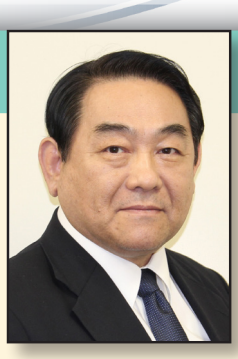
The WSRM Newsletter
Winter 2017
Volume 7, Issue 11

World Society for Reconstructive Microsurgery

In this edition

Message from the Editor



Isao Koshima, M.D.
Chief, International Center of lymphedema
Hiroshima University Hospital, Hiroshima, Japan

Success of WSRM Seoul and Future of Microsurgery

I have recently taken over the position of President of the World Society from Professor David Chuang. First of all, I sincerely bless the success of the last WSRM conference in Seoul. I am thankful to all the participants from all over the world who gathered and I am sincerely thankful for the efforts of the Korean Society of Microsurgery conducted by the local chair, my old and best friend, Prof. Myong Chul Park.

Looking at the success of this academic society in such magnificent Korea, I remember here that Professor SM Baek, the father of microsurgery in South Korea. Professor Baek learned the procedure of plastic & microsurgery at New York and returned home to Korea and was able to start modern plastic surgery, craniofacial / aesthetic surgery in Seoul. He is also the founder of the current Korean facial aesthetic surgery. In 1983, a historical paper from Korea was published in the Journal of Plastic, Reconstructive Surgery. Even now I still remember my emotion at that time. It is the world's first paper of thigh flap (AMT flap) which remains in history. It is well known that the ALT /AMT flap was reported first by Professor Song of China in 1984, but one year ago, Professor Baek also reported thigh flap (AMT flap).

Afterwards as you know ALT flap got the first position to be selected as free flap for head, neck and limb reconstruction. Another pioneer of the Korean Society of Microsurgery is Professor Wang. He succeeded the first finger replantation in Korea. Professor Emeritus Yoshikazu Ikuta of Hiroshima University Orthoplastic Surgery had a workshop on mico-technique in Seoul in the early '70's, which is said to have led to Dr Wang 's success. Without this pioneer's efforts, I believe that there was no prosperity of the current Korean Society of Microsurgery. Thanks to their great predecessors.

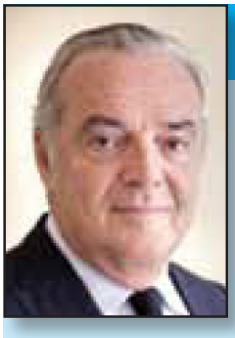
As for the future direction of the WSRM, first of all I believe that we stimulate the young microsurgeon and appealing the interest of microsurgery. In addition, the technology of microsurgery is popular only in developed countries, and there are many underdeveloped countries without this technology. Many patients in these countries suffer from the disease without receiving the microsurgical benefit. How to plant the latest technology in a country without microsurgery must also be a big goal.

– continued on page 2

Message from the Editor - *continued from pg 1*

Recently, new technologies such as advanced nerve surgery, aesthetic microsurgery, lymphatic surgery, supermicrosurgery, etc. are being born one after another, but these technologies are still not fully penetrated even in developed countries.

The development of such new procedures and micro-instruments and micro-robot will be recent topics. How to spread it to the world quickly and spread it to many people will become a big goal for the next 10 years. For this purpose, I would like to further strongly promote the WSRM local symposiums in local meetings in the world, which has been underway by David Chuang, former chairman. Let's all help each and every member heading towards this big goal with a volunteer spirit. At last, we would like to thank you all over the world in various countries and for the Korean members to host such a great meeting.



Prof. Giorgio De Santis
2019 Congress Chairman

Message from the 2019 Congress Chairman

I am happy and honored to invite you to Bologna for the 10th WSRM, which will be held from 13 to 15 June 2019, with a rich program including the latest innovations of this challenging discipline.

Bologna, located in the region of Emilia-Romagna is seat to the oldest University in the Western world. It is a city with an intense cultural life and a very interesting historical heritage. In 2000 it was selected as the European Capital of Culture and in 2006 UNESCO named it "the creative city of music." The most renowned symbols of Bologna are its characteristic arcades, extending along 38 kilometers in the old city alone, and its towers offering visitors the opportunity to admire Bologna and its lovely surroundings. The most important of them are Torre Garisenda and Torre degli Asinelli rising where the old Via Emilia entered the city. The number of historic buildings is almost endless, and three of them - Palazzo del Podestà, built around 1200, Palazzo Re Enzo and Palazzo Comunale or Accursio, now home to the Town Hall - are all facing the main square (Piazza Maggiore). However, Bologna is first and foremost a university city, where young people and a vibrant cultural life can be seen at each step. In every street, narrow alley and porticoed walkway one can experience the spirit of cordiality and hospitality of Bologna and discover its great cuisine tradition. Bologna is all this and much more. If you join the 10th WSRM in 2019, we will do our best to make you enjoy our country.

The motto of the Bologna 2019 WSRM congress is "ad augusta per angusta," that is to say, "great achievements through narrow paths." In addition to the classical topics of reconstructive surgery, the congress will address innovative microsurgery techniques for lymphatics, supermicrosurgery, tissue prefabrication and use of microvascularised grafts from cadaver.

Head and Neck, Limbs and Breast are the topics that will receive special focus during the congress.
Head and Neck sessions will include Soft Tissue reconstruction, Bone and Osteocutaneous Flaps, Cad Cam technology, Innovations in Pedicled and Perforator Flaps, Skull and Scalp Reconstruction and Aesthetic Microsurgery.
Limbs sessions will include Upper Limb, Lower Limb, Orthoplastic, Hand, Trunk, Nerves and Burns.
Breast sessions will include Autologous Reconstruction with Local and Free Flaps, Refinements and Lymphatics.
Miscellaneous session will include Allotransplant, Innovative Technology, Pediatric Microsurgery, Education, Monitoring Flaps, Prevention of Failure and Drugs.

To ensure optimal congress organization, each topic will be discussed in a different day.
The format will be organized in sessions, lectures, instructional courses, free paper sessions and video sessions. Each topic will be presented with a state-of–the-art lecture delivered by a world leader on the subject.
I hope the conference will have a large attendance, and I am working with the Scientific Committee, chaired by Prof. Marco Innocenti, to draw up a top-level program making the event dynamic, interactive and international, involving the main groups of reconstructive microsurgeons in the world.

WSRM meetings have traditionally been an important occasion to meet and exchange opinions and techniques, as well as a great opportunity to interact with the most renowned experts of the field and with friends from all different continents.
We want not only to continue this tradition, but we would also like to include young microsurgeons in all scientific sessions to consolidate the generational change that this society is experiencing.

We look forward to seeing you in Bologna. Merry Christmas and Happy New Year!

WSRM2019

10th Congress of World Society for Reconstructive Microsurgery

12th - 15th June 2019

Palazzo della Cultura e dei Congressi
Bologna, Italy

FIRST ANNOUNCEMENT

"Ad augusta per angusta"
"Great achievements through narrow paths"

CONGRESS CHAIRMAN
Prof. **Giorgio De Santis**
Modena

CONGRESS CO-CHAIRMAN
Prof. **Francesco Moschella**
Palermo

www.wsrm2019.com

FORMAT

- Lectures
- Panel Sessions
- Instructional Courses
- Comprehensive Sessions
- Free Paper Sessions
- Video Sessions
- Pre-congress Workshops

TOPICS

HEAD & NECK

- Soft Tissue Reconstruction
- Bone and Osteocutaneous Flaps
- Cad Cam Technology
- Innovations in Pedicled Flaps
- Skull and Scalp Reconstruction
- Aesthetic Microsurgery

BREAST

- Autologous Reconstruction: Local Flaps
- Autologous Reconstruction: Free Flaps
- When Autologous Improves Eterologous
- Refinements
- Lymphatic

LIMBS

- Upper Limb
- Lower Limb
- Orthoplastic
- Hand
  (Replantation, Toe to Hand, Local Flaps, etc.)
- Trunk
- Nerves
- Burns

MISCELLANEOUS

- Allotransplant (Critical Revision)
- Innovative Technology (Robot, Imaging, Simulation)
- Pediatric Microsurgery
- Education
- Monitoring Flaps
- Prevention of Failure
- Drugs
- Genitourinary Microsurgery

SCIENTIFIC COMMITTEE

CHAIRMAN
Prof. **Marco Innocenti**
Florence

CO-CHAIRMAN
Dr. **Bruno Battiston**
Turin

CO-CHAIRMAN
Prof. **Adriana Cordova**
Palermo

CO-CHAIRMAN
Prof. **Marzia Salgarello**
Rome

CONGRESS VENUE

Palazzo della Cultura e dei Congressi
Piazza Costituzione, 4/a
40128 Bologna - Italy

CONGRESS ORGANIZERS

nord est congressi

info@nordestcongressi.it
www.nordestcongressi.it

Piazza di Pietra 63
00186 Rome - Italy
Tel. +39 06 68807925
Fax +39 06 68212211

Via Portanuova 3
33100 Udine - Italy
Tel. +39 0432 21391
Fax +39 0432 506687

SICPRE Italian Society of Plastic, Reconstructive and Aesthetic Surgery

SIM Italian Society of Microsurgery

2nd International Oldenburg-Groningen Perforator Flap Course

www.crossing-the-borders.eu

An event endorsed by WSRM

April 19-21, 2018

Stay ahead of your peers!

Join a selected group of world-renowned experts in reconstructive microsurgery and get the opportunity to learn perforator flap harvesting in a unique “one-to-one” scenario.

Master your skills during 20 hours of hands-on training, on over 15 perforator flap models using state-of-the-art facility and fresh anatomical specimens.

Faculty | Register now | Program

ANY QUESTIONS? CONTACT US:

E: info@crossing-the-borders.eu | T: +49 172 687 6893

Department for Plastic, Aesthetic, Reconstructive and Hand Surgery

Evangelisches Krankenhaus, Medical Campus University of Oldenburg

Steinweg 13-17, 26122 - Oldenburg, Germany

umcg

EVANGELISCHES KRANKENHAUS OLDENBURG

S&T

Microsurgery Around the World

Africa

The Reality of Microsurgery In Africa

Written by Ken Otuoke, MD

Challenges in global microsurgery both in developed and developing continents has almost the same handicap.

Microsurgery in Africa can be seen through the prims of hope and opportunity amidst the challenges of lack of awareness, little or no funding and poor access to existing practices.

Practices in the regions of South Africa, North Africa, East Africa and West Africa reveal varying levels of progress.

Practitioners in West Africa and East Africa seems to be on the path of aspirations, in small, slow but steady steps. Whereas, practitioners in North Africa and South Africa, especially South Africa, are on strong and bold path. I believe that the vision and message of global microsurgery, can help kick-start dormant aspirations, strengthen weak hands, hasten the bold and well established hands in the various practices in the regions.

South Africa is in the pole position in the continent. It has well established microsurgery centres. Their first free flap was reported in the 1972, in Cape Town, this paved way for all virtual vascularised tissue transplant or replant. Universiteit Stellen Bosch University, Division of Plastic and Reconstructive Surgery, run a microsurgery programme for basic skill in the laboratory of the Department of Hand and Microsurgery. Tyberberg Hospital performed the first successful penial transplant on a victim of botched circumcision.

In most countries they are still struggling with the basis of microsurgery not due to lack of interest in surgeon eager to pick on new challenges, but bad governance in prioritizing health issues regardless that few centers are still performing great jobs with amazing results comparable to their counter parts in Europe.

East Africa, they are not left out in the race for microsurgery. Uganda group at CoRSU Hospital started microsurgery before 2009 and have a centre, not in large scale but with encouraging impressive results. There is not a centre yet for microsurgery training irrespective of their efforts. Their article published in J Plast Reconst Aesthet 2016, Feb 69[2] speaks volume for their centre. Or unit. (Challenges in global microsurgery: A 6 years review of outcomes at an East African hospital.

In West Africa and Sub-Sahara region, nothing much is happening microsurgery wise, but there is an encouraging signal with results from UNILAG teaching hospital in Lagos, Nigeria for treatment of shot injuries, RTA (road traffic accidents), sarcoma excision cranium vault, re- excision plus ALT flap microsurgery reconstruction. **Figure: A. Below**

Figure 1: (a) A 17-year-old with sarcoma eroding the craneal vault. (b) Following initial excision and local flap cover. (c) Intraoperative appearance of tumor recurrence (d) Three months following re-excision and anterolateral flap cover

In conclusion, we have to help promote and spread microsurgery in this huge Africa by encouraging trainees, have more training centres and fellowships/ bursaries. It would be encouraging interest that WSRM community shifts its horizon and zoom into how to incorporate their entire continent by aiding to create more center of excellent teaching and fellowships. The continent is a fertile ground for the growth of microsurgery and their results are impressive even with limited resource. The principal of will and way should be applied here. The WSRM knows no boundary.

REFERENCES

1. Bolaji Oyawale, Andrew O. Ugburo, Olufemi B. Bankole. Micro vascular Anastomosis of vessels Less than 0.5 mm in diameter: A super microsurgery training Model in Lagos. Journal of Hand and Microsurgery, June 2011, Volume 3, Issue 1, PP15-17

2. Challenges in global microsurgery: A six year review of outcomes at an East Africa hospital. J. Plastic Aesthetic Surg. 2016 Feb, 69(2): !89-95. Do: 10.1016/J.bjpsn 2015.10.0.016.Epub2015 oct 24M166TN. Copyright C 2015 British Associate Of Plastic, Reconstructive and Aesthetic Surgeons: Publish by Elsevier Ltd. All rights reserved.

Continued on page 5

Microsurgery Around the World

3. Merrel JC , Tien NV, son NT, An LN, sellers D, Russell R.et al. Introduction of microsurgery in Vietnam by charitable organization: A 15 year experience. Plast. Reconst. Surg 2007; 119:119:

4. Schustterman MA, Miller MJ, Reece GP, Kroll SS, March M. GoepferH. A single center's experience with 308 free flaps for repair of head neck cancers defects. Plast Reconst Surg:1994,93:472-8

5. Daniel RK, Tayor GI. Distant transfer of an island flap by microvascular anostomosis. A clinical technique. Plast. Reconst. Surg. 1973;52:111-7

6. O'Brien BM, Hayhurst JW, Morrison Successful transfer of of a large island flap from the groin to the foot by microvascular anastomosis. Plast Reconst surg 1973; 52.271-8

7. Horch RE, Stark GB. The rectus Abdominis free flap as an emergency procedure in extensive upper extremity soft tissue defects. Plast Reconst Surg 1999;103:1421-7

8. Galiwango GW. Free flap surgery at Mengo Hospital Uganda. A Review of the first 19 conservative micro vascular free tissue transfer. East central Afr J Surg 2009; 1:38-43

9. Visse JH, Addendorf DJ, Malherbe WD. Free flap transfer with Microvascula. S. Afr Med J 1976; 50:2026-31

10. Salati SWalati SA, Wani SA. Rather A, Iqbal S. Free flap transfer at a medical center in Kashmir in five years experience. Nig JPlastic Surg 2009; 5:8-14

Asia

News from the Asian Pacific Federation of Societies for Reconstructive Microsurgery (APFSRM)

Asian Pasific Federation of Societies For Reconstructive Microsurgery was established with the participation of 19 nations including Australia, China, Hong Kong SAR, India, Indonesia, Japan, Kazakhstan, Korea, Kyrgyzstan, Lebanon, Malaysia, Philippines, Singapore, Sri Lanka, Taiwan, Tajikistan, Turkey, Uzbekistan, Vietnam in 2012 aiming to advance the specialty of Reconstructive Microsurgery in the Asia Pacific region through closer collaboration, training and education. The President of the WSRM in 2012, Dr. Kazuteru DOI first mooted the formation of a federation of local societies for reconstructive microsurgery in the Asian Pacific countries.

As a local division of WSRM, APFSRM held its first Council Meeting on 8th October 2012 during its Inaugural Congress in Singapore and Prof Kyoung-Moo YANG from Korea was elected as the first President of the APFSRM. The theme of the first Congress was "Artistry in Reconstructive Microsurgery." The Congress was well attended by more than 160 delegates from 20 countries.

The 4th Congress of APFSRM

It's my great pleasure to announce the 4th Congress of APFSRM in conjunction with the 8th National Congress of the Turkish Society for Reconstructive Microsurgery (TSRM) which will be held on **May 9-13, 2018 in Antalya, Turkey**. After very succesful meetings of Singapour, Korea and China, we are honored to host this prestigious Congress in Antalya as The Turkish Society for Reconstructive Microsurgery. The Congress will focus on the most recent scientific findings in the area of microsurgery and will bring together the best and the brightest surgeons in the specialty all around the world with the motto "Excellence Through Diversity".

WSRM will contribute to the APFSRM Congress with **a half day symposium** formed by master series from the most experienced surgeons. Please note that the registration fee will be **waived for residents** until January 31, 2018.

The Congress Hotel, Gloria Golf Resort is a five star property celebrated among luxurious travellers. The resort is an expansive all-inclusive hotel surrounded by lush greenery and a turquoise lagoon. All inclusive package includes buffet style breakfast, lunch and dinner at the three buffet restaurants and six "à la carte" restaurants serving a range of international and Turkish cuisine. The hotel is also renowned for its two 18 hole championship golf courses and 9 hole Verde course which lie at the center of the resort.

The web site of the Congress is www.apfsrm2018.org.

"Don't miss this instructive and amazing event in Antalya"

The 5th Congress of APFSRM

During the last Council Meeting held in the course of WSRM Congress in Seoul, Korea, The Japanese Society For Recunstructive Microsurgery are elected as the host society for the next APFSRM Congress. The 5th APFSRM Congress will be in 2020 in Japan. The chair of the board of JSRM is Prof. Fuminori Kanaya and Dr. Yasunori Hattori from the Ogori Daiichi General Hospital will be the local Chairmen.

As the current President of APFSRM, I am more than happy to witness the improvement and maturing of our Federation proving the aphorism **"Ex Oriente Lux – The light comes from the east"**.

Continued on page 6

Microsurgery Around the World

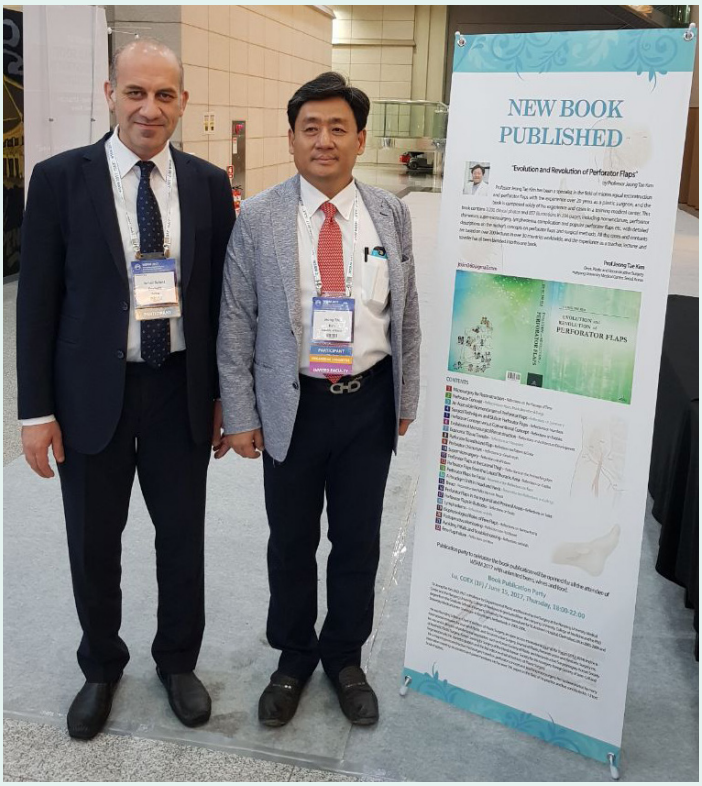
2nd Instructional Course for Adult Brachial Plexus Injuries

An important event will be come true at Chang-Gung Memorial Hospital, Taiwan between November 13-16, 2017 on brachial plexus injuries. Dr. Fu-Chan Wei and Dr. David CC Chuang are the Honorary Presidents and Dr Tommy NJ Chang and Dr. Johnny CY Lu are Executive Chairmen. A very worldly wise International Faculty from France, Japan, Thailand, China, India and Canada will participate to the course to share their experience. Lectures from the experts and live surgeries will enrich the course.

A new book by Prof. Jeong Tae Kim

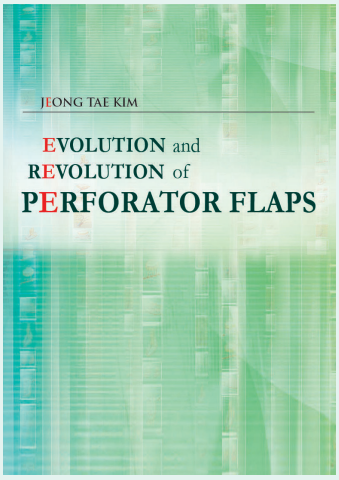
Prof. Jeong Tae Kim from Korea launched his book on Perforator Flaps on June 2017 during the WSRM Congress in Seoul. Named as ***Evolution and Revolution of Perforator Flaps***, this book contain the huge experience of the Senior Author with very intresting applications enriched by his own surgical photos. I think that it will be a very important reference book on perforator flaps.

Prof. Taçkın Özalp
President of APFSRM
Chairman of APFSRM 2018
WSRM Asian Representative



Dr. JT Kim and Dr. Bülent Özçelik (APFSRM Turkish Deleguate) on the book launch

APFSRM Flyer



Dr. Kim's book flyer

2nd Instructional Course on ABPI

Prof Taçkın Özalp and Dr. Kazutero DOI during the last Executive Meeting

Continued on page 7

Microsurgery Around the World

Reconstructive Microsurgery in the Arab Countries

Joseph Bakhach, M.D, Ph.D.
Assistant Professor of Clinical Surgery
Plastic and Reconstructive Surgery
Director of Hand and Reconstructive Microsurgery Unit
American University of Beirut Medical Center
Beirut, Lebanon.
E.mail: yb11@aub.edu.lb

The Arab world consists of twenty two countries stretches across more than 5,000,000 sq miles of North Africa, Arabian Peninsula, South-Western Asia and the Middle East with a combined population around 407 million people. The medical level of these countries is relatively advanced in the most of them with hundreds of Plastic and Reconstructive Surgeons, Orthopedics and Reconstructive trauma Surgeons. Recently, some of these countries experienced civil war crisis and the Arab Spring revolution which urged the Reconstructive Surgeons experts to leave their towns seeking a new and safer life, particularly, Iraq, Syria and Libya. This pulled down the medical level in these countries rendering very difficult to the wounded people to receive adequate medical care.

As we already know, the practice of Reconstructive Microsurgery necessitates a long and tedious learning process, which includes the acquisition of the basic surgical principles encountered by rotating in General, Plastic and Reconstructive Surgery. Numbers of the Reconstructive Microsurgeons in the Arab World are very limited. They can be counted by hand in some countries and cannot exceed one or two specialists
in others.

These microsurgeons have organized themselves in National Reconstructive Microsurgery Societies as in Lebanon and Egypt while in other countries they have organized National Hand and Upper Arm Societies as in Morocco, Tunisia, Algeria and Kuwait. The lack of Scientific Societies and the limited numbers of Reconstructive Microsurgeons in most of the Arab Countries urged us to create the Pan Arab Federation for Reconstructive Microsurgery “PAFRM” which main aim is to federate Microsurgeons practicing in the Arab Countries and those working abroad from Arab origin.

We have already listed more than 90 Reconstructive Microsurgeons sharing our cases, ideas and expertise through social media and we are planning to organize our first Scientific Congress with the Lebanese Society of Reconstructive Microsurgery “LSRM” & the Lebanese Society of Plastic, Reconstructive & Aesthetic Surgery “LSPRAS” with the participation of the Pan Arab Federation for hand Surgery “PAFHS” and the collaboration of the Association of Plastic Surgeons of Lebanese Descent “APSLD” & the Euro-Mediterranean Council for Burns and Fire Disasters “MBC” which will be held in Beirut – Lebanon in September 2018.

We look forward for having you in Lebanon, land of Cedars, to participate in the different scientific sessions and to enjoy the rich social program.

Continued on page 7

Microsurgery Around the World

Europe

Prof. Marko Bumbasirevic

Welcome to Belgrade 5-8 May, 2018.

http://www.efsm2018.org/en

The European Federation of Societies for Microsurgery is the only federation that joins together the European national microsurgery societies. Their interest is to promote a high quality education for their members by permanently increasing their level of knowledge. The First Congress was held in Rome, Italy in 1992 and the forthcoming, 14th will be held in Belgrade from May 5th to May 8th, 2018.

Invitation

So, the main event in the European Microsurgery will be the 14th Congress of European Federation of Societies for Microsurgery (EFSM). It will be held in Belgrade from May 5th to May 8th 2018. The co-chairs of the congress are the General Secretary of EFSM Professor Alexandru Georgescu and the president of EFMS Professor Marko Bumbasirevic. With contribution of distinguished microsurgeons from both Europe and other countries, there is a hope that Congress will be very successful. So far, the waste majority of the best microsurgeons, all around the world confirmed their participation in the Belgrade EFSM congress (http://www.efsm2018.org/en).

Confirmed participants, Scott Levin, past President of WSRM, Milan Stevanovic, Historian of WSRM and Marko Bumbasirevic, President of EFSM.

Park, Sabapathy, Fu-Chan Wei, Santamaria, Bumbasirevic, Georgescu, Ninkovic

Such a contribution is brought about keeping each specific cultural makeup, within a common language and in the interest of a shared cultural and operational purpose.

The Congress will gather microsurgeons from all European associations as well as microsurgeons and reconstructive surgeons from different countries around the world. One day will be devoted to the Symposium organized by WSRM, chaired by Professor Isao Koshima. Also, the basic microsurgical course will be organized for the first time and it will be free of charge for all participants.

The program includes instructional courses, panels, conferences, and free papers that will cover all the fields of modern microsurgery. The sessions are divided into: Lower limb reconstruction – trauma; Upper Limb reconstruction – trauma; Microsurgical and non-microsurgical reconstruction of war injuries (ballistics); Limb reconstruction – elective; Congenital deformities Micro vs. non microsurgical; bone defects ; head and neck ; brachial plexus; Microsurgical course; Mangled extremities; Replantation; Free Flaps; Spine; Urogenital; Breast; Peripheral Nerve; Lymphedema; Cadaveric Limb transplant; Functional muscle transfers; Artificial limb – crossfire – limb, bionic, robotic; microsurgery in solid organ transplant.

For the first time in the history of EFSM, a contest will be organized for residents only. There would be a best case award and a best young surgeon award.

Also, there will be the Nursery day. The invited speakers will give their point of view in a book entitled “Technical Tips for Microsurgery. How I do it”, which will be given to all participants. The outstanding microsurgeons are invited to contribute to the special issue of Injury journal, related to this congress, which will be published before the Congress and distributed to participants.

On behalf of the EFSM Council, we will be looking forward to meeting you in Belgrade.

PAST ACTIVITIES

In 2017, the year between the EFSM Congresses, there have been a lot of microsurgery activities held in different countries.

Continued on page 8

Microsurgery Around the World

discussions were added to illustrate which flap is the most appropriate in clinical practice. Such courses give orthopedic surgeons sufficient knowledge of the most commonly used flaps. By the end of the entire procedure for each flap, participants learned techniques of flap elevation, tips and tricks for each one, and specific cases in which this flap could be used.

The main dissections, demonstrations and supervision were done by outstanding orthopedic surgeons and microsurgeons.

Cluj, Romania

Between 27-29 April 2017, a major event took place in Cluj Napoca, Romania: the XI Congress of the Romanian Society for Surgery of the Hand, joined with the XII Congress of the Romanian Society for Reconstructive Microsurgery and The National Conference of the Romanian Association of Plastic Surgeons.

Excepting the 296 registered participants, there were 45 international invited lecturers, from Europe, USA, Egypt, etc. and 36 Romanian lecturers. The congress's program included 33 scientific sessions, 6 invited Conferences, 3 Keynote lectures and another 229 scientific lectures.

Because the event catalyzed surgeons involved in various microsurgical procedures, regardless of specialty field, there were a large number of sessions dedicated to microsurgery, such as brachial plexus reconstruction, peripheral nerves, composite tissue transfers, facial palsy, breast reconstruction, replantation, compression neuropathies, mangled upper and lower limb reconstruction, free flaps, perforator flaps, lymphedema, experimental and teaching in microsurgery, head and neck reconstruction and diabetic foot reconstruction.

During the meeting were organized sessions dedicated to residents and also contests for the best free paper in Microsurgery, Hand surgery and Plastic surgery.

Before the congresses, took place the 1st Cluj-Napoca International Course on Perforator Flaps, April 24-25, 2017, and the AAHS Pre-Congress Course – Advances in Hand Surgery, April 26, 2017.

The 1st Cluj-Napoca International Course on Perforator Flaps was organized in the Simulation and Practical Skills Center at the "Iuliu Hatieganu" University of Medicine and Pharmacy Cluj Napoca and was enriched by the presence of Prof. Geoffrey Hallock (USA), Bruno Battiston (Italy), Lucian Jiga (Germany) and Alexandru Georgescu (Romania). In the course, 10 participants were able to harvest by themselves, supervised by specialized trainers, the most used and important perforator flaps all over the body, in experimental animal living tissue (pig), in real surgical theatre operations.

