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PERSPECTIVES FROM THE 2023 38TH INTERNATIONAL ISMISS SYMPOSIUM HELD IN ZURICH, SWITZERLAND

PERSPECTIVAS DO 38º SIMPÓSIO E CURSO INTERNACIONAL ISMISS DE 2023 REALIZADO EM ZURIQUE, SUÍÇA

PERSPECTIVAS DEL 38º SIMPOSIO Y CURSO INTERNACIONAL ISMISS 2023 REALIZADO EN ZURICH, SUIZA

KAI-UWE LEWANDROWSKI[1,2,3], JOACHIM OERTEL[4], BENEDIKT BURKHARDT[5], PETER WINKLER[4,5], HANSJÖRG LEU[6]

1. Surgical Institute of Tucson, Center for Advanced Spine Care of Southern Arizona, Arizona, Tucson, United States.
2. Fundación Universitaria Sanitas Bogotá, Cundinamarca, Bogotá D. C., Colombia.
3. Universidade Federal do Estado do Rio de Janeiro, Hospital Universitário Gaffree e Guinle, Rio de Janeiro, Brazil.
4. Universitaetsmedizine Berlin, Germany.
5. University of Tbilisi, Georgia.
6. Wirbelsäulenzentrum / Spine Center – WSC, Hirslanden Klinik Zurich, Witellikerstrasse.

INTRODUCTION

The International Society for Minimally Invasive Spine Surgery (ISMISS) is an organization with its roots in the early adoption of minimally invasive spinal surgery techniques in Europe and North America. Its first annual meeting was held at the GIEDA-BRUXELLES Meeting in 1988. It was established as a non-profit organization in 1989 under the leadership of Professor Parviz Kambin (Philadelphia) and the first President of ISMISS. European key opinion leaders were Professor Adam Schreiber (Zurich), Professor Sadahisa Hijikata (Tokyo), Professor Mario Brock (Berlin), Professor Hansjörg Leu (Zurich), and Dr. Jan Sheppard (Hastings). These pioneer surgeons of minimally invasive and endoscopic spinal surgery were actively involved in organizing meetings in Japan, the Americas, and Europe and coordinated instructional courses in all three continents by organizing inauguration meetings in these different locations. The ISMISS mission was simple: To promote minimally invasive spinal surgery. Regular biannual ISMISS symposiums were held in Philadelphia (USA) and annual meetings in Zurich (Switzerland).

Over the years, ISMISS activities focused on initiating a paradigm shift away from traditional open translaminar spine surgery to minor access techniques that more and more focused on treating spinal pain generators, particularly in those patients without much deformity or instability. The SARS2-COVID-19 pandemic interrupted ISMISS activities as many of their members had to recalibrate their practice focus and could not travel. The 2023 meeting was the first opportunity to get together in over four years. Much had changed in the interim as members realized that some practice changes initially thought of as temporary has turned permanent. The fallout from pandemic-related alterations in resource allocation and utilization regarding permitted elective surgeries, equipment, supply, and personal shortages, along with new work hour rules affecting training standards applicable to the younger upcoming generation of surgeons, have changed the context and culture in which spine surgery is being performed in 2023. While many of the topics discussed at the meeting were solidly based on established surgical indications for common painful conditions of the spine, the common interest throughout all the sessions was the strong desire of spine surgeons to learn from each other how to best adapt to the changed post--COVID environment to pursue the mission of ISMISS - treat patients to the highest standards possible with innovative clinical and surgical protocols. The latter is at the heart of this editorial – a blunt attempt to inform the reader of ISMISS's renewed interest in engaging surgeons on an individual and collaborative level to increase the relevance of what surgeons have to say regarding modern spine care.

