



World Society for Reconstructive Microsurgery



David Chwei-Chin
Chuang, M.D.
President WSRM

Message from the Editor

Dear Members of The WSRM:

It is an immense honor for me to have this message in this particular time. I am Dr. David CC Chuang, a professor at Taipei-Linkou Chang Gung Memorial Hospital, Taiwan. I am your newly elected President of WSRM (due on 2015-2017), succeeding Dr. Scott Levin after the Presidency transition in the 8th WSRM Congress Meeting in Mumbai, India in March, 2015.

By this opportunity I would like to briefly tell you how I become an international man. The first international meeting I attended abroad was ISRM (International Society for Reconstructive Microsurgery) in Paris, France in 1985 (30 yrs. ago), when I became a junior microsurgeon. The 2nd international meeting I attended abroad was IMS (International Microsurgical Society) in Brescia, Italy one year later in 1986. Both meetings were biennial meetings. I attended the ISRM, then the IMS and so on, every year thereafter because they were so attractive, until 1999. The ISRM and IMS merged in 1999 to become one international society, which is now our Society, World Society for Reconstructive Microsurgery (WSRM). In fact, the first WSRM meeting was held in Taipei, Taiwan in 2001, and Prof Fu-Chan Wei was then elected as the 2nd President of our Society. The reason I told you the above history is I have learned from many, become acquainted, and shared experiences, ideas, and photos with international colleagues, many pioneers in different specialized fields and many friends from different countries. Through those important international meetings, I have been inspired and had many ideas. Professor Wei and I, although live on a small island 200Km off the coast of China, we have established global reputations. I myself also improved my English-speaking ability through this interaction. This is how I become an international man. This is the reality of WSRM, and value as a WSRM membership.

WSRM is a world congress. It includes the North American (ASRM), Latin American (ALAM), Europe (EFSM), and Asian Pacific (APFSRM) four continental societies. The WSRM Council includes the Presidents of those four regional societies. The WSRM Congress Meeting takes place every other year. The most recent meeting, the 8th Congress Meeting, in Mumbai was a huge success with over 600 in attendance.

To assure the success and vitality of The Society and Meeting, Council Members at the most recent meeting agree the WSRM should make certain changes:

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The WSRM should shift the focus from the recognized microsurgeons to the young microsurgeons. We will facilitate this through increasing **CME** (continuing medical education) credits, offering more instructional courses free-of-cost and establishing more Young Microsurgeons Group Panels etc...

The WSRM should decrease year dues (\$200 USD) to attract more members of nations with lesser resources.

The WSRM should better align with Regional Societies. The aims are to strengthen ties between the Central Office and Regional Societies, to improve global exposure and membership of WSRM, and to especially encourage and attract many young microsurgeons. Because of that, the concept of "WSRM Pre-Congress Symposium" was proposed. It is a one day symposium before the every Regional Meeting. Both WSRM and regional society can share the benefits simultaneously: the local organizer earns more attendees, and the WSRM benefits from its global reach. The 1st "WSRM Pre-Congress Symposium" will be held in Mexico City, Mexico on Nov. 25th, 2015, before the ALAM Meeting (Nov. 26-28th), where over 300 are expected to attend.

I sincerely hope that the Congress will continue to grow forever, and that WSRM members will appreciate the value and significance of being a WSRM membership. Surgeons, scientists and associates familiar with the WSRM have benefited through idea sharing and networking. Every prospective and current microsurgeon stands to benefit from the Society. So please spread the WSRM to the world, encouraging your colleagues to be a membership of WSRM. I hope to see you all at forthcoming Pre-Congress Symposia and the 9th World Congress Meeting in Seoul, Korea in 2017.

Thank you again for electing me to serve as your President. I am happy to receive any feedback you might have. I look forward to hearing from you. Thank you very much for your attention and consideration.

Yours Sincerely

David CC Chuang, M.D.
President, WSRM

The scientific program of the meeting will deal with the different aspects of microsurgery and how it can be applied to different body parts: hand, head & neck, upper and lower limb, lymphatics, etc.

The meeting will also include a special session on "exceptional cases" and a video surgery pre-congress. The meeting will include a special symposium on Peripheral Nervous System repair and regeneration. It will be held entirely in English (whereas the other sessions will mainly be in Italian). From basic science to surgery, a way to bring together basic scientists and surgeons on common themes and to stimulate discussion, prioritizing different opinions on the peripheral nerve and all its different aspects.

You are all invited to take an active part in the meeting and we look forward to receiving your contribution: the abstract form can be found inside the official website of the meeting <http://www.sim2015.it>

The "social" part of the meeting includes a musical surprise with Italian and non-Italian guests for whoever wants to stay out late in the evening.



I am looking forward to reading your abstracts and I am looking forward to receiving any advice you wish to give me on the Meeting.

Pierluigi Tos, MD, PhD
President of the Italian Society for Microsurgery
www.microchirurgia.org

Societa' Italiana Di Microchirurgia

The XXVI Meeting of the Italian Society for Microsurgery will be held on November 26th to 28th 2015 at the Automobile Museum in Torino.

In the last few years, the major effort of our Scientific Society has been to invest its energies in training young surgeons who can then employ microsurgical techniques for reconstruction in different fields. The Italian Society for Microsurgery (SIM) has worked alongside the official university teaching organizing beginner and advanced courses, dissection courses and clinical fellowships. A part of the Meeting will gather the experience and the progress that result from the courses organized by our scientific Society over the years. The Meeting will be the coming together of all these energies that converge to pass on to others the progresses in each field of our discipline. I have fulfilled my wish to have a scientific committee that includes all those who have been the Society's Chairmen, since the moment when I started to approach and fall in love with this discipline. They are the surgeons that guided my knowledge that set a goal for me: they are the people that are helping me to put together the different parts of the Meeting and will guarantee the quality of our scientific meeting.

Liaison Update



SAVE THE DATE!

