Proceedings of the 6th Annual SOLAS® Research Meeting

May 9-11, 2013 | The Grand Del Mar Resort, San Diego, CA

SOLAS®
Society of Lateral Access Surgery
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Welcome to the 6th Annual SOLAS® Research Meeting!

We are excited to present the content for this year’s Research Meeting, which again provides an early look at the work being done across the globe to strengthen the ever increasing body of evidence supporting and evolving the lateral approach. The expansion of less invasive techniques has been paved largely by the XLIF® procedure itself, but only through continued validation and shared learning. As members of the Society of Lateral Access Surgery, you have been key to that success, and we appreciate your support of research and education.

The end of 2012 marked a new milestone in SOLAS history—the publication of over 100 peer-reviewed studies on XLIF. As we grow in our experience, applications become more varied, and data expands and matures, it is incumbent upon us to continue to be self-critical, forthright, and vocal about our outcomes and techniques. But the focus going forward will be on quality over quantity. How do we elevate, complement, or fill the gaps in the published research? Fortunately, SOLAS provides the opportunity for collaboration and comparison—important features of higher level investigations, as well as the venue for open discussion and dialogue. So while we have come so far, there is still more journey ahead. We hope you look forward to it as we do!

Thank you for your participation and engagement.

Frank Phillips, MD
Co-Chair, Research Committee

Kelli Howell, MS
Co-Chair, Research Committee
AGENDA

THURSDAY, MAY 9, 2013

4:00-6:00pm  Board of Directors Meeting
             (Board members only)
             Amaya Restaurant

6:00-7:00pm  Welcome Reception
             North Foyer & Courtyards

7:00-9:00pm  Challenging Case Presentations
             Moderator: Stephen Ryu, MD Capella

FRIDAY, MAY 10, 2013

6:00-7:00am   Breakfast
              Ballroom A

INTRODUCTORY SESSION
Ballrooms B & C

7:00-7:30am   Welcome & Society Update
              Frank M. Phillips, MD; Kelli Howell, MS
              Co-Chairs, Research Committee, SOLAS

7:30-8:00am   Advocacy Update
              Alex Lukianov
              Chairman & CEO, NuVasive®, Inc.
              Jim A. Youssef, MD
              Chair, Advocacy Committee, SOLAS

SCIENTIFIC SESSION I
Ballrooms B & C
Moderators: W. Blake Rodgers, MD

8:00–8:40am
Preoperative Planning & Technique

1. Bone Scans are Reliable in Identifying Lumbar Disc and Facet Pathology
   Gregory M. Malham, MD¹; Ngaire J. Ellis, MD²; Rhiannon M. Parker, MD²; Ben Goss³
   ¹Neuroscience Institute, Epworth Hospital, Melbourne, VIC, Australia
   ²Greg Malham Neurosurgeon, Melbourne, VIC, Australia
   ³NuVasive Australia / New Zealand, Melbourne, VIC, Australia

2. Diffusion-Weighted Magnetic Resonance (DW-MR)
   Neurography of the Lumbar Plexus in the Preoperative Planning of Lateral Access Lumbar Surgery
   Cristiano M. Menezes, MD¹; Luciene Andrade Mota, MD²;
   Marcello H. Nogueira-Barbosa, MD, PhD²; Helton L.A. Defino, MD, PhD²;
   Carlos Fernando P. da Silva Herrero, MD, PhD²;
   W. Blake Rodgers, MD¹
   ¹Lifecenter Hospital, Belo Horizonte, Brazil
   ²Axial Image Center, Belo Horizonte, Brazil
   ³Faculdade de Medicina USP-RP, Ribeirão Preto São Paulo, Brazil
   ⁴Spine Midwest, Inc., St Mary’s Health Center, Jefferson City, MO, USA

3. Lateral Pressure Analysis for the Lateral Lumbar Interbody Fusion Procedure
   Robert Tatsumi, MD
   Pacific Spine Specialists, Tualatin, OR, USA

4. Two-Incision Approach vs. One-Incision Approach in Lumbar XLIF®; Advantages and Pitfalls
   Domenico Bombardieri, MD; Josip Buric, MD; Carmine Del Gaizo, MD
   Neurospine Team, cdc Villa Torri, Bologna, Italy

DISCUSSION

8:40-9:10am
Choice of Fixation—Biomechanics

5. Shear Loading Response of Anterior Interbody Implants and Supplemental Fixation in a Cadaveric Spondylolisthesis Model
   Guy Fogel, MD¹; Alexander W.L. Turner, PhD²; Zachary Dooley²; G. Bryan Cornwall, PhD²
   ¹Spine Pain Be Gone, San Antonio, TX, USA
   ²NuVasive, Inc., San Diego, CA, USA

6. Medial-to-Lateral Trajectory Pedicle Screws (Cortical/Pars Screws) – A Biomechanical Analysis Using a Novel Screw Design and Early Clinical Applications
   Gurvinder S. Deol, MD¹; Nitin Khanna, MD²; Bradley A. Heiges, MD²; Zachary A. Dooley³; Alexander W.L. Turner, PhD⁴
   ¹Wake Orthopaedics, WakeMed Health and Hospitals, Raleigh, NC, USA
   ²Spine Care Specialists, Munster, IN, USA
   ³Optim Orthopaedics, Optim Healthcare, Savannah, GA, USA
   ⁴NuