as multiple right upper lobe small pulmonary metastasis. She subsequently underwent wedge resection and biopsy of pulmonary metastasis followed by chemoradiation. One month later, we proceeded with an en-bloc resection of the left thigh mass (anterior thigh muscles) as well as the femoral head. Left femoral nerve had segmental resection and reconstruction using a 14 cm cadaveric nerve graft. Her profunda femoris artery was involved and ligated and the tumor was dissected off the common femoral artery, vein and superficial femoral artery. Her femoral head and proximal femur were reconstructed (proximal femoral modular oncology hemiarthroplasty). To fill a large defect in her anterior thigh a left pedicled vertical rectus abdominis myocutaneous (VRAM) flap was tunneled into the thigh. Superficial partial dehiscence of the left groin wound and the abdominal wound was managed with delayed primary closure and a split thickness skin graft (STSG) to the thigh wound. She underwent multiple cycles of chemotherapy post operatively. One year after her thigh surgery, she is pain free with good functional gain and modified independent mobility with crutches, with only mild thigh weakness.

**Conclusions**

Successful functional lower limb salvage/reconstruction with the use of long cadaveric nerve graft, muscular flap and hemiarthroplasty in the setting of large extremity sarcoma with the presence of bone, muscle, artery and major nerve involvement can be done.

**11:42      A SYSTEMATIC REVIEW AND META-ANALYSIS  
OF ULCERATION AFTER MICROSURGICAL  
RECONSTRUCTION OF THE WEIGHT- BEARING FOOT**

Oren Lapid, Pieter Zwanenburg, Frederique Kemme, Oren Lapid, Miryam Obdeijn, Marja Boermeester  
*Academic Medical Center, Amsterdam, THE NETHERLANDS*

**Introduction**

Providing durable coverage in weight-bearing foot reconstruction is a challenge. Current methods include a variety of free flaps, but it is unclear what flap provides the best odds at a durable reconstruction. The aim of this review is to provide meta-analyses of the ulceration rates associated with the identified flap categories.

**Materials and Methods**

PubMed, EMBASE and CENTRAL were searched for studies that reported ulceration after microsurgical weight-bearing foot reconstruction. Ulceration rates were pooled from individual studies using random-effect models and subsequently compared using Fisher's exact test. The evidence was assessed using the MINORS risk of bias tool and GRADE.

**Results**

Overall, 164 of 506 identified flaps were reported to develop ulcerations (32% of cases, 43 studies). A high proportion of ulceration was seen in pediatric cases (0.58, 95% CI 0.41-0.73, 22 of 38 flaps). Interventions for recurrent ulcerations included shoe inlays, ulcer excision, off-loading periods, and secondary flaps. Some patients were reported to request amputation. Free muscle flaps were associated with more ulcerations compared to innervated fasciocutaneous, cutaneous perforator, and glabrous skin flaps ( $p < 0.05$  for all comparisons), with a proportion of 0.24 (CI 0.12-0.41, 43 of 155 flaps). Non-innervated fasciocutaneous flaps developed significantly more ulcerations (0.16, 95% CI 0.07-0.30) compared to innervated fasciocutaneous flaps (0.04, 95% CI 0.00-0.51,  $p < 0.05$ ). Only 1 of the cases that received an innervated medial plantar artery flap developed ulceration (1 pediatric case of 42 cases in total). We identified a 'very low' level of evidence using GRADE.

**Conclusions**

Ulcerations seem to develop in a significant amount of cases, especially in children. Free muscle flaps seem to develop ulcerations in a relatively large amount of patients. Sensory nerve coaptation of fasciocutaneous flaps seems to result in improved flap stability. Innervated glabrous skin flaps such as the innervated medial plantar artery flap seem to provide the most durable reconstruction.



**11:54 EVALUATION OF FLUORESCENCE BIOMODULATION IN THE REAL- LIFE MANAGEMENT OF CHRONIC WOUNDS**

Franco Bassetto, Carlotta Scarpa  
*Clinic of Plastic Surgery, Padua, ITALY*

**Introduction**

*Fluorescence biomodulation (FB), has become an increasingly used clinical tool to induce wound healing in wounds that remain recalcitrant to treatment. Our aim was to confirm the efficacy and safety of LumiHeal, a system based on FB, in the treatment of chronic wounds.*

**Materials and Methods**

*A multicenter, prospective, observational, uncontrolled trial in 12 clinical sites in Italy was performed. Wound area evaluation was assessed using the Silhouette Imaging System and quality of life (QoL) with the Cardiff Wound Impact Schedule (CWIS). A seven-point evaluation of the clinicians' view was also examined.*

**Results**

*We enrolled 100 subjects, with the final analysis including 99 patients/ulcers consisting of 52 venous ulcers (VLUs), 32 diabetic foot ulcers (DFUs) and 15 pressure ulcers (PUs). Total wound closure at the end of the study was achieved in 47 patients by aetiology: 26 VLUs (50% of VLUs); 16 DFUs (50% of DFUs); and five PUs (33.3% of PUs). The mean wound area regression at last study assessment was significant for VLUs (41.0%;  $p < 0.001$ ) and DFUs (52.4%;  $p < 0.001$ ). After four weeks of treatment, it was possible to significantly predict if the ulcer would respond (defined as a decrease of wound size) to the study treatment. Adherence was high (95.2%) and no related serious adverse events were reported during the study. QoL significantly improved, with an increase of 15.4% of the total score, using the CWIS ( $p < 0.001$ ).*

**Conclusions**

*The study confirmed a positive efficacy profile of the FB system in inducing the wound healing process in three different types of hard-to-heal chronic wounds. The treatment was shown to be safe and well tolerated by the patients, with a significant improvement in patient QoL. This approach offers an effective modality for the treatment of hard-to-heal chronic ulcers.*

**12:02 THE USE OF MEDIAL FEMORAL CONDYLE FLAPS IN THE PEDIATRIC POPULATION IS SAFE AND EFFECTIVE**

David Colen, L. Scott Levin, Marco Innocenti, Stephen Kovach  
*University of Pennsylvania, Philadelphia, USA*

**Introduction**

*The use of medial femoral condyle flaps (MFC) has grown in popularity and is now a workhorse for reconstruction requiring free vascularized osseous or osteochondral defects throughout the body. To date, the utility of this technique has not been described for the pediatric patient population, likely due to infrequency of pediatric patients requiring this type of reconstruction, the relative nascence of the surgical technique, and/or fear of disrupting bone growth in skeletally immature patients. In this article we present a series of pediatric patients who underwent an MFC free flaps for skeletal reconstruction and demonstrate the safety and efficacy of this technique in the pediatric population.*

**Materials and Methods**

*A retrospective review of all patients 18-years-old or younger who required free MFC flaps for reconstruction of skeletal defects was undertaken. Charts were reviewed with attention to operative technique, radiographic and clinical outcomes. A novel technique was employed to identify and avoid injury to the distal femoral physis in which 2 kirschner wires were placed under fluoroscopic guidance. One wire was placed just proximal to the growth plate, marking the distal extent of corticocancellous bone harvest, and the second more proximal based on flap requirements with the intervening segment of bone harvested with osteotome.*

**Results**

*Chart review included seven patients, average age 13.7 years (range 8-18) with a mean follow-up of 16 months (range 3 Å– 40). Five patients were skeletally immature at the time of surgery. All seven patients achieved bony union and no patients suffered pathologic fractures or physeal injuries; zero patients developed femoral length discrepancy.*

**Conclusions**

*We present the first series of MFC free flaps in the pediatric population. This technique is effective for a variety of skeletal defects or nonunions and is safe for growing patients without causing physeal arrest or growth disturbance.*

**12:10 FLAP RECONSTRUCTION FOR DEEP STERNAL WOUND INFECTIONS FOLLOWING CARDIOTHORACIC SURGERY: FACTORS INFLUENCING MORBIDITY AND MORTALITY**

Shelby L. Nathan, Will Piwnica-Worms, Said C. Azoury, Geoffrey M. Kozak, David L. Colen, Prashanth Vallabhajosyula, Joseph M. Serletti, Stephen J. Kovach  
University of Pennsylvania, Philadelphia, USA

**Introduction**

*Flap reconstruction in deep sternal wound infections (DSWI) aims to lessen the morbidity and mortality. A better understanding of patient and surgical risk factors at a high-volume center may help better guide management.*

**Materials and Methods**

*Retrospective study (2007-2018) was conducted of all patients with DSWI following cardiothoracic surgery referred to a single surgeon for flap reconstruction. Patient and operative factors were reviewed including procedure types and outcomes. Predictors of morbidity and mortality were analyzed.*

**Results**

*119 patients requiring flap reconstruction for DSWI following cardiothoracic procedures met inclusion criteria. The majority of patients were American Society of Anesthesiologists (ASA) type 3/4 (99%). Unilateral (49.6%) or bilateral (40.3%) pectoralis muscle flaps were performed most frequently, followed by vertical rectus abdominus myocutaneous (VRAM) (4.2%), omental (4.2%), and omental/pectoralis flap combination (1.7%). Superficial surgical site infection (SSI) was the predominant post-operative complication (17.6%), followed by dehiscence (15.1%), hematoma (6.7%), and seroma (5%). Nineteen patients (16%) required additional debridement/revisonal procedures and five (4.2%) had total flap failure. Overall 30-day mortality was 15.1 percent. ESRD ( $p=0.002$ ), congestive heart failure ( $p=0.049$ ), low albumin ( $p=0.0089$ ), and high ASA classification ( $p=0.003$ ) were associated with mortality. Only ESRD (OR 10.2,  $p=0.0014$ ) was predictive of mortality by multivariate analysis. ESRD was significantly associated with flap failure ( $p=0.003$ ), COPD with dehiscence ( $p=0.043$ ) and diabetes with seroma ( $p=0.01$ ). VRAM reconstruction was found to be a significant independent predictor of SSI (OR=9.6,  $p=0.022$ ).*

**Conclusions**

*Morbidity and mortality following flap reconstruction for deep sternal wound infections remains high. ESRD and VRAM reconstruction may pose additional challenges to the recovery of these patients from this devastating complication.*

**12:22 FREE STERNUM TURNOVER FLAP FOR CORRECTION OF PECTUS EXCAVATUM DEFORMITY**

Arian Rezai, Milomir Ninkovic, Niclas Broer, Rüdiger Lange, Paul Heidekrüger, Denis Ehrl  
*Munich Bogenhausen Hospital, Munich, GERMANY*

**Introduction**

*Pectus excavatum (PE) is the most common congenital chest deformity. However, most patients are asymptomatic, a great variation of symptoms can occur, including functional deficiencies. Connective tissue diseases (CTD) are associated with increased rates of cardiac, life threatening complications. Therefore, current guidelines recommend early and aggressive surgical intervention. Aim of this case series was to evaluate the indications and feasibility of performing extended cardiac surgical procedures concomitant with free vascularized sternum turnover (FVST)-flaps, and to evaluate the long-term outcomes.*

**Materials and Methods**

*Within 8 years, 5 men and 3 women suffered from CTD and presented severe PE. These patients underwent FVST-flaps in combination with cardiac surgical procedures. The data were retrospectively screened for patients' demographics, perioperative details, flap survival, surgical complications and functional as well as aesthetic long-term outcomes.*

**Results**

*During postoperative follow-up in one patient thrombosis of the vessel graft was detected and solved by removal of the thrombus and local lysis. One patient had to undergo re-thoracotomy due to bleeding. However, after revision surgery in both patients the FVST flap survived. Mean follow-up time was  $3.4 \pm 2.7$  years. Follow-up was complete in 100% with all patients alive and showed improved functional outcomes. In two patients in the course re-thoracotomy was necessary. Within these surgeries one patient showed sternal pseudo-arthritis of the FVST flap. All of the patients were subjectively satisfied with the aesthetic as well as functional result of the FVST flap reconstructions. The postoperative thoracic VSS was  $0.8 \pm 1.7$  on the average. All CT-examinations showed good bony consolidation.*

**Conclusions**

*In cases of severe PE as well as CTD the FVST flap is a great surgical access to combine both surgeries within one procedure. The FVST flap is a save surgical approach with low complication rates and good functional as well as aesthetic results.*

**12:30            MODIFIED INTERNAL MAMMARY ARTERY  
PERFORATOR (IMAP) FLAP IN TREATMENT OF  
STERNAL WOUND COMPLICATIONS**

Heidi Myllykangas, Leena Berg, Paula Mustonen  
Kunink University Hospital, Kunink, FINLAND

**Introduction**

*There are multiple flap options to cover defects after deep sternal wound infections and other similar defects. The choice of flap is made according to surgeons' preferences and the size and location of the defect. Many of these options do not cover the entire length of the sternum or are associated with donor site morbidity and multiple potential complications including functional disability, hernias, seromas and pain. The declining numbers of sternotomies performed in recent years have resulted in the sub-selection of a group of patients with numerous comorbidities. This poses extra challenges for possible reconstructions. Our aim is to introduce a new option to cover sternal defects with an IMAP flap combined with a pectoralis major muscle flap mostly raised with a muscle-sparing technique*

**Materials and Methods**

*We treated 13 patients with a sternal defect after cardiothoracic operations with this technique between 2010-2016. Ten patients had a deep sternal wound infection, two had an infection of the prosthesis after carotico-subclavian bypass and one had a fragmented sternum. Nine patients were treated with an IMAP fasciocutaneous flap with a muscle-sparing pectoralis major muscle flap and four patients with an IMAP fasciocutaneous flap combined with a right pectoralis major muscle flap*

**Results**

*The median duration of the operation was 90 minutes. Three patients (23%) experienced major complications and four patients (31%) had conservatively treated minor complications. There were no flap losses.*

**Conclusion:**

*This combination of flaps is a suitable option for patients with large defects in whom direct skin closure is not possible. It can be utilized for defects comprising the entire vertical length of the sternum. These are local flaps with a short operation time and are therefore most suitable for patients with comorbidities in whom major surgery is not an option.*

**Session 5**

**14:00-16:00**

***BREAST***

*Moderators*

Francesca DE LORENZI, Milan, ITALY

Thomas SCHOELLER, Stuttgart, GERMANY

**14:00 THE USE OF ABSORBABLE MESH IN IMPLANT-BASED BREAST RECONSTRUCTION: A 7-YEAR REVIEW**

William Austen, Heather Faulkner  
Massachusetts General Hospital - Harvard Medical School, Boston, USA

**Introduction**

*Prosthetic breast reconstruction is the most commonly used reconstructive method after mastectomy in the United States. Adjunctive materials such as acellular dermal matrices and synthetic meshes are routinely used for prosthetic reconstruction (both one-stage and two-stage). Few studies exist detailing the advantages and disadvantages of using synthetic meshes, whereas many studies exist detailing similar information for acellular dermal matrices. This is the largest long-term observational cohort of patients who have undergone single-stage prosthetic reconstruction with synthetic absorbable mesh.*

**Materials and Methods**

*The charts of patients who underwent mastectomies with prosthetic reconstruction using absorbable mesh from years 2011-2017 who had been treated consecutively by the senior author were reviewed. Data were housed using REDCap (Research Electronic Data Capture), and analyzed using Stata/IC version 15.1. Alpha was set at 0.05. All reconstructions were performed subpectorally, and a piece of knitted polyglactin 910 mesh (Vicryl®<sup>®</sup>, Johnson and Johnson, USA) is sewn to the released edge of the pectoralis major muscle.*

**Results**

*A total of 227 patients underwent 376 mastectomies with direct to implant subpectoral reconstruction. Bilateral cases were performed in 146 patients (65.6%). The majority were nipple-sparing mastectomies (68.9%). A total of 70 patients (30.8%) had either received previous breast radiation or received post-mastectomy radiation. A total of 66 complications were experienced by 50 patients. Per breast, the infection rate was 2.1%, the rate of capsular contracture was 4.8%. Patients who received post-mastectomy radiation had a significantly higher rate of capsular contracture ( $p < 0.001$ ). Total cost savings of using Vicryl mesh instead of AlloDerm acellular dermal matrix during 2011-2017 was \$1,231,610 USD.*

**Conclusions**

*Prosthetic breast reconstruction can be accomplished successfully and safely using absorbable mesh in lieu of acellular dermal matrix. This method is relatively simple to adopt and permits a significant cost savings in addition to reliable long-term patient outcomes.*

**14:08 ONCOLOGICAL OUTCOME OF FAT GRAFTING FOR BREAST RECONSTRUCTION AFTER CANCER**

Vincenzo Vindigni, Valentina Guarneri, Eleonora De Antoni, Gaia Griguolo, Federica Miglietta, Franco Bassetto  
*University of Padova, Padua, ITALY*

**Introduction**

*Fat grafting has become widely used in breast reconstruction after breast cancer. It might express protumorigenic factors or alter radiological aspect of the breast, raising some concerns on its oncological safety. The aim of the study was to describe clinical outcome of patients undergoing fat grafting.*

**Materials and Methods**

*Records of 424 patients who underwent fat grafting between 2010 and 2017 were reviewed. Patients without invasive breast cancer were excluded, leaving 206 patients for analysis. Cumulative Incidence of relapse was calculated from first fat grafting. Association between clinico-pathological factors and relapse was explored.*

**Results**

*Patients were mostly post-menopausal (n=115, 56%) and the majority had HR+/HER2- BC (n=134, 65%). Eight patients (4%) were BRCA-mut carriers. Disease stage at diagnosis was: I (42%), II (34%), III (24%). Median interval from surgery to first fat grafting was 23 months (range 0-257). 336 fat grafting interventions were performed (median per patient: 1, range 1-9). At median follow-up of 38.9 months, 35 patients relapsed (10 locoregional, 25 distant relapses). Semestral hazard rates of relapse in the three years after fat grafting were: 0.010, 0.053, 0.034, 0.007, 0.039, and 0.038, respectively. 59 patients (29%) underwent additional breast imaging over standard recommendation (range 1-6 per patient), and 40 (20%) patients underwent breast biopsies (range 1-4, 10 confirmed a local recurrence).*

**Conclusions**

*This study describes a not negligible rate of recurrence in breast cancer patients receiving fat grafting, especially in stage III and conservative surgery patients. High risk of relapse in the first years after fat grafting might suggest a potential relation between the procedure and events. Moreover, a significant proportion of patients underwent additional breast imaging and biopsies, which can adversely affect quality of life. A careful discussion in multidisciplinary setting is crucial for proper patients selection.*



**14:16      COMPARATIVE STUDY OF LONG-TERM EFFECTS ON SHOULDER FUNCTION AND PATIENT'S SATISFACTION FOLLOWING PEDICLED ISLANDED LATISSIMUS DORSI (PILD) FLAP IN DELAYED BREAST RECONSTRUCTION**

Stefania Tenna, Beniamino Brunetti, Mauro Barone, Barbara Cagli, Rosa Salzillo, Paolo Persichetti  
Campus Bio Medico University, Rome, ITALY

**Introduction**

The aim of this study was to evaluate the long-term effects of Pedicled Islanded Latissimus Dorsi (PILD) flap on patient reported shoulder function and satisfaction, compared to control group of patients who underwent just implant-based reconstructions.

**Materials and Methods**

The cross-sectional study population consisted of women who had undergone breast reconstruction and radiotherapy between 2006 and 2016. Exclusion criteria were patients with not radiotherapy, and patients with not lymphadenectomy. Seventy-two women who had undergone PILD flap breast reconstruction (study group) and eighty who had undergone implant-based (IBR) reconstruction (control group) were enrolled in the study. Italian validated BREAST-Q questionnaire and WOSI shoulder questionnaire were used to analyse outcomes. Two reviewers analyzed the post-operative outcomes of patients and compiled the Kroll Scale. We applied Fisher's exact test to the results to obtain answers 1 year after the last procedure for the two groups.

**Results**

All patients answered to BREAST-Q and WOSI questionnaire. From the BREAST-Q analysis, the group of patients undergoing PILD reconstruction achieved significantly better results regarding the outcomes ( $p \hat{=} \hat{=} 0.001$ ), psychosocial well-being ( $p \hat{=} \hat{=} 0.001$ ) and physical well-being ( $p \hat{=} \hat{=} 0.001$ ). From the analysis of the Kroll Scale, the group of PILD reconstruction received the highest score for shape ( $p \hat{=} \hat{=} 0.001$ ) and aesthetic result overall ( $p \hat{=} \hat{=} 0.001$ ). From the WOSI analysis, no significant differences in shoulder function and back pain between the two groups were registered.

**Conclusions**

Study group patients reported higher levels of satisfaction respect control group. PILD flap, with complete detachment from the humerus, proved not to adversely impact back and shoulder function, achieving high patients' satisfaction in breast reconstruction following radiotherapy

**14:24      A COMPARISON OF SHOULDER FUNCTIONAL RECOVERY PATTERNS AFTER EXTENDED LATISSIMUS DORSI FLAP AND THORACODORSAL ARTERY PERFORATOR FLAP BREAST RECONSTRUCTION**

Kamuran ZEYNEP, Beril DOĐU, Alican GÜNENÇ, Bülent ÇYGTGEZ, Selami Serhat PÝRVAN, Sevgi Kurt YAZAR  
*Liv Hospital Ulus, Istanbul, TURKEY*

**Introduction**

*Latissimus Dorsi flap and thoracodorsal artery perforator flap are among the most performed methods of reconstruction following mastectomy. Current evidence suggests that patients who have latissimus dorsi breast reconstruction can experience long term shoulder dysfunction. This research aimed to investigate and compare the impact of Latissimus dorsi flap and thoracodorsal artery flap breast reconstruction with using the quantitative shoulder dysfunction tests.*

**Materials and Methods**

*A total of 10 consecutive patients undergoing breast reconstruction with extended LD flap and 15 consecutive patients undergoing thoracodorsal artery perforator flap for breast reconstruction participated. Muscle strength, shoulder range of motion were checked preoperatively and then at week 2, week 6, month 3, month 6 and month 12. Functional disability and quality of life were also measured by the SPADI( shoulder pain and disability index) test and Western Ontario Rotator Cuff Index(WORCI). The assessments were performed preoperatively and then at month 3, 6 and 12. Statistical analysis was performed by analysis of variance.*

**Results**

*At 12 months postoperatively extended latissimus dorsi patients had a mean SPADI score of pain 18%, disability 5% total 8.2% and thoracodorsal artery perforator flap patients had a mean SPADI score of pain 4%, disability 3.75% total 3.4% and WORCI was 400/2100 in LD patients and 80/2100 in thoracodorsal artery perforator flap patients. Muscle strength in flexion extension internal rotation was significantly( $p=0.01$ ) reduced on the operated sides but comparably the same in both flap selections at 12 months postoperatively.*

**Conclusions**

*Although patients having extended LD or Thoracodorsal aretry perforator flaps expect to achieve full range of shoulder movement, they should be informed that perforator flap breast reconstruction patients will experience a better range of shoulder motion and better scapula positioning after 1 year of follow-up.*

**14:32          ENHANCED RECOVERY AFTER BREAST  
RECONSTRUCTION USING AN LD FLAP**

Christian Bonde, Henrik Kehlet, Jens Hoejvig  
Copenhagen University Hospital, Rigshospitalet, Copenhagen, DENMARK

**Introduction**

*We have implemented and published an enhanced recovery program (ERP) for autologous breast reconstruction (ABR) using DIEP flaps. The latissimus dorsi (LD) flap is another commonly used flap for ABR. The aim of the present study was to use our experience from the ERP in DIEP flap reconstruction to optimize our LD breast reconstruction program.*

**Materials and Methods**

*We retrospectively examined our results for a 10-year period (n=135) and compared this with two different surgical team approaches, within the same unit. One team implemented an ERP (n=18), the other did not (n=12). Data were collected prospectively. All patients underwent breast reconstruction using a unilateral LD flap. In the ERP group, patient information was revised and multimodal analgesia was used. Nurses removed drains without consulting the doctors according to written guidelines or patients were discharged with drain on POD 3. Functional discharge criteria were assessed twice daily and reasons for not allowing discharge registered.*

**Results**

*Patient and surgical parameters were comparable in all 3 groups. Length of stay (LOS) was significantly shorter in the ERP group (3.2 days) compared to the historical (6.9) and non-ERP group (6.3)( $p < 0.0001$ ). Drains were removed significantly faster in the ERP group (day 3.9) vs day 6.3 (historical) and day 7.0 (non-ERP)( $p < 0.0005$ ). This was the main reason for extended LOS. There were no differences in reoperations, readmissions or complications. All patients in the ERP group were ambulating, pain free, had abdominal function, and were eating normally and managing personal hygiene on POD 1.*

**Conclusions**

*LOS was safely reduced to 3 days after LD breast reconstruction using our ERP. By discharging patients with drains, it should theoretically be possible to reduce LOS to 1 day, as all other discharge criterias have then been fulfilled. Thorough patient information and close cooperation with the nursing staff was essential for the succes of the ERP.*

**14:40      A NOVEL APPROACH IN BREAST RECONSTRUCTION:  
THE THORACODORSAL FLIP-OVER FLAP WITH LOOPS  
AND LIPOFILLING (TD.F.O.L.L.)**

Nicolas Abboud, Hiba EL HAJJ, Marwan ABBOUD  
*Chu Tivoli, Bruxelles, BELGIUM*

**Introduction**

*The use of thoracodorsal musculocutaneous flap has been limited to donor site complications. The Thoracodorsal fasciocutaneous flap spares the muscle and limits these morbidities. We present a new technique of breast reconstruction using a ThoracoDorsal fasciocutaneous Flip-Over flap with Loops and Lipofilling (TD.F.O.L.L.)*

**Materials and Methods**

*Between 2013 and 2017, 64 patients underwent breast reconstruction using TD.F.O.L.L. The flap was designed in an elliptical transverse pattern, extended three centimeters lateral to the back midline up to the mid infra-mammary fold and centered on intercostal perforators located between the sixth and the eighth ribs. After de-epithelialization of the skin paddle, dissection of the breast pocket and scoring of the scar tissue were performed. Flap dissection was done from distal to proximal and discontinued once the midaxillary axis was reached. No perforator dissection was performed. The flap was turned-over and fixated to the medial part of the thoracic wall. Breast remodeling was then achieved using loops passed transcutaneously, spanning the superficial subcutaneous tissues at the lower inner and outer quadrants and upper outer quadrant of the breast. At the upper inner quadrant, the loop was taken in the deep plane to act as an anchor for suspension. The loop was pulled to enhance breast projection and recruit skin from breast surroundings. Then Lipofilling was performed to all breast quadrants.*

**Results**

*73,4% of reconstructions were delayed and 92.2% were unilateral. A fourth of the patients were smokers, and 39.1% received radiotherapy. The average operative time was 57 minutes. No complications were reported except for the shoulder function affected at 6 weeks post-operatively with a DASH score rising from 6.53 in preoperative to 11.32 at 6 weeks.*

**Conclusions**

*TD.F.O.L.L. is a simple, safe, fast and reliable alternative for breast reconstruction.*

14:48      **THE CONSEQUENCES OF MASTECTOMY AND ALLOPLASTIC BREAST RECONSTRUCTION ON THE SENSIBILITY OF THE BREAST: A CROSS-SECTIONAL STUDY**

Ennie Bijerk, Stefania Tuinder, Sander van Kuijk, René van der Hulst  
Maastricht University Medical Center, Maastricht, THE NETHERLANDS

**Introduction**

*The primary goal of reconstructive breast surgery is improving quality of life (QoL) for breast cancer patients. The impact on QoL of the functional aspects of the breast, such as sensibility, have been underestimated for a long time. Patients feel they are not prepared preoperatively for the impaired breast sensibility. The aim of the study is to evaluate the level of sensible impairment after mastectomy or alloplastic breast reconstruction.*

**Materials and Methods**

*A cross-sectional study was performed in Maastricht University Medical Center between July 2016 and August 2018. Women with unilateral mastectomy, with or without alloplastic breast reconstruction, were included in the study. Objective sensory measurements were performed using Semmes-Weinstein monofilaments. Their healthy breast served as control. Subgroup analysis was performed between women who underwent mastectomy and women who underwent alloplastic breast reconstruction. Linear regression was performed to evaluate the association between patient characteristics and impaired breast sensibility.*

**Results**

*Fifty-one patients were eligible for inclusion. Sixteen patients underwent alloplastic reconstruction after mastectomy. Twenty-four patients received radiotherapy and 35 patients received chemotherapy. The monofilament values were significantly higher in the operated breasts compared to the healthy breasts ( $p < 0.001$ ). After alloplastic reconstruction the sensibility is significantly impaired in the nipple-areola-complex (NAC). Linear regression showed a statistically significant relation between alloplastic breast reconstruction and objectively measured impaired sensation ( $p = 0.008$ ).*

**Conclusions**

*This is the first study to evaluate the consequences of mastectomy and alloplastic breast reconstruction on breast sensibility. Alloplastic breast reconstruction has a clinically relevant negative impact on the sensibility of the breast compared to mastectomy alone, as the protective function of the skin is lost in almost the whole breast. This topic needs to be brought under the attention of plastic surgeons worldwide and has to become a standard aspect of the preoperative counseling of patients, before they make a decision regarding breast reconstructive surgery.*

**14:56      PERFUSION DYNAMICS IN ABDOMINAL SKIN AFTER  
FREE ABDOMINAL FLAP BREAST RECONSTRUCTION  
USING INTERNAL MAMMARY VESSELS AS RECIPIENT  
VESSELS. A CLINICAL STUDY USING DYNAMIC  
INFRARED THERMOGRAPHY**

Nergaard Solveig, Louis de Weerd, James Mercer  
*University hospital North Norway, Tromsø, NORWAY*

**Introduction**

*Internal mammary vessels (IMV) are used to provide blood to the free abdominal flap in autologous breast reconstruction. Wound healing problems at the abdominal donor site in free abdominal flap breast reconstruction cause significant morbidity to patients. No previous study have investigated what impact the use of the internal mammary artery in free abdominal flap breast reconstruction has on abdominal skin perfusion. We hypothesized that harvesting the IMV has a negative effect on abdominal skin perfusion.*

**Materials and Methods**

*17 patients scheduled for free abdominal flap breast reconstruction were included in this study. Examination of skin perfusion of the abdomen and thoracic wall in the pre-, intra-, and postoperatively phase was performed using Dynamic Infrared Thermography. The abdomen and thorax were exposed to a mild cold challenge. The abdomen was divided into vascular zones as defined by Huger with modifications. The lateral zone III on the side where the IMV were harvested was numbered zone IV. Zone III is not involved in the surgery and therefore selected as the reference zone. Each patient served as its own control. Qualitative and quantitative analysis of the rate and pattern of recovery in Huger's vascular zones with modifications was performed.*

**Results**

*Qualitative analysis showed large variability in distribution of hot spots between patients and between left and right side of the abdomen. The rate of rewarming of the abdominal skin was lower at the side where the IMV were used. The quantitative results reflected the qualitative findings.*

**Conclusions**

*This study showed that using IMV in free abdominal flap breast reconstruction had a significant effect on abdominal skin perfusion and may contribute to abdominal wound healing problems.*

**15:08            COMPARING THE LUMBAR ARTERY PERFORATOR  
FLAP TO THE GOLD STANDARD: FLAP PROPERTIES  
AND SECONDARY CORRECTIONS**

Dries Opsomer, Edward De Wolf, Bernard Depypere, Filip Stillaert, Phillip Blondeel, Koenraad Van Landuyt  
*UZ Gent, Gent, BELGIUM*

**Introduction**

The lumbar artery perforator (LAP) flap is an excellent free flap for breast reconstruction whenever the DIEPflap is not an option. The main indication is a lack of abdominal bulk, often seen in young BRCA positive women seeking prophylactic amputation and immediate reconstruction.

**Materials and Methods**

Between October 2010 and July 2016, a total of 661 free flap breast reconstructions were performed. All patients that still had to undergo additional corrective procedures were excluded and a minimum follow-up of 24 months was required. We retrospectively analyzed patient demographics, perioperative parameters and secondary corrections.

**Results**

Seventy-six lumbar artery perforator flaps were retained and compared to a cohort of 560 DIEP flaps. Average BMI for lumbar patients was 23.47 kg/m<sup>2</sup> with a mean age at operation of 45 years. BMI for the DIEP patients was 25.17 kg/m<sup>2</sup> with a mean age of 48.8 years old. Mean OR time for the LAP flap procedure was 6h45min with a mean hospital stay of 9.28 days versus an operating time of 6h23min for unilateral DIEP flaps and 9h26 for bilateral cases. LAP flap weight was 504 grams (77-1216g) versus 530 grams (108-1968g) for the DIEP flaps. The amount of corrective procedures necessary was the same for both cohorts: 12 % underwent no procedures, 59% one procedure and 29% underwent two or more procedures. Lipofilling was performed in 45% of LAP flaps compared to 56% of the DIEP flaps. Mean volume injected was 108.7 cc and 128.7 cc for LAP and DIEP flaps respectively. The donor site scar was revised in 42% of LAPs versus 60% of DIEP flaps.

**Conclusions**

The lumbar artery perforator flap is an excellent alternative if a DIEP flap is not possible. The amount of fat around the iliac crests makes bilateral autologous reconstruction possible for very thin patients and necessary secondary corrections are comparable.

**15:16 PATIENT REPORTED OUTCOMES OF MIXED TIMING MICROVASCULAR BREAST RECONSTRUCTION: A PROSPECTIVE LONG-TERM OUTCOME STUDY**

Harma Majju, Helene Retrouvey, Isabel Kerrebijn, Stephanie Sebastiaipillai, Toni Zhong, Stefan Hofer, Anne O'Neill  
*Hospital for Sick Children, Toronto, Canada and Department of Plastic Surgery, Helsinki University Hospital and University of Helsinki*

**Introduction**

*At our center, many women who have undergone a unilateral mastectomy later seek prophylactic contralateral mastectomies and bilateral reconstruction. In these "mixed timing" cases, it can be particularly challenging to achieve symmetry as patients have immediate reconstruction of one breast and delayed reconstruction of the other. This study aims to evaluate patient satisfaction following mixed timing breast reconstruction as compared to immediate or delayed bilateral autologous breast reconstruction.*

**Materials and Methods**

*Patients undergoing bilateral autologous breast reconstruction completed the BREAST-Q questionnaire preoperatively and postoperatively. A cohort of patients undergoing unilateral delayed breast reconstruction was also included for subgroup analysis. Linear regression analyses were performed to evaluate outcomes at 12 months when controlling for age and preoperative BREAST-Q scores.*

**Results**

*Two hundred and thirty women who underwent immediate (n=106), delayed (n=72) or mixed timing (n=52) bilateral microvascular breast reconstruction were included in the study. Preoperatively the BREAST-Q breast satisfaction scores were significantly lower in the delayed and mixed timing groups (mean 26.7 and 36.6 respectively) compared to the immediate group (52.5 (p<0.0001)). At 12 months, breast satisfaction was significantly different between groups with the highest in the delayed group (mean 74.9), followed by immediate (64.1) and mixed timing (59.8) groups. When comparing the mixed timing group with the cohort (n=85) of unilateral delayed breast reconstruction, a significant difference between breast satisfaction scores at 12 months scores (mean 59.8 and 70.9, respectively) was found.*

**Conclusions**

*This large single-center prospective study shows that mixed timing microvascular breast reconstruction patients are less satisfied with their breasts compared to those who have bilateral or unilateral delayed reconstructions. Patients seeking contralateral prophylactic mastectomy and bilateral mixed timing reconstruction should be counseled regarding the likelihood for relative dissatisfaction with the appearance of their reconstructed breasts. This reduced level of satisfaction reflects the difficulties in achieving symmetry in these cases.*



**15:28      DELAYED TWO-STAGE NIPPLE SPARING MASTECTOMY  
AND SIMULTANEOUS EXPANDER TO IMPLANT  
RECONSTRUCTION OF THE LARGE AND PTOTIC  
BREAST**

Thierry Tondu, Filip Thiessen, Guy Hubens, Wiebren Tjalma  
University Hospital Antwerp, Antwerp, BELGIUM

**Introduction**

*Large and/or ptotic breasts are considered an anatomical contraindication for nipple sparing mastectomy. Necrosis rates in these procedures rise up to 76 %, which is unacceptable. The authors examined whether targeted preshaping mastopexy/reduction combined with simultaneous two-stage preshaping of the implant pocket prepares these patients for an uneventful implant reconstruction.*

**Materials and Methods**

*Macromastia and ptosis patients opting for risk-reducing nipple-sparing mastectomy or having a peripherally localized carcinoma in situ, were offered a two-stage mastopexy/reduction simultaneously with preshaping of the implant pocket by subpectoral tissue expansion. Only the inferior pedicle bearing the nipple areola complex, remained. A delayed secondary nipple-sparing mastectomy and tissue expander-to-implant reconstruction was scheduled 3 months later. The use of an acellular dermal matrix was not necessary because the capsula around the expander created a hammock, strong enough to cover the definite prosthesis. Follow up time was at 2 weeks, 3 and 6 months.*

**Results**

*Forty-one procedures were performed in 24 patients. The average age was 45 years (range, 22 to 72 years). Patients' median body mass index was 26,79 kg/m<sup>2</sup> (range, 19 to 35 kg/m<sup>2</sup>). Ten patients had a family history of breast cancer (4 with carcinoma in situ), two had fibrocystic mastopathy and twelve patients were genetically predisposed. One patient had diabetes and two smoked. No nipple-areola complex or skin necrosis occurred; no implant had to be removed.*

**Conclusions**

*A two-stage mastopexy/reduction, simultaneously with preshaping of the implant pocket by tissue expansion, and followed by a 4 months delayed secondary nipple-sparing mastectomy with tissue expander-to-implant reconstruction is a safe technique in large ptotic breasts. The absence of an acellular dermal matrix not only decreases the risk of infection in the second stage, but avoids a major cost because a matrix is not reimbursed by our Belgian national health insurance.*

**15:36            SERRATUS FASCIA FLAP IN IMMEDIATE BREAST RECONSTRUCTION WITH TISSUE EXPANDER: ALL THAT GLITTERS IS GOLD?**

Mario Faenza, Corrado Rubino, Giovanni Francesco Nicoletti  
*Università degli Studi della Campania "Luigi Vanvitelli", Naples, ITALY*

**Introduction**

*The lack of coverage at the inferolateral aspect of a prosthetic device puts at high risk the whole process of breast reconstruction,*

*The aim of our study is to perform an observational study on an homogenous population of patients undergoing mastectomy and immediate breast reconstruction with tissue expander comparing two different surgical techniques for the coverage of the lateral aspect of tissue expander: Serratus Anterior Muscular Flap (SAMF) and Serratus Anterior Fascial Flap (SAFF).*

**Materials and Methods**

*In this study, we followed up a consecutive cohort of 70 female patients that underwent unilateral skin-sparing mastectomy with negative sentinel node biopsy and immediate reconstruction with tissue expander,*

*Patients were divided into two groups:*

- *Group A: Serratus Anterior Fascial Flap (SAFF) (33 patients)*
- *Group B: Serratus Anterior Muscular Flap (SAMF) (37 patients)*

*We collected data in terms of percentage of intraoperative filling, lateral projection and postoperative pain.*

**Results**

*The statistical method used was the Mann-Whitney test.*

*We did not find significance in terms of increased intraoperative filling between the two groups. (P = 0.338)*

*For what concerns the lateral projection, we found that SAAF in our series have shown a better definition and a better projection of the lateral portion of the reconstructed breast. (P = 0)*

*There are statistically significant differences between two groups (P = 0.001) confirming that the use SAAF in our experience reduces pain in the postoperative course of the patients,*

*We did not find significant statistical differences between the two groups of patients neither in terms of age (P=0.506), BMI (P=0.995) nor smoking habit (P=0.676).*

**Conclusions**

*The employ of SAAF to cover the inferolateral third of the tissue expander in immediate breast reconstruction after a skin-sparing mastectomy without axillary dissection allows the same intraoperative filling capacity that would be obtained using SAMF, increasing also the aesthetic appearance and reducing postoperative pain*

**15:44 SWEDISH NATIONAL LONG-TERM SURVEY ON  
OUTCOMES OF MASTECTOMY AND BREAST  
RECONSTRUCTION: PART 2. QUALITY OF LIFE**

Rojda Gumuscu, Dmytro Unukovych, Yasin Folkvaljon, Yvonne Brandberg, Petra Näsell, Jana DeBoniface, Fredrik Wernberg, Maria Mani  
*Uppsala University Hospital, Uppsala, SWEDEN*

**Introduction**

*The Swedish Breast Reconstruction Outcome (SweBRO) survey is a nationwide study aiming to assess long-term outcomes after mastectomy in Sweden. This part (nr 2) of the study is designed to analyze Quality of Life (QoL) among women who has undergone mastectomy with or without breast reconstruction. There is a lack of QoL data with a longterm perspective in this patient group.*

**Materials and Methods**

*Women who had undergone mastectomy in Sweden in 2000, 2005, 2010 were invited to participate. They were asked to answer questionnaires on paper or on-line (Breast-Q, EORTC (C30, BRxx and BRR24) EQ5D and a questionnaire assessing socio-demographic characteristics and provided health care). The National Breast Cancer Registry was used to identify all patients. Patients who met the inclusion criteria were sent an invitation letter to participate in the study.*

**Results**

*A total of 5853 patients were eligible for the study: 1259, 1976, and 2618 in groups of year 2000, 2005, and 2010, respectively. Fifty percent of the women responded to the questionnaires (n=2904), 31% had received a breast reconstruction (BR) of which 58% (n=516) were reconstructed with implants and 31%(n=281) were autologous. Du behåller skriva 3 rader om de aktuella resultat från gorna.*

*There was a significant difference between groups according to body mass index (BMI) (57% of BR had a BMI within 20-25 vs 48% in the mastectomy only), being in a relationship (72% BR vs 60% mastectomy only), and educational level (86% BR vs 63%).*

**Conclusions**

*The SweBRO study reports on quality of life data on a national level. Reconstruction seem to affect QoL in a long-term perspective. The data analysis is on-going and results from the EORTC QLQ-C30, EORTC QLQ-BR23 and BRR24 will be presented according to type of breast reconstruction.*

**15:52 CHARACTERISTICS AND OUTCOMES OF PRIMARY INTERPOSITION VASCULAR GRAFTS IN FREE FLAP BREAST RECONSTRUCTION**

Ayush Kapila, Abhijeet Wakure, Venkat Ramakrishnan  
St. Andrews Centre for Plastic Surgery and Burns, Chelmsford, UNITED KINGDOM

**Introduction**

*There is paucity of data on primary vascular graft use in microsurgery. Our study examines the characteristics, indications and outcomes of primary interposition vascular grafts (IVG) in free flap breast reconstruction.*

**Materials and Methods**

*All cases of breast reconstruction with free flaps between January 2013 and June 2018 were examined and cases with primary IVG were included. Data was collected on patient, flap and graft characteristics, indications and outcomes.*

**Results**

*75 interposition vascular grafts, specifically 64 vein grafts and 11 arterial grafts, were used for 49 (of 1547) flaps in 48 (of 1346) cases: 16 TUG, 14 DIEP, 4 SIEA, 4 MS-TRAM, 10 LAP and 1 SGAP. 51 grafts were primarily used to lengthen the pedicle and aid flap inset, and 24 grafts were used to augment venous flow. 49 grafts were harvested from the flap harvest site, 6 from the anastomosis recipient site and 20 from an entirely separate site. 16.7% (8/49 flaps) required salvage procedures – in 7 cases for venous congestion and in 1 for ischemic compromise – in comparison to 4.3% in cases without IVG (65/1498) ( $p < 0.0001$ ). Of these, 3 flaps failed, giving a failure rate of 6.1% (3/49) in comparison to 1.7% (26/1498) where IVG were not used ( $p < 0.05$ ). 2 were TUGs with a noticeable vessel calibre mismatch, and 1 LAP with a past infected implant and failed DIEP. Major donor site complications included infection needing antibiotic therapy ( $n=2$ ), wound dehiscence or haematoma requiring surgical intervention ( $n=3$ ) and abdominal wall weakness ( $n=1$ ). Minor complications included seromas ( $n=4$ ) and delayed wound healing ( $n=2$ ).*

**Conclusions**

*We present the largest number of primary vascular grafts for free flap breast reconstruction in the literature. Whilst being a viable option to prevent venous congestion and lengthen the pedicle to aid inset and shaping, caution must be used in vessel calibre mismatch and pre-operative risk factors.*

**Session 6**

**16:30-17:42**

***MISCELLANEOUS***

*Moderators*

Giovanni DI BENEDETTO, Ancona, ITALY

Damir KOSUTIC, Manchester, UNITED KINGDOM

**16:30 ARE CLINICIANS PERFORMING SHAVE BIOPSIES PUTTING PATIENTS AT RISK OF UNDERTREATING MALIGNANT MELANOMA?**

Monica-Paraschiva Marcean, Titus-Andrei Grecu, Kantappa Gajanan, Adam Hague, Andrej Salibi, Ralph Murphy, Damir Kosutic  
*The Christie NHS Foundation Trust, Manchester, United Kingdom*

**Introduction**

*Breslow thickness is the most important prognostic factor in patients with malignant melanoma. The tumour depth is most accurately measured by evaluating tumours in their entirety - via excisional biopsy. Other types of biopsies (shave, punch or incisional) are less accurate as they only remove a part of the tumour, potentially underestimating its true thickness.*

*The aim of the study was to investigate long-term outcomes of patients who underwent shave biopsy for diagnosis of malignant melanomas and its relationship to local and regional recurrence, distant metastasis and survival rates.*

**Materials and Methods**

*1395 patients treated for malignant melanoma between 2010 until 2017 at our tertiary cancer centre were included in retrospective study. Data analysis included information on type of biopsy, original and final histopathology, surgical management, recurrence, metastatic disease and mortality.*

**Results**

*52 patients who underwent shave biopsy were identified. 46 of them had an invasive melanoma with initial mean Breslow thickness of 3.58 +/- 0.02mm. In 6 patients (11.53%) initial thickness was not mentioned due to distorted sample. Residual melanoma was found in 21 patients (40.38 %) following wider excision with a residual BT equal or less than the initial one in 12 patients (23.07 %) and larger than the initial biopsy in 10 patients (19.23 %). Upstaging occurred for 14 patients (26.92%). Further re-excision was done in 5 and SLNB in 2. One patient with positive lymph node biopsy underwent lymphadenectomy. At a mean follow-up of 5 years, 40 patients (76.92 %) developed recurrent disease with 6 local recurrences, 1 in-transit, 11 regional-nodal recurrence and 22 patients (42.3 %) developed distant metastasis.*

**Conclusions**

*This study demonstrates that patients diagnosed with melanoma via shave biopsies are being misdiagnosed/understaged and are at a higher risk of developing earlier loco-regional and distant metastasis.*

**16:38          WOUND CLOSURE BY REGENERATIVE SURGERY**

Roger Khouri, Daniel Calva, Raul Cortes, Kimberly Khouri  
*Miami Hand Center, Miami, USA*

**Introduction**

*Tissues can regenerate across small wound gaps with essentially no scar. Stacking up a multitude of these gaps in a mesh expansion pattern can add up to the amount of scarless tissue regeneration required to close substantial wound defects that would have otherwise required flap transfer. We report our experience with this regenerative wound closure alternative.*

**Materials and Methods**

*After tumescent anesthesia we place the wound edges under extreme tension. Then with a 1.2 mm needle that preferentially severs tensed tissues, we inflict a staggered alternating pattern of full-thickness needle punctures down to the restrictive fascia. Each puncture nicks the tight tissues to release a tiny amount of tension. We start peripherally and, as the tension is relieved through mesh expansion, we move towards the edges till a tensionless closure is achieved. We avoid meshing close to the edges and perform no undermining.*

**Results**

*200 skin cancer excision wound defects (3cm<sup>2</sup>-60cm<sup>2</sup>) that would have required flaps were closed by this percutaneous mesh expansion technique. The wounds healed uneventfully with a straight-line scar as long as we meshed 10cm for every 2cm of required tissue gain. Complications were seen when the expansion ratio exceeded 20%. Interestingly, blind needle punctures caused no nerve damage.*

**Conclusions**

*Percutaneous mesh expansion of the wound edges is a useful and practical regenerative procedure. The regeneration that occurs across the sum of tiny gaps advanced the edges beyond tissues viscoelastic property to simply close wounds that would have required flaps.*

**16:46      A SYSTEMATIC REVIEW AND META-ANALYSIS EVALUATING  
INCISIONAL NEGATIVE PRESSURE WOUND THERAPY  
FOR THE PREVENTION OF POSTOPERATIVE WOUND  
COMPLICATIONS**

Pieter Zwaneburg, Berend Tol, Oren Lapid, Miryam Obdeijn, Marja Boermeester  
*Academic Medical Center, Amsterdam, THE NETHERLANDS*

**Introduction**

Postoperative wound complications (PWCs) lead to morbidity, mortality, and dramatic increases in costs; PWCs are a peril to patients, surgeons and policy makers. Incisional Negative Pressure Wound Therapy (iNPWT) seems a promising intervention. The aim of this review is to perform meta-analyses that investigate the efficacy of iNPWT for the prevention of PWCs.

**Materials and Methods**

PubMed, EMBASE, CINAHL and CENTRAL were searched for randomized and non-randomized studies that compared iNPWT with regular surgical dressings with surgical site infection (SSI), wound dehiscence, seroma, hematoma and skin necrosis as outcome. The evidence was assessed using the Cochrane Risk of Bias Tool, the Newcastle-Ottawa Scale and GRADE.

**Results**

We identified 43 observational comparative studies that indicated that iNPWT significantly reduces SSI (OR 0.33, 95% CI, 0.25-0.43), 10120 patients). Twenty-four RCTs indicated that iNPWT significantly prevents 61 SSIs per 1000 procedures with a number needed to treat of 15 (OR 0.52, 95% CI, 0.39-0.70, 3346 patients). Using GRADE we identified a moderate level of evidence for SSI as outcome. Observational studies indicated that iNPWT also prevents dehiscence (OR 0.50, 95% CI 0.34-0.72), seroma (OR 0.33, 95% CI 0.22-0.51), and skin necrosis (OR 0.47, 0.30-0.74). For dehiscence, a significant reduction was also seen in randomized studies (OR 0.73, 0.58-0.93, 2899 patients).

**Conclusions**

Randomized studies indicate that iNPWT prevents SSI and wound dehiscence. Observational studies indicate that iNPWT also reduces formation of seroma and skin necrosis.



**16:54 CONGENITAL TUFTED ANGIOMA: A MULTICENTER  
RETROSPECTIVE STUDY OF 30 CASES**

Beatriz Berenguer, Marta Feito, Alba Sanchez, Raul De Lucas, Juan Carlos Lopez-Gutierrez, Elena Ruiz, Eulalia Baselga, Angela Hernandez, Minia Campos-Dominguez, Gloria Garnacho, Angel Vera, Asuncion Vicente, Jose Bernabeu-Wittel, Heinz Kutzner, Luis Requena, Beatriz Gonzalez-Meli  
Clinica La Luz and HGU Gregorio Mara, Madrid, SPAIN

**Introduction**

Recent reports indicate that tufted angioma is a rare vascular neoplasm that manifests more frequently at birth than previously thought. No studies have specifically addressed congenital presentation. We analyzed the clinicopathological characteristics, clinical course and treatment of congenital tufted angioma (cTA) and evaluated variables that were indicative of problematic lesions.

**Materials and Methods**

The authors performed an observational retrospective study of 30 patients with cTA in 9 pediatric hospitals over a 14-year period. Treatment modalities including medical therapies and surgical interventions as well as complications were registered with a mean follow-up of 4 years. Histopathology and immunohistochemistry studies were reviewed and new ones were performed.

**Results**

Congenital tufted angioma mainly affected the limbs (56.67%) followed by the face and/or neck (23.33%). The vast majority of the facial cTA were located over the mandibular area. Almost one half of the patients (44%) developed complications that required a combination of medical and surgical strategies. Indications were pain (20%), cosmetic disturbance (12%), functional limitation (6%) and Kassabach Merritt phenomenon (6%). Immunohistochemically, proliferating cells expressed markers of endothelial cells, whereas cell clusters in the periphery showed positivity for podoplanin, a marker for lymphatic cells.

