wssfn
World Society for Stereotactic and Functional Neurosurgery
NEWSLETTER
Spring 2017

Letter From The President


Joachim K. Krauss

Dear colleagues, dear friends,

This will be my last Letter from the President in our Newsletter. Tempus fugit - time flies! In June this year my term as president will be over, and I would like to thank you all for your support during the last four years. It has been a busy period for myself and also for our society with many goals having been achieved and several changes having been installed.

One of my major efforts as president of the WSSFN was to implement and develop the mutual benefit plan making WSSFN a true global organization reflecting the diversity and multitude of stereotactic and functional neurosurgery worldwide. But how did this all start? For that we need to have a look back in history. As you might know, WSSFN evolved from the International Society for Research in Stereoencephalotomy founded by Spiegel and Wycis in 1961. Subsequently, an American branch was established in Atlantic City in 1968, and the European Society for Stereotactic and Functional Neurosurgery (ESSFN) was founded in Freiburg in 1970. This development led to a major change in the representation and organization within the International Society. When a reorganizational meeting was held in Tokyo in 1973, the ASSFN was founded to follow the American branch of the International Society, and WSSFN became the official name of the mother society. Unfortunately, this resulted also in a split-off of ESSFN from WSSFN, while ASSFN continued to be affiliated with WSSFN. This dilemma became difficult to solve over the next decades.

I always thought that it would be great to have ESSFN affiliated once more with WSSFN. By the way, ironically I was first a member of ASSFN before I applied as member of ESSFN! Subsequently, when I became president of ESSFN I managed, with the help of many friends and colleagues from both sides of the Atlantic, in a lengthy process and with many obstacles, to bring back ESSFN to WSSFN in 2012. Of course, then the question came up why not affiliate other societies as well to WSSFN. In our last Newsletter I was happy to announce that three regional societies had become affiliated with WSSFN including those from Korea (KSSFN), India (ISSFN), and the Middle East (MSSFN). Since then two other societies followed and we now have signed agreements for affiliation also with the Japanese So-

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From The Editor


Erich Richter

The Society is experiencing a vibrant period of growth under Dr. Krauss' leadership and we look forward with excitement to our Berlin meeting. In this issue we present an overview of our upcoming meeting and highlight activity of our society around the globe. Dr. Kiss draws our attention to the competing agendas related to patent protection and discusses the question of whether method patents protect or stifle innovation. Dr. Asahi shares his journey exploring non-invasive treatment of dystonia through his description of a device to exploit the hanger reflex. Drs. Fonoff and Hamani report work on the use of DBS and SCS for the refractory axial symptoms of Parkinson's Disease. This newsletter also showcases the career of a rising star in Neurosurgery with our Featured Neurosurgeon piece on Dr. Horisawa, and pays respect to the passing of a master, Dr. Kanpolat. Perhaps most aligned with the mission of the WSSFN, we welcome the contribution of Dr. Pant, detailing the 12 year journey to independent movement disorders surgery in Nepal, a journey that began under the tutelage of our past president, Dr. Taira, and now continues as an independent national center. Please enjoy these articles; I look forward to seeing you in Berlin!

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ciety for Stereotactic and Functional Neurosurgery (JSSFN) and the Sociedad Latinoamericana de Neurocirugia Funcional y Estereotaxia (SLANFE). That means we now are bigger than any time before!

I am also happy to tell you that we could accomplish the task we set for The MDS Pedunculopontine Nucleus DBS Working group in collaboration with WSSFN. This working group remained active despite the decreased interest in PPN DBS over the last few years, and we managed to publish two manuscripts on anatomy and surgical technique in Stereotactic and Functional Neurosurgery last year. A third paper dealing with outcome is currently under revision in another journal, and a fourth is being prepared and almost ready for submission. We are confident that this series of manuscripts will pave the way for the future.

The "Unmet needs in DBS" project was endorsed during the WSSFN Interim congress in Mumbai in 2015. This project which includes an expert meeting and publication of a manuscript is progressing very well under the leadership of Andres Lozano, chair of the Scientific Research Committee, and myself. It tackles several questions regarding challenges and future demands of DBS. We hope we can see the final product published later this year!