WSRM Pre-Congress Symposium

November 25, 2015 in conjunction with 2nd Ibero-Latin American Meeting of Reconstructive Microsurgery

Mexico City, Mexico

www.microcirugia2015.mx

Wednesday, November 25, 2015

WSRM Pre-Congress Symposium

(Format: Video recorded surgeries, described by the authors, followed by Q & A)

8:00 a.m. - 3:00 p.m.	Registration	
8:00 a.m. - 8:05 a.m.	Opening ceremony	David CC Chuang (President, WSRM)
8:05 a.m. - 10:00 a.m. Topic: 8:05 a.m. - 8:45 a.m. 8:45 a.m. - 9.30 a.m.	Peripheral Nerve Surgery Adult Brachial Plexus Injury Facial Palsy	Speakers: Dr. David CC Chuang (Taiwan) Dr. Juan Carlos Rodriguez () Dr. Alexander Cárdenas (México) Dr. Jorge Clifton (México) Dr. Alexander Musset (Spain)
9:30 a.m. - 10:00 a.m.	Coffee Break	
10:00 a.m. - 11:00 a.m.	Breast Reconstruction DIEP flap SIEA flap TDAP flap	Speakers: Dr. Eric Santamaría (México) Dr. David Chang (USA) Dr. Claudio Angrigiani (Argentina)
11:00 a.m. - 12:30 p.m.	Lymphedema Surgery Lymphatico-Venous Anastomosis and Super-microsurgical Techniques Supraclavicular Lymph Node Transfer Groin Lymph Node Transfer (and Total Breast Reconstruction)	Speakers: Dr. Isao Koshima (Japan) Dr. David Chang (USA) Dr. Jaume Masía (Spain)
12:30 p.m. - 1:30 p.m.	LUNCH	
1:30 p.m. - 2:30 p.m.	Head and Neck Fibula Free Flap ALT Free Flap Radial Forearm Free Flap for H & N Reconstruction	Speakers: Dr. Fu-Chan Wei (Taiwan) Dr. Raymundo Priego (México) Dr. Giovanni Montealegre (Colombia)
2:30 p.m. - 4:30 p.m.	Upper & Lower Extremity Toe to hand transfer Ultra-thin ALT flap SCIP flap and perforator to perforator free flaps Medial Plantar Free Flap	Speakers: Dr. Fu-Chan Wei (Taiwan) Dr. Javier López (México) Dr. J.P. Hong (South Korea) Dr. Isao Koshima (Japan)
4:30 p.m. - 5:00 p.m.	Overview, Q & A	David CC Chuang Dr. Isao Koshima (Japan)

Mini Review

Nerve Transfers in Brachial Plexus Surgery

Authors: Aleksandra McGrath (clinical fellow);
David Chwei-Chin Chuang (corresponding author)

Introduction

Nerve transfer (or neurotization or nerve crossing) is a surgical option involving intentional division of a physiologically active nerve with low morbidity, and transfer of that nerve to a distal, more important but irreparable, denervated nerve within the golden time period. During the last two decades, nerve transfer emerged as a new and popular technique to treat severe brachial plexus injury (BPI). In adult BPI, nerve transfer can be simply classified into two types: proximal nerve transfer and distal nerve transfer.¹ Proximal nerve transfer includes intraplexus nerve transfer (eg., medial pectoral to musculocutaneous) and extraplexus nerve transfer (eg., spinal accessory nerve to suprascapular nerve). Distal nerve transfer is a method of close-target nerve transfer (eg. branch of ulnar nerve to branch to biceps). Distal nerve transfer is a type of closed-target nerve transfer in BPI, it is defined as a procedure outside the supra- and infraclavicular fossa.

While the close-target nerve transfers gain increasing popularity², there is still a lack of strong evidence supporting their use in adult BPI, neither in obstetric brachial plexus injury (or palsy). Investigating the efficacy of proximal vs distal nerve transfers is plagued by the lack of outcome measure instruments designed specifically for brachial plexus patients³ and the low volumes of cases described by most authors.

Debates about the nerve transfers in adult BPI include (1) Is intercostal nerve transfer to the musculocutaneous nerve a proximal nerve transfer or distal nerve transfer? (2) Is contralateral C7 nerve transfer an intraplexus nerve transfer or extraplexus nerve transfer? (3) Intraplexus nerve grafting vs. nerve transfer, which is better? (4) Proximal vs. distal nerve transfer which is better in primary brachial plexus reconstruction?

Debate 1: Is intercostal nerve to musculocutaneous nerve a proximal nerve transfer or a distal nerve transfer?

Some authors consider the intercostal-musculocutaneous nerve transfer is a proximal nerve transfer (one of extraplexus nerve transfers)⁴, but some are not, considering it belongs to distal nerve transfer. The authors concludes that if the intercostal nerves are transferred directly to the biceps branch (only biceps muscle is innervated), it is a distal nerve transfer; if the intercostal nerves are transferred to the musculocutaneous nerve (biceps and brachialis muscle are innervated), it is proximal nerve transfer (extraplexus nerve transfer).

Debate 2: Is contralateral C7 nerve transfer an intraplexus nerve transfer or extraplexus nerve transfer?

Some authors consider the contralateral C7 (healthy side) transfer to the lesioned brachial plexus is an intraplexus nerve transfer, but some are not, considering it belongs to extraplexus nerve transfer^{5,6}. The authors conclude it is a type of extraplexus nerve transfer, similar to spinal accessory-suprascapular nerve transfer.

Debate 3: Intraplexus nerve grafting vs. nerve transfer, which is better?

and

Debate 4: Proximal vs. distal nerve transfer, which is better in primary brachial plexus reconstruction?

These two debates should be discussed together. So far, both are still in question and not answered. Some studies showed better recovery of elbow flexion strength following nerve transfers than proximal nerve with interposition of nerve grafts. The results for shoulder abduction are equivocal, with one of the reviews finding no difference between two treatment methods; while the other describing better results for transfer of two donor nerves for shoulder abduction than for nerve grafting^{7,8}. While initially developed for distal nerve transfer which is only indicated where proximal spinal nerves were not available because of avulsion, the distal nerve transfers are now viewed by some surgeons as a preferred option of reconstruction, even when proximal nerve stumps are or might be available^{2,9,10}. The main reason for such indication is the distance. Too long distance will result in poor outcome in proximal nerve grafting, making the distal nerve transfer a preferable option. The distal nerve transfers are considered to be technically easier, while proximal dissection through the scar requires dedicated training and higher technical skills. A prospective, multicentre study enrolling an adequate number of patients is needed to investigate the true differences in outcome between proximal nerve grafts and distal nerve transfer two techniques.