Faculty in Cluj, Georgescu, Soucacos, Bumbasirevic, Nabil, Beris, Hallock.

The AAHS Pre-Congress Course – Advances in Hand Surgery was organized with the exceptional involvement of the American Association of Hand Surgeons, with 19 USA eminent lecturers and panelists, who shared their experience with the Romanian and foreign participants.

Athens, Greece
33rd Microsurgery Seminar

Education has been a primary concern in the Greek Microsurgery family. The first initiative was the Hellenic Microsurgery Seminar that is designed to give hands on training to young surgeons in basic techniques. It was initiated in 1984, and this yearly seminar has trained over 1000 surgeons. These Seminars have met with great success, with extensive waiting lists to be trained by the best national and international microsurgeons including Urbaniak, Gilbert, Nunley, Foucher, Brunelli, Villki, Georgescu, Bumbasirevic, Cuice, Ioanac, Frostick, Millesi, Eisenschenck, Stevanovic, and many more.

Faculty in Athens.

The Orthopaedic Research & Education Center (OREC) is a very important research and education initiative that was established in 2010, by Professor Panayotis N. Soucacos, with the aim to champion cutting edge orthopaedic research, provide stimulating laboratory and training environments for orthopaedic residents, students, post-doctoral fellows and faculty. OREC's dedication to education is reflected in its logo which reads "γηράσκω δ' αεί πολλά διδασκόμενος" (I grow old ever learning many things) quoted from Solon (630-560 BC), an Athenian statesman, founder of the Athenian democracy and poet.

Since 2010 after Professor Soucacos' appointment to Athens in 2002 and the opening of the Orthopaedic Research & Education Center (OREC), the seminars have been hosted in Athens. This year, on June 7-10, 2017, the 33rd Annual Microsurgery Seminar and 7th Peripheral Nerve & Brachial Plexus Surgery Seminar was celebrated. By unanimous vote, it was decided that the 33rd Annual Seminar was in tribute

Continued on page 9

Microsurgery Around the World

to the advancement of Microsurgery in Greece and Europe over a lifetime. The Seminar trained 28 young surgeons (20 orthopaedic surgeons, 4 plastic surgeons and 4 maxillofacial surgeons), who were from Athens (14), peripheral Hospitals and Universities in Greece (10), Turkey (3) and Egypt (1). The program included 29 lectures, 7 preparatory-video sessions for the workshops and a total of 6 4-hour hands-on workshops including:

1) Familiarity with the surgical microscope, instruments and sutures in microsurgery and microsurgery knots;

2) End-to-end artery anastomosis in an animal model;

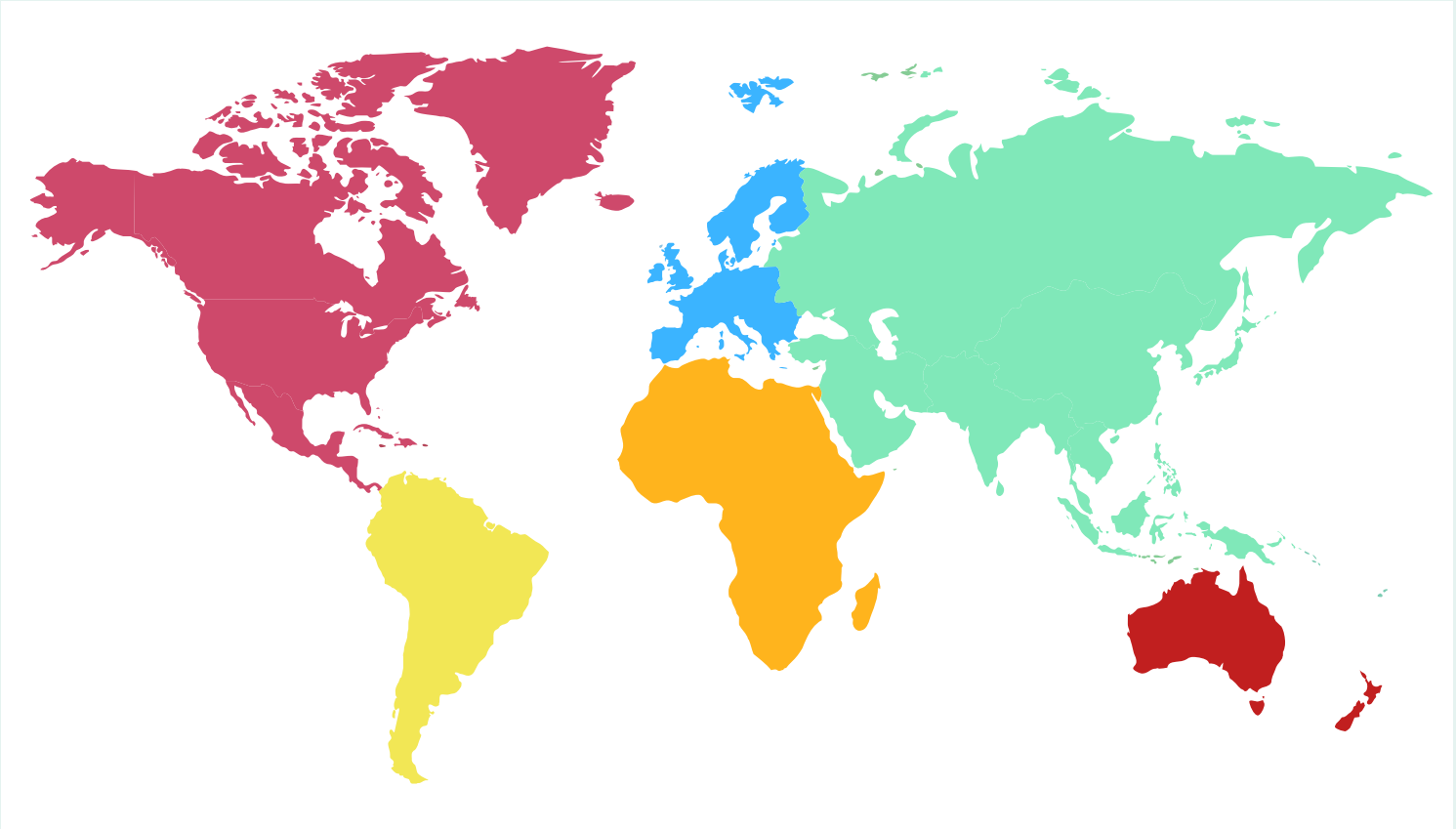
3) End-to-end vein anastomosis and end-to-end arterial anastomosis;

4) Vein grafts in arteries and vein grafts in veins;

5) End-to-end nerve repair and

6) Nerve grafts, allografts, end-to-side nerve repair and nerve conduits.

In order to achieve this, 45 instructors and trainers were recruited not only from Greece, but also from outside the country, including distinguished Professors and microsurgeons from Serbia (Marko Bumbasirevic), Romania (Alexandru Georgescu), Turkey (Ibrahim Kaplan, Tackin Ozalp), Lebanon (Ramzi Moucharafieh) and Egypt (Hassan Noaman). The Opening Ceremony of the Seminar included an Opening Lecture by Markus Spingler, President & CEO, S&T AG on the "History of Microsurgery and the Company S&T", as well as a lecture by Professor Ariadni Gartziou-Tati, Department of Ancient Greek Philology, University of Ioannina on "Orthopaedic deviations from normality in Ancient Greek Mythology".



Continued on page 10

TOPICS

- Stem Cells
- Body Contouring
- Breast Reconstruction
- Hand Surgery
- Lower Limb Reconstruction
- Replantation & Transplantation
- Maxillo-Facial Surgery
- Head & Neck Reconstruction
- Lymphedema
- Burns & Wound Healing

LEBANESE PLASTIC & RECONSTRUCTIVE MICROSURGERY CONFERENCE

1st CONGRESS OF THE PAN ARAB FEDERATION FOR RECONSTRUCTIVE MICROSURGERY

With the participation of

THE PAN ARAB FEDERATION FOR HAND SURGERY

Beirut – LEBANON – Sept. 28-29, 2018
METROPOLITAN HOTEL

Organized by

LEBANESE SOCIETY OF RECONSTRUCTIVE MICROSURGERY LSRM

LEBANESE SOCIETY OF PLASTIC, RECONSTRUCTIVE & AESTHETIC SURGERY LSPRAS

With the collaboration of

ASSOCIATION OF PLASTIC SURGEONS OF LEBANESE DESCENT APSLD

EURO-MEDITERRANEAN COUNCIL FOR BURNS & FIRE DISASTERS MBC

Trust & Traders International
EVENT ORGANIZER
executive@trustandtraders.com
www.trustandtraders.com
00961 1 333 900

www.lspras.com

executive4@trustandtraders.com

Perspectives on the Future of Reconstructive Microsurgery

David Chwei-Chin Chuang
Department of Plastic Surgery,
Chang Gung Memorial Hospital,
Taipei-Linkou, Taiwan

Level of brachial plexus injury

We have described brachial plexus lesions with "number", Level I-IV, instead of word description[1]. It is simply and easily understood: Level I injury: the injury inside the (vertebral) bone, mostly preganglionic root injury including spinal cord, rootlet, and root injury;, Level II injury: the injury is inside the (scalene) muscle, a postganglionic spinal nerve injury;, Level III injury: the injury locates pre- and retroclavicular, including trunk and division injury;, and Level IV injury: the injury locates infraclavicular, including cords and terminal branches injury.

High level of peripheral nerve injury

In peripheral nerve injury, it is often described individually and variously. For the upper limb, high level of radial nerve injury means the injury locates between posterior cord bifurcation and inlet to the spinal groove [2]; high level of median and ulnar nerve injury is the injury above the elbow[3,4]. For the lower limb, it usually means lumbosacral plexus injury or injury above the knee.