During the WSSFN congress in Berlin in June 2017, the Assembly will vote on the revision of the society´ s Constitution and By-Laws. There will be several changes suggested to allow wider participation of members in the society which were necessary with regard to the tremendous growth of the society we have seen in the last couple of years. One of the main changes will be the introduction of a 2-year term for the office of the president, and wider appreciation of commissions, executive management and task forces. The suggested revision will be posted on the website soon.

I am amazed to see that the terminus "superspeciality" which I have suggested to use to denote our area of "added competence" stereotactic and functional neurosurgery (or any other area of expertise) is gaining ground and appears to replace the former "subspeciality." Form follows function, but words change meanings.

I wish also to take this opportunity to give some appreciations to all those who aided me on a regular basis during my office as president including my co-officers, the scientific program committee and last but not least our administrative secretary Melody Dian!

There are only a few weeks until we see each other upon the occasion of the 17th quadrennial WSSFN congress in Berlin, Germany, from June 26 – 29, 2017! This will be a most outstanding conference with many invited lectures, selected presentations, workshops, breakfast and lunch seminars, and several other new features. As indicated earlier the general motto is "Emerging Techniques and Indications." Please, check the website and contact the congress secretariat of MCO should you need further information.

Best wishes for all your future endeavours and may the society thrive. See you soon in Berlin.

Joachim K. Krauss,
Germany
President WSSFN

Patenting Brain Regions?

Patenting is generally seen as critical for innovation. Inventors need patent protection in order to fund the translation of their technologies to the public. They need to raise capital to develop the product. Academia has embraced this approach as it benefits inventing faculty and the university financially. Technically, brain regions cannot be patented because the brain is like the human genome, a naturally occurring phenomenon. Only the means (e.g. device) or the method (called a process claim) to alter or identify a naturally occurring phenomenon can be patented in the US. The method patent must be precise and unique, not general, and most other countries do not allow medical method patenting. This allowed Medtronic to hold a strong IP position on DBS for several decades. However, since the incredible success of DBS for movement disorders, various individuals and companies have managed to patent vague methods of altering one or multiple brain targets for one or more indications. In a recent paper, Roskams-Edris et al argue that this is de facto patenting of brain regions and discuss why it is unethical.

In this paper in Nature Biotechnology (http://www.nature.com/nbt/journal/v35/n2/full/nbt.3782.html), all US patents granted from the 1970s to 2015 were reviewed. While many claims were ridiculous, how such patenting could stifle innovation was not even fully appreciated. Since the presentation of this work, the consequences of such a laissez faire approach have become apparent. For example, a university tech transfer office told a clinician-scientist that he may have trouble publishing his own research, because someone else had patented the brain region that he had been studying for decades. We can also wonder whether such practices contributed to the two premature randomized controlled trials of DBS for depression because of the competitive nature of industry and investigators. Finally, this practice may also limit interest by industry in funding research on DBS (or other technologies) applied to novel brain targets, because someone already "owns that target." It behooves us to openly discuss these issues and debate whether this approach is more likely to help or hinder innovation in stereotactic and functional neurosurgery.

Zelma Kiss
Canada

Tipu Aziz
United Kingdom

Mojgan Hodaie

WSSFN Berlin Meeting

The 17th meeting of the World Society of Stereotactic and Functional Neurosurgery will take place this year in Berlin, June 26-29, 2017. This meeting is the result of intense planning by the Scientific Committee and focuses on emerging techniques and indications. The three days of international meeting are proceded by a day of workshops focusing on education and training. Ten workshops will cover areas including surgical treatment of epilepsy, radiosurgery, pain, neuromodulation as well as education and fellowship training. WSSFN special workshops include a primer on functional neurosurgery for industry, surgery for psychiatric disorders committee workshop and additional sponsored sessions.

As a global society, international participation remains a paramount goal of this meeting and we continue our encouragement by offering travel grants to residents and fellows who submit an abstract to the meeting. At the same time, two research awards, established in the names of two illustrious German neurosurgeons, Traugott Riechert and Fritz Mundinger will be awarded to the best research projects in the field of stereotactic and functional neurosurgery.

We are looking forward to a busy meeting, one that represents the depth and the breadth of stereotactic and functional neurosurgery. At the present time, we have a very well-represented international faculty roster of over 100 speakers!

The meeting's Gala dinner will be held at the Kosmos venue, the largest and most famous theatre of former East Germany, a most momentous place to experience the historical forces that have shaped Germany in the past few decades.

It is an immense privilege for me to be the Chair of an illustrious scientific committee, a unique team of colleagues and friends. The meeting is the result of everyone's input and efforts including foremost my co-chair Jean Regis (Marseille, France), as well as Joseph Neimat (Louisville, Kentucky), Michael Schulder (Long Island, New York), Konstantin Slavin (Chicago, Illinois), Sameer Sheth (Columbia, New York), Jin Woo Chang (Seoul, South Korea), Takaomi Taira (Tokyo, Japan), Paresh Doshi (Mumbai, India), Osvaldo Vilela Filho, (Goiania, Brazil), Jurgen Voges, (Magdeburg, Germany), Andres Lozano, (Toronto, Canada), Marwan Hariz (London, United Kingdom) and of course our society President Joachim Krauss (Hannover, Germany).
Berlin is a vibrant, modern city living at the edge of the future, and where we see the footprints of its historical past. How apt it is that the Quadrennial meeting of the WSSFN takes place here in Berlin, where we explore how our history has shaped us as a society, and what the future holds for us and our patients.

We look forward to seeing you in Berlin!

Mojgan Hodaie
Canada

Paresh Doshi

Country Ambassadors for the WSSFN meetings

In 2015, we introduced a novel concept of "Country Ambassadors" for the WSSFN interim meeting. The idea was to involve an active Neurosurgery leader from each country to highlight and promote the WSSFN meeting. The country ambassador would circulate the meeting announcements to the neurosurgeons of his or her country through email, presentation slides etc. This would provide WSSFN much larger visibility. We used the same concept for the WSSFN 2017 meeting as well. This year fourteen people from across the globe agreed to serve as Country Ambassadors. Some of them used innovative ideas to get more people to participate in the meeting. Dr. Hamani, the Canadian ambassador, got funding through the local Medtronic representative to support two students/fellows to attend the meeting.

Others encouraged their colleagues to submit more abstracts and register for the meeting.

The Country Ambassador program provides an opportunity to the functional neurosurgeon to actively associate with the WSSFN meeting. Over the course of time this role can be expanded toward development of country specific agendas or social programs. It was a pleasure for me to coordinate this activity for the WSSFN leadership.

Prof. Paresh K. Doshi,
India

Thank you to all the Country Ambassadors who are assisting in providing information to their colleagues

Ahmed Alkhani, (Saudi Arabia)
Clement Hamani, (Canada)
Ghanem Alsulaiti, (Qatar)
Hiroki Toda, (Japan)
Jairo Espinoza, (Columbia)
Jocelyne Bloch, (Switzerland)
Osvaldo Vilela Filho, (Brazil)
Patric Blomstedt, (Sweden)
P.R. Schuurman, (Netherlands)
Roberto Spiegelmann, (Israel),
Ron Alterman, (United States)
Terry Coyne, (Australia)
Tipu Aziz, (United Kingdom)
Walid Ghany, (Eygpt)

Introduction of a Device that Induces the Hanger Reflex

When the head is encircled with an ordinary wire clothes hanger and the frontotemporal region is compressed by the long side of the hanger, reflexive head rotation away from the compressed side occurs. This phenomenon is called the hanger reflex.[1,2] This unique story starts from a TV program broadcast in 1995. A man tried to wear a wire clothes hanger on his head and found that his head rotated. The phenomenon was named the hanger reflex by Kajimoto et al. in The University of Electro-Communications (Tokyo) in 2008. The earliest reference describing this phenomenon was published in The Lancet in 1991, which we were not aware of at that time.[3] A square cardboard box was placed on the heads of 2 patients with spasmodic torticollis at approximately 45°, such that the boxes pressed on the frontotemporal forehead, and abnormal head rotation was restricted.