From the author point of view, although the new strategy of distal nerve transfer can provide an exciting alternative of the traditionally proximal nerve transfer, distal nerve transfer should not be applied in situations where proximal nerve grafting is still possible and indicated. Proximal brachial plexus exploration to confirm the lesion (diagnosis) then do nerve grafting and/or transfer (extraplexus and intraplexus nerve transfer) is still the main reconstructive procedure based on the principle of "No diagnosis, no treatment". Proximal nerve transfer can avoid iatrogenic injury where the lesion is still in continuity (Sunderland 3 injury) and neurolysis might be the only procedure needed without dividing a functioning nerve. However, in proximal nerve transfer, dense scars with difficult dissection will be encountered.

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Sometimes it is necessary to trim a part of C5 transverse process to access the ruptured C5 stump. Oozing and bleeding is likely to occur and requires careful haemostasis with bipolar diathermy. Long operation time can be expected. Although the health of proximal ruptured stump is sometimes unpredictable even when assessed under surgical microscope, interposition of a nerve grafts is always required, which might jeopardize functional recovery, and longer rehabilitation time is necessary. Proximal nerve transfer can be applied in cases of either complete or incomplete avulsion of brachial plexus. Distal nerve transfer without brachial plexus exploration actually create a second injury to the peripheral nerves of the affected limb and the potential donor side morbidity might be even more worse than expected.

In Chang Gung experience, 188 patients with different methods of musculocutaneous nerve neurotization for acute brachial plexus injuries were selected based on inclusive criteria in the author series. Musculocutaneous nerve neurotization from C5, C8, medial cord, contralateral C7, spinal accessory nerve, or phrenic nerve to obtain elbow flexion was all included into the group of proximal nerve transfer. Musculocutaneous neurotization 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 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 +/- 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 addition, additional gain of shoulder abduction from proximal nerve grafting or transfer following brachial plexus exploration was 95.6% (43/45 patients who received proximal nerve transfer for shoulder and elbow). The result of shoulder abduction from distal nerve transfer was significantly less than proximal nerve grafting and proximal nerve transfers. In conclusion, in adult BPI for complete or incomplete palsy, brachial plexus exploration for not missing any available spinal nerve is still mandatory. If some proximal nerve stump is still available, combined proximal nerve grafts and additional nerve transfer are recommended. If there is no available proximal nerve stump, combined proximal nerve transfers (such as phrenic nerve, spinal accessory nerve, hypoglossal nerve, cervical motor branch transfer) for shoulder and distal nerve transfers (such as ulnar nerve and median nerve fascicle transfer) for elbow functions are recommended for C5C6 ± C7C8 avulsion injury.

The laboratory studies in a rat model of varying degrees of

injury to C7 transferred to neurotize biceps muscle showed that partially injured nerve sustaining 10 second crush results in the same biceps recovery as uninjured one¹¹. Not performing the supraclavicular dissection to delineate the pathology of the brachial plexus injury with assessment of spinal nerve stumps wastes possible donors which together with distal nerve transfers might have augmented the reconstructed function. The paradigm shift from proximal to distal nerve transfers might stop the patients from obtaining the best possible function after brachial plexus injury and my result in future generations of surgeons receiving no training in performing supraclavicular dissection for diagnosis of the injury and identification of potential donors.

All nerve transfers require highly motivated patients with higher cognitive levels with sufficient brain plasticity for best results. The patients are required to perform so called induction exercise¹ during the rehabilitation or recovery period. The "induction exercise" is based on trying to induce the function of the recipient muscle simultaneously performing the donor nerve function. For example, in case of C5 transfer to the anterior division of upper trunk for elbow flexion, an attempt to abduct the shoulder (donor nerve function) with resistance while simultaneously attempting to flex the elbow (recipient muscles).

References:

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What's New in Microsurgery

New Frontiers in Research

Four experimental studies related with "Nerve Transfer" have been done at Chang Gung Memorial Hospital, Taiwan

- 1. Comparative study of single-, double- and triple-nerve transfer to a common target: experimental study of rat brachial plexus (Published in *Plast Reconstr Surg* 127: 1155-1162, 2011)**
- 2. The impart of different degrees of injured C7 nerve transfer: an experimental study (published in *Plast Reconstr Surg Glob Open*, 2014, Nov. 7, 2(10):e-230.**
- 3. Steal phenomenon in nerve transfer**
- 4. Comparison of proximal vs distal nerve transfer- experimental rat study**

Title 1. Comparative Study of Single-, Double- and Triple-Nerve Transfer to a Common Target: Experimental Study of Rat Brachial Plexus

Author: Andres Rodriguez, Chuang, DCC et al from Chang Gung Memorial Hospital, Taipei-Linkou, Taiwan

The purpose of this study was to investigate the recovery of a common target motor function after different single and combined motor nerve transfers in rat brachial plexus model.

The musculocutaneous nerve and biceps muscle were chosen as the target for neurotization. The phrenic, pectoral, and suprascapular nerves were selected as the neurotizers. Forty-two Sprague-Dawley rats were randomly assigned to seven groups (six rats in each group): single-neurotizer transfer (three groups), double-neurotizer transfer (three groups), and triple-neurotizer transfer (one group). The contralateral intact forelimb was used as a control. Functional outcomes were measured by grooming test, electrophysiological study, muscle contraction strength, muscle weight, and axon counts.

At 12 weeks, 40 operative rats were studied (two had died). In the single-neurotizer transfer, all three transfers showed no significant difference in motor recovery of the biceps. In the double-neurotizer transfer groups, the worst results were seen in group 6 (combined pectoral and suprascapular nerve transfer) despite increasing axon counts.

In conclusion, this study may potentially suggest: (1) single-neurotizer transfer will not have synergistic or antagonistic effects; (2) two neurotizers with functional antagonism will significantly downgrade motor recovery of the neurotized muscle despite increasing axon counts; (3) multiple motor neurotizer transfers may not always provide a better outcome, although increasing axons may outweigh antagonistic effects; and (4) phrenic nerve transfer alone did not upgrade the functional outcome despite its automatic discharge. Any nerve transfer combined with phrenic nerve transfer, however, showed improved functional results.