HISTORICAL RECALLS OF THE EARLY ADOPTERS

The recurring annual Zurich/Switzerland instructional courses were inaugurated in October 1987 by Adam Schreiber and Yoshinori Suezawa at Balgrist University Clinic in Zurich, Switzerland. By November 1991, ten courses were completed. Since 1988 Hansjörg Leu has held multilingual courses in English, German, and French – typically in November and December. Since 1992, the ISMISS courses and annual board meetings of ISMISS have been held in English. In 1995, the course activities were moved to Neumünster Hospital and held annually in January. Since 2014, ISMISS meetings have been held at the Hirslanden Hospital focusing presentations on new technology advances presented by an invited international keynote speaker and 50 – 70 faculty presenters. The distinguished special guest lecturers from 1987 to 2015 are listed in Table 1. With 38 courses held, the annual ISMISS meetings became a worldwide recognized MIS forum. The roster of current and past presidents (Table 2) is a testament to ISMISS's global brand recognition in the minimally invasive spine surgery field. On Jan 29, 2015, the ISMISS board decided to rotate the annual ISMISS meetings on a triennial cycle between Asia, the Americas, and Europe.

THE IMPACT OF MIS TECHNOLOGY ADVANCES

In the early 1990ies, the leaps were fueled by technological advances in optical systems that were a step up from the limited quality of the "discoscopic views" from within the disc first published by Kambin in 1991.[1] This groundbreaking publication by Kambin resulted from the works of many other nowadays often forgotten pioneers that built on Kambin's initial concept of a transforaminal approach with the use of percutaneously placed Craig's cannula's through which he performed microdiscectomy in a non-visualized fashion.[2] Some of the early pioneers in the 1970ies was Hijikata, who reported on the non-visualized posterolateral percutaneous nucleotomy in 1975.[3] William Friedman introduced the direct lateral approach for percutaneous nucleotomy in 1983 and reported that

Study conducted by the 38TH International Ismiss Symposium

Correspondence: Kai-Uwe Lewandrowski. Center for Advanced Spine Care of Southern Arizona, 4787, E Camp Lowell Drive, Tucson, AZ, USA. 85712. busniess@tucsonspine.com

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Table 1. ISMISS invited keynote lecturers from 1987 to 2015.

Jan 29 2015:	Richard Fessler, M.D.	Jan 22 1998:	David McCord, M.D.
Jan 30 2014:	Gun Choi, M.D.	Jan 23 1997:	John Regan, M.D.
Jan 24 2013:	Lester F. Wilson, M.D.	Jan 25 1996:	Hallet Mathews, M.D.
Jan 26 2012:	Pil Sun Choi, M.D.	Dec 1 1994:	Jürgen Krämer, M.D.
Jan 27 2011:	Gilles Dubois, M.D.	Dec 2 1993:	Henry Sherk, M.D.
Jan 28 2010:	Munehito Yoshida, M.D.	Nov 26 1992:	Manohar Panjabi, M.D.
Jan 29 2009:	Andrea Fontanella, M.D.	Nov 28 1991:	Raymond Roy-Camille, M.D.
Jan 24 2008:	Jean Destandau, M.D.	Jun 27 1991:	Parviz Kambin, M.D.
Jan 25 2007:	Sebastian Ruetten, M.D.	Nov 29 1990:	John McCulloch, M.D.
Jan 26 2006:	Rudolf Bertagnoli, M.D.	Jun 21 1990:	Parviz Kambin, M.D.
Jan 27 2005:	John Chiu, M.D.	Nov 30 1989:	Raymond Roy-Camille, M.D.
Jan 29 2004:	Lee Sang-ho, M.D.	Jun 15 1989:	Sadahisa Hijikata, M.D.
Jan 23 2003:	De Antoni Daniel, M.D.	Dec 1 1988:	Jan Sheppherd, M.D.
Jan 24 2002:	Anthony Yeung, M.D.	Jul 7 1988:	Wolfgang Rauschning, M.D.
Jan 25 2001:	Wolfgang Rauschning, M.D.	Jan 28 1988:	Sadahisa Hijikata, M.D.
Jan 20 2000:	Hallet Mathews, M.D.	Oct 22 1987:	Adam Schreiber, M.D.
Jan 21 1999:	Daniel Rosenthal, M.D.		

this procedure was associated with a higher rate of bowel injury.[4] The introduction of a specially modified arthroscope into the intervertebral disc, and, thus, the first visualized microdiscectomy, was reported by Forst and Hausman in 1983.[5] Coaxial endoscopes with a central working channel soon emerged as an alternative to the arthroscope. They were developed because they offered to visualize and remove painful pathology with a wide range of surgical instruments or thermal and laser therapy equipment. The addition of a motorized shaver was described by Onik in 1985, which led to the coining of the term "Automated Percutaneous Nucleotomy".[6-8] In 1989, Schreiber described the injection of indigo carmine dye into the disc to stain abnormal nucleus pulposus and annular fissures.[9] Leu et al. later emphasized the importance of epidural visualization as well with both the mechanical or laser discectomy.[10,11] Later, multichannel endoscopes with optics, illumination, a working channel, and flushing function were simultaneously developed by Schreiber and Leu (Karl Storz platform)[9] and by Hal Matthews (Danek platform) for foraminoscopic surgery.[12,13] In 1992, Dr. Thomas Hoogland worked with the Danek System but quickly realized that the Danek foraminoscope had significant shortcomings and was unsuitable to treat intracanal, foraminal, extraforaminal herniations, and herniations with free fragments in lumbar spine. In 1994, he concluded that a foraminoplasty was necessary to treat the variety of disc herniations frequently encountered in clinical practice.[14] Foley, Mathews, and Ditsworth also popularized the transforaminal between 1998 and 1999.[13,15,16] In 1998, Yeung introduced "The Yeung Endoscopic Spine System" (YESS) using a multichannel, wide-angled endoscope produced by Richard Wolf.[17] In 2001, Knight demonstrated that endoscopic foraminoplasty with a side-firing Ho: YAG laser is an effective decompression tool.[18] In 2002, Tsou and Yeung advocated for electrothermal annuloplasty.[19,20]

About that time in 2000, Foley popularized the Metrix™ tubular retractor system[15] which was widely accepted by many surgeons[21-23] as the premier minimally invasive spinal surgery platform as it could be combined with familiar microsurgical techniques with use of the operating room microscope. Burkhardt and Oertel et al. championed the combination of tubular retractors with non-irrigated endoscopic visualization with systems such as Easy-Go™.[24,25] The latter two surgeons have led ISMISS with Hans Jorg Leu over the years and carried the organization. They organized meetings and set the agenda for clinical evidence and protocol development for its membership and discussion with decision-makers on all sides of the healthcare sector equation. They orchestrated a climate of open non-scripted lectures with open discussions on the pros and cons of preferred treatments for standard clinical indications in spine surgery, allowing the presenting member surgeons to report directly from the operating room on their hands-on experience with technology and protocol changes without having to go through a lengthy preapproval or selection process. The desire to maintain this intimate atmosphere ultimately drove the ISMISS leadership to stay clear of associations with other spine societies and reenergized its leadership to regain momentum in the post-pandemic era by starting up a new series of clinical initiatives and meetings. The meeting held between February 10 to 12, 2023, in Zurich took members back to where it all started – at the Hirslanden Klinik in Zurich, where Prof. Hans Jorg Leu gave a historical similar to what has been said in this editorial but more attention to detail on the event and players who drove the organization forward. (Figure 1)

THE NEW ISMISS

A noticeable generational change has occurred since the last ISMISS meeting in 2018. Professor Oertel took a head count on the meeting's participants by asking them about their training background, clinical interests, and whether they had previously participated in ISMSS. It turns out that approximately 50% of participating surgeons and affiliated providers attended the IMISS meeting for the first time. When asked about their motives, the original founding ideas of smaller discussion forums of likeminded surgeons focused on clinical problem-solving resonated with most participants, many of which came from faraway countries in the Americas, Asia, and the Middle East – a testament to the weight ISMISS still carries around the world amongst spine surgeons. The other half of veteran attendees expressed their delight with the influx of new members and renewed interest in the ISMISS approach to solving clinical problems. Many attendees held positions in healthcare organizations on

Table 2. Current and past ISMISS presidents.