I encountered the hanger reflex in 2009 when I watched a TV program in which the performer's head turned around when he/she wore a wire clothes hanger on his/her head, which was shocking to me. This reminded me of a patient with cervical dystonia who was not responsive to pallidal-deep brain stimulation (DBS). I placed a hanger on that patient's head. Surprisingly, the abnormal head rotation suppressed after applying the hanger. We needed an esthetically pleasing portable device because wearing a wire clothes hanger is not realistic. We developed a device to induce the hanger reflex. After applying the device for 1 month to the patient, his abnormal head rotation suppressed without applying the device.[4] We started a clinical trial for evaluation of device efficacy in 2012, and found significant improvement after using the device for rotational type cervical dystonia after 3 months (in submission). The device is currently produced as a medical device in Japan (Fig). The hanger reflex is not only rotational, but also occurs in anteroposterior and lateral directions. We developed a device for anterocollis (head drop), retrocollis, and laterocollis. We have found favorable responses to anterocollis, and a clinical trial is ongoing.

Headache owing to craniocervical dystonia is a category in the international classification of headache disorders. We have seen some patients who complain of headache and neck and shoulder pain with restriction of head movement without abnormal head posture. Seven of 88 (8.0%) patients, who presented at our head clinic over a 6 month period displayed restricted head movement. Head movement improved in these patients after applying the device, with remarkably reduced headache and neck pain (unpublished data). A multicenter clinical trial of these cases is ongoing.

We investigated the occurrence rate of the hanger reflex in healthy subjects.[1] There was a sensation of head rotation in 95.8% of subjects. In 85.4%, head rotation was observed in the direction of the side compressed by the hanger. We previously hypothesized that the shearing force of a device applied to the skin of the head induces head rotation. This hypothesis has been supported by a study from our co-authors, who developed a spring-loaded lozenge device to generate shearing force on the skin of the head. Regardless of the region of frontotemporal compression, the head rotated medially when the skin was sheared to the medial side and laterally when the skin was sheared to the lateral side.[5] With our device, rotation first pulled the skin on the frontotemporal region to the medial side and then pulled the skin laterally after device release. Thus, we suggest that shearing force is required for induction of the hanger reflex; specifically, we hypothesized that discomfort related to the shearing force causes subjects to move in the direction of the shearing force to resolve the uncomfortable sensation. Accordingly, when the head is continuously sheared toward the compressed side, the head rotates.

Similar phenomena have been identified in other regions of the body including the wrist and waist; the hanger reflex is thus considered a universal bodily phenomenon.[6] Knowledge of this phenomenon has the potential to improve the treatment of neurological disorders, including dystonia, in various body parts. The hanger reflex device is especially beneficial for patients with cervical dystonia who cannot afford costly treatments such as Botulinum toxin or DBS. Therefore, our hanger reflex device should be considered for use in developing countries with limited financial resources. We propose to produce the device worldwide. The hanger reflex is quite an interesting phenomenon, and we believe it has a potential to treat various types of neurological disorders including those in various parts of the body.

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Takashi Asahi
Japan

Invasive Neuromodulation for Axial Symptoms in Parkinson's Disease

Deep brain stimulation (DBS) improves quality of life in patients with advanced Parkinson's disease (PD) by ameliorating cardinal symptoms of the disease and reducing levodopa-induced dyskinesias. It does not, however, improve axial symptoms to a significant extent. This is of importance as freezing, falls, postural instability and gait disturbance (PIGD) can be extremely disabling and severely affect quality of life. In recent years, neuromodulation therapies have been proposed as "add on" strategies to treat axial symptoms in PD. Some of these include DBS delivered to the pedunculopontine nucleus (PPN) and spinal cord stimulation (SCS). In the following paragraphs we provide a brief overview of some of these therapies.