**Conclusions**

Our findings emphasize the clinical features and course of cTA. We describe 2 clinical patterns, focal and segmental. Segmental lesions located on the head and neck were more prone to complications and required more complex workup and medical/surgical treatment. Medical protocols and surgical approaches are proposed for these complex cases.

**17:02      SENTINEL NODE BIOPSY IN PATIENTS WITH THIN  
MELANOMA - A CASE-CONTROL STUDY**

Ilkka Koskivuo, Lauri Talve, Pia Vihinen, Majja Mäki, Tero Vahlberg  
*Tyks Plastiikka- ja yleiskirurgian klinikka, Turku, FINLAND*

**Introduction**

Sentinel node biopsy (SNB) is standard of care in intermediate thickness melanoma, but its use is controversial in patients with thin melanoma (Breslow thickness  $\leq 1.0$  mm). The aim was to investigate the outcome of patients with thin melanoma undergoing SNB. We hypothesized that SNB could be beneficial for them because of minimal risk of distant dissemination, while the eradication of nodal micrometastasis could theoretically interrupt the initial metastatic cascade.

**Materials and Methods**

This is a case-control study on 454 patients with thin melanoma. A total of 234 patients underwent SNB and were compared with 220 historical control patients. The data were collected from prospective SNB study registry and patient records. Study endpoints were the recurrence of melanoma and the death of metastatic melanoma. Survival analyses were calculated with Kaplan-Meier method overall and separately in subcategories T1a and T1b according to American Joint Committee on Cancer (AJCC) classification 2018.

**Results**

Median tumor thickness (0.7 mm) and median follow-up time (6.7 years) were equal between study groups. There were 19 sentinel-positive patients (8.1 %). They underwent completion lymph node dissection and non-sentinel lymph node metastases were detected in one patient. Overall, recurrence was detected in 25 patients (5.5 %) and melanoma-related death in 21 patients (4.6 %). There was no significant difference in survival between SNB patients and controls. In the subgroup analyses of T1a and T1b patients, no difference was detected in survival between study groups. Among SNB patients, there was a significant difference in melanoma-specific overall survival between SNB-positive and SNB-negative patients ( $P=0.001$ ).

**Conclusions**

SNB provided no survival benefit in patients with thin melanoma compared with controls, but this study was statistically underpowered due to low incidence of nodal metastases and endpoint events. However, SNB provided valuable prognostic information, and therefore we suggest that SNB can be considered in patients with thin T1b melanoma.

**17:10 THORACOSCOPIC VIDEO-ASSISTED  
SYMPATHICOTOMY FOR THE TREATMENT OF  
HYPERHIDROSIS: SINGLE-ACCESS, MINIMALLY  
INVASIVE TECHNIQUE**

Gianluigi Lago, Nicolò Bertozzi, Giuseppe Sanese, Carlo Fante, Edoardo Raposio  
*Plastic Surgery Unit, Department of Medicine and Surgery, University of Parma, Parma,  
ITALY*

**Introduction**

Hyperhidrosis is a frequent disorder with an estimated prevalence of 3% in the general population. This condition carries relevant impairments in social relationships for the patients. Hyperhidrosis can affect different anatomical areas with palmar region being the most disturbing for everyday activities and social relevance. Several conservative and topical treatments are available for the patients but their efficacy is often limited and temporary. Video-assisted thoracoscopic sympathectomy of T2 and T3 ganglia with a minimally invasive technique might represent a definitive treatment for palmar and axillary hyperhidrosis.

**Materials and Methods**

This minimally invasive approach for thoracoscopic sympathectomy was first described by Raposio et. al. two decades ago. This single-entry thoracoscopic procedure is carried out with a specifically modified endoscope equipped with optic fiber and a wire loop for electrocautery at its distal end. Since 1995, 760 patients have been treated in our department with this surgical technique.

**Results**

Out of 760 patients, 714 reported complete resolution of palmar hyperhidrosis. In 46 subjects, the procedure could not be completed due to the presence of vascular structures overlying sympathetic ganglia. In 6 patients symptoms relapsed after the procedure, most likely due to accessory sympathetic pathways. Only 2 patients complained of generalized compensatory hyperhidrosis.

**Conclusions**

Video-assisted thoracoscopic sympathectomy represents a definitive treatment for palmar and axillary hyperhidrosis and it should be considered when conservative options failed to relieve the symptoms. This minimally invasive approach provides effective resolution for this disorder with minimal post-operative complication rate.

**17:18 GENDER AFFIRMATION SURGERY FOR GENDER DYSPHORIA: SYSTEMATIC REVIEW ON BENEFITS AND RISKS**

Konstantinos Georgas, Ulrika Beckman, Inger Bryman, Anna Elander, Lennart Jivegård, Ellenor Mattelin, Teresa Olsen Ekerhult, Josefine Persson, Lars Sandman, Ida Stadig, Ulla Vikberg Adania, Annika Strandell, Gennaro Selvaggi  
*Sahlgrenska University Hospital, Gothenburg, SWEDEN*

**Introduction**

Gender affirmation surgery(GAS) aims in affirming the self-perceived gender of the gender dysphoric patient, and includes genital, facial and body procedures. Currently there is no systematic review assessing the quality of the studies previously performed on this topic. Objective was to study the GAS effects on: 1.patients' quality of life (QoL); 2.patients' satisfaction with the surgery; 3.frequency of regret; 4.frequency and extent of complications.

**Materials and Methods**

The PRISMA protocol was followed. During January 2018 two of the co-authors performed searches in PubMed, Embase, the Cochrane Library, PsychInfo and Human Technology Assessment databases: the obtained abstracts have been independently assessed by all the co- authors, and selected for inclusion as full-text articles. Final inclusion was decided by consensus according to PICO criteria. The quality of comparative studies was assessed. Data were extracted by at least two authors.

**Results**

The literature search resulted in 70 observational studies. Outcomes were grouped by type of gender affirmation. There were few comparative studies and most of those were hampered by selection bias. The certainty of evidence for the benefits of genital, facial and body gender affirmation surgery is generally very low(GRADE +000). It is uncertain if GAS improves the patient quality of life(QoL) (GRADE +000).. Patients are generally very satisfied after surgery, although the certainty of evidence of patient satisfaction is low(GRADE ++00). None of the included studies reported regret after GAS. The complications extent and frequency vary depending on GAS procedure. Major surgical complications are frequent after genital gender affirmation surgery(GRADE +++0).

**Conclusions**

The included literature contains only observational studies of mostly poor quality; data from long-term follow-ups are lacking. Patients usually value the effects of the interventions highly, in spite of the lack of long-term follow-ups. Gender affirmation surgery needs to be performed within systematically research projects in order to improve the knowledge about benefits and risks.

**17:26 IS THE LICOX® PTO2 SYSTEM RELIABLE FOR MONITORING OF FREE FLAPS? COMPARISON BETWEEN 2 COHORTS OF PATIENTS**

Chiara Stocco, Ramella Vittorio, Federico Cesare Novati, Sara Leuzzi,  
Zoran Marij Arnez  
*University of Trieste, Trieste, ITALY*

**Introduction**

Free Flap monitoring is crucial for early recognition of vascular complications as any delay in detection of flap compromise decreases the free flap salvage rate. Our study compares two consecutive series of patients undergoing microsurgical reconstruction monitored with standard clinical bedside surveillance and with the Licox® PtO2 system regarding flap loss and flap salvage, sensitivity and specificity.

**Materials and Methods**

A prospective study of all patients undergoing microsurgical reconstructions between 2016 and 2017 was performed. Two groups were identified: group 1 patients that underwent standard clinical bedside postoperative flap monitoring and group 2 with Licox® PtO2 system monitoring. Flap re-exploration in group 2 was performed when the PtO2 values continuously dropped for at least 50% of their original value in 30 minutes or reached levels lower than ten mmHg while in group 1 clinical signs of arterial/venous compromise had to be present.

**Results**

Between 2016 and 2017, we performed 87 microsurgical flaps. 43 free flaps were monitored clinically (group 1) and 44 with the Licox® PtO2 system (group 2). No significant difference between the two groups was recorded regarding vascular complications ( $p=0.31$ ), return to the theatre ( $p=0.31$ ), flap salvage ( $p=0.9$ ), total and partial flap loss ( $p=0.49$  and  $0.36$  respectively). When analyzing group 2, we documented six false-positive results (13.6%) and 0 false negatives with an accuracy of 0.86, a sensitivity of 1.00 and a specificity of 0.85 (with positive and negative predictive value of 0.33 and 1.00 respectively).

**Conclusions**

Licox® PtO2 system detects early postoperative circulation problems in all types of free microvascular flaps, including buried and bone ones. The high sensitivity of this method gives a promising safety profile when the values remain stable without any alarm signal. Its lower specificity requires additional clinical monitoring; this could be related to the lack of precise guidelines regarding the probe insertion.

**17:34 ANTERIOR COMPONENT SEPARATION DECREASES  
HERNIA RECURRENCE RATES IN ABDOMINAL  
WALL RECONSTRUCTION WITH BIOLOGIC MESH  
REINFORCEMENT: A PROPENSITY SCORE ANALYSIS**

Salvatore Giordano, Patrick Garvey, Donald Baumann, Alexander Mericli, Charles Butler

*Turku University Hospital, Turku, Finland*

**Introduction**

It is not clear whether mesh-reinforced anterior component separation (CS) for abdominal wall reconstruction (AWR) results in better outcomes than mesh-reinforced primary fascial closure (PFC) without CS, particularly when acellular dermal matrix (ADM) is used. We compared our outcomes of CS versus PFC repair in AWR procedures to determine whether CS results in better outcomes than PFC in AWR.

**Materials and Methods**

This retrospective study included 461 patients who underwent AWR with ADM in a 10-year period and mean follow-up of 31.8 months in a single Academic Cancer Center. Three-hundred-twenty-two (69.9%) patients who underwent mesh-reinforced AWR with CS (AWR-CS) and 139 (30.1%) who underwent AWR with PFC (AWR-PFC) without CS were compared. These groups were also matched using propensity score analysis. The primary endpoint was hernia recurrence at follow-up. Secondary outcome was surgical site occurrence (SSO).

**Results**

AWR-PFC repairs had a higher hernia recurrence rate (10.8% vs. 5.3%,  $p=0.002$ ), but similar overall complication rate (28.8% vs. 31.4%,  $p=0.580$ ) and surgical site occurrence (SSO) rate (18.7% vs. 25.2%,  $p=0.132$ ) compared to AWR-CS repairs. CS repairs experienced significantly higher wound separation (17.7% vs. 7.9%,  $p=0.007$ ), fat necrosis (8.7% vs. 2.9%,  $p=0.027$ ) and seroma (5.6% vs. 1.4%,  $p=0.047$ ) rates than PFC repairs. When the treatment method was adjusted for propensity score in the propensity-score-matched pairs ( $n=125$ ), we found that the hernia recurrence (10.4% vs. 8.0%,  $p=0.181$ ), but not SSO were higher for the AWR-PFC versus the AWR-CS groups. We did not observe differences in any specific wound healing complications between the two groups after propensity-score matching. The Youden index was used to determine the best cutoff value to perform CS according to the hernia width.

**Conclusions**

AWR-CS repair results in lower hernia recurrence but similar SSO rates than AWR-PFC on long-term follow-up. CS should be performed whenever possible in case of defect wider than 7.1 cm.

SATURDAY 25 MAY 2019

**Session 7**

**8:30-10:26**

***NERVE***

*Moderators*

Oskar ASZMANN, Vienna, AUSTRIA

Hans Guenter MACHENS, Munich, GERMANY

**8:30 BILATERAL VOCAL FOLD PARALYSIS. A CASE OF LARYNGEAL REINNERVATION USING ANSA CERVICALIS AND VASCULARIZED SURAL NERVE GRAFT**

Rossella ELIA, Giuseppe Di Taranto, Vittoria Amorosi, Ngamcherd Sitaphul, Li Ying Liao, Reza Alamouti, Giuseppe Giudice, Hung-Chi Chen  
University of Bari Aldo Moro, Bari, ITALY

**Introduction**

*Bilateral vocal fold paralysis (BVFP) due to bilateral recurrent laryngeal nerve (RLN) injury is a potentially fatal condition that presents as progressive airway compromise with or without voice changes. The traditional treatments (tracheostomy, cordectomy, arytenoidectomy, laterofixation) aim to ensure ventilation at the cost of deterioration of voice and risk of aspiration. Laryngeal reinnervation is considered a promising procedure that may allow to return to vocal fold abduction without impairing adductory functions but human trials are limited despite of several animal models*

**Case Report**

*A 37-year-old male presented with BVFP due to bilateral RLN injury after neck contusion with grade II laryngeal blunt injury 2 years before. He suffered from breathing voice and could not be decannulated over time. Bilaterally, the distal stump of the RLN was prepared with resection of scar tissue back to the nerve fascicles (12mm length). The inferior root of ansa cervicalis (AC) and the external jugular veins (EJV) were identified. A vascularized sural nerve graft (26 cm) was harvested from the left leg, split into two and reversed. Sural nerve was interposed between AS and RLN while lesser saphenous vein was interposed between the two ends of EJV. Microsurgical anastomoses were performed in an end-to-end fashion with 10-0 Nylon sutures. No surgical complications were encountered. Videostroboscopic recordings showed increased excursion of abductive movements during inspiration 1 month after reinnervation and the findings continued to improve 6 months later. Significant difference was observed in the maximum phonation time values and overall voice grade, roughness, breathiness, asthenia and strain between preoperative and postoperative values ( $p < 0.05$ ). Normal deglutition function was achieved with no aspiration episodes and the patient was decannulated 8 months post-operatively.*

**Conclusions**

*Laryngeal reinnervation using ansa cervicalis and vascularized nerve graft succeeded in restoring vocal fold abduction to a satisfactory extent while improving phonatory function without evident morbidity.*



**8:38 THE CURRENT UK EXPERIENCE OF TARGETED  
MUSCLE REINNERVATION: 40 CASES AND COUNTING**

Norbert KANG, Alex Woollard  
The Royal Free London NHS Foundation Trust, London, UNITED KINGDOM

**Introduction**

Targeted muscle reinnervation has irreversibly changed the way we approach a patient with limb loss. We are now able to improve the lives of amputees with otherwise untreatable neuroma or phantom limb pain. We now report on the experiences of the UK's first 40 cases, treated over a 5 year period.

**Materials and Methods**

Retrospective review of 40 patients undergoing TMR surgery from 2013 to the present. Pain levels before and 3, 6 and 12 months after surgery were assessed using a self-reported scale (1 - 10). Analgesia requirements before and 12 months after surgery were recorded along with any complications, worsening or pain or "unmasking" phenomenon.

**Results**

Patients noted an improvement in their neuroma and phantom limb pain. Most patients discontinued pain medication altogether. Complications after surgery were minimal and limited to post-operative wound infection or unmasking of pain in other sites in the stump. The most notable side-effect was temporary (3-6 months) exacerbation of phantom limb pain.

**Conclusions**

TMR surgery was originally devised to improve the ability of an upper limb amputee to control a prosthetic limb. The effect of TMR on both neuroma and phantom limb pain was a serendipitous observation and has become the main indication for carrying out this procedure for the UK amputee population. We discuss the best indications for treatment and examine the strategies for dealing with the side effects of TMR surgery. We are now confident in our ability to offer this treatment to most of the patients who are referred to our clinics with otherwise intractable nerve-related pain.

**8:50            PATIENT EXPERIENCE IN NERVE-TO-MASSETER  
DRIVEN SMILE REANIMATION**

*Martinus VAN VEEN, Paul Werker, Tessa Hadlock  
University Medical Center Groningen, Groningen, THE NETHERLANDS*

**Introduction**

The nerve-to-masseter is one of the most frequently used neural sources in smile reanimation surgery. Very little has been reported regarding the patient experience with respect to reanimated smile usage and sequelae following transfer. The aim of this study was to quantify patient perception of nerve-to-masseter use in smile reanimation surgery.

**Materials and Methods**

An online questionnaire was developed based on the clinical expertise of our team, patient interviews, and existing questionnaires of facial palsy-related quality of life and temporomandibular joint dysfunction. All patients treated with nerve-to-masseter driven smile reanimation surgery, both nerve transfers and muscle transplantations, between 2007 and 2016 with a known email address were invited to participate.

**Results**

Of 171 operated patients, 122 with a known email address were invited to participate. Seventy-one patients responded (63.4% female, mean age 51.1) after a median follow-up of 3.8 years. A voluntary smile while biting down at least 'most of the time' was reported by 83.1% of patients; 46.5% reported ability to smile on the affected side without bite. A 'normal' or 'almost normal' spontaneous smile was reported in 23.9% of patients. 18.3% of patients self-reported masseter muscle atrophy, and 1.4–14.1% reported temporomandibular joint dysfunction. Forty-one patients (57.7%) reported prandial movement of the face at least 'most of the time', with 9 patients (12.7%) considering this bothersome.

**Conclusions**

Patients report good voluntary smiling ability following nerve-to-masseter driven smile reanimation surgery, with low rates of sequelae.

**8:58 FREE FUNCTIONAL PLATYSMA TRANSFER FOR RE-ANIMATION OF THE PARALYSED EYE**

Adrian O. GROBBELAAR, Jonathan Leckenby  
Great Ormond Street Hospital, London, UNITED KINGDOM

**Introduction**

Facial palsy patients suffer an array of problems ranging from functional to psychological issues. With regard to the eye, lacrimation, lagophthalmos and the inability to spontaneously blink are the main symptoms and if left untreated can compromise the cornea and vision. This paper reports the outcomes of 23 free functional vascularized platysma transfers used for reanimation of the eye in unilateral facial paralysis.