Nerve Transfer

Proximal nerve graft/nerve transfer, distal nerve transfer, pedicled local muscle transfer or functioning free muscle transplantation (FFMT) provide the possibilities for functional restoration of brachial plexus injury (BPI), or high level of peripheral nerve injury. Nerve transfer is a surgical option which intentionally divides a physiologically active nerve (with low donor morbidity) and transfers it to a distal, more important but irreparable paralyzed nerve[5]. The procedure is best done within a golden time period, usually within 5 months of the injury in order to reactivate the paralyzed muscle(s) effectively. Nerve transfer can be broadly separated into two categories: proximal nerve graft and/or transfer, and distal nerve transfer[6]. Proximal nerve graft/transfer is a traditional technique which requires exploration of the nerve lesions to find out the healthy proximal and distal stumps, putting nerve grafts or nerve transfers for reconstruction. Distal nerve transfer is a new strategy, providing an exciting and alternative option for nerve reconstruction. Definition of proximal nerve transfer and distal nerve transfer is based on the distance (from the nerve coaptation site to the neuromuscular junction), scar encountered in dissection, and whether it has nerve branching out or not (Table 1). The superiority of proximal nerve graft/transfer or distal nerve transfer strategy has been debated extensively, but which strategy is the best has not yet defined. However, in the last three decades, a major shift away from the traditional proximal nerve graft/transfer has occurred with the introduction and rapid popularization of distal nerve transfer. Distal nerve transfer surgery has become part of the standard armamentarium offered to the BPI or high level of peripheral nerve injury.

My point of view

Distal nerve transfer should not be applied in situations where proximal nerve graft/transfer is more worthy and indicated. This is especially true in adult BPI and high level of radial nerve injury. Proximal nerve graft/transfer is still the main reconstructive procedure based on the principle of "no diagnosis, then no treatment". Proximal nerve graft/transfer has less brain adaptation requirement, easy spontaneous recovery without specific induction exercise training. Proximal nerve graft/transfer allow intraoperative diagnosis as well as surgical intervention. Distal nerve transfer provides only surgical intervention. Proximal nerve transfer can avoid iatrogenic injury where the lesion is still in continuity and neurolysis is the only procedure without further cutting the nerve. Proximal nerve graft/transfer can be applied in either complete or incomplete avulsion brachial plexus injury or any high level of peripheral nerve injury. However, disadvantages of proximal nerve graft/transfer include 1) dense scars with difficult dissection will be encountered. oozing and bleeding will be very often which requires diathermy carefully. long operation time can be expected; 2) the health of proximal ruptured stump is sometimes unpredictable, even accessed microscopically; 3)interposition of nerve grafts is always required, which can jeopardize functional recovery; and 4) longer rehabilitation time is necessary. Advantages and disadvantages of proximal nerve graft/transfer and distal nerve transfer are shown in the Table 2 and 3.

Experimental study

Male Sprague-Dawley rats were used. C6 spinal nerve with a nerve graft (proximal nerve transfer model, n=30) and 50% of ulnar nerve (distal nerve transfer model, n=30) were used as the donor nerves. The targets were the reinnervated musculocutaneous nerve and biceps muscle. Outcomes were records at 4, 8, 12 and 16 weeks different time points. Outcome parameters included grooming test, biceps muscle weight, compound muscle action potentials, tetanic contraction force, and axonal morphology of the musculocutaneous nerve. Results showed 1) the axonal morphology of the two donor nerves revealed no significant difference; 2) the proximal nerve transfer group demonstrated a trend of progressively improving results that were statistically significant between each time point for the following parameters of grooming test, CMAP, tetanic muscle contraction force, muscle weight and axon counts. In the distal nerve transfer group showed a statistically significant

Continued on page 13

Perspectives on the Future of Reconstructive Microsurgery

improvement in these parameters only between 4 and 8 weeks. After the 8 week time point, results reached a plateau, and there were no significant differences found. Ultimately the proximal model produced superior outcomes at 16 weeks compared to the distal transfer model. The proximal transfer group's time interval analysis showed a peak axonal counts at 12 weeks with a trend of improvement in all functional and physiologic parameters across all time points. In contrast, the distal transfer group it was only observed significantly different between at 4 and at 8 week time points, then plateaued from 8 to 16 weeks. In conclusion, the proximal nerve transfer outcomes are superior to the distal nerve transfer in our experimental model [7].

Clinical Study

147 patients with different methods of musculocutaneous nerve neurotizationfor acute brachial plexus injuries were selected based on inclusive criteria. Musculocutaneous nerve neurotization from C5, medial cord, C8, contralateral C7, spinal accessory nerve, or phrenic nerve to obtain elbow flexion was all included into group of proximal nerve graft/transfer. Musculocutaneousneurotization from partial ulnar nerve and/or partial median nerve was classified into distal nerve transfer. Intercostal nerve transfer to the musculocutaneous nerve was categorized into a separate group. Results showed there were no significant difference in the success rate of recovery of elbow flexion (M>3) between the use of proximal nerve graft/transfer vs. distal nerve transfer (P = 0.424). Even though the speed of recovery was faster in the distal group, 19 months vs. 23.9 months, the difference was also not significant. The only statistically significant difference was the speed of recovery between the use of partial ulnar nerve and/or median nerve fascicle and the use of intercostals nerves (P = 0.046). However, a selective number of patients had grip strength deficits resulted from distal nerve transfers for many years. In conclusion, proximal-nerve graft/transfer offers more accurate diagnosis and proper treatment to restore shoulder and elbow functions simultaneously. Distal-nerve transfers can offer more efficient elbow flexion. Combined both strategies in the primary nerve reconstruction are especially recommended when there is no healthy or not enough donor nerve available.[6]

Conclusion

Proximal nerve grafts/transfers are still the main stream of my reconstructive strategy. Distal nerve transfers should be considered as a complementary option for proximal nerve grafts/ transfers. Distal nerve transfers are valuable in some specific situations such as long nerve grafts (>10cm) required in the proximal nerve grafting, unhealthy proximal nerve stumps, and not in patients with pan-brachial plexus injury or triple nerve injury.

Table 1: Definition of proximal nerve graft/transfer and distal nerve transfer:

	Proximal Nerve Transfer	Distal Nerve Transfer
Distance (from the nerve coaptation to the neuromuscular junction)	Longer (usually ≥ 10 cm)	Shorter (usually < 5cm)
Scar encountered	Yes	No
Nerve branching during its course	Yes	No
Nerve graft required	Usually "Yes"	No
For examples	XI-to-SS from volar approach ICN-to- MCN Ph–to-SS Ph-to- distal C5 C5-ng- C6 C6- ng- C5 C7-to- UT Long thoracic nerve to MCN Pectoral nerve to MCN CC7 T	XI-to- SS from dorsal approach ICN-to- biceps branch One fascicle transfer (Oberlin method) Two fascicle transfers (Mackinnon method) Radial nerve branch-to- anterior division of the axillary nerve AIO nerve transfer PIO nerve transfer Pronator teres branch transfer Sensory nerve transfer Lower limb nerve transfer

XI, spinal accessory nerve; SS, suprascapular nerve; Ph, phrenic nerve; ng, nerve graft; UT, upper trunk; MCN, musculocutaneous nerve; CC7T, contralateral C7 transfer; ICN, intercostal nerve; AION, anterior interosseous ; PIO, posterior interosseous

Table 2: Advantages and disadvantages of proximal nerve grafts/nerve transfers

Advantages	Disadvantages
For diagnosis and treatment Avoid unnecessary nerve transfer Check C5, C6, C7 stumps (especially C5) Mother nerves, more axons and power More options for shoulder reconstruction	Dissection in the scar tissue Easy bleeding May have stump unhealthy Usually need nerve grafts Long operative time Long rehabilitation time Need patience

Continued on page 14

Perspectives on the Future of Reconstructive Microsurgery

Table 3: Advantages and disadvantages of distal nerve transfers

Advantages	Disadvantages
Dissection in the healthy tissue Nerve stumps are usually healthy Direct nerve coaptation without nerve graft Short op time Close targets, short rehabilitation time	No diagnosis May miss the powerful proximal nerve sources May have iatrogenic injury

References

1. Chuang DCC. Brachial plexus injuries: adult and pediatric. In: Neligan PC (eds): Plastic Surgery. Philadelphia: Saunders Elsevier Inc. 3rd version Volume VI, 2012: 789-816.
2. Pan CH, Chuang DCC, and A Rodriguez. Outcomes of nerve reconstruction for radial nerve injuries based on the level of injury in 244 operative cases. Journal of Hand Surgery (European volume), 2010, 35(5):385-91.
3. Burkhalter W.E. Median nerve palsy. In: Green DP (eds): Operative Hand Surgery. New York: Churchill Livingstone. 3rd version, Volume 2, 1993:1419-1448.
4. Omer GE. Ulnar nerve palsy. In: Green DP (eds): Operative Hand Surgery. New York: Churchill Livingstone. 3rd version, Volume 2, 1993:1449-1466.
5. Chuang DCC. Nerve transfers in adult brachial plexus injuries: my methods Hand Clinics 2005:71-82.
6. Hu CH, Chang NJ, Laurence VG, Chuang DCC. Comparison of Surgical Strategies Between Proximal-Nerve Grafts and/or Nerve Transfers and Distal-Nerve Transfers Based on Functional Restoration of Elbow Flexion: A Retrospective Review of 147 patients. Plast Reconstr Surg (accepted 2017)
7. McGrath AM, Lu JCY, Chang TNJ, Fang F, Chuang DCC. Proximal versus distal nerve transfer for biceps reinnervation - A comparative study in a rat's brachial plexus injury model. Plast Reconstr Surg Glob Open 2016;4:e1130; doi: 10.1097/GOX0000000000001130; published online 13 December 2016.