The selection of the PPN as a DBS target stems from preclinical work suggesting that this nucleus plays a role in mechanisms of gait and posture (for a review see 1). In contrast to animal data, results from clinical trials have been somewhat inconclusive. Uniformly described are improvements in the frequency of falls and the fact that, following DBS, UPDRS motor scores and cardinal symptoms of the disease remain relatively unaltered. [2-4] Controversial aspects include the exact site of stimulation in the PPN area and the effects of treatment on other axial symptoms, with different studies showing no significant changes, some improvements in freezing, and less often in gait and postural stability. [2-8]

SCS is another technique that recently emerged as a potential treatment for PIGD. Preclinical studies in rodent and non-human primate models of PD have shown that SCS is effective in improving locomotion and suppressing low frequency oscillations associated with bradykinesia and rigidity. [9-10] To date, only a few clinical reports have been published on the use of SCS in PD. Most of these studies included pain patients treated with SCS who later developed PD. Despite some promising results, findings across trials were largely inconsistent due to variations in the spinal level of implant (from upper cervical to lower thoracic levels) and stimulation parameters (from 5 to 300Hz and from 210 to 500 µs of pulse width) (for a review see 11). Our group has recently published a pilot clinical trial using SCS to treat patients with advanced PD who had freezing of gait as one of the main complaints. [12] To mimic preclinical studies, high frequency stimulation (i.e. 300Hz) was delivered through paddle electrodes implanted in the upper thoracic spine. Overall, patients experienced a significant positive effect on gait measurements and PIGD symptoms at 6 months. The beneficial effects of SCS were confirmed in a blinded experiment in which patients received stimulation at either 60 or 300Hz. While a similar degree of paresthesias was reported with both settings, objective measurements of gait were only improved after 300Hz SCS.

To date, treatments proposed to improve axial symptoms in PD are largely investigational with variable results being recorded across centers. As additional studies are being conducted, discrepancies involving targeting, stimulation parameters, kinetics of treatment and the effectiveness of different therapies for specific symptoms should be elucidated. Without solving these issues and homogenizing treatment response across centers, the development of larger, more definitive series will certainly be challenging.

We are thankful to Prof. Marwan Hariz for proofreading the text.

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Erich T. Fonoff
Brazil

Clement Hamani
Canada

In Memorium: Yucel Kanpolat, MD

Yucel Kanpolat (1941-2016)

Professor Kanopolat, one of the most prominent neurosurgeons in the field of pain surgery, passed away on September 17, 2016.

Dr. Kanpolat was born in 1941 in Sivas, Turkey. He graduated from Gazi High School, Ankara, in 1959. He then attended Ankara University, School of Medicine, and obtained his medical degree in 1965. He worked as a practitioner during his public health service between 1965 and 1968 in Diyarbakir, where he won the World Health Organization's (WHO) "Best Public Health Service Unit Award" with his colleagues in 1966. He became a resident assistant at the Department of Neurosurgery, Ankara University, during 1968-1973. The next year, Dr. Kanpolat served as the chief of Haydarpasa Military Hospital's Neurosurgical Department during his military service between 1974 and 1975 in Istanbul.

Dr. Kanpolat became an assistant professor at the Department of Neurosurgery, Ankara University, in 1975. He subsequently got promoted to associate professor and professor at the same institute in 1978 and 1988, respectively. He served as the chairman of the Neurosurgery Department, Ankara University, between 1999 and 2008. Dr. Kanpolat trained more than 100 neurosurgical residents until his retirement in 2008. He was elected and appointed as the president of the Turkish Academy of Sciences (TUBA) following his retirement from Ankara University, where he served until 2012. Moreover, he became the charter member of the Turkish Neurosurgical Society in 1985 and served as the president of the society twice, first in 1990-1991 and then in 1995-1996. Furthermore, Dr. Kanpolat received the Paxton International Professorship from Oregon Health Sciences University (USA) in 2006.

He practiced CT-guided stereotactic pain surgery for the first time worldwide in 1986. He undertook numerous academic studies in stereotactic and functional neurosurgery. Dr. Kanpolat made several presentations in international congresses, while he made publications in neurosurgical journals. He was invited as a key speaker to many national and international congresses to give lectures. On every occasion and manner, Dr. Kanpolat trained numerous neurosurgeons from Turkey and abroad throughout his career. Those instances include the Kanpolat Cordotomy Kit (KCTE), which was produced in Burlington, Boston, USA in 1994, as well as a total of 176 international publications referred in Index Medicus (1869 citations as of 13.11.2015), 92 globally invited lectures, and 48 presentations in international congresses.