Title 2. The Impart of Different Degrees of Injured C7 Nerve Transfer: An Experimental Study

Authors: Chieh-Han John, Tzou; Chuang DCC et al

Ipsilateral C7 nerve transfer is an available procedure in C5C6 two-root avulsion injury of the brachial plexus. However, concomitant injury of a normal-looking C7 cannot be ruled out. The efficiency of a concomitant injury of C7 transfer was investigated.

Forty-two Sprague-Dawley rats were randomly assigned to five groups. They all underwent a two stage procedure. In the first stage from dorsal spine approach, left C5 and C6 roots were avulsed and C7 was crushed with jeweler's forceps with different degrees: Group A (n=6) C7 not injured; Group B (n=10) C7 crushed for 10 seconds; Group C (n=10) C7 crushed for 30 seconds; Group D (n=10) C7 doubly crushed for 60 seconds; and Group E (n=6) C7 transected and not repaired. Four weeks later in the 2nd stage, the C7 was re-explored via volar approach, transected and coaptated to the musculocutaneous nerve. At 12 weeks following the nerve transfer, functional outcomes were assessed with grooming test, electromyography, muscle tetanus contraction force, muscle weight, and axon counts.

Grooming test, muscle weight, electromyography and muscle titanic contraction force all showed the biceps muscles were significantly worse in Group C (C7 moderate crush) and D (C7 severe crush) were worse than Group B (C7 mild crush) or A (C7 uninjured). Group B and A showed no difference. Group E (C7 cut and not repaired) was the worst.

In conclusion, an injured but grossly normal-looking ipsilateral C7 can be used as a motor source to restore function but with variable results. The result is directly proportional to the severity of injury, potentially implies that better results will be achieved when longer regeneration time is allowed.

Title 3. To Know Whether Steal Phenomenon Happens in Nerve Transfer to The Different Targets (in proceeding)

Authors: Johnny Chuieng-yi Lu, David Chwei-Chin Chuang

The purpose of this study is to know whether steal phenomenon happens in nerve transfer to the different targets.

The 200-250 gram in weight rats are utilized. The ulnar, median and the musculocutaneous nerves in the left upper arm are used as model. The rats are divided into 4 groups with 10 rats in each. In Group A rats, the ulnar nerve is transferred to the musculocutaneous nerve (one target), and the median nerve is maintained intact; in Group B, the ulnar nerve is transferred to the musculocutaneous nerve (one target), but the median nerve is cut without repair; in Group C, the ulnar is divided and separated into two halves: one half is transferred to the median and one half to the

What's New in Microsurgery - *continued from pg 6*

musculocutaneous nerve (two targets). The right non-operative rat's biceps is used as control. After a 12 week recovery period, outcome studies of the biceps muscle are assessed, including grooming test, electrophysiological study, muscle contraction strength, muscle weight, and axon counts to evaluate the muscle strength of the biceps for comparison.

Results show 1. muscle weight showed difference between one target vs two targets, but functionally (EMG / contraction) there is no obvious difference. 2. tetanic contraction showed significant difference : proximal muscles (biceps), significant drop but smaller; but distal muscles (flexors) significant drop and larger. 3. from axon account, distal muscles can attract more axons when hooked up to two targets than when one target, and proximal muscle group gets much less axons

Steal phenomenon: Distal muscles will steal axons from Proximal muscles.

In conclusion, this is an example where connecting to two targets may not show obvious significant functional difference clinically, but that there may still be a subclinical difference (time to reach M4, muscle weight, endurance etc). When two targets are neurotized, two targets affect proximal muscles by axon steal phenomenon.

Title 4: Comparison of Proximal vs. Distal Nerve Transfer, Experimental Rat Study (in proceeding)

Authors: Aleksandra McGrath, MD and David CC Chuang

The purpose of this study is to investigate if the distal nerve transfer more effective than proximal nerve transfer in brachial plexus injury.

The 200-250 gram rats are utilized. Each one had two stage procedure: Stage 1- division of C5 and C7 from posterior neck approach, preserving phrenic nerve;

Stage 2: 4 days later after the primary surgery; three groups were involved

- Gr 1: C6 transfer to the musculocutaneous nerve (MCN) in the supraclavicular region; Gr2: C6 transfer to the MCN with a nerve graft in the supraclavicular region; and Gr 3: 50% ulnar nerve transfer to the MCN in the upper arm . Postoperative neck immobilization with suture for 1 week. After a 16 week recovery period, outcome studies of the biceps muscle are assessed, including Grooming test, muscle morphology, biceps muscle weight, EMG, tetanic muscle contraction force, nerve morphology (axon count, fiber diameter, axon diameter, myelin thickness).

Results: At 16 weeks proximal nerve transfers show statistically significant higher biceps muscle weight, EMG and tetanic muscle contraction force and

grooming test than distal nerve transfer. The number of myelinated axons is higher for the distal nerve transfer, possibly due to sprouting.

New options in Practice

Post-Paralysis Facial Synkinesis(PPFS) – Clinical Classification and Surgical Strategies

Author: David Chwei-Chin Chuang, MD, Chang Gung Memorial Hospital, Taipei-Linkou, Taiwan

Post-paralysis facial synkinesis (PPFS) represents a wide spectrum of involuntarily unwanted facial movements after recovery of facial palsy from any etiology. Paralysis, a synonym for palsy, usually means a complete form. Paresis is an incomplete form of paralysis. Synkinesis is a synonym for co-contraction, which only occurs in incomplete paralysis (paretic form) . Therefore, PPFS is a synkinesis deformity occurred in facial paralysis patients with incomplete facial recovery. PPFS occurs not only always during facial expression, but also at rest(intermittent blinking reflex causes intermittent cheek muscles twitching) and at sleeping (upper and lower lip constantly retracted), which are often not noticed by the patients. Long-term unresolved synkinesis may result in permanent contracture such as hypertrophy of corrugator muscle, deep nasolabial fold, lower lip retraction, chin skin dimples, and neck bands. These will disrupt the resting facial posture and the involved face and neck will become tight and sore. Those symptoms and signs make PPFS patients distressed with severe emotional sequelae.