Joachim Oertel Neurosurgeon, MD	President: 2021-2025 Location: Homburg / Germany	
Yue Zhou Orthopedic Surgeon, MD	Vice-President elect: 2021-2025 Location: Chongquing / PRC-China	
Richard Fessler Neurosurgeon, MD, PhD	President ISMISS: 2017/21 Location: Chicago / USA	
Vladimir Radchenko Orthopedic Surgeon, MD	President ISMISS: 2014/17 Location: Charkiv / Ukraine	
Sang-Ho Lee Neurosurgeon, MD	President ISMISS: 2011-2014 Location: Seoul / Korea	
Hansjörg Leu Orthopedic Surgeon, MD	President ISMISS: 2008-2011 Location: Zürich / Switzerland	
John Chiu Neurosurgeon, MD	President ISMISS: 2007-2008 Location: Thousand Oaks, California / USA	
Hallett Mathews Orthopedic Surgeon, MD	President ISMISS: 2005-2007 Location: Richmaond, Virginia /USA	
Hwan-Yung Chung Orthopedic Surgeon, MD	President ISMISS: 2002-2005 Location: Seoul / Korea	
Jean-Pierre Benazet Orthopedic Surgeon, MD	President ISMISS: 1999 - 2001 † Location: Paris / France	
Mario Brock Neurosurgeon, MD	President ISMISS: 1996-1999 Location: Berlin / Germany	
Adam Schreiber Orthopedic Surgeon, MD	President ISMISS: 1993-1996 Location: Zürich / Switzerland	
Parviz Kambin Orthopedic Surgeon, MD	President ISMISS: 1990 -1993, 2001-2002 Location: Philadelphia, Pennsylvania / USA	

a department chair level or were running complex clinical programs, which elevated the discussion to an advanced, sophisticated level on a wide range of topics at a high pace. The direct talk and clarity of the no-nonsense approach to highlighting what works and what does not and sorting our myth from reality were welcome as a fresh breath of air by most.

THE POST-COVID CULTURE IN SPINE CARE

Members reported that the clinical focus has shifted since COVID. Clinical operations are slowly returning to pre-pandemic levels, with supply and staff shortages dominating many discussions. Just getting back into the elective surgery game was considered by most tedious and time-consuming in the current operational context, where many healthcare facility administrators are still struggling with replacing pandemic-related revenue streams with elective surgeries. Discussions also revolved around the approval process by health insurance companies and government regulation of allowed work hours which created additional bottlenecks in hospitals and surgery centers involved in delivering spine care in the public sector. For example, failed medical- and interventional non-surgical management with spinal injections, physical therapy, and nonsteroidal anti-inflammatories were reported by most as a prerequisite to obtaining authorization for elective spine surgery. In itself, this does not sound very controversial and is commonplace in most public healthcare systems; it can become problematic when religiously and rigidly executed in every case without exception to the chagrin of suffering patients, some of which suffer from advanced disease symptoms were surgery is inevitable and every provider/surgeon having custody of the patients knows it. Ignorance of spine surgeon's clinical expertise and experience frustrated many members and attendees to a level where some decided to minimize their exposure to these types of patients with limited health-insurance mandated wiggle room or quit these plans altogether, which defeats the whole purpose of a system-wide approach delivering spine care. Others have left institutionalized practices for private practice settings to provide the necessary care to their patients when needed – a trend somewhat contrary to the United States,[26] where many physicians have left private practices to work in salaried positions to limit their pandemic-related financial hardships. While the need for good stewardship was recognized in the discussion, many members indicated that, in their opinion, the pendulum had swung too far from a reasonable debate about medical necessity where many elective surgeries are denied or reimbursed at such a low level, where they are essentially discouraged. The need for positive EMG/Nerve conduction studies, in addition to unrelenting clinical radiculopathy or claudication symptoms and corresponding