**Materials and Methods**

Data was collected prospectively for all patients undergoing reanimation of the paralysed eye using free functional platysma transfer. The only exclusion criteria was that a minimum of a two-year follow up was required. Patients were assessed pre- and post-operatively and scored using the eFACE tool focusing on eye-symmetry with documentation of the blink reflex.

**Results**

A total of 26 free functional platysma transfer were completed between 2011 and 2018; three patients were excluded due to inadequate follow up. The mean age was 10 years (SD 7.5) and a ratio of 12 males to 11 females. Pre-operatively no patients had evidence of a blink reflex in comparison to 22 patients at two-year follow up. There was a statistically significant improvement in palpebral fissure ( $p < 0.001$ ) and full eye closure ( $p < 0.001$ ) scores at two-year follow up.

**Conclusions**

This is a preliminary report of our experience free functional platysma outcomes in eye reanimation. The results demonstrate that successful restoration of the blink reflex can be achieved and full eye closure is obtainable following surgery.

**9:10 THE CHALLENGE OF FACIAL REANIMATION  
FOLLOWING PREVIOUS FAILED FREE FLAPS AND  
OTHER COMPLEXITIES**

*Stephen MORLEY, John Biddlestone  
Canniesburn Plastic Surgery Unit, Glasgow, UNITED KINGDOM*

**Introduction**

*In dense facial paralysis microsurgical re-animation surgery to recreate the smile is the gold standard. With no prior intervention the surgical algorithm is straightforward. Where prior attempts at reanimation with a free flap or other complicating factors including oncological free flap or neck dissection procedures are present these are deemed complex cases. Such cases present a challenge to determine the best surgical solution for facial re-animation and often free flaps are considered too hazardous to attempt.*

**Materials and Methods**

*24 cases where a free flap was used for smile recreation either following failed initial free flap attempt at re-animation (n=10) or other complex factors (n=14) according to published guidelines were analysed. 14 free gracilis and 10 free latissimus dorsi flaps were used. 15 co-aptations were made to the ipsilateral nerve to masseter; 3 to a cross face nerve graft and 6 to the contra-lateral facial nerve. Results were assessed by using video clips; the Sunnybrook scoring system and by measuring symmetry at rest and modiolus excursion.*

**Results**

*All surgeries were completed without flap loss. The average improvement in Sunnybrook score was 46; improvement in resting symmetry was 8.5mm and improvement of modiolus movement of 6.0 mm. Although these results are not comparable to primary procedures in otherwise ideal candidates, we found that 22 patients developed facial movement corresponding to a good quality smile.*

**Conclusions**

*Very complex cases of facial paralysis with previous free flap for reanimation or other complicating factors can be effectively and safely treated with free tissue transfer. Co-aptating the NTM or a one stage approach to the contralateral facial nerve is more commonly advocated than in primary cases. Recipient vessel selection is crucial and the more frequent use of the latissimus dorsi can be justified due to the long neurovascular pedicle. Previous microsurgery does not contraindicate a free flap.*

**9:22 ANATOMICAL STUDY OF A NEW ENDOSCOPIC-ASSISTED APPROACH OF THE AXILLARY NERVE**

Andres A. MALDONADO, Elhassan Bassem, Bishop Allen, Sauerbier Michael, Spinner Robert  
BG Unfallklinik Frankfurt, Frankfurt, GERMANY

**Introduction**

*Previous studies have described a segment of the axillary nerve (AN) that cannot be surgically explored through standard open surgical approaches (blind zone). The aim of this study is to evaluate the feasibility of combining the standard posterior approach to the AN with the use of the arthroscope to visualize all segments of the AN.*

**Materials and Methods**

*Ten fresh frozen shoulders in five adult human torsos were included in the study. A standard posterior approach was performed on four shoulders and dry arthroscopy was performed through the surgical opening in an attempt to visualize all segments of the AN. A surgical clip was applied to the most proximal and anterior segments of the AN that could be visualized with the arthroscope. A standard open deltopectoral approach was then performed to determine the exact location of the surgical clip and its relation to the origin of the AN.*

**Results**

*Using the arthroscopic-assisted approach, all segments of the AN (including the blind zone) were visualized from the quadrilateral space to their origin from the posterior cord in all four specimens. The surgical clip was found at an average 1 cm (range from 0.5 to 1.5 cm) from the origin of the AN from the posterior cord.*

**Conclusions**

*This cadaveric study shows that it is feasible to visualize all segments of the AN (including the blind zone) using this novel arthroscopic-assisted approach that combines the use of the standard posterior approach to the AN with dry arthroscopic exploration.*

**9:34 SEVERELY INJURED C5, C6 “SPINAL NERVE-IN-CONTINUITY” CAUSING INTRAOPERATIVE DIAGNOSTIC DILEMMA DURING MICRO RECONSTRUCTIVE BRACHIAL PLEXUS SURGERY: A CASE REPORT**

Jenny Yun Jen YEOW, Kee Min Yeow  
Chang Gung Memorial Hospital Linkuo, Taoyuan City, TAIWAN

**Introduction**

*Micro reconstruction of adult brachial plexus injury using proximal nerve transfer is advantages in that the diagnosis of nerve injuries can be established under direct intraoperative dissection. However, this method is difficult because operating field is often covered by scars causing profuse bleeding on dissection. Severe nerve rootlets avulsions which can affect spinal nerves integrity is not routinely checked during micro reconstruction surgery . We report a case of severely avulsed C5, C6 nerve rootlets presented with grossly normal spinal nerves which resulting in diagnostic dilemma and error in management.*

**Case Report**

*This 40-year-old woman presented with complete palsy of shoulder (M0), elbow (M0) functions and slightly weaken hand function due to suicidal jump from one floor height. Pre-operative MR revealed C5, C6 severe near total avulsions but having apparently normal C5, C6 spinal nerves which we called spinal nerves “lesion in continuity”, were confirmed by operation. Confusion of intraoperative diagnosis resulted in treatment dilemma arose when direct electric stimulation (ES) on C5, C6 spinal nerves which continued as anterior (AD) and posterior (PD) divisions of upper trunk were unresponsive initially, which improved slightly after extensive neurolysis of the above neural network. The presence of severely impaired ES response deterred the surgeon’s decision to cut and repair the C5, C6 nerves which unfortunately ended with persistent elbow palsy at 2 years follow up. Salvage free functional gracilis muscle transfer for elbow flexion was performed.*

**Conclusions**

*Deciding the healthiness of available C5, C6 spinal nerve stumps is a major diagnostic dilemma for micro reconstruction of brachial plexus because the status of preceding nerve rootlets connections to the spinal cord are hidden by cervical spine. Pre-operative MRI is crucial to ensure proper selection of donor nerve stump, especially in the setting of severe avulsions with apparent normal spinal nerves called “lesion in continuity”.*

**9:42                    NOVEL NEUROVASCULAR DECOMPRESSION  
TECHNIQUE TO TREAT OCCIPITAL MIGRAINES: LONG-  
TERM RESULTS FROM THE FIRST 15 PATIENTS**

*Saja SCHERER, Giorgio Pietramaggiore  
University of Padova & Global Plastic and Migraine Surgery, Lausanne, SWITZERLAND*

**Introduction**

*Occipital migraines painful crisis have been related to the conflict of the greater and lesser occipital nerves with muscles and aponeurosis and arteries. In our experience the commonly described methods of decompression offer only limited access to the nuchal line compression points. These points in a selected number of patients correspond to the region of maximum pain.*

**Materials and Methods**

*We describe here a novel approach to treat occipital migraines through two 4.5 cm oblique incisions designed between the insertion of the trapezius and the sternocleidomastoid muscles. 15 patients with refractory occipital headaches were addressed for occipital surgical decompression from a neurologist. Selection criteria included description of the symptoms and positive response to at least three diagnostic tests (local anesthesia and/ or cortisone infiltrations). The procedure was performed under general anesthesia and the patients were followed for 12 months.*

**Results**

*This approach allows for exposure of the greater and lesser occipital nerves, communicating branches, occipital artery and decompression from central and peripheral musculo-aponeurotic conflicts. Results show complete remission of pain in 8/15 (53%), 75% improvement in 4/15 (26.7%) and at least 50% improvement in 3/15 (20%) patients. In this series all patients responded with at least 50% improvement.*

**Conclusions**

*The positive outcome may be due to the comprehensive, yet minimally invasive approach, although limitations include the small number of cases studied. Since it remains unclear to date for most patients whether the occipital nerves, arteries or both are the main triggers of the peripheral pain crisis, this technique addresses all these structures through one incision. The multidisciplinary evaluation and repetitive response to occipital infiltrations is also critical to obtain a positive outcome. More research is required to better understand the mechanisms responsible for occipital migraines and to further optimize the surgical techniques.*

**9:54**                    **7-YEARS' EXPERIENCE OF MINIMALLY INVASIVE  
AND ENDOSCOPIC TECHNIQUE IN MIGRAINE  
SURGERY**

*Edoardo RAPOSIO, GianLuigi Lago, Nicolò Bertozzi, Carlo Fante, Giuseppe Sanese  
University of Parma, Parma, ITALY*

**Introduction**

*Migraine Headache (MH) is a very common disorder affecting 1.7–4% of the world's adult population. The first line therapy for these patients is usually a combination of conservative treatments. Despite this large variety of options available, some patients remain refractory. For such group, migraine surgery might offer a definitive solution for their medical condition. In these patients, migraine is usually caused by extracranial nerve compression due vascular, fascial or muscular structures nearby. The aim of migraine surgery is to relieve such compression at specific trigger points located in the occipital, temporal and frontal regions.*

**Materials and Methods**

*From 2011, in our Plastic Surgery Unit at the University of Parma, Italy, we performed 235 surgical procedures for Migraine Headache in patients suffering from either frontal, occipital or temporal headache. In patients with occipital and temporal migraine, nerve decompression was achieved by occipital and superficial temporal artery ligation, respectively. Vessels were previously localized by mean of portable Doppler device. In patients suffering from frontal headache we performed nerve decompression with a new minimally-invasive single-entry endoscopic myotomies of procerus, corrugator and depressor supercilii muscles.*

**Results**

*Among patient suffering from occipital migraine, 95% of them observed significant improvement of their condition, with 86% reporting complete relief. In temporal migraine, positive outcome was achieved in 83% of the patients (50% complete elimination and 33% partial improvement). In patient treated with endoscopic frontal myotomies, positive results were observed in 94% of the patients (32% complete elimination, 62% partial improvement).*

**Conclusions**

*Migraine is a common and debilitating condition that can be treated successfully with minimally invasive surgical procedures. Our results suggest that vascular compression is the main causative agent in occipital and temporal migraine.*



**10:06 OCCIPITAL NEURALGIA/ MIGRAINE: INTRA- OPERATIVE EVIDENCE FOR EXTRACRANIAL PATHOLOGY**

*Lisa GFREERER, Marek A. Hansdorfer, Ricardo Ortiz, Cassandra P. Nealon, William G. Austen Jr.  
Harvard Medical School, Boston, USA*

**Introduction**

*Recent data supports a theory that inflammation of structures surrounding extra-cranial sensory nerves can provoke migraines through compressio/ irritation. Anecdotally, at the occipital trigger site, intra- operative anatomy of migraine surgery patients is distorted with thickened fascia, and dilated vessels that are tightly adhered to nerves. This study scientifically evaluated this observation.*

**Materials and Methods**

*92 subjects undergoing migraine surgery at the occipital trigger site were enrolled prospectively. The senior author evaluated intraoperative anatomy using an intraoperative anatomy form. The resulting data was examined.*

**Results**

*Preoperatively, 67% of subjects reported bilateral pain. Pain on both sides was associated with abnormal tissue anatomy bilaterally (0.016). Unilateral pain was not predictive of one-sided tissue aberration. In fact, 19/30 (63%) subjects with pain on one side had abnormal findings on both sides. In 94% of subjects, abnormally thick trapezius fascia was seen, and in 30% of cases the nerve was encased in or compressed by fibrotic tissue at the muscle/ fascia interface. The occipital artery interacted with the GON in 88% of cases and 20% had dilated veins. The GON had an anomalous course in 42% of patients, and appeared crushed/discoled in 32%.*

**Conclusions**

*In an effort to understand the extra-cranial pathophysiology of migraine, it is critical to describe the tissue changes encountered during migraine surgery. Interestingly, patients with unilateral pain had bilateral pathology, highlighting the importance of release on both sides. The majority of subjects operated on had thickened/ fibrotic appearing trapezius fascia (94%), indicating a much more important role of soft tissues surrounding the nerve than previously implicated. Further, interaction of the occipital artery was seen in 88% of cases. This nerve/ artery interaction has a much higher incidence in migraine surgery patients than previously reported in dissection of cadavers (0-54%). This work is the basis for further research to elucidate the pathogenesis of migraine.*

**10:14      MINIMALLY INVASIVE NEUROVASCULAR APPROACH  
FOR THE TREATMENT OF TEMPORAL MIGRAINE  
HEADACHES: LONG TERM RESULTS FROM 85  
PATIENTS**

*Giorgio PIETRAMAGGIORI, Saja Scherer*

*University of Padova & Global Plastic and Migraine Surgery, Lausanne, SWITZERLAND*

**Introduction**

*The temporal area is one of the most affected during migraine painful crisis. The region is dense with structures that may be the origin of the pain syndrome, including the temporal artery, the auriculotemporal nerve, the zygomatico-temporal nerve, the temporal muscle and the tempo-mandibular joint. Here we describe our approach to diagnose and treat temporal migraine headaches.*

**Materials and Methods**

*100 patients with temporal headaches refractory to conventional drugs and conservative treatments were screened in our migraine headaches surgery clinic. Diagnostic tests with local anesthesia identified 85 candidates for surgery. Surgical treatment included auriculotemporal nerve decompression and superficial temporal artery arteriolysis and biopsy through a pre-auricular 1.5cm incision under local anesthesia. At 12 months, results were measured in terms of decreased intensity, frequency and duration of pain attacks and overall reduction of migraine burden as measured by the MIDAS score.*

**Results**

*Long term results showed over 86% success rate, with 66.2% showing complete remission and 20% at least 50% improvement. 13.7% of the patients did not respond to surgery. About 5% of patients suffered from minor complications such as local wound dehiscence and minor infections, requiring topical wound care. Histology from the biopsies of the superficial temporal artery showed intimal fibrosis in over 75% of samples.*

**Conclusions**

*Microsurgical decompression of the auriculotemporal nerve and biopsy of the superficial temporal artery is a minimally invasive approach highly effective in improving the quality of life of patients with temporal migraines. The role of endofibrosis in the pathogenesis of temporal migraine headaches needs still to be elucidated.*

**Session 8**

**10:56-12:56**

***BREAST & LYMPHEDEMA***

*Moderators*

Philip BLONDEEL, Gent, BELGIUM

Maria MANI, Uppsala, SWEDEN

**10:56 DOES A LONGER ISCHEMIC TIME IN BREAST RECONSTRUCTION WITH A FREE DEEP INFERIOR EPIGASTRIC PERFORATOR FLAP (DIEP) INCREASE THE RISK OF MAJOR COMPLICATIONS?**

*Nadine HILLBERG, René van der Hulst, Jip Beugels, Sander van Kuijk, Stefania Tuinder*

Maastricht University Medical Center, Maastricht, THE NETHERLANDS

**Introduction**

The deep inferior epigastric artery perforator flap (DIEP) is one of the most used free flaps for the reconstruction of the breast after a mastectomy. The free flap can be injured by prolonged ischemia during the operation. The aim of this study was to evaluate the association between ischemic time and postoperative complications in the breast using a DIEP flap.

**Materials and Methods**

A retrospective study based on a prospective database of all patients who received a breast reconstruction with a DIEP flap in one hospital between January 2010 and June 2017 (n= 609). The patients were divided into two groups: one with ischemic times of less than 60 minutes and one with ischemic times of 60minutes or more. Complications on the recipient side, in particular major complications equal to venous congestion, partial or total flap loss were the primary outcome measures. A follow-up of at least one month was achieved for all patients.

**Results**

Preliminary results show that in 22,2% of the 609 included DIEP flaps the ischemia time was 60 minutes or longer. Within this group, in 31.1% of the flaps a complication of the recipient side occurred and in 17% a major complication occurred. In the flaps with an ischemia time of less than 60 minutes in 22.4% a complication occurred and in 9.5% of the cases there was a major complication. A significant association was found between ischaemic time and major complications on univariate (p-value = 0.014) and multivariate analyses (p-value = 0.037).

**Conclusions**

This study shows that it is useful to aim for an intraoperative ischemia time of less than 60 minutes when performing a DIEP-flap for reconstruction of the breast. With a longer ischemia time there is a greater risk of major complications at the recipient side postoperatively.

**11:04 LAPAROSCOPIC ASSISTED DIEP FLAP HARVEST IMPROVES BREAST RECONSTRUCTION OUTCOMES**

Sameer SHAKIR, Amy Spencer, Geoffrey Kozak, Shelby Nathan, Suhail Kanchwala

University of Pennsylvania Health System, Philadelphia, USA

**Introduction**

Total extra-peritoneal laparoscopic-assisted (TEP-lap-assisted) harvest of the deep inferior epigastric (DIE) vessels permits a dramatic decrease of myofascial dissection in DIEP flap breast reconstruction. We present a reliable technique that further decreases donor site morbidity in autologous breast reconstruction.

**Materials and Methods**

Since March 2018, 24 patients underwent TEP-lap-assisted harvest of the DIE vessels. A supraumbilical 10 mm camera port is placed at the medial edge of the rectus muscle to enter the retrorectus space. The extraperitoneal plane is developed using a balloon dissector and insufflation. Two 5 mm ports are then placed through the linea alba below the umbilicus to introduce dissection instruments. The DIE vessels are dissected from the underside of the rectus muscle. Muscle branches and the superior epigastric are ligated using a ligasure. The DIE pedicle is similarly ligated and the vessels delivered through a minimal fascial incision. The flap(s) is transferred to the chest for completion of the reconstruction.

**Results**

Twenty-four subjects totaling 40 flaps were included in the study. All flaps were single perforator DIEP flaps. The mean length of fascial incision was 1.9 cm. Mean length of procedure for unilateral and bilateral reconstructions was  $337.5 \pm 91.3$  and  $442.9 \pm 100.0$  minutes, respectively. The laparoscopic portion of the harvest underwent a significant learning curve during this series (from 90 to 15 minutes per side). No subjects required narcotics during or after their hospitalization. Mean length of stay was 2.1 days. Successful flap salvage after venous congestion occurred in one subject. There was one pedicle transection during harvest that required perforator-to-pedicle anastomosis.

**Conclusions**

Total extra-peritoneal laparoscopic-assisted harvest of the DIE pedicle is a reliable method which dramatically decreases the pain and morbidity of autologous breast reconstruction.

**11:12 PERFORATOR MAPPING IN DIEP BREAST RECONSTRUCTION WITH DYNAMIC INFRARED THERMOGRAPHY, LASER FLUORESCENCE ANGIOGRAPHY OF INDOCYANINE GREEN, ULTRASOUND DOPPLER AND CT ANGIOGRAPHY: A COMPARATIVE STUDY**

Muiz Akram CHAUDHRY, Thomas Sjøberg, Svein Weum, James B. Mercer, Louis de Weerd  
University Hospital of North Norway, Tromsø, NORWAY

**Introduction**

The aim of this study was to compare invasive and non-invasive techniques for selecting a dominant perforator when harvesting a DIEP-flap for breast reconstruction.

**Materials and Methods**

Fifteen patients selected for DIEP breast reconstruction were examined with preoperative CTA and a handheld Doppler Ultrasound for perforator mapping. In general anesthesia, perforators were mapped by dynamic infrared thermography (DIRT) and Indocyanine green fluorescent angiography (ICG-FA). All selected perforators were classified for their location using a previously published quadrant system. The quality of the selected perforators was assessed intraoperatively with DIRT and ICG-FA. The results from each modality were compared.

**Results**

Visual assessment of the results showed that the brightness and first appearing hot spots on DIRT were associated with powerful fluorescence spots on ICG-FA and these corresponded with suitable perforators selected during surgery. Most perforators mapped with CTA corresponded with the results of DIRT and ICG-FA. However, in some cases there was inconsistency between the diameter of the perforators assessed by CTA and the intensity of hot spots and fluorescent uptake. Preoperative mapping with Doppler Ultrasound corresponded well with the location of hot spots and ICG results, with a few false positive findings. ICG-FA visualized only for short time the flap perfusion. DIRT allowed continuous monitoring of the dynamics in skin perfusion by measuring skin temperatures. Both DIRT and ICG-FA demonstrated changes in the perfusion patterns of the skin flaps after perforator dissection and drainage through the superficial vein.

**Conclusions**

The results from the invasive technique ICG-FA corresponded well with non-invasive DIRT for both perforator mapping and assessment of its quality. Some dominant perforators on CTA could not be related to perforators selected on basis of DIRT and ICG-FA results.

**11:20 AUGMENTED REALITY IN BREAST RECONSTRUCTIVE SURGERY - PROJECTING THE PRE-OPERATIVE DIEP FLAP PLANNING ONTO PATIENTS IN A RANDOMIZED CONTROLLED TRIAL**

Stefan HUMMELINK, Yvonne Hoogeveen, Leo Schultze Kool, Dietmar Ulrich  
Radboudumc - Plast. chir HP 634, Nijmegen, THE NETHERLANDS

**Introduction**

In Deep Inferior Epigastric Artery Perforator (DIEP) flap breast reconstructions, the survival of this free flap relies on perforators, providing blood supply to the newly moulded breast. Preoperative mapping of these randomly distributed blood vessels is of the essence to avoid complications. It was investigated whether the pre-operative projection of a virtual 3D planning based on computed tomography angiography onto the abdomen leads to more correctly identified perforator locations and less operation time spent on dissecting the free flap compared to handheld Doppler ultrasound.

**Materials and Methods**

The study design was a randomized, open, single-center, superiority trial in patients undergoing a DIEP flap breast reconstruction between December 2015 to March 2017 with 1 week follow-up. The participants (n=60) undergoing a DIEP flap breast reconstruction without a lymph node transfer were randomly allocated in either the projection group (n=33, age 52  $\hat{\pm}$  9 yrs, BMI 26.5  $\hat{\pm}$  2.0), or the control group (n=27, age 50  $\hat{\pm}$  8 yrs, BMI 26.8  $\hat{\pm}$  2.7). In the projection group a virtual 3D planning was created, projected and traced onto the patients' abdomen prior to surgery, where in the control group the perforators were located using handheld Doppler ultrasound.

**Results**

Sixty patients provided 69 DIEP flaps for analysis. The projection method is capable preoperatively of displaying significantly more perforators compared to the Doppler method (respectively 61.7%  $\hat{\pm}$  7.3% versus 41.2  $\hat{\pm}$  8.2%, p=0.020) and decreasing flap harvest time by 19 minutes (136  $\hat{\pm}$  7 versus 155  $\hat{\pm}$  7 minutes, p=0.012). Complications were comparable across both groups.

**Conclusions**

Not only can more perforators be identified intraoperatively using the projection method compared to Doppler US, but there is also a significant time reduction in harvesting the DIEP flap without increasing complications.

**11:28 THE EFFECT OF PREVIOUS ABDOMINAL SURGERIES ON DEEP INFERIOR EPIGASTRIC PERFORATORS**

Chiara GELATI, Valentina Pinto, Federico A. Giorgini, Luca Contu, Maria E. Lozano Miralles, Matteo Renzulli, Riccardo Cipriani  
Ospedale Sant'Orsola-Malpighi, Bologna, ITALY

**Introduction**

Although there has been a growing body of literature aiming to identify the best candidates for mammary reconstruction with DIEP flap, we found only a few works about the correlation between scars in the abdominal wall and the eligibility for this specific surgery.

**Materials and Methods**

We conducted a retrospective study on 125 consecutive patients who underwent breast reconstruction with DIEP flap and sustained a preoperative CT angiogram. Patients were divided into three groups, according to presence of scar on the abdominal wall. Group A: patients without any scars on the abdominal wall (N= 56). Group B: patients presenting only laparoscopic scar (N= 34). Group C: patients with any kind of laparotomic scars on the abdominal wall (N= 35).

For every patient, diameter and branching of the left dominant and right dominant perforator artery were assessed by a single radiologist with experience in this evaluation.

**Results**

Group A presented an average diameter of the two main perforator arteries of  $2.57 \pm 0.54$  mm, the same average for the group B was  $2.64 \pm 0.66$  mm and in the group C it was  $2.90 \pm 0.65$  mm.

Averages of group A and B were comparable ( $p=0.46$ ), while a statistically significant difference was found between group C and both group A ( $p=0.0012$ ) and B ( $p=0.0117$ ).

No difference was found between the average branching of the two main perforator arteries (Group A=  $42 \pm 34$  mm, Group B=  $44 \pm 28$  mm, Group C=  $43 \pm 34$  mm).

**Conclusions**

The diameter is just one of the parameters that must be considered, but still has a role in the choice of the perforator. The results of this study suggest that previous laparoscopic surgeries had no effect on the vascularization of the abdominal wall, while laparotomic surgeries induced hypertrophy of the main perforator arteries, without affecting their branching.



**11:36 DOES PREGNANCY PREDICT INCISIONAL HERNIA REPAIR AFTER ABDOMINALLY-BASED AUTOLOGOUS BREAST RECONSTRUCTION? A RETROSPECTIVE REVIEW OF 890 FREE FLAPS**

Joseph M. SERLETTI, Jaclyn T. Mauch, Geoffrey M. Kozak, Irfan A. Rhemtulla, Shelby L. Nathan, Michael Tecce, Robyn B. Broach, Joseph M. Serletti  
University of Pennsylvania, Philadelphia, USA

**Introduction**

The abdomen is the most common donor site in autologous breast reconstruction (ABR). Since pregnancy weakens abdominal wall musculature, we aim to determine if pregnancy post-ABR increases incisional hernia repair (IHR) risk.

**Materials and Methods**

All women under 50 years old who underwent abdominally-based ABR between 2005-2016 were identified at our institution. Patients with less than 20 months of follow-up were excluded, unless IHR occurred. Demographics, operative details, outcomes, IHR occurrence, and pregnancy history were analyzed.

**Results**

519 patients underwent ABR (890 free flaps: Free TRAM=645 (72.5%); DIEP=214 (24.0%); Pedicled TRAM=18 (2.0%); SIEA=13 (1.5%)). Average follow-up was 57.2 months (range: 9.5 Å– 312.8 months). 14 women became pregnant (PG), with a mean follow-up post-pregnancy of 31.4 months (range: 5.4 Å– 70.8 months; pregnancies=17). Age of non-pregnant patients (NP) (mean: 43.1 years; range: 20.6 Å– 50.0 years) was higher than PG (mean: 32.1 years; range: 27.1 Å– 37.9 years) ( $p<0.0001$ ); in univariate analysis, age was not associated with IHR. 12 (85.7%) PG underwent C-section post-ABR. No statistically significant differences existed between groups regarding flap type and closure technique. Zero PG underwent IHR, compared to 6.0% IHR rate in NP ( $p=0.339$ ). In multivariate analysis, hematoma (OR=17.2;  $p=0.013$ ), reoperation (OR=11.0;  $p=0.001$ ), fascial dehiscence (OR=11.9;  $p=0.010$ ), and prior-IHR (OR=17.2;  $p<0.0001$ ) were predictors for IHR.

**Conclusions**

We present the largest cohort to date analyzing the risk of IHR associated with pregnancy after abdominally-based autologous breast reconstruction. Our results demonstrate that there may not be an increased risk of IHR associated with pregnancy post-ABR despite additional weakening of the abdominal wall.

**11:44      DIEP FLAP MONITORING WITH MICRODIALYSIS VS  
DOPPLER MONITORING**

Fabio SANTANELLI DI POMPEO, Benedetto Longo, Vittoria Amorosi, Michail Sorotos, Valeria Berrino  
Sapienza University of Rome, Rome, ITALY

**Introduction**

Perfusion of free-tissue transfer needs to be monitored postoperatively because of the risk of microvascular complications. Up to date, no universally accepted method of flap monitoring exists. We compare microdialysis vs Doppler for DIEP flap monitoring.

**Materials and Methods**

From September 2017 to November 2018 57 DIEP flaps operated by two surgeons (43 patients) were prospectively enrolled. Data collected included demographics, surgery information. At the end of surgery a microdialysis catheter was inserted in Zone I of the flap and postoperative follow-up protocol was applied with Doppler and the ISCUSFLEX® system. Primary outcomes were time for positive signal of flap viability, microvascular complications requesting surgical intervention, flap complications. Statistical analysis was done with the Mann-Whitney U test and a  $p < 0.05$  was considered statistically significant.

**Results**

Twenty-nine flaps were monolateral and 14 bilateral. Thirty-seven reconstructions were immediate while 6 delayed. Thirty-three patients were non-smokers and 10 smokers while 36 were pluriparous and 7 nulliparous. Positive microdialysis signal was revealed immediately in all cases (100%) while 82.5% had immediate positive doppler signal  $p < 0.05$ . Mean time of positive signal of flap viability was 1h25min (0-7hrs) for Doppler monitoring and 20min (minimum time for vial filling) for microdialysis (20min)  $p < 0.05$ . Two patients returned in the operating room for anastomosis revision. In both cases Doppler was never revealed during follow up while microdialysis signaled a normal perfusion (glucose  $> 1\text{mmol/L}$  and lactate  $< 6\text{mmol/L}$ ) initially and an ischemia alert later on (glucose  $0.1\text{mmol/L}$ , Lactate  $> 15\text{mmol/L}$ ). Both flaps were successfully revascularized. Doppler showed 100% sensibility and 77% specificity, while microdialysis sensitivity was 100% and specificity 100%.

**Conclusions**

Although microdialysis is an invasive monitoring system thanks to its high specificity and sensitivity, it can substitute Doppler in postoperative free flap monitoring and the necessity for sentinel skin paddle (SSP) therefore reducing useless reexploration and SSP removal surgery.

**11:52      PREOPERATIVE PLANNING OF LYMPHATICOVENULAR ANASTOMOSIS IN IODINE ALLERGY PATIENTS: A MULTICENTRIC EXPERIENCE**

Alessandro BIANCHI, Giuseppe Visconti, Akitatsu Hayashi, Marzia Salgarello  
University Hospital Agostino Gemelli, Università Cattolica del Sacro Cuore, Rome, ITALY

**Introduction**

In supermicrosurgical Lymphaticovenular anastomosis (LVA), indocyanine green lymphography (ICG-L) has been demonstrated to be useful in the preoperative planning. However, ICG is contraindicated in patients with history of allergy to iodines.

**Materials and Methods**

From August 2014 to August 2016, 23 consecutive iodine allergic patients affected by extremity lymphedema underwent LVA in two Institutions by means of ultrasound based methods. Quantitative outcome analysis was performed by comparing preoperative and postoperative upper extremity lymphedema (UEL) and lower extremity lymphedema (LEL) index.

**Results**

In all patients, we were able to perform LVA using the described methods. On a total of 105 incisions, we were not able to find lymphatic channels in 8 incision sites (7%) and in 1 incision site (0.9%) we were not able to locate a recipient venule. Postoperatively, UEL index decreased from 143,29 (mean)  $\hat{A}\pm 19,23$  to 128,85 (mean)  $\hat{A}\pm 14,34$ , and LEL index decreased from 291,07 (mean)  $\hat{A}\pm 25,26$  to 271,59 (mean)  $\hat{A}\pm 14,74$ , which showed statistically significant differences both in UEL cases LEL cases ( $p < 0.05$ ).

**Conclusions**

The reported methods were both found reliable and allowed to successfully perform LVA in iodine allergy patients, in whom ICG-L is contraindicated.

**12:00 PARTNERS' PERCEPTIONS OF WOMEN'S BODY IMAGE PROBLEMS, SEXUALITY, AND SATISFACTION OF BREAST RECONSTRUCTION LONG-TERM AFTER RISK-REDUCING MASTECTOMY AND IMMEDIATE BREAST RECONSTRUCTION**

Lucy BAI, Brita Arver, Hemming Johansson, Marie Wickman Chantereau Kerstin Sandelin, Yvonne Brandberg  
Karoniska Institutet, Department of Oncology-Pathology, Stockholm, SWEDEN

**Introduction**

Partners' views of women's perception of body image, sexuality, and satisfaction with the results after risk-reducing mastectomy (RRM) and immediate breast reconstruction (IBR) are of interest, as sexuality and body image are essential aspects of intimate relationships. However, there is limited data about partners' perception in this context. The purpose of this study was to evaluate partners' responses and compare them with the women's responses long-term after RRM+IBR, using validated questionnaires, one of them breast reconstruction specific.

**Materials and Methods**

Partners' contact information was provided by women in a prospective long-term follow-up after RRM+IBR. Partners received written information about the study and questionnaires to be completed/returned in a prepaid return envelope. The Hospital Anxiety and Depression scale and the Swedish Short Form-36 Health Survey (SF-36) were answered from the partners' perspective, and the Breast Reconstruction Questionnaire (EORTC QLQ-BRR26), the Body Image Scale, and the Sexuality Activity Questionnaire from partners' perception of the women's experience. Partners' responses were compared with the women's responses, and with the SF-36 in the normative Swedish population.

**Results**

Sixty partners' names were provided by the 146 (73%) participating women. Thirty-six (60%) partners participated in total. The partners' perception of the women's satisfaction with IBR showed a lower level than the women's own perceptions,  $p=0.0362$ . They perceived that the women had more problems with body image than the women themselves,  $p=0.0419$ , but both groups scored sexuality items similarly. Both partners and women had in general a higher level of health-related quality of life compared to the age-standardised normative Swedish population.

**Conclusions**

When partners' long-term perception of women's perception of body image, sexuality, and satisfaction with the breast reconstruction was investigated, both partners and women demonstrate high levels of health-related quality of life after RRM+IBR. Partners tend to underestimate women's satisfaction with the procedure. These observations have not previously been demonstrated.

**12:08      TREATING LYMPHEDEMA WITH A PEDICLE  
VASCULARIZED LYMPH NODE TRANSFER COMBINED  
WITH NANOFIBRILLAR COLLAGEN SCAFFOLDS**

Dimitrios DIONYSSIOU, Efterpi Demiri, Dung Nguyen, Tatiana Zaitseva, Stanley Rockson

Aristotle University of Thessaloniki, Thessaloniki, GREECE

**Introduction**

This study was conducted to evaluate a pedicle vascularized lymph node flap transfer (pVLNT) combined with a thread like multi-lumen aligned nanofibrillar collagen scaffold (CS) in the treatment of a rat hind limb lymphedema, and asses the possibility of translating to humans.

**Materials and Methods**

Unilateral left hind limb lymphedema was created in 15 female Sprague-Dawley rats following inguinal and popliteal lymph node (LN) resection and radiation. An inguinal pVLNT including 3 LN was elevated from the contralateral groin and transferred through a skin tunnel to the affected groin. Four collagen threads were attached to the flap and inserted to the hind limb at the subcutaneous level in a fun shape.