Kazuteru Doi, MD, PhD
Department of Orthopedic Surgery, Ogori Daiichi General Hospital, Ogori, Yamaguchi, Japan

Concept of Nerve Transfer

In case of brachial plexus (BP) or major proximal nerve injuries, and when the proximal nerve stump is not suitable for direct coaptation or grafting, there should be another way to reconstruct the compromised nerve function especially when there are no available musculotendinous transfers. In these situations, an intact nerve can be selected for coaptation to the distal stump of the injured nerve as a method of reinnervating a critical sensory or motor territory.

In case of brachial plexus injuries, extraplexal nerve transfers represent an example of these methods. The intercostal nerves (ICN) can be transferred to the musculocutaneous nerve (MCN) for reconstruction of elbow flexion, and the spinal accessory nerve (SAN) can be coapted to the suprascapular nerve (SSN) for reconstruction of shoulder function. Over the past 30 years, diverse new waves of nerve transfers (NTs) including the contralateral C7 (CC7), partial ulnar nerve (PUN), partial radial nerve (PRN) and anterior interosseous nerve (AIN) transfer have emerged and gained a lot of popularity.

In this session, the president of the World Society for Reconstructive Microsurgery, Prof. David Chuang, advocated the discussion of the distal nerve transfer, as a perspective of reconstructive microsurgery, and I was honorably chosen to present my personal views, especially focusing on the current assessment of NTs, which includes many misinterpretations and misunderstanding.

Chuang DCC and others defined the distal nerve transfer (DNT) as a close-target direct nerve coaptation without nerve grafts. The transferred nerve is often close to the target muscle with a short regeneration time, short rehabilitation and quick recovery. Proximal nerve grafts/transfers (PNT) are traditional strategies that include nerve grafts between the divided nerve roots or trunks of BP, and distal nerve stumps. According to Chuang, several procedures of extraplexal NTs e.g. SAN or phrenic nerve (PN) to SSN transfers, should match the definition of DNT, because in these situations, the distance between the nerve suture site and the neuromotor unit of the target muscle is not longer than that between PUN to MCN or AIN to deep branch of UN.

I would like to ask to modify his categorization of "distal" and "proximal" transfers to be unrelated to either supraclavicular or infraclavicular regions. I think that they should better be categorized according to the distance of nerve suturing from the terminal units of the target muscle or sensory territory. The term of proximal NT should be applied when the donor nerve is connected far from the proper neuromotor units (NMU), and the distal NT should imply that the donor nerve is connected close to NMU. The target nerve in case of DNT should have neither motor nor sensory bifurcations distal to the nerve suture site, which is not the case in PNT. These bifurcations or side-branches may promote the growth of regenerating axons in the wrong way in case of PNT.

DNTs should then include ICN or PUN to proper branch of MCN to biceps, SAN to SSN, triceps branch of radial nerve to anterior branch of axillary nerve (AxN) and AIN to deep branch of UN.

PNTs include C5 to C5 NT with NG, CC7 to upper trunk with NG and ICN to main trunk of AxN or median nerve. The former

Continued on page 15

Perspectives on the Future of Reconstructive Microsurgery

NTs have a superior chance of target muscle reinnervation. Free muscle transfer can be categorized as DNT.

PNT has poorer reinnervation potential to the target muscle or sensory organs than expected in DNT. That is why DNT should be selected as much as possible. However, the updated articles have strongly emphasized the superiority of DNTs despite indefinite assessment. I would like to introduce the problems of functional evaluation following NTs.

Current Assessment of Long-term Results following NT Manual Muscle Test

Exact evaluation of motor function is crucial in the management of BP palsy patients. Manual muscle test (MMT) or the Medical Research Council Muscle Strength Grading System is still widely used to assess muscle strength, however, the ability of today's computerized muscle-dynamometer system to generate quantitative data helping accurate assessment has far surpassed MMT regarding the evaluation of motor power.

MMT has been modified to represent approximate numerical equivalents of M4 (good), M3 (fair) and M2 (poor) categories in spite of the wide, unequal, difficult-to-quantify gaps between each category. MMT has only an ordinal level scale of measurement and its mean and standard deviation have no validity.

Most reconstructive surgeons misunderstood MMT as a quantitative interval scale and used it for statistical comparison of surgical procedures. Comparative studies between MMT and dynamometer have been reported to find a substitutional quantitative assessment of muscle strength. The quantitative and correlative assessments of MMT have been discussed, however, there are still controversies on its reliability and availability. Wide variation of M4 has widely been recognized, however, power of correlation was varied between each M3, M4 and M5 grading scores. We should not compare the mean value with standard deviation of MMT grading for postoperative outcomes of NT and should use quantitative assessment of ratio or intermittent scales such as range of motion (degrees) and quantitative measurement of power strength (Nm).

Quantitative Measurement of Power Strength

The gold standard for quantitative measurement of power strength is isokinetic dynamometry using machinery. These machines have been used for evaluation of BP palsy reconstruction. However, that is limited by the cost and size of the apparatus and the time required for positioning and testing. In addition, the minimum measurable strength on these isokinetic dynamometers may be more than that was recovered by nerve repair.

A hand-held dynamometer (HHD) provides more accurate measurement of isometric muscle strength than MMT and makes it possible to measure muscle power less than M3. On the other hand, HHD has some disadvantages such as the difficulty to maintain adequate stabilization of the patient's body and extremities. Stability is necessary to eliminate or reduce the effect of the other co-working muscles. Often the strength of the examiner's upper extremity is insufficient to overcome the contraction of the muscle groups of the patient's lower extremity.

We evaluated motor power of elbow flexion in patients with BBP by hand-held dynamometer (HHD) and assessed its validity and reliability. The intra-rater, inter-rater and inter-device reliability coefficients of HHD measurements were almost perfect. The minimally detectable changes of the involved side and their percentage to the uninvolved side were within the minimal clinically-significant differences. HHD is a reliable method to precisely measure and detect small changes of the motor power of elbow flexion. We recommend the use HHD for quantitative assessment of shoulder abduction, elbow flexion and extension. HHD assessment for other joints of the upper extremity did not prove its validity and reliability.

Substitution Action

When we consider the outcomes of nerve repair, we should also consider substitution actions such as Steindler effect for elbow flexion. We found common mistakes in previous literature, with ICN to MCN transfer and SSN repair. A difference of Steindler effect generated by forearm muscles is found between palsy types.

Comparison of ICN-MCN transfer outcome between a group with C56 and another with C567 palsies, and another comparison between C5~8 and total palsies, were done. A significant difference was observed. This implies that Steindler effect of forearm muscles is different between groups. This data explains to us that the final outcome of elbow flexion should consider the Steindler's effect as well.

Shoulder abduction following SSN repair is very different between C56 palsy and C567 palsy. Range of shoulder abduction in C56 is usually better than those in C567.This difference is due to the presence of serratus anterior muscle function. Most of the previously reported articles did not consider this as an immensely important factor. Dynamic shoulder X-Ray assessment of the serratus anterior function is imperative to evaluate SSN repair status.

Proper Statistical Analysis

There are frequently two major statistical misinterpretations in the assessment of NT. One is that statistically non-significant or negative results are thought to be an evidence for equivalence, mistakenly validating treatment modalities and putting patients at risk. The other is that statistically significant results are always thought to be clinically significant. In the former, type II errors (β errors) statistical conclusion state that there is no difference

Continued on page 16

Perspectives on the Future of Reconstructive Microsurgery

between the groups when in reality there is a difference. No evidence of difference in such studies may be the result of inadequate sample sizes, small treatment differences or simple chance. We must be suspicious about studies that state equivalence under these circumstances, because using superiority study design when a non-inferiority design is more appropriate, perpetuates the misuse of these tests and the misunderstanding of how study designs are best utilized. The current international journals obligated to examine not only p-values, but also, sample size or power of analysis to avoid these statistical errors.

Another misinterpretation occurs when the effect size is smaller than the minimal important difference. The two pieces of information listed previously can be combined into a single concept know as effect size. The minimal important difference (MID), is the smallest change in a treatment outcome that a patient would recognize as important. For example, MID of shoulder abduction was set at 30 □ based on the Japanese Orthopaedic Associatio shoulder scoring system (JOA score) from patients' QoL. The less than 30□ difference between each mean values of nerve transfer group does not satisfy clinical superiority even if the statistically significant difference was proved. Your choice of effect size depends on the scientific or clinical context.

We feel sorry to say that the current outcomes of NT are unreliable because their conclusions are based on an unreliable assessment measure like MMT, which comprises wrongly measured substitution action, incorrect statistical analysis and so on. We should better reevaluate the current outcomes of NT before we advance from PNT to DNT.

Conclusion

NT is a strong alternative weapon for nerve repair following BPP. However, strictly speaking, the outcomes of NT have not been so satisfactory and still far from patients' expectation by either distal or proximal NT. The current articles might have been misguided by the inadequate assessments and analyses. To improve the results, we should strictly examine them biomechanically and statistically. NT has limited ability to overcome the disabled functions of BPP patients and we should look for other alternative of NT using recently developed artificial intelligence or robot technology.

Susan E. Mackinnon, M.D.

Shoenberg Professor and Chief
Washington University School of Medicine in Saint Louis, MO, Department of Surgery, Division of Plastic and Reconstructive Surgery

Over the last century, management of nerve injuries has advanced from amputation, to tendon transfers, to nerve repair, to nerve grafts, and now nerve transfers. This white paper, prepared for the World Society of Microsurgeons (WSRM), discusses the recent surgical paradigm shift from nerve graft to nerve transfers. While nerve transfers were described in the early 1900s and termed neurotization, nerve cross, and nerve anastomosis, they have more recently been adopted as an additional surgical tool in the management of complex nerve injuries. The results of surgical reconstruction of a nerve injury far from target are negatively impacted not only by changes at the end organ, but also by cellular changes along the pathway[1,2]. The recent reintroduction of nerve transfer surgery moves regenerating axons closer to target and offers an alternative to nerve repair and nerve graft. This communication evaluates the current state of the paradigm shift to nerve transfer surgery. Nerve surgeons who began their practices in the early 1980s will have experienced the paradigm shift from nerve repair supported by proponents such as Leonard Goldner and Sir Sydney Sunderland and nerve grafting as championed by our colleague, Hanno Millesi. In a personal e-mail from Millesi in 2012, he described challenges with his advocation of nerve grafts and the strong opposition he experienced from the proponents of nerve repair, even with long gap injuries.