The possible pathogenesis of synkinesis cross-talks in brain cortex, facial motor neurons, or facial nerve fibers. Hypothesis of aberrant reinnervation among facial nerve fibers following nerve injury is more preferred. PPFS should be clearly differentiated from hemifacial spasm which is caused by vascular loop compression of the facial nerve at facial nerve exit zone from the brain stem.

Several treatments have been proposed, including facial rehabilitation, botulinum toxin A (BTX-A) injections, and minor surgical procedures such as selective myectomy and neurectomy. However, these treatments were all inadequate and not convincing. BTX-A injection and rehabilitation have been the main streams to treat PPFS in the literatures, mostly due to lack of effective surgical treatment. There are many varieties related to the BTX-A injection, including injection sites, injection dosage, timing of injection, frequency of injection, result evaluation, and follow-up period. Although quick effects were noted after botox injection, the effect of Botox will also be decreasing following the repeated injections. Those will usually exhaust patients. Most patients will lose their patience and finally disappear from clinic after a short follow-up period (usually less than 2 years), but they were not cured yet. Rehabilitation therapy is attempting to inhibit the trigger movement or change the intended voluntary movements to decrease synkinesis. It has involved exercises (eg. mirror exercises, EMG feedback training), learning (neuromuscular reeducation), relaxation training, mime therapy, electrical stimulation, and combined with BTX-A injection. However, there has been little support showing it could significantly and permanently reduce synkinesis.

What's New in Microsurgery - *continued from pg 7*

A retrospective review was performed from 1986 to 2012 (a 27 year period). A total of 343 facial palsy patients were reconstructed by functioning free muscle transplantation (FFMT) for facial reanimation. Ninety-nine percent of FFMT utilized gracilis muscle. They all were operated by the senior surgeon (D.C-C.C). Fifty-three were PPFs patients. Incidence of PPFs was at least 15% (53/343).

Clinically PPFs involves two movements: trigger and synkinesis movements.

The trigger muscle(s) may be active or paralytic, but synkinetic muscle(s) is always active. There are basically five trigger and six synkinesis movements. The five trigger movements, which were regularly ordered to the patients, include forehead raise, eye closure, smile, lower lip pulled down, and lip pout or whistling. The six synkinetic movements, following the ordered movements, involve corrugators, eye, cheek, lower lip, chin skin, and platysma synkinesis. Through that, patients were divided into 4 patterns based on quality of smile and degree of synkinesis.

Pattern I: good smile but synkinesis

In Pattern I, patients were aware of their altered facial expression, but observers including physicians might not fully recognize the problems due to their mildness. Patients themselves were even not aware that they had synkinesis. Their big smile could always show at least 4 teeth. However, they always had intermittent perioral twitching following eye blinking. Some patients had a unique synkinesis with bizarre facial expression, such as lip pouting-induced eye narrowing on the affected side (oral-eye synkinesis) during spitting or whistling. Pattern I patients mostly concerned more with cosmetic problems than synkinesis.

Pattern II: acceptable smile but moderate to severe synkinesis

In Pattern II, patients were classified as having an acceptable smile but with moderate to severe synkinesis. Facial disfiguration in Pattern II majority came from synkinesis. Their big smile could usually show 3-2 teeth. Such synkinesis could not be cured or improved by cosmetic surgery. Some aesthetic surgery might even make the appearance worse.

Pattern III: unacceptable smile and severe synkinesis

In Pattern III, patients were classified as having a poor smile and severe synkinesis. They had lagophthalmos with weak eye closure, poor smile with one or no tooth visible, hypertrophic corrugators, narrow eye, dominant nasolabial fold, chin skin dimples and neck bands on the affected side. Patients in this pattern all demonstrated more courage to accept more aggressive procedures to correct their disfigurements.

Pattern IV: poor smile and mild synkinesis

In Pattern IV patients were classified as having a poor smile and synkinesis. The patients' complaints in this pattern were focused on the paralytic face, less on the synkinetic movements. All patients in this pattern requested more aggressive procedures for correction.

Surgical Procedures includes

- (A) Myectomy of synkinetic muscles such as orbicularis oculi muscle, platysma muscle, corrugator muscle, or sometimes
- (B) Myectomy and neurectomy and then reconstruction as the total facial paralysis
Extensive myectomy of the cheek and platysma muscles, neurectomy of the zygomatic, buccal and cervical facial nerve branches (Fig. 1)

(C) Facial reanimation

C-1: A Two Stage Procedure: First stage involves short cross-face nerve graft (CFNG); and second stage (6-9 months later) of gracilis FFMT for facial reanimation after the myectomy and neurectomy.

C-2: A One Stage Procedure: Extensive myectomy and neurectomy, and gracilis FFMT innervated by the spinal accessory (XI) or masseter (V3) nerve simultaneously

Results

14 out of 17 patients of Pattern II and all 34 pattern III patients received the aggressive surgical procedure. They all achieved a more symmetrical smile (smile score from average 2.6 preoperatively to 4.0 postoperatively in Pattern II operated patients; and 0.86 preoperatively to 3.57 postoperatively in Pattern III operated patients) and significantly decreased synkinetic movements (from moderate or severe down to mild ($p < 0.001$)). Clinically it was more witnessed in eye opening and

teeth visibility. No one required any more of BT-A injection. "Satisfactory Score" showed at least score 3. (Fig. 2. A-B)



Fig. 1: extensive myectomy and neurectomy of the involved synkinetic muscles and nerves



Fig. 2 A-B: (A) A 25 Y/O girl had right parotid gland tumor resection 2 years ago and developed PPFs, Pattern II.

She received extensive myectomy and neurectomy, and reconstruction by cross face nerve graft-innervated gracilis a two stage procedure. (B) Excellent results of 2 years after free gracilis muscle reanimation.

This paper has been published in *Plast Reconstr Surg Glob Open* 2015, April 7, 3(3):e320.

Journal of Reconstructive Microsurgery

In 2014 we again saw an increase in usage to the Journal of Reconstructive Microsurgery, with particular interest in the WSRM issues.