The three study groups consisted of Group A (no LN transfer-control), Group B (pVLNT), and Group C (pVLNT + CS).

Volumetric analysis of bilateral hind limbs was performed using micro-CT imaging at 1 and 3 months postoperatively, lymphatic drainage was assessed with ICG fluoroscopy for number and morfology of new collectors, and ICG transfer time). Finally histology used to estimate lymphangiogenesis in all groups.

**Results**

An increased mean limb volume of 9,3% remained at Group A, while a significant mean volume reduction was seen in Groups B (-11,3%) and in a greater degree in Group C (-12,8%) at all time points. ICG proved the functional restoration of lymphatic vessels through the CS and viability of lymph node flaps in both B and C groups, while histology confirmed the advantages of Group C.

**Conclusions**

The pedicle vascularized lymph node transfer is an effective procedure for the treatment of lymphedema in rats. It can be easily translated in humans' lower limb lymphedema after contralateral pLNT, or in upper limb with the use of a pedicle propeller lateral thoracic pLNT, if both are combined with collagen threads; further studies are required prior to recommend the above method.

**12:16      LYMPHO-VENOUS ANASTOMOSIS AS  
RECONSTRUCTIVE TREATMENT FOR CHRONIC  
LYMPHOCELE AND THORACIC DUCT LESIONS**

Nicole LINDENBLATT, Semra Uyulmaz, Pietro Giovanoli, Gilbert Puiippe  
University Hospital Zurich, Zurich, SWITZERLAND

**Introduction**

The treatment of postoperative seroma and chronic lymph fistula is challenging, especially in immunosuppressed patients. Currently there is no proven prevention or therapeutic strategy. Based on our experience in the treatment of chronic lymph fistulas, we established a comprehensive multidisciplinary treatment concept.

**Materials and Methods**

A standardized approach was chosen depending on wound status (open/closed) and presence of immunosuppression. We proceeded either directly to surgery (microsurgical lymphatic ligation, lympho-venous anastomosis) or alternatively to sclerotherapy with OK-432. Sclerotherapy alone was successful in 92% of the cases. Herein we specifically present the results of the supermicrosurgical therapy.

**Results**

42 patients undergoing surgical revision for lymphocele or chyle leak between 06/2014 -10/2018 were evaluated. All patients had multiple surgical wound revisions. In 32 patients sclerotherapy was attempted without success and/or a high-flow lymph fistula was present. Mean duration of seroma was 157 days (range 13-593). 10 patients were immunosuppressed after solid organ transplantation. Most patients received femoral cut-down for cannula insertion for extracorporeal circulation in the context of heart- or lung transplantation or implantation of a left ventricular assist device. Intraoperative ICG visualization of lymphatic vessels was performed. Chyle leak was visualized with high fat cream via the gastric tube. Severed lymph vessels were treated with LVA whenever possible. Two patients were treated with lympho-lymphatic anastomoses. In 18 patients additional flap reconstruction was performed. Lympho-venous anastomosis was successfully performed to reconstruct a thoracic duct transection after neck dissection for hypopharyngeal cancer.

**Conclusions**

Chronic seromas and lymph fistulas represent an ongoing challenge especially in immunocompromised patients. A multimodal approach of super/microsurgery and interventional therapy may have complementary effects. In addition, lympho-venous anastomoses represent a new reconstructive option to treat thoracic duct lesions.

**12:24 PHASE 1 LYMFACIN® STUDY: SAFETY OF COMBINED ADENOVIRAL VEGF-C AND LYMPH NODE TRANSFER TREATMENT FOR UPPER EXTREMITY LYMPHEDEMA**

*Pauliina HARTIALA, Sinikka Suominen, Erkki Suominen, Ilkka Kaartinen, Juha Kiiski, Tiina Viitanen, Outi Lahdenperä, Antti Vuolanto, Anne Saarikko  
Turku University Hospital, Turku, FINLAND*

**Introduction**

*Upper limb lymphedema is a common clinical challenge after treatment of metastatic breast cancer. Lymfactin® is a prolymphangiogenic growth factor (VEGF-C) therapy that aims to correct the underlying cause of secondary lymphedema in combination with lymph node transfer surgery by promoting the growth and repair of lymphatic vessels to restore the function of the lymphatic system.*

**Materials and Methods**

*In a Phase I study, Lymfactin® was combined with microvascular groin lymph node transfer surgery to study the safety and tolerability of Lymfactin® treatment in patients with breast cancer related upper limb lymphedema. Efficacy will be quantified using volumetry measurements, semiquantitative lymphoscintigraphy and quality of life measurements.*

**Results**

*15 patients suffering from breast cancer associated secondary lymphedema of the upper arm were recruited from three centers in Finland. 5 patients underwent lymph node transfer and 10 patients underwent simultaneous breast reconstruction and lymph node transfer. Lymfactin® was injected in the flap ex vivo. 3 patients received a lower dose and 12 patients a higher dose of 1x10<sup>10</sup> and 1x10<sup>11</sup> adenoviral particles, respectively. No dose limiting toxicities were observed and the study was completed with the pre-determined maximum dose. The most commonly reported adverse events during the 10 months follow-up were common cold, gastroenteritis, pain, headache, muscle ache and elevated liver enzymes. Preliminary volumetry and quality of life results at 6 months are promising.*

**Conclusions**

*At the moment no curative treatment is available for lymphedema patients. We hope that Lymfactin® combined with lymph node transfer surgery will offer new hope for patients. The Phase 1 study indicates that Lymfactin® combined with lymph node transfer surgery is safe and well tolerated. The Phase 1 study continues with a 24-month follow-up of the patients. The oncological safety aspects of Lymfactin® treatment will require longer follow up.*

**12:36      DECREASING DONOR SITE MORBIDITY AFTER  
HARVESTING THE GROIN VASCULARISED LYMPH  
NODE FLAP WITH LESSONS LEARNED DURING 12-  
YEAR EXPERIENCE: A CASE SERIES AND REVIEW OF  
THE LITERATURE**

Lisa RAMAUT, Randy De Baerdemaeker, Assaf Zeltzer,  
Benoit Hendrickx, Moustapha Hamdi  
University Hospital Brussels, Brussels, BELGIUM

**Introduction**

Vascularised lymph node transfer (VLNT) has been described as a treatment for breast cancer related lymphedema of the upper limb. Our study has been designed to investigate donor site morbidity after groin lymph node flap harvest and what surgical strategies are at hand to reduce these numbers.

**Materials and Methods**

A retrospective chart review of donor site complications after groin VLNT from 2006 to 2018 was performed. The patients' medical histories and demographic data were analysed for risk factors. A literature review was implemented to investigate the most common donor site complications and to compare our own surgical strategies with those in other papers.

**Results**

Seventy-two patients were included in our case series. Thirty-six cases (48%) were combined with DIEaP-flap breast reconstruction which itself entails a risk of seroma formation. Seroma rate diminished from up to 90% in the very first 29 cases to 15,5% in the last five years (45 cases) since the implementation of the described surgical method. Statistical analysis did not reveal risk factors. Lymphedema of the afferent lower limb is described in the literature but did not occur in our series. Our proposed surgical strategy corresponds with several known methods like avoiding lower limb sentinel lymph nodes, the use of drains and reversed lymphatic mapping, and contains unique features like the deepithelialisation of the upper abdominal flap in order to obliterate dead space.

**Conclusions**

Seroma is the most common donor site morbidity after groin vascularised lymph node flap harvest. This paper contains the largest reported series of combined DIEaP+VLNT and describes surgical strategies on how to avoid iatrogenic lymphedema of the lower limb as well as seroma formation.



**12:48 QUALITY OF LIFE AFTER LYMPH NODE TRANSFER FOR THE TREATMENT OF CHRONIC LYMPHEDEMA – A PROSPECTIVE STUDY**

Nikolaos PAPAPOULOS, Christian Krammer, Min-Seok Kwak, Daniel Müller, Gerhard Henrich, Peter Herschbach, Laszlo Kovacs, Hans-Günther Machens Athens & Alexandroupoli, GREECE; Munich, GERMANY

**Introduction**

In modern medicine, improving the patients' quality of life (QOL) is very important. The aim of the study is to prospectively examine the QOL after free/microvascular lymph node transplantation (FLNT). Chronic lymphedema often means a lifelong, very costly conservative therapy with significant impairment of QOL. The FLNT represents a significant alternative. This gives us the reason to check the reproducibility of this method and results.

**Materials and Methods**

A total of 51 patients met the criteria for participation and underwent a FLNT between June 2013 and December 2017. 39 patients completed T0 and T1 (at least 1 year postoperatively). The testing instruments consisted of a self-developed indication specific questionnaire. In addition, we used the FLZM, FPI-R-L, RES, PHQ-4, FLQA-te, FLQA-b, FLQA-k and FLQA-l. All of them are standardized, validated and widely used questionnaires. Most of them can be compared to norm data. The paired and unpaired t-test were used. The threshold for statistical significance was set at  $p < 0.05$ .

**Results**

3% of the study participants are male, 97% female, the median age was 48.5 years. For example, the self-developed questionnaires revealed a significant reduction in the number of lymph drainage therapy per week ( $p = 0.003$ ) as well as other factors. The FLZM revealed several significant improvements. The FPI-R-L provided an improvement from pre- to postoperative, but not significant. The RES showed an improved self-confidence of the patients ( $p = 0.566$ ). Improved scores were also found on the PHQ-4 depression scale.

**Conclusions**

The FLNT has a positive influence on the perception of the patients' QOL. The good scores in the self-developed indication-specific questionnaires correlate with those in the standardized and validated questionnaires.

**Session 9****14:10-15:45**

## PRESIDENTIAL PANEL

**LATEST ADVANCES IN AUTOLOGOUS FAT TRANSFER – WHAT IS TRENDSETTING IN REGENERATIVE PLASTIC SURGERY?***Chair*

Norbert PALLUA

*2018-2019 EURAPS President*

- 14:10**     **Introduction**  
Norbert PALLUA – Aachen, GERMANY
- 14:15**     **FEMALE AND MALE INTIMATE SURGERY BY LIPOGRAFTING**  
Sylvie ABRAHAM – Paris, FRANCE
- 14:30**     **THE HYPE ABOUT GLUTEAL FAT GRAFTING**  
Daniel DEL VECCHIO – Boston, USA
- 14:45**     **IS LIPOGRAFTING AN ALTERNATIVE TO FLAP SURGERY IN PROBLEM WOUNDS?**  
Kim BONG-SUNG - Zurich, SWITZERLAND
- 15:00**     **FAT GRAFTING TO THE FACE: HOW CAN WE GET A PERFECT REGENERATION OF THE SKIN?**  
Ramon LLULL - Palma De Mallorca, SPAIN
- 15:15**     **PITFALLS AND RISKS OF LIPOGRAFTING - AN ALGORITHM**  
Riccardo MAZZOLA - Milan, ITALY
- 15:30**     **Panel Discussion**

**Session 10**

**16:15-18:27**

***AESTHETIC PLASTIC SURGERY***

*Moderators*

Charles FILIP, Oslo, NORWAY

Kenneth J. STEWART, Edinburgh, UNITED KINGDOM

## 16:15 GENDER-ORIENTED RHINOPLASTY: DEFINITION OF “GENDER ANGLE” IN 1774 PATIENTS

Paolo PERSICHETTI, Mauro Barone, Annalisa Cogliandro  
Campus BioMedico University of Rome, Rome, ITALY

### Introduction

The aim of this study report is to introduce the “gender angle” for performing a gender-oriented rhinoplasty.

### Materials and Methods

The study population was obtained from the 3560 patients who had undergone rhinoplasty between January 1986 and September 2016. Patients answered the Italian version of the FACE-Q outcome instrument on post-rhinoplasty satisfaction with their nose. Anthropometric measurements were performed retrospectively by AutoCAD for MAC on a photograph of the profile view taken postoperatively at the last follow-up.

### Results

A total of 1774 (706 male and 1068 female) patients satisfied the inclusion criteria and were finally enrolled in this study. We identified a gender angle ranging from 168° to 182° for the male nose and from 160° to 178° for the female nose. We subdivided all study patients into 3 ranges of angles, as follows: male nose, range 1 = 168°–172°, range 2 = 173°–177°, range 3 = 178°–182°; female nose, range 1 = 160°–166°, range 2 = 167°–171°, range 3 = 172°–178°. All study patients completed the FACE-Q Rhinoplasty postoperative module. Analysis was performed of the FACE-Q results and the angle obtained for each nose. The most satisfactory angle range for the male patients was range 3 ( $P=0,01$ ) and for the female patients was range 2 ( $P=0,01$ ). According to evaluations by the 2 reviewers, angle range 3 and angle range 2 were the most satisfactory postoperative results for the male ( $P=0,01$ ) and female ( $P=0,01$ ) patients, respectively.

### Conclusions

We identified the 2 ranges of nasal angles that were associated with masculine and feminine appearance. The gender angle might be a parameter that effectively provides the optimal cosmetic result for male and female patients who undergo rhinoplasty.

**16:27      ROLE OF SPREADER FLAPS IN RHINOPLASTY:  
ANALYSIS OF PATIENTS UNDERGOING CORRECTION  
FOR SEVERE SEPTAL DEVIATION WITH LONG-TERM  
FOLLOW UP**

Mauro BARONE, Annalisa Cogliandro, Paolo Persichetti  
Campus BioMedico University of Rome, Rome, ITALY

**Introduction**

The aim of this randomized controlled study was to analyze the long-term results of patients undergoing rhinoplasty because of severe septal deviation and to evaluate the stability of results.

**Materials and Methods**

The study was performed with a randomized block design. Patients were randomly divided into 4 groups: group 1, spreader flaps were used in combination with spreader grafts; group 2, spreader flaps were used alone; group 3, spreader grafts were used alone; and group 4, neither the spreader flaps nor grafts flaps were used. Patients answered the Italian version of the FACE-Q rhinoplasty module. Anthropometric measurements were performed by AutoCAD for MAC. We determined the angle of deviation and we compared the pre- and postoperative angles and compared patient satisfaction in the 4 groups using the chi-squared test for unpaired data. Two plastic surgeons reviewed all the postoperative photos of the study patients and rated the photos on a scale of 1 to 5.

**Results**

A total of 264 patients, underwent to primary rhinoplasty between January 2010 and September 2016, satisfied the inclusion criteria and were finally enrolled in this study. Anthropometric measurements revealed statistically significant differences ( $P<0.01$ ) between the preoperative and postoperative values for the angle of septal deviation in group 1 versus the other groups. Over the long-term follow up, group 1 maintained an angle close to 180 degrees ( $P<0.01$ ). Group 1 and group 3 were more satisfied compared with group 2 and 4 ( $P<0.01$ ). According to evaluations by the 2 reviewers, group 1 and angle group 3 were the most satisfactory outcomes ( $P<0.01$ ).

**Conclusions**

This was the first randomized study to show that the combined use of the spreader flap and spreader graft is the best choice for a good long-term outcome and durable correction of septal deviation.

**16:39      PIEZOELECTRIC INSTRUMENTATION VS.  
CONVENTIONAL INSTRUMENTS. IS THERE A BENEFIT  
IN RHINOPLASTY SURGERY?**

Marion SAN NICOLO, Isabella Mazzola, Alexander Berghaus  
University Clinic Munich, Munich, GERMANY

**Introduction**

Piezoelectric Instrumentation (PEI) has been widely used in maxillofacial surgery. Due to its good preservation of surrounding soft tissue and its high cutting precision, it offers a good surgical applicability for rhinoplasty.

This retrospective study aims to evaluate the results of bony and cartilaginous interventions with the use of piezoelectric instruments in rhinoplasty, its safety and preciseness, and to discuss advantages and disadvantages in comparison to conventional instruments.

**Materials and Methods**

31 patients underwent rhinoplasty under general anaesthesia, conducted by the same two surgeons.

Surgical performance of PEI was compared with conventional instruments and evaluated by a customized questionnaire. Post-operative pain, facial swelling and bruising were assessed.

**Results**

Overall PEI showed to be very precise and safe. In bone modelling procedures like hump removal (N= 25), osteotomies (N= 104) and bony fixations (N= 41) PEI revealed to be superior to conventional instruments in 100% of the cases. Bleeding was found less in 62% of the patients. Excellent tissue preservation could be confirmed with no reported mucosal perforation. Operation time required was longer with PEI in almost all cases. Postoperative pain was absent to moderate in 70% of the cases. 61% of the patients presented no to mild facial swelling and/or bruising.

**Conclusions**

PEI offers a highly precise method with preservation of soft tissue and demonstrates to be an effective and safe novel instrumentation for rhinoplasty surgery.