Dr. Kanpolat had memberships, presidencies, and chairmanships in many neurosurgical communities. He was an active and emblematic member of various international societies such as European Association of Neurosurgical Societies (EANS) and European Society for Stereotactic and Functional Neurosurgery (ESSFN). He served as both officer and executive member in all of them. Dr. Kanpolat organized ESSFN-Congress in Antalya in 1994.

His legacy as a continuous contributor to scientific education had been remarkable, especially during his presidency in the Turkish Academy of Sciences (TUBA). Dr. Kanpolat has endeavored to practice "La main á la pâte" in pilot schools. The objective of this TUBA program was to promote the education of science among children in Turkey via game playing. Dr. Kanpolat collaborated with valuable teachers during this project. He arranged the training of 20 teachers from Turkey in Paris, France, whereas Georges Charpak, Nobel laureate for Physics in 1992, Pierre Léna, and Yves Quéré took part in this project in Turkey as important contributors.

During the presidency of Prof. Kanpolat in TUBA, Open Courseware Project was continued. Commenced in 2007, 80 lectures on Basic Sciences and Social Sciences were put together within this framework under Dr. Kanpolat's presidency between 2010 and 2011. Dr. Kanpolat also contributed on humanitarian issues where the need was most dire. He and two members of TUBA went to Afghanistan in 2004 on a voluntary project. There they observed the most pressing humanitarian problems, and prepared a report which the visiting team published on Surgical Neurology with the title "Is there a common consciousness of humanity? Should there be one?"

Apart from numerous academic conferences, he gave so many lectures on lives and disciplines of Marie Curie, Louis Pasteur, Ramon Cajal, Leonardo da Vinici, Michelangelo, etc., in many cities and countries. He also gave a Marie Curie lecture titled "A Woman of Wisdom in the Science Age-Maria Sklodovska Curie," in the Pomeranian Academy of Medicine, Department of Neurosurgery, on May 9, 2003, in Szczecin, Poland. He advised young neurosurgeons, neurosurgeons, and other audiences to listen, write, read, ask, and work hard in all his conferences, lessons, and presentations.

Dr. Kanpolat and his work, especially in the surgical treatment of pain, inspired many neurosurgeons all over the world. he grandly supported a course in therapeutic action which ultimately benefited his patients. As an influential neurosurgeon, he often organized regular local or international training courses, giving lectures, offered fellowship programs that he designed to realize his vision in the surgery and treatment of pain. Dr. Kanpolat did not ignore the social aspect of leadership either. He was always accessible to students, academicians, and visitors in a warm and hospitable manner. At all stages of his professional career, Dr. Kanpolat was a highly regarded neurosurgeon and a very productive tutor.

We will all hold in our memories forever his friendly and kind nature, his passion for knowledge, as well as scientific progression. We have witnessed the passing of a thoroughly outstanding neurosurgeon, academician, mentor, and friend, who contributed a lot to the neurosurgical societies, neurosurgeons, and neurosurgery. He will be missed by many people for a lot of reasons. It is my distinct honor to recollect him in an obituary in an issue of the Surgical Neurology International.

Professor Kanpolat graduated from medical school in 1965 and received his diploma from Ismet Inönü, the second president of Turkish republic and brothers of arm of Ataturk.

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Neurosurgical Management of Movement Disorders in Nepal

Movement disorder surgery in Nepal was pioneered with the gracious help of Professor T. Taira beginning in 2005, when we started doing selective neurotomies, intrathecal baclofen therapy for spasticity, and thalamotomy using the KOMAI frame. We also had the privilege of doing a phrenic nerve pacemaker for post-traumatic quadriparesis. Initially we did 6 lesions (3PD 3 Dystonia) using the KOMAI frame and cysternograph. The lesions were made by monopolar cautery with a custom-made lesion probe.

Since 2014, we are regularly performing independent movement disorder surgery in our institute. To date we have performed 7 cases of Deep Brain Stimulation (DBS) and 7 lesion cases. Our target was the Subthalamic Nucleus (STN) or Globus Pallidus pars interna (GPi) for DBS cases and GPi for lesion cases. In most Parkinson's disease (PD) cases, we did staged lesioning, but in Dystonia cases we did simultaneous bilateral lesions.