The author Thomas S. Kuhn coined the term paradigm shift as a fundamental change in the practice of a scientific discipline3. He spoke of the challenges of transferring allegiance from one paradigm to the next, stating that resistance is inevitable and change cannot occur with proof as "those whose productive careers have committed them to an older tradition, will not be persuaded to change their minds in light of new teachings". He continues to say that "resistance is inevitable and legitimate, that paradigm change cannot be justified by proof, but that is not to say that no arguments are relevant or that scientists cannot be persuaded to change their minds. Though a generation is sometimes required to effect the change, scientific communities have again and again been converted to new paradigms. Though some scientists, particularly the older and more experienced ones, may resist indefinitely, most of them can be reached in one way or another. Conversions will occur a few at a time until after the last holdouts have died, the whole profession will again be practicing under a single but now different paradigm."[3]

An evaluation of the scientific literature, by review of PubMed indexed articles, notes a rapid increase from baseline of nerve transfer publications beginning in the early 1990s such that clinical nerve transfer publications now exceed those of nerve repair or nerve graft. Interestingly, a similar rapid adoption of tendon transfers in the 1960s is noted, with reports of tendon transfers still far exceeding reports on any type of nerve reconstruction.

Continued on page 17

Perspectives on the Future of Reconstructive Microsurgery

PubMed/MEDLINE and EMBASE databases were evaluated for articles that compare specifically "nerve graft" and "nerve transfer." Most of the data regarding outcomes of nerve grafts and transfers exist in the form of reports that focus on only one of the two techniques. In four meta-analyses and systematic reviews authors sought to conglomerate the large body of literature on results of varying repairs (predominantly for restoration of elbow and shoulder function following brachial plexus injuries). Not surprisingly, conclusions varied.[4-7] Heterogeneity of nerve injuries as well as graft and transfer techniques necessarily existed among individual studies included in each review. Furthermore, although success rates often seemed to differ based on type of repair, statistical analysis frequently failed to reach significance. Nonetheless, some general trends were identifiable across these analyses: *Both graft and transfer can generate functional results and relative success of graft versus transfer depends on both the function to be restored as well as the specific transfer used.*

For restoration of elbow flexion following brachial plexus injuries, comparisons of graft to all transfer techniques yielded somewhat equivocal results, and at least one study4 found graft repair superior. However, narrowing the analysis to include only single or double fascicular transfer to the musculocutaneous nerve seemed to reliably shift results in favor of nerve transfers.

Shoulder function is far more complex than elbow function, and outcomes analyses for restoration of shoulder function via graft or transfer are correspondingly more difficult to compare. In transfers, not only do donor nerves vary, but recipients do as well. The surgeon may target either the axillary or the suprascapular nerve, or may choose to reinnervate both. Once again, findings of graft repair compared to all techniques of transfer are, overall, equivocal. Narrowing analyses based on type of transfer, however, suggests that following brachial plexus injury, simultaneous transfer to axillary and suprascapular nerves may generate superior results. On the other hand, transfer to only one recipient fares no better than graft repair and, especially if suprascapular nerve is the single recipient, transfer may fare worse.

Recently, original chart reviews directly comparing graft and transfer outcomes for specific nerve lesions have become more prevalent.[8-16] Similar to the meta-analyses and systematic reviews, these original articles report varying results relating to donor nerve and recipient nerve selection. Overall, they too suggest that certain distal transfers are equivalent or more than equivalent to a graft, while other transfers lead to inferior outcomes.

Results for elbow flexion and shoulder function in these retrospective reviews were similar to the results of the meta-analyses and systematic reviews. Once again, single or double fascicular transfers were found to be equivalent to or better than proximal grafts (both brachial plexus and isolated musculocutaneous nerve injuries).

Both level of injury and transfer techniques in some studies comparing outcomes for shoulder function were more specific than they were in the meta-analyses and systematic reviews. Findings were similar between the two types of manuscripts, though the retrospective reviews were somewhat less favorable towards nerve transfers. Wolfe et al found no functional difference following distal transfers (to axillary nerve alone or in addition to transfer to the suprascapular nerve) compared to proximal graft repair using long (average 13.2 cm) nerve grafts for plexus and terminal branch (axillary and suprascapular nerve) injuries. Examining only isolated axillary nerve injuries, Baltzer et al found results to be equivalent following graft and triceps to axillary nerve transfer, with the exception of shoulder abduction strength, which was superior following graft.

In addition to restoration of elbow and shoulder function, outcomes following treatment of ulnar nerve lesions was also addressed by retrospective reviews. Overall, results favor use of distal transfer – both end-to-end as well as proximal repair augmented with distal end-to-side transfers – for restoration of ulnar intrinsic function following traumatic ulnar nerve injuries. Relative quality of sensory recovery is less clear, and most results indicate no difference between graft and transfer repairs.

A survey regarding prevalence of nerve transfer surgery was administered to WSRM. Sixty-two responses were received. Of the respondents, 52% were also members of American Society for Reconstructive Microsurgery, 24% members of American Society for Peripheral Nerve, and 27% of American Association for Hand Surgery. The majority specialize in plastic (69%) and orthopedic (34%) surgery. Forty percent live in North America, 5% South America, 24% Asia, 23% Europe, 5% Africa and 3% Australia. Eighty-eight percent of respondents reported using nerve transfers to treat nerve injuries. These surgeons report their frequency of "usually or always" using nerve transfers for repairing brachial plexus nerve injuries as 68%, radial nerves as 27%, median as 25%, and ulnar as 33%. They report using nerve transfers "sometimes" for brachial plexus (18%), radial (30%), median (34%) and ulnar (35%) nerve injuries. Two case studies were given. For a proximal ulnar nerve laceration, 61% report they would use end to end nerve transfer (anterior interosseous nerve to deep motor ulnar), while 33% report they would use this as an end to side nerve transfer. For proximal forearm nerve lacerations, 33% would use an end to end transfer, while 26% would use end to side nerve transfer. Most surgeons (88%) reported using motor nerve transfers more frequently within the last three years.

Taken together, this evidence suggests that nerve transfers offer an alternative technique along with tendon transfers, nerve repair, and nerve grafts –and is a logical extension of the paradigm shifts from nerve repair and nerve graft. I would suggest that, as with all new innovations, nerve transfer techniques will in time be pushed to failure and be a stimulus for newer paradigms to the betterment of the nerve injured patient population.

Continued on page 18

Perspectives on the Future of Reconstructive Microsurgery

References:

1. Poppler L, Ee X, Schellhardt L, Hoben G, Pan D, Hunter D, Yan Y, Moore A, Snyder-Warwick A, Stewart S, Mackinnon S, and Wood, M. Axonal Growth Arrests After an Increased Accumulation of Schwann Cells Expressing Senescence Markers and Stromal Cells in Acellular Nerve Allografts. Tissue Engineering Part A 22:949-960, 2016.
2. Sahed-Al-Zamani, M, Yan Y, Farber S, Hunter D, Newton P, Wood M, Stewart S, Johnson P, Mackinnon S, Limited regeneration in long acellular nerve allografts is associated with increased Schwann cell senescence. Experimental Neurology. 2013. 247: 165-177.
3. Kuhn Thomas. The Structure of Scientific Revoltuions. The University of Chicago Press, Ltd. London, 1962.
4. Ali ZS, Heuer GG, Faught RW, et al. Upper brachial plexus injury in adults: comparative effectiveness of different repair techniques. J Neurosurg. 2015;122(1):195-201.
5. Yang LJ, Chang KW, Chung KC. A systematic review of nerve transfer and nerve repair for the treatment of adult upper brachial plexus injury. Neurosurgery. 2012;71(2):417-429; discussion 429.
6. Garg R, Merrell GA, Hillstrom HJ, Wolfe SW. Comparison of nerve transfers and nerve grafting for traumatic upper plexus palsy: a systematic review and analysis. J Bone Joint Surg Am. 2011;93(9):819-829.
7. Koshy JC, Agrawal NK, Seruya M. (In Press) Nerve transfer versus interpositional nerve graft reconstruction for post-traumatic, isolated axillary nerve injuries: A systematic review. Plast Reconstr Surg. In Press.
8. Socolovsky M, Martins RS, Di Masi G, Siqueira M. Upper brachial plexus injuries: grafts vs ulnar fascicle transfer to restore biceps muscle function. Neurosurgery. 2012;71(2 Suppl Operative):ons227-232.
9. Bhandari PS, Deb P. Management of Isolated Musculocutaneous Injury: Comparing Double Fascicular Nerve Transfer With Conventional Nerve Grafting. J Hand Surg Am. 2015;40(10):2003-2006.
10. Wolfe SW, Johnsen PH, Lee SK, Feinberg JH. Long-nerve grafts and nerve transfers demonstrate comparable outcomes for axillary nerve injuries. J Hand Surg Am. 2014;39(7):1351-1357.
11. Baltzer HL, Kircher MF, Spinner RJ, Bishop AT, Shin AY. A Comparison of Outcomes of Triceps Motor Branch-to-Axillary Nerve Transfer or Sural Nerve Interpositional Grafting for Isolated Axillary Nerve Injury. Plast Reconstr Surg. 2016;138(2):256e-264e.
12. Malessy JA, deRuiter GCW, deBoer KS, Thomeer RTW . Evaluation of suprascapular nerve neurotization after nerve graft or transfer in the treatment of brachial plexus traction lesions. J. Neurosurg. 2004;101:377-389.
13. Flores LP. Comparative Study of Nerve Grafting versus Distal Nerve Transfer for Treatment of Proximal Injuries of the Ulnar Nerve. J Reconstr Microsurg. 2015;31(9):647-653.
14. Baltzer H, Woo A, Oh C, Moran SL. Comparison of Ulnar Intrinsic Function following Supercharge End-to-Side Anterior Interosseous-to-Ulnar Motor Nerve Transfer: A Matched Cohort Study of Proximal Ulnar Nerve Injury Patients. Plast Reconstr Surg. 2016;138(6):1264-1272.
15. Sallam AA, El-Deeb MS, Imam MA. Nerve TransferVersus Nerve Graft for Reconstruction of High Ulnar Nerve Injuries. J Hand Surg Am. 2017. 42(4):265-273.
16. Hu C, Chang TN, Laurence V, Lu, JC, Chuang DC. (In Press) Comparison of Surgical Strategies Between Proximal Nerve Grafts and/or Nerve Transfers and Distal Nerve Transfers Based on Functional Restoration of Elbow Flexion: A Retrospective Review of 147 patients. Plast Recon Surg.