**16:47      DEFINING A NEW VARIABLE THAT MAY IMPACT LONG-TERM POSTOPERATIVE NASAL TIP SUPPORT: THE BIOMECHANICAL PROPERTIES OF THE COLUMELLAR STRUT GRAFT**

Billur SEZGIN, Kirdar Guney, İsmail Lazoglu, Sedat Tatar, Ehsan Layegh, Melis Ozel, Selahattin Ozmen, Reha Yavuzer  
Istanbul, TURKEY

**Introduction**

*Although columellar strut grafts are fundamental for providing tip support, a downward rotation of the nasal tip in patients with strut grafts can still be encountered. Patient-related factors such as skin thickness can allow the plastic surgeon to foresee certain drawbacks that can be encountered during healing, but patient-based differences of nasal cartilage and the resulting impact have yet to be investigated. The purpose of this study was to evaluate the effect of the biomechanical properties of columellar strut grafts on late postoperative nasal tip position and support.*

**Materials and Methods**

*The study was undertaken with 20 patients undergoing closed-technique primary rhinoplasty with columellar strut grafts. Each cartilage specimen was biomechanically analysed to calculate the modulus of elasticity. Preoperative and postoperative images were obtained to determine nasal tip position with quantitative measurements. Postoperative 3rd and 12th month measurements were evaluated according to their relationship with the elasticity modulus of the utilized cartilages.*

**Results**

*The mean elasticity coefficient of cartilage samples was  $0.039 \pm 0.04$  GPa while the threshold value was 0.040 GPa. A regression analysis model was utilized to determine the individual impact of the dimensions and the modulus of elasticity of strut grafts on long-term stability of the nasolabial angle. Stability was determined by subtracting the 12-month angle values from 3-month values. Only the modulus of elasticity was found to have a significant impact on the stability of the nasolabial angle ( $p < 0.05$ ). A negative correlation was determined, meaning that an increase in the modulus of elasticity results with a decrease in long-term nasal tip stability.*

**Conclusions**

*The results of the study reveal a new objective variable that can impact nasal tip dynamics and patient-related differences following rhinoplasty. This study not only brings forth a different perspective in the evaluation of nasal tip dynamics but can also provide data for determining ideal values for cartilage prefabrication.*

**16:59 A NOVEL TECHNIQUE IN TIP CONTOURING**

Mariam ISMAIL, Karima Ismail, Taher Ismail, Ahmad Ismail  
Kasr El-Aini hospitals, Cairo University, Cairo, EGYPT

**Introduction**

*Achieving a well-defined symmetrical tip is done by addressing the cartilaginous framework (L.L.C) as well as soft tissue coverage. Narrowing of the domes is done by L.L.C suturing and/or resection techniques. Optimizing results especially in bulbous or boxy tips is done best by dome resection. However, resection may lead to pinching, narrowing, and tip notching. In this study we are proposing a novel technique avoiding these complications by "Dome resection and auto-augmentation"*

**Materials and Methods**

*A cohort of rhinoplasty patients (210) from January 2014 to January 2017, 112 cases with bulbous and boxy tips were included in this study. All patients were operated upon using closed rhinoplasty technique in the same clinic by three separate surgeons adopting the same concept. Routinely cephalic trimming of L.L.C together with inter-domal, inter-crural sutures and subcutaneous fat / fascia excision were done. Followed by identifying the dome, marking and incising the 2 edges of wide dome (2.5-4mm). Medial and lateral cartilaginous flaps are elevated and separated from underlying mucosa. The central segment remains attached to underlying mucosa. Medial and lateral cartilaginous flaps are sutured over the central segment, followed by capping of the sutured cartilage by suitable tip grafts (Peck graft). Evaluation done objectively by the three operating surgeons and subjectively by the patients through a questionnaire addressing the shape. Follow up duration from 6 months to 3 years.*

**Results**

*14.2% of patients (n:16) were excluded; follow up less than 6months. 85.4% (n: 82) were extremely satisfied with results. 8.3 % (n:8) moderately satisfied due to prolonged post- operative edema. 4.1% (n: 4) complained of unilateral pinching. 2% (n:2) complained of bilateral pinching.*

**Conclusions**

*Narrowing the tip in bulbous and boxy noses by dome resection and auto augmentation offers an effective method avoiding tip pinching, narrowing, and soft tissue triangle notching with reproducible and consistent long-term results.*



**17:07 PREGNANCY AND BIRTH AFTER LOWER BODY CONTOURING SURGERY**

Susanna PAJULA, Janne Jyränki, Erkki Tukiainen, Virve Koljonen  
Helsinki University Hospital, Helsinki, FINLAND

**Introduction**

*We examined whether lower body contouring surgery (LBCS) effects pregnancy or delivery with or without bariatric surgery.*

**Materials and Methods**

*In this retrospective register linkage study we used data from National Health registers and Medical Birth Register. We included women aged 18-54 with beltlipectomy or abdominoplasty during 1999-2016 with pregnancy and delivery after LBCS. The patients were divided into two groups:*

*group 1 (G1) with bariatric procedure*

*group 2 (G2) with no preceding bariatric procedure.*

*We focused on the first pregnancy and delivery after LBCS. Both groups were compared between each other and to all deliveries during the study period, n=1 028 503 with adjusted odds ratios (ORs) and 95% confidence intervals (CI) taking account the year of delivery, maternal age and parity.*

**Results**

*G1 included 26 women, mean age 35.9 years and G2 66 women, mean age 33.2 years ( $p=0.025$ ). In both groups abdominoplasty was frequent. The first delivery in G1 group was mean 4.87 years and in G2 3.56 years after LBCS. The women in study groups had Caesarean section more often than other women (16.4%): G1 27.3%,  $p=0.092/<0.001$  G1/G2. Risk for Caesarean section was elevated in G2: adjusted OR 2.77; 95% CI 1.72-4.47. Low birth weight (< 2500g) was recorded in G1 in 12.1% and G2 in 5.5%, in all deliveries 4.4%;  $p=0.033/0.596$  for G1/G2. We found elevated risk in G1: adjusted, 3.75; 95% CI 1.32-10.69. Preterm delivery (< 37 weeks) was recorded in G1 6.1% and in G2 9.1%, in all deliveries 5.2%,  $p=NS$*

**Conclusions**

*There was slightly elevated risk for low birth weight baby after LBCS in post-bariatric women. After LBCS Caesarean section was more common compared with all deliveries. Based on our preliminary results, the possible deviations from normal pregnancy and delivery should be discussed with fertile aged women seeking for LBCS.*

**17:19      META-ANALYSIS ON THE COMPARATIVE EFFICACY OF DRAINS, PROGRESSIVE TENSION SUTURES AND SUBSCARPAL FAT PRESERVATION IN REDUCING COMPLICATIONS FROM ABDOMINOPLASTY**

Ho WEIGUANG, Weiguang Ho, Christopher David Jones, Elizabeth Pitt, Marc-James Hallam  
Ulster Hospital, Belfast, UNITED KINGDOM

**Introduction**

*Abdominoplasty is a popular aesthetic operation. Complication rates vary from 4-80%. To date, there is a lack of evidence for complication-reducing techniques. The aim of this meta-analysis was to summarise and quantify the effects of these techniques on complication rates and determine the safest combination.*

**Materials and Methods**

*A literature search was undertaken from MEDLINE, EMBASE, and Cochrane Central Register of Controlled Trials databases. Two authors assessed the abstracts and evaluated their suitability for inclusion in the review. For each complication (including overall), a random effects meta-analysis was conducted to investigate the average number of complications. The log rate and associated variance is calculated in R using the "escalc" function from the metafor R package. For the forest plots the model output is back-transformed to the original scale.*

**Results**

*4295 patients were included in the meta-analysis. Overall complication rates ranged from 9.3- 33.8%. Revision rates were 3-21.9%. Forest plots of data extracted from observational studies demonstrated summary measures favoring the sub-scarpal fat preservation and drains, and drains only groups for overall complications. There were no significant differences between groups for seroma, haematoma, infection/abscess, skin/fat necrosis, dehiscence, surgical revision rate and VTE rate.*

**Conclusions**

*The rates of individual complications are no different with or without the use of PTS, drain or sub-Scarpal fat preservation in different combinations. Higher rates of overall complications observed favours the use of "fat preservation only", "quilt only" or "quilt and drain" techniques. We recommend consideration when "drain only" or "drain and fat preservation" techniques are employed.*

**17:31 IS IT NECESSARY TO USE DRAINS IN BREAST REDUCTION SURGERIES ?**

Alli İPEK, Yakup Cil, Mustafa Erol Demirseren  
Ankara, TURKEY

**Introduction**

In order to avoid complications such as hematoma that may occur during breast reduction operations, drains are commonly used by surgeons. In this study, the necessity of using drains in breast reduction operations was investigated.

**Materials and Methods**

In this study, the results of breast reduction surgeries performed between 2005-2017, with using drains (first 6 years) and without using drains (last 6 years) by the same surgeon (Yİ) were evaluated. The mean age of the patients was 43 years (22-66 years) in the undrained group and 45 years (21-68) in the drained group. The mean body mass index was 27.3 kg / m<sup>2</sup> in the undrained group and 28.2 kg / m<sup>2</sup> in the drained group. In all patients bilateral breast reduction surgery was performed and 136 patients were operated without drains and 142 patients were operated with drains. All of the patients were dressed with an appropriate sized bra, over the dressing, within an hour after the surgery.

**Results**

The average excision amount in the undrained group was 680 grams (480 - 960) for the right breast; 670 grams (460 - 940) for the left breast. The average excision amount in the drained group was 660 (480 - 960) for the right breast and 650 (450 - 910) for the left breast. Hematoma occurred in 3 patients in the undrained group (2 right, 1 left breast); and 2 patients (one right and one left breast) in the drained group. There was no statistically significant difference between the drained and undrained groups regarding the hematoma ( $p < 0.05$ ).

Mean hospitalization time was 36 hours (28-48 hours) for drained group. Mean hospitalization time was 16 hours (12-20 hours) for undrained group.

**Conclusions**

As a result of this study, it was concluded that the use of prophylactic drains in breast reduction surgeries is not necessary.

**17:43            SHORT SCAR AUGMENTATION MASTOPEXY WITH  
IMPLANTS IN MASSIVE WEIGHT LOSS PATIENTS**

Marzia SALGARELLO, Giuseppe Visconti  
Università Cattolica Sacro Cuore, Rome, ITALY

**Introduction**

*Massive weight loss (MWL) population shows peculiar breast deformities usually characterized by breast ptosis and deflation with inelastic skin envelope. Augmentation mastopexy is usually considered a challenging procedure in this subset of patients because of both the technical difficulties in providing satisfactory cosmetic outcomes and the high risk of complication. The traditional approaches for augmentation mastopexy in MWL patients are based on an inverted-T pattern to manage skin excess. However, a high rate of wound healing complications and poor cosmetic outcomes has been reported.*

*The aim of this study is to report the authors' experience with augmentation mastopexy in the MWL population using short-scar patterns.*

**Materials and Methods**

*Thirty-one consecutive MWL patients undergoing augmentation mastopexy between January 2008 and December 2017 were retrospectively reviewed. All patients underwent vertical or L short-scar mastopexy and dual plane polyurethane-covered anatomical implant positioning using our standardized four-step principles consisting of 1) footprint definition with implant; 2) skin envelope excess draping; 3) gland reshaping; 4) nipple-areola complex positioning. Cosmetic outcomes analysis was performed separately by a blinded group of plastic surgeons and by the attending surgeons using a standardized evaluation method. The BREAST-Q data templates and scoring software, Q-score, were used to study patients' satisfaction.*

**Results**

*No major complications were experienced. In two cases, superficial epidermolysis was reported along the vertical scar, which healed in 10 days. Two patients reported reduced sensation in one breast. No implant-related complications and no waterfall deformity occurred. Breast cosmetic outcomes were rated high to very high for all patients. The Q-score showed a high level of satisfaction.*

**Conclusions**

*The described four step surgical principles for short-scar augmentation mastopexy in MWL patients enables to obtain durable and pleasant cosmetic outcomes with very low complication rate. This may help plastic surgeons to obtain reliable and reproducible results for this challenging procedure.*

**17:51      A TEN-YEAR EXPERIENCE OF SURGICAL CORRECTION  
OF GYNAECOMASTIA; TREATMENT ALGORITHM  
BASED ON A SINGLE INSTITUTIONS EXPERIENCE**

Paulien HILVEN, Michelle Griffin, Ash Mosahebi, Peter Butler  
The Royal Free London Hospital, London, UNITED KINGDOM

**Introduction**

*Gynecomastia is a common finding in the male population of all ages caused by the proliferation of ductal, stromal and/or fatty tissue. Although a common condition, there are multiple surgical options described to improve the outcome of gynaecomastia. This study aims to analyze the surgical approaches used in the treatment of gynecomastia over a 10-year period to provide a systematic treatment algorithm.*

**Materials and Methods**

*Clinical records of patients affected by gynaecomastia and treated at our department between January 2006 and January 2016 were identified. The cohort was studied for age, co- morbidities, BMI, follow- up, surgical technique, complications, risk factors and need for secondary procedures.*

**Results**

*We performed 378 gynaecomastia corrections in a total of 328 patients over the ten-year period. The average follow up was 25 months (18-35 months). The average age was 34 years (21-57 years) with minimal co-morbidities. Gynaecomastia was monolateral in 39/328 (12%) and bilateral in 256/290 of cases(88%); idiopathic in 295/328 (90%) and secondary in 32/328(10%). Liposuction was used alone in 76 of the 378 procedures (20%) and combined with breast resection in 302/378 (80%). Surgery was performed using a single procedure in 278 patients and multiple procedures in 50 patients. Patient and surgeon satisfaction was satisfactory in over 301/328 (92%) of cases. There was 10/378 (3%) postoperative complications including 2 haematoma that required surgical intervention and 8 wound infections that were treated conservatively.*

**Conclusions**

*For mild gynaecomastia liposuction will adequately correct asymmetry. For moderate and severe cases of gynaecomastia direct excision through periareolar incisions is an effective option with minimal postoperative complications. Surgical treatment of gynaecomastia provides adequate resection, and optimal aesthetic results with a minimal complication rate.*

**18:03      REFINING THE TECHNIQUE OF POWER-ASSISTED  
                  GLUTEAL AUGMENTATION USING BARBED SUTURES**

Karl WAKED, Nicolas Abboud, Hiba El Hajj  
University Hospital Brussels Brussels, BELGIUM

**Introduction**

The surgical approach of power-assisted gluteal augmentation has been described in detail by the senior author before. Recently, this technique has been refined with the use of barbed sutures to obtain an even better projection and convex shape of the buttocks.

**Materials and Methods**

The combination of power-assisted liposculpting and fat harvesting of the zones around the buttock with autologous fat transfer of the buttocks has been described previously. However, the use of barbed sutures permits the surgeon to better define the superior and inferior gluteal crease, as well as the sacral triangle, thus obtaining more projection of the buttocks. This principle is based on the concept that, by guiding and tightening a barbed suture through the superficial subcutaneous tissues and along the circumference of a specific volume – the loop acting as a temporary internal support – the central projection will increase, without necessarily augmenting the volume. The mega-volume of fat injection is therefore no longer needed. The injected amount diminishes from an average of 650cc to 300cc per buttock, thereby minimizing the risk of complications, associated with gluteal fat transfer.

**Results**

The use of barbed sutures in gluteal augmentation has been implemented in the daily practice of the senior author since December 2015. Between December 2015 and December 2018, 83 patients have been treated with this technique. The temporary internal support lasts for six to eight weeks, which is the time needed for the fibrosis to develop at the level of the creases to ensure a stable and long-lasting result.

**Conclusions**

The combination of power-assisted gluteal augmentation and barbed sutures results in high- definition buttocks with an increased projection, better convex shape, and symmetrisation of the inferior gluteal creases. It ensures a long-term stable result and reduces the risk of fat grafting complications by diminishing the needed amount of fat transfer.

**18:15 OUTCOMES OF MEDIAL THIGH LIFT AFTER MASSIVE WEIGHT LOSS - A 13-YEARS REVIEW J**

Jan PLOCK, Andre Barth, Riccardo Schweizer, Holger Klein, Matthias Waldner, Pietro Giovanoli  
University Hospital Zurich, Zurich, SWITZERLAND

**Introduction**

Medial Thigh Lift (MTL) after massive weight loss (MWL) is associated with high complication rates. Since scientific evidence is scarce, we assessed surgical outcomes after MTL in our own cohort.

**Materials and Methods**

We performed a retrospective single-center analysis including patients, who underwent MTL after MWL with an excess body mass index loss (EBMIL) >30% between 2005 and 2018. Surgical outcome, demographic data, comorbidities and perioperative data were statistically evaluated.

**Results**

Ninety patients underwent MTL after MWL, of which 94.4% were female and 5.6% were male with a median age of 42 years. 19% underwent a horizontal, 51% a full-length vertical and 30% a combined-vertical MTL with the classical T-shaped incision. Mean excess body mass index loss (EBMIL) was  $88 \pm 19\%$ , BMI max.  $49 \pm 7 \text{ kg/m}^2$  and BMI at the time of surgery  $29 \pm 5 \text{ kg/m}^2$ . The overall complication rate was 58.9%. After horizontal lift it was 23.5%, increasing to 58.7% after vertical and 81.5% in the combined-vertical group. Wound dehiscence (62%) and lymphatic complications (21%) were the most frequent. In detail full-length vertical lift technique was associated with lymphatic complications ( $p < 0,001$ ) and T-incision was associated with a significantly higher rate of postoperative complications ( $p = 0,03$ ). An initial BMI  $> 40 \text{ kg/m}^2$  ( $p = 0,01$ ), an EBMIL  $> 80\%$  ( $p = 0,01$ ), and an age  $> 40$  years ( $p = 0,05$ ) were independent risk factors for an increased rate of postoperative complications in both full-length vertical and combined-vertical medial thighplasty groups. Compared to vertical techniques, horizontal MTL exhibited significantly lower rate of complications ( $p < 0,001$ ). There were no lymphatic complications in this group.

**Conclusions**

The horizontal technique demonstrated significantly less postoperative complications in our group. MWL body contouring is still associated with high rates of complications, however. Preoperative discussion with the patient about the concept and goals of the body contouring surgery are imperative to achieve the best possible outcome for both. the patient and the surgeon.