The top downloaded paper last year was “Surgical Anatomy of the Medial Sural Artery Perforator Flap”. In this paper the investigators took ten fresh cadaveric lower limbs before identifying the locations and courses of the medial sural artery perforators then correlating them to anatomic landmarks. It is well worth seeking out again and can be found here: <https://www.thieme-connect.com/products/ejournals/abstract/10.1055/s-0032-1315778>

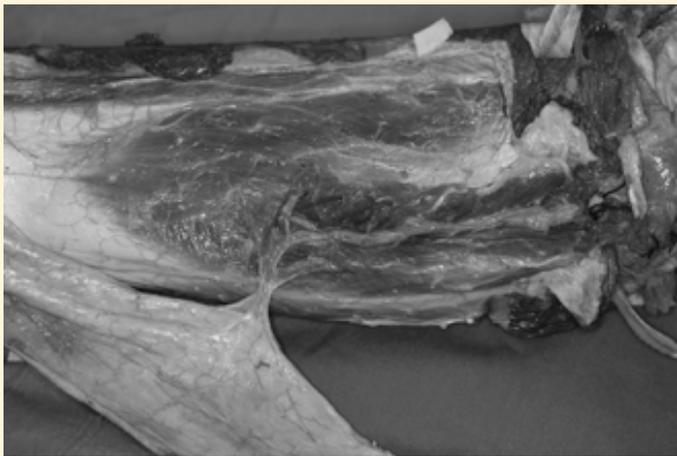


Fig 1. Image from Surgical Anatomy of the Medial Sural Artery Perforator Flap – In nine of ten specimens, a consistent major perforator could be identified between 10 cm (+/-2 cm) from the popliteal crease and an average 2 cm (+/-0.5cm) from the posterior midline. This perforator was large and had a superficial intramuscular course, facilitating intramuscular dissection



So far this year we are already exceeding the results we were hitting in 2014. The top paper so far this year is “Liposuction in Lymphedema Treatment” which Håkan Brorson outlines the benefits of using liposuction and presents evidence to support its use <https://www.thieme-connect.com/products/ejournals/abstract/10.1055/s-0035-1549158>

Fig 2. Liposuction in Lymphedema Treatment

Another paper with significant interest to WSRM members and already showing strong usage this year is “Surgical Site Infections after Free Flap Breast Reconstruction: An Analysis of 2,899 Patients from the ACS-NSQIP Datasets <https://www.thieme-connect.com/products/ejournals/abstract/10.1055/s-0035-1548739> a very interesting paper from the Perelman School of Medicine at the University of Pennsylvania, in which they demonstrate that patients who are active smokers or have hypertension are at the highest risk for SSIs.

These are only a few highlights being published in JRM, and with the launch of our new open access companion title “JRM Open” we hope you agree with us that the journal continues to publish research of the highest quality and thank WSRM members for their continued support and look forward to receiving your research for publication.

Source data

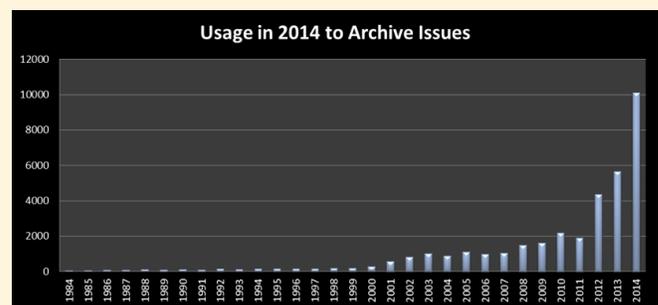
We show top downloaded issues (WSRM issues in bold):

Rank	Issue	Year
1	Vol. 30, No. 07	2014
2	Vol. 30, No. 01	2104
3	Vol. 29, No. 03	2013
4	Vol. 28, No. 08	2012
5	Vol. 30, No. 06	2014
6	Vol. 30, No. 02	2014
7	Vol. 30, No. 03	2014
8	Vol. 30, No. 05	2014
9	Vol. 30, No. 04	2014
10	Vol. 29, No. 02	2013

Volume 30, issue 7 is the very successful WSRM flaps issue and issue 6 of the same year is the issue comprising the scientific papers from the 2013 WSRM meeting

Top downloaded manuscripts

Rank	Issue	Article Title	Year	Issue	Category
1	Vol. 28, No. 08, September 2012	Surgical Anatomy of the Medial Sural Artery Perforator Flap	2012	08	
2	Vol. 29, No. 03, February 2013	Nerve Repair by Means of Tubulization: Past, Present, Future	2013	03	
3	Vol. 28, No. 01, January 2012	Surgical Aspects of a Lower Face, Mandible, and Tongue Allotransplantation	2012	01	
4	Vol. 29, No. 02, January 2013	Microsurgical Techniques for the Treatment of Breast Cancer—related Lymphedema: a Systematic Review	2013	02	
5	Vol. 30, No. 01, January 2014	The Use of Magnetic Resonance Angiography in Vascularized Groin Lymph Node Transfer: An Anatomic Study	2014	01	
6	Vol. 29, No. 03, February 2013	Perioperative Evaluation and Outcomes of Major Limb Replantations with Ischemia Periods of More Than 6 Hours	2013	03	
7	Vol. 30, No. 02, January 2014	The Evolution of Perforator Flap Breast Reconstruction: Twenty Years after the First DIEP Flap	2014	02	
8	Vol. 30, No. 07, September 2014	A New Plane of Elevation: The Superficial Fascial Plane for Perforator Flap Elevation	2014	07	Original Article WSRM Special Topic Issue—Flaps
9	Vol. 30, No. 07, September 2014	Osteochondral Flaps from the Distal Femur: Expanding Applications, Harvest Sites, and Indications	2014	07	Original Article WSRM Special Topic Issue—Flaps
10	Vol. 28, No. 09, October 2012	Pedicled-Perforator (Propeller) Flaps in Lower Extremity Defects: A Systematic Review	2012	09	
11	Vol. 30, No. 01, January 2014	Barcelona Consensus on Supermicrosurgery	2014	01	
12	Vol. 21, No. 02, February 2005	Sural Nerve Harvest: Anatomy and Technique	2005	02	
13	Vol. 29, No. 06, June 2013	Perioperative Fluid Management and Use of Vasoactive and Antithrombotic Agents in Free Flap Surgery: A Literature Review and Clinical Recommendations	2013	06	
14	Vol. 29, No. 03, February 2013	Ten-year Evolution Utilizing Computer-Assisted Reconstruction for Giant Ameloblastoma	2013	03	
15	Vol. 25, No. 01, January 2009	The Clinical Use of Artificial Nerve Conduits for Digital Nerve Repair: A Prospective Cohort Study and Literature Review	2009	01	
16	Vol. 29, No. 05, May 2013	Dynamic Rehabilitation of Facial Nerve Injury: A Review of the Literature	2013	05	
17	Vol. 29, No. 04, April 2013	Perioperative Interventions to Reduce Chronic Postsurgical Pain	2013	04	
18	Vol. 28, No. 06, July 2012	The Anatomic Basis of the Profunda Femoris Artery Perforator Flap: A New Option for Autologous Breast Reconstruction—A Cadaveric and Computer Tomography/Angiogram Study	2012	06	
19	Vol. 30, No. 06, July 2014	Nerve Transfer to the Deltoid Muscle Using the Nerve to the Long Head of the Triceps with the da Vinci Robot: Six Cases	2014	06	Original Article WSRM 2013 Scientific Paper
20	Vol. 30, No. 09, October 2014	The Ultra-Thin, Fascia-Only Anterolateral Thigh Flap	2014	09	