All surgeries were done awake, in constant communication with the patient. The ZD Fisher frame, with its software, built-in Schaltenbrand Atlas, and standard functional coordinates was used for target calculation. The Brio DBS system with rechargeable pulse generators was used.

In recent years, MR guided Focused Ultrasound (MRGFUS) has rekindled interest in stereotactic functional lesions. In our cases, we used thermal lesioning by a Cosman RF generator/ N50 RF generator. The voltage, impedance and rate of thermal coagulation were set. The lesioning electrode was 1 mm in diameter with a 2 mm exposed tip. All cases except the first also underwent MER Recording (Microelectrode recording, Inmito) with 2-3 MER electrodes aligned diagonally. Recording commenced 6 cm above the target. The targets were set and checked by C-arm. Usually a test lesion of 50 degrees centigrade for 30 sec was created and the patient was examined to ensure there were no motor deficits. Then two lesions were made 1 mm apart at 70 degrees centigrade for 40 seconds each. Continuous communication with the patients ensured that there were no motor symptoms or visual deficits.

We have mean follow-up of 12 months and the male and female ratio is 1.5:1. Our results for DBS and pallidotomy are quite comparable in terms of improvement in UPDRS score. Both Dystonia patients who underwent bilateral pallidotomies got better and there is no no recurrence in 1.5 years' time. In terms of complications, one pallidotomy patient with PD developed Parkinson's crisis which eventually got better, and one patient undergoing STN DBS developed a postoperative hematoma which required immediate evacuation, but she also improved.

From our results, we came to the conclusion that lesioning has a definite place in the surgical treatment of movement disorders irrespective of the financial situation of the nation. We believe that pallidotomy may surpass DBS in our setup due to affordability and avoidance of time-consuming adjustment of pulse generator parameters.

Basant Pant, Nepal
Resha Shrestha, Nepal
Takaomi Taira, Japan

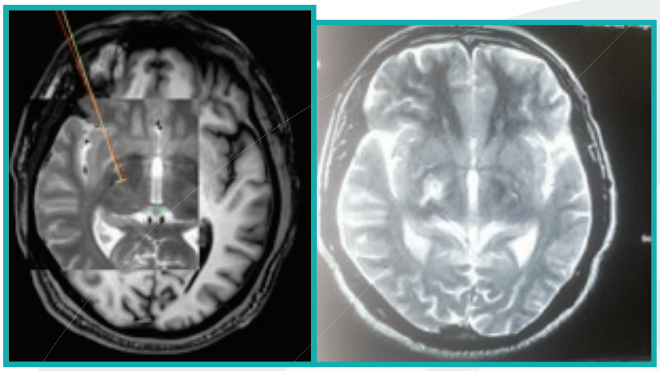

Figure 1. A) Preoperative targeting of Right GPi in T1/T2 image fusion MRI and **B)** Postoperative T2W MRI of same patient showing Right pallidotomy with perilesional edema

Figure 2: Lead placement during DBS Surgery

Figure 3: Surgical Setup of DBS Surgery

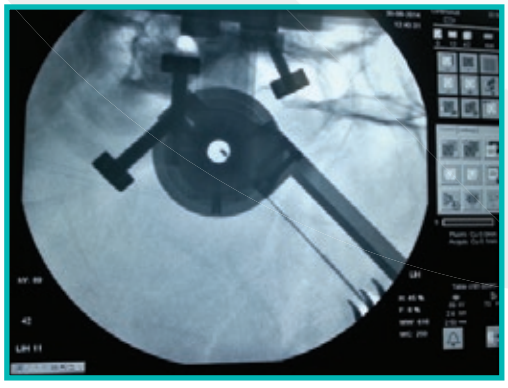

Figure 4: Lead placement confirmed by C-arm

Shiro Horisawa

WSSFN Featured Neurosurgeon: Shiro Horisawa

Dr. Horisawa earned his medical degree from Tokai University in 2008. He then went on to complete a two-year Junior Residency Program at Tokyo Women's Medical University (TWMU) and entered a five-year residency training in general neurosurgery at TWMU in 2010. In 2012, he was awarded the Young Traveler Award at a Joint Meeting of the German Society of Neurosurgery and Japanese Neurosurgical Society in Leipzig, and in 2013, he was awarded the WSSFN Resident and Fellow Award. Dr. Horisawa subsequently began a career in functional neurosurgery under the guidance of Professor Taira in 2015.