2017 Congress – Seoul, Korea

The 9th Congress of the World Society for Reconstructive Microsurgery (WSRM) was held from June 14 to June 17, 2017 at the COEX Convention and Exhibition Center in Seoul. The Seoul organizing committee spent the past few years planning and preparing for this biennial meeting. WSRM president David CC Chuang, M.D. provided immense support for the success of this meeting.

The academic and social program of the Congress was planned out based on the main theme: “Bridging the Gap and Beyond”.

The Scientific Committee received confirm from more than 350 international faculties one year before the congress date. Also, activities at regional societies and social media allowed invitation of more guests from all over the world. The scientific committee led by Professors JP Hong and GH Mun, JW Park deserve special mention for their exceptional efforts which I believe made a big difference for this congress.

There was a record attendance. The Seoul congress welcomed an unprecedented 1,350 participants from 72 countries making this truly a global event. This significant number was possible due to the participation of microsurgeons from Africa, Central and South America, and Europe, who were not active with our society prior to this event.

At this congress, we tried several new programs to demonstrate the main theme.

The session ‘Tribute to the Giants” described the pioneers who were giants in our field and bridged the old and new generations together. Also, ‘The Best Innovative Case” session promoted academic excellence as well as excitement.

Both of new sessions were executed with the format of Korean traditional culture.

Apart from the academic sessions, the pre-congress video presentation entertained more than 400 participants with scientific passion.

At the invitation lecture sessions, an additional session commemorating Dr. Fu Chan Wei who is the innovator and true teacher of microsurgery was scheduled.

More than the expected number of members joined our social program at the welcome reception and two banquets. These social activities gave the organizing committee pleasant issues to worry about.

An overview of the Seoul congress is as follows:

1. Unprecedented participation from all around the world, especially Europe, Central and South America, and Africa.
2. Significant participation by microsurgeons from developing countries and young microsurgeons.
3. New sessions and events highlighting the theme: “Bridging the Gap and Beyond.”

The Seoul Congress identified some things to consider as we move forward:

1. Open the door for young microsurgeons: we need to encourage and welcome the younger generation to participate
2. New regulations need to be settled to boost regional participation, such as Central and South America, Europe and Asia

Again I would like to express my sincere gratitude to our WSRM leadership team (including leaders of regional societies such as Asian Pacific, South American, European) for their support. Their detailed guidance helped make the Seoul congress a success. Lastly, I want to thank all of the members of the organizing committee who dedicated themselves despite many hardships to the success of this congress.

On a personal level, I was honored and delighted to have this congress meet in my homeland. I appreciate that so many members of the WSRM participated in this congress despite the military tensions on the Korean peninsula. They are truly messengers of peace, and the unsung heroes of WSRM 2017.

Myong Chul Park, M.D., Ph.D.
Chairman of Organizing Committee
Seoul Congress of WSRM

1. Opening ceremony of Seoul congress

2. Judges and winner of “Best Innovative Case”

3. Tribute to the Giants session. All attendees are paying homage to the Giants with respect.

WSRM SERVICE INITIATIVE – CALL FOR VOLUNTEERS

WSRM has a new initiative to sponsor surgical missions to needy world areas to perform complex microsurgical reconstructions. The team would provide care to needy patients and also provide education in approach to management of complex disorders for the local surgeons and support staff. The support for these mission trips would need to come from donations from individuals and major health organizations and industry. In addition, the initiative would address:

A. Service to local hospitals, including lectures and surgeries

B. Service to teaching local surgeons, accepting candidates for short term or long-term service

C. Patient Care, patients traveling to the participating hospital (WSRM doctor's hospital) for treatment.

To further this initiative the Ad Hoc Service Committee has been created to look at opportunities for WSRM to engage in clinical/ educational service missions, investigate funding and cost issues to WSRM as well as investigate Medical /Legal issues of service work. If you are interested in serving on this committee and have service work experience please contact Krista Greco at kristagreco@isms.org as soon as possible.

Mark Your Calendar

2019 WSRM World Congress
June 12-15, 2019
Bologna, Italy

Global Meetings*

*The posting of these meetings does not define the WSRM as a sponsor or endorser.

14th EFSM Meeting
April 25-28, 2018
Belgrade, Serbia
www.efsm.eu

4th APFSRM Meeting
May 10-13, 2018
Antalya, Turkey
www.apfsrm.org

News from the Executive Council

2017 - 2019 Executive Council

PRESIDENT
Isao Koshima, MD
Hiroshima City, Japan
koushimaipla@gmail.com

PRESIDENT-ELECT
David W. Chang, MD, FACS
Chicago, IL, USA
dchang@surgery.bsd.uchicago.edu

VICE PRESIDENT
Robert Walton, MD
Chicago, IL, USA
doctornotlaw@gmail.com

SECRETARY GENERAL
Gregory R. D. Evans, MD, FACS
Orange, CA, USA
gevans@uci.edu

HISTORIAN
Milan Stevanovic, MD
Los Angeles, CA, USA
stevanov@usc.edu

IMMEDIATE PAST-PRESIDENTS
David Chwei-Chin Chuang, MD
Taipei, Taiwan
dccchuang@gmail.com

L. Scott Levin, MD, FACS
Philadelphia, PA, USA
scott.levin@uphs.upenn.edu

MEMBERS-AT-LARGE
Ming Huei Cheng, MD
Tao-Yuan, Taiwan
minghueicheng@gmail.com

Marco Innocenti, MD
Florence, Italy
marcoinnocenti1212@gmail.com

Jaume Masia, MD
Barcelona, Spain
jmasia@santpau.cat

Joon Pio Hong, MD
Seoul, South Korea
joonphong@amc.seoul.kr

William Pederson, MD
San Antonio, TX, USA
micro1@ix.netcom.com

ASIAN REPRESENTATIVE
Prof. Tackin Ozalp, MD
Manisa, Turkey
tackino@yahoo.fr

EUROPEAN REPRESENTATIVE
Marko Bumbasirevic, MD
Belgrade, Serbia
marko.bumbasirevic@gmail.com

NORTH AMERICAN REPRESENTATIVE
Samir Mardini, MD
Rochester, MN, USA
guenter.germann@ethianum.de

LATIN AMERICAN REPRESENTATIVE
Javier Lopez, MD
Mexico City, Mexico
javier211278@hotmail.com

2017 CONGRESS CHAIRMAN
Giorgio De Santis, MD
Modena, Italy
desantis.giorgio@unimo.it

WSRM Endorsement Microsurgery Seminars, Meetings & Workshops Worldwide

WSRM is making an effort to show its support of the various microsurgery activities and meetings that take place around the world. Please contact Krista Greco to obtain the endorsement guidelines. A formal request must be submitted addressing the guidelines stated and your qualifications. The WSRM will not endorse a meeting within the same region and within one year of the biennial congress. The WSRM will only endorse national meetings.

News from the Executive Council

2017 - 2019 WSRM Committee Roster

This is official notification to the membership of the members that have been appointed to serve in the standard committees of the WSRM. Please help us applaud those members that have volunteered their time to serve on a committee to better the organization.

Congress Organizing Committee

Giorgio DeSantis, MD – Organizing Committee Chairman
Francesco Moschella, MD – Organizing Committee Co-Chairman

Scientific Program Committee

Marco Innocenti, MD – Co-Chairman
Bruno Battiston, MD – Co-Chairman
Marzia Salgarello, MD – Co-Chairman

Membership Committee

David Chang, MD, FACS (USA)
Eric Santamaria, MD (Mexico)
Roman Skoracki, MD (USA)
Milomir Ninkovic, MD (Austria)
Myong Chul Park, MD (South Korea)

Nominating Committee

David Chuang, MD (Taiwan)
Matthew Hanasono, MD (USA)
Yixin Zhang, MD (China)
Raja Sabapathy, MD (India)
Gemma Pons, MD (Spain)

Constitution and Bylaws Committee

Jan Vranckx, MD (Belgium)
B. K. Tan, MD (Singapore)
Steve Moran, MD (USA)

Know someone who wants to become a member?

The application process is simple. Applications can be obtained at www.wsrm.net and submitted via email, mail or fax to the Central Office. Applications are accepted and reviewed on a continual basis so we encourage applicants to submit the information as soon as possible to start taking advantage of the membership benefits.

World Society for Reconstructive Microsurgery
Winter 2017 – Volume 7/ Issue 11

Purpose
The object of the Society shall be to stimulate and advance knowledge of the science and art of Microsurgery and thereby improve and elevate the standards of practice in this field of surgical endeavor. The Society shall be the highest medium of recognition in the field of Microsurgery as evident by superior attainment and by contribution to its advancement. It shall provide an international forum for the exchange of ideas and the dissemination of innovative techniques.

The WSRM Newsletter is published two times yearly for members of WSRM, a non-profit organization. Subscriptions are included in the annual membership dues. All correspondence, address changes, and news for upcoming events should be addressed to:

WSRM Central Office | 20 North Michigan Avenue, Suite 700
Chicago, Illinois 60602 | USA