Figure 1. Images from the 2023 38th International ISMISS Symposium & Course for Percutaneous Endoscopic Spinal Surgery and Complementary Minimal Invasive Techniques held in Zurich, Switzerland at the Hirslanden Klinik: Top left panel left to right: Drs. Kai-Uwe Lewandrowski, Stefan Hellinger, Paul Park, James Yuue, and Erwin Cornips. Top middle: Dr. Hansjörg Leu, Top right, left to right: Paul Park, Thomas Lübbers. Middle left panel: Nadja Mamisch-Saupe, Middle second to left panel: Dr. Sefan Hellinger. The bottom left panel, left to right: Sergio Soriano Solis, Shrinivas Rohidas, Roth Vargas, Auditorium at Hirslanden Klinik.

advanced imaging findings, is another example of an authorization hurdle that, by many accounts, could be considered unreasonable, particularly if the patient has tried everything.

DOMINATING CLINICAL TOPICS

Treatment of spinal cervical and lumbar spinal stenosis with or without spondylolisthesis and deformity were the main topics of presented at this years ISMISS. Treatments center around artificial disc versus anterior cervical discectomy and fusion in the cervical spine. In the lumbar spine, the anterior versus lateral and posterior MIS approaches were debated in the context of complication and revision surgery rates favoring simplified pain generator based operations to improve functioning and reduce disability at lower cost with simplified surgeries that members were able to get approval for. Therefore, course goals were centered around the following topics:

- Anatomical pathways and technical considerations in less invasive spinal surgery
- Evolution of minimal invasive spinal surgery and its state of the art
- Indication for percutaneous and minimal intervention procedures
- Percutaneous posterolateral intradiscal/ transforaminal endoscopic techniques
- Percutaneous interlaminar and translaminar endoscopic techniques
- Endoscopic and minimal invasive intervertebral fusion procedures
- Minimal retroperitoneal operative pathways in the thoracolumbar spine
- Minimal open approaches to the anterior thoracolumbar spine
- Minimal invasive thoracoscopic disc surgery
- Minimal invasive vertebral body augmentation and stabilization for tumors and trauma
- Interspinous process devices and dynamic fixation in the lumbar spine

Attendees discussed pitfalls of spinal MRI diagnostic for the visualization of nerve compression, preoperative neurophysiological assessment as a predictor of clinical outcome, percutaneous full endoscopic approach to the cervical, thoracic and lumbar spine and anatomical considerations how to avoid complications including injury to the magna radicularis Adamkiewiecz artery, volumetric reconstructions of Kambin triangle safe, the inside-out versus the outside-in and biportal technique, endoscopic method of removal of flavum ligament, extradural cyst, and canal stenosis with endoscopic and Destandau technique, tubular microsurgical foraminoplasty the learning curve in percutaneous endoscopic interlaminar, sublaminar and transforaminal disc procedure, MIS complications, mini-open stand-alone ALIF, endoscopic lumbar interbody fusion with expandable cages, and allograft, endoscopically assisted ACDF, minimally invasive reduction of dysplastic spondylolisthesis, MIS surgery in neuromuscular and adult, MIS vertebral augmentation with PMMA and quattroplasty, spinal tumors, navigation, sacroiliac joint disease fusion and non-fusion, transsacral epiduroscopic laser decompression, and denervation therapies for discogenic low-back pain.

CONCLUSIONS

After a long pandemic-related hiatus, ISMSS is reenergized, with over 50% of its 38th International symposium & course attendees being first-time attendees. Presentations focused on endoscopic and minimally invasive spinal surgery technique applications in treating common painful degenerative spine conditions. MIS tumor resection, navigation, and the most up-to-date endoscopic decompression techniques were most relevant to course attendees. ISMISS members voted for continuing small-group discussions as the best forum for openly discussing controversial problems. ISMISS will attempt to keep its surgeon focused by developing clinical guidelines that help the practicing spine surgeon overcome authorization hurdles and manage the patient's symptoms in a staged management context.

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