Dr. Horisawa first developed an interest in neurosurgery under the influence of his father, who was a brilliant gastrointestinal surgeon and but forced to end his surgical career after developing Parkinson's disease. In his medical student days, Dr. Horisawa learned about deep brain stimulation as a treatment for Parkinson's disease and developed an interest in functional neurosurgery. With the desire to learn under the world renowned Professor Taira, Dr. Horisawa decided to undergo training at TWMU for his junior residency.

During the first three months of his neurosurgical residency program, Dr. Horisawa was assigned to Professor Taira's functional neurosurgery group. He was deeply impressed by a surgery for focal hand dystonia in a violinist during that time. During the surgery, the violinist's dystonia improved as he played the violin, ultimately allowing the violinist to produce beautiful sounds. This patient had continued to play the violin for 29 years while suffering from dystonia, and Dr. Horisawa was deeply moved by the sight of this violinist being released from suffering.

From that point onward, Dr. Horisawa took an interest in thalamotomy for focal hand dystonia. As he learned more about focal hand dystonia, he discovered that thalamotomy, which dramatically improves dystonia, is performed almost nowhere else besides TWMU, and that while focal hand dystonia is treated worldwide with botulinum toxin, more than half of the musicians treated are forced to end their careers in music. Dr. Horisawa began to strongly wonder if patients with focal hand dystonia throughout the world could be saved by raising global awareness of thalamotomy. This became the impetus behind Dr. Horisawa's desire to write a paper on thalamotomy for focal hand dystonia. In June 2013, Dr. Horisawa published his first paper in the Annals of Neurology titled "Long-term improvement of musician's dystonia after stereotactic ventro-oral thalamotomy." This paper was subsequently introduced by Professor Michael Okun from the University of Florida in the New England Journal of Medicine Journal Watch as a noteworthy paper, and drew the attention of many physicians.

Dr. Horisawa began his career as a functional neurosurgeon under Professor Taira in 2015 and has already initiated a number of clinical studies and has published many research papers. While he initially took an interest in focal hand dystonia, Dr. Horisawa is nowadays focusing on research into surgical therapy for all kinds of dystonia. He has done research into the potential utility of surgical therapies, particularly lesioning surgery, and besides radiofrequency ablation, he has also studied non-invasive lesioning surgery, using a gamma knife or focused ultrasound. Dr. Horisawa is currently conducting research to clarify the changes in brain function that occur as a result of lesioning surgery by using transcranial magnetic stimulation and resting state functional MRI. He is also launching activities in collaboration with TWMU cardiologists to expand the use of spinal cord stimulation in Japan, particularly for critical leg ischemia and refractory angina, because spinal cord stimulation is overwhelmingly under-recognized in Japan compared to abroad. The main focus of his future research will be deep brain stimulation of the cerebellum and pallidothalamic tract thermocoagulation for Parkinson's disease.

Dr. Horisawa's father underwent deep brain stimulation while Dr. Horisawa was in his third year as a neurosurgeon. And his father had a dramatic recovery from his previously bedridden state. He is now enjoying his career post-retirement and is once again deeply grateful for the value of functional neurosurgery. Dr. Horisawa spends most of his time in a week on work, but is deeply thankful for having been able to learn under Professor Taira, always enjoying his work. Before entering medical school, Dr. Horisawa enrolled in the Faculty of Literature and majored in Philosophy for one year. He enjoys hot springs, reading and music, and loves reading the works of Kobo Abe and Haruki Murakami. His musical tastes lie in hard rock, such as AC/DC and Guns and Roses. The majority of his earnings go toward his greatest passion - cars. A new Ferrari just purchased this year in 2017 almost drove him to the brink of bankruptcy, yet Dr. Horisawa is truly enjoying his life. With his new car as his source of motivation to engage in further studies, Dr. Horisawa is ambitiously working on his research. Dr. Horisawa is a promising young functional neurosurgeon whose future activities are keenly awaited.

Officers

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