Archive content continues to draw usage, and in 2014 we see the following year's content being used as follows. It is interesting to note that at least one article from every publication year was downloaded in 2014:



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 visit www.wsrn.net to view 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.

Join Us!

WSRM Post- Congress Symposium “ALT (antero-lateral) Thigh Flap” Symposium

Tuesday, January 19, 2016

1pm-5pm

Westin Kierland Hotel
Scottsdale, Arizona

Registration Fee:

\$100 USD

Registration opens September 15th

Register at www.wsrn.net

Purpose: The purpose of this symposium is to create a more detailed discussion on the ALT (antero-lateral) Flap addressing terminology, surgical techniques, reliability and clinical applications.

**ASRM
2016
ANNUAL
MEETING**

January 16-19, 2016
Westin Kierland Hotel
Scottsdale, Arizona



Mark Your Calendar

Future WSRM Congresses

2017 WSRM World Congress

June 15-18, 2017

Seoul, Korea

www.wsrn2017.com

2019 WSRM World Congress

Summer 2019

Shanghai, China

2021 WSRM World Congress

Summer, 2021

Bologna, Italy

Global Meetings*

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

American Society for Reconstructive Microsurgery

January 16-19, 2016

Scottsdale, Arizona, USA

www.microsurg.org

13th EFSM Congress

April 21-24, 2016

Antalya, Turkey

www.efsm2016.org

27th Annual EURAPS Meeting

May 26-28, 2016

Brussels, Belgium

<http://www.euraps.org/meetings/>



WSRM 2015 - Mumbai, India

India had the privilege of hosting the 8th Biennial Congress of the World Society for Reconstructive Microsurgery from the 19th to 22nd of March, 2015. The venue was the Grand Hyatt, Mumbai. Organizing an event of such magnitude is a matter of Pride, Opportunity, Trust, and Leadership for the host nation. Dr Ashok Gupta, Host Chair had a great role in bidding for the congress and getting it to India.

The theme of the congress was, “**Looking back and Surging Ahead**”. Now looking back it gives us fantastic memories of a great experience which we will cherish forever. It was the first time ever, the congress is being held in this part of the world. Naturally the biggest beneficiary was India and young Indian Surgeons who had the opportunity to listen to the masters first hand. We have found that it has generated immense interest in Microsurgery in the nation and tangible results will be seen in the years to come.

The meeting had **689** delegates from **49** countries, making it a truly world congress. Dr Samir Kumta, the scientific committee chair had put up a great programme. We had 12 master classes, 3 theme lectures, 10 keynote lectures, a challenging case session, 22 panel discussions and 2 video sessions. With 4 breakaway halls we managed to have 20 hours of free paper sessions and accommodated 20 invited talks and 170 free papers. Samir had a tough time in choosing the best from the over 500 papers submitted. 100 papers were accommodated as e posters. We had a pre-congress video workshop which attracted more than 160 delegates. The skills of the audiovisual team and the watch out screen made tremendous impression on the delegates. President Scott participated actively in all aspects of the preparations and it is to his credit that he chose two outstanding speakers, Dr Ian Taylor for the inaugural S & T lecture and Mr. Anand Sharma as the Presidential invited lecturer.

On the social front, we had a very colorful cultural extravaganza during the inauguration and banquet. It was very well professionally managed by our congress coordinator Vinita. The staff of the venue hotel was extremely cooperative in throwing up a gastronomic delight at all times. 90 percent of delegates stayed at the venue almost making it an in house congress which improved the collegiality.

Financially also it was a success. The WSRM bylaws of the organization require the congress specifies the deposition of 10% of the registration fees to the parent body. WSRM 2015 is the first to be held after this provision has been in place and we are happy to announce that we were able to send US \$ 27,333 as per this norm within 3 months of the conclusion of the congress. The accounts are being finalized and the surplus will be utilized for the furtherance of microsurgery in India.

To keep the memories alive we have uploaded 1486 photographs in the website www.wsrn2015mumbai.com It is available for you to download.

As in any meeting, WSRM 2015 also had its fair share of moments of crisis and during all these period our President Scott Levin led from the front, as a true leader. The central office led by Krista was excellent in providing logistic support. Distances never mattered since we were all united by purpose. I should sign off expressing my deep appreciation to the awesome support given by the Scientific Committee Chair Dr. Samir Kumta, Organizing Secretary Dr Rajendra Nehete and Congress Coordinator Dr Vinita Puri, at all stages and to the entire Indian microsurgical community who stood as one to make this event a great success.



Dr. S. Raja Sabapathy
Organizing Chairman



Dr. Scott during the valedictory function with some members of the organizing team



Change of guard



Culturals during the inauguration

2017 Congress Preview - Seoul, Korea

We are glad to introduce our society and venue city, Seoul. Seoul, Soul of Asia. City of heritage and futuristic technology

The 2017 biennial meeting of WSRM will be held in Seoul, Korea. Seoul is the capital and largest city in South Korea. Seoul's history stretches back to more than 2,000 years and continued as the capital city. Seoul contains five UNESCO World Heritage Sites: Changdeok Palace, Hwaseong Fortress, Jongmyo Shrine, Namhansanseong and the Royal Tombs of the Joseon Dynasty. The traditional heart of Seoul is the old Joseon Dynasty city, now the downtown area where most palaces, government offices, traditional markets are located. Originally the city was entirely surrounded by a circular stone wall to regulate and protect the city in case of an invasion. After many centuries of destruction and rebuilding, approximately 2/3 of the wall remains, as well as six of the original eight gates. The city has grown beyond those walls and gates, but those are still remaining near the downtown district of Seoul. You can see the gates just next to the modern streets and buildings. During the stay for the conference in Seoul, you can easily visit the historical place and modern landmarks in Seoul.

Within half hour from any place in Seoul, you could visit Royal Palaces with 600 year history and experience the culture and heritage of the Joseon Dynasty. Near one of the old gate, Dongdaemun, there is a fashion town that never sleeps. Near the market and fashion town, Dongdaemun Design Plaza with outstanding feature designed by Zaha Hadid is located. This is one of the spots you can experience how old meets new, how Asian culture harmony with western.

Historical landmarks are mostly located on the northern part of Seoul. On the other hand, in the southern part of Seoul is full of futuristic technology and far-east Asian culture. These areas are called 'Gangnam'. Popularized by Psy's 'Gangnam Style', it refers to a part of Seoul situated on the south side of the Han River. In gangnam you can see modern fashion places. Lotte World Mall opened in 2014 with the world's largest cinema and the 123-floor supertall Lotte World Tower will open in 2016 with the world's tallest observation deck. Gangnam is also notable for high-end shopping, restaurants, unique cafes, and entertainment. You should take a cruise on the Han River at night and can see the beautiful night sight from Gangnam (southern part) and Gangbook (northern part). Even on June you can feel comfort breeze on the top of the cruise.



2017 Congress Preview - *continued from pg 12*

In gangnam, there are also many historical places. Bongeunsa is a Buddhist temple founded in 794 during the Silla (one of the Three Kingdoms of Korea) period. The temple has more than 1,000 years of history and has many interesting historic and cultural features, including woodblock carvings of the Avatamsaka Sutra (Flower Garland Sutra). The temple is also a very popular tourist destination, offering various programs relating to traditional Korean Buddhist culture, in a variety of languages.

Seoul has a very technologically advanced infrastructure. It has the world's highest fibre-optic broadband penetration; resulting in the world's fastest internet. Seoul provides free Wi-Fi access in outdoor spaces. This \$44 million project will give residents and visitors internet access at 10,430 parks, streets and other public places in near future. Its public transportation infrastructure is one of the world's densest. It is served by the high-speed rail and the Seoul subway, the world's largest subway network and you can easily go everywhere you want to go in Seoul by public transportation service.

Seoul is now living in days of harmony between old and new, a national heritage and future technology. There are many places to have fun with your family and kids and show the Asian culture and teach them how a country hold their tradition and develop as a leading country in technology and culture. Actually, the birthplace of K-Pop, Seoul received over 12 million international visitors in 2013, making it the world's 10th most visited city. There will be tour program also for your family. We hope you can enjoy Korean banquet with mouthwatering dishes such as Bulgogi and Korean BBQ.

Korean Society of Microsurgery also has a long history and potential. With the growing maturity and interest to the microsurgery, nine professionals with various major including orthopedic surgery, plastic surgery and general surgery were gathered in 1980 in Seoul to form the board of Korean Society for Microsurgery. After the foundation, it has served to foster microsurgery and to teach microsurgical technique and principals. With over 35 years of foundation, the Korean Society for Microsurgery is focused on advancing the field of microsurgery and educating young future surgeon to become skillful microsurgeon with a sense of responsibility. Since 1981 annual scientific meeting was held with high quality scientific sessions with deeper knowledge and perspectives. In spring, there is annual combined symposium with Korean Society for Hand Surgery and microsurgical workshop for the basic members or trainee to attract their interest for microsurgery. Especially in microsurgical workshop, senior microsurgeons are teaching the juniors one-by-one from the basic of the proper positioning for microsurgery and microanastomosis of vessels and nerves with a hope that in near future young doctors will be coming back to the workshop as an instructor. With 546 of full member of Korean Society for Microsurgery, we also publish Archives of Reconstructive Microsurgery Journal biannually with many articles with new perspectives ranging from basic research to high technical advancement full of challenges. All Korean microsurgeons are working together to build up scientific program to share deeper knowledge and open new perspectives ranging from clinical expertise to innovative ideas in the field of reconstructive microsurgery. The microsurgeons in Korea will continue with our long tradition of hospitality and continue to enhance the friendship within WSRM.

This will be an exciting time for all of WSRM.

We look forward to seeing you in Seoul.

Myong Chul Park, M.D., Ph.D

Organizing Chairman, WSRM 2017 Congress

News from the Executive Council

2015 - 2017 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

Myong Chul Park, MD, PhD, Organizing Chairman

Membership Committee

Isao Koshima, MD Chairman (Japan)

Yixin Zhang, MD (China)

Joon Pio Hong, MD (Korea)

Ming-Huei Cheng, MD (Taiwan)

Raja Sabapathy, MD (India)

Nominating Committee

L. Scott Levin, MD, FACS Chairman (USA)

Erkki Tukianen, MD (Finland)

Marko Bumbasirvec, MD (Serbia)

Roman Skoracki, MD (USA)

Jaume Masia, MD (Spain)

Constitution and Bylaws Committee

Milan Stevanovic, MD, Chairman (USA)

Lawrence Gottlieb, MD (USA)

Michel Saint-Cyr, MD (USA)

Samir Kumta, MD (India)

Damien Grinsell, MD (Australia)

Know someone who wants to become a member?

The application process is simple. Applications can be obtained at www.wsrn.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

Fall / Winter 2015 - Volume 6 / Issue 7

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.

David Chwei-Chin Chuang, M.D.
Editor-in-Chief, President

Kazuteru Doi, MD
Isao Koshima, MD
Associate Editors

Krista A. Greco
Executive Director

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**

The views expressed in articles, editorials, letters and or publications published by The WSRM Newsletter are those of the authors and do not necessarily reflect the society's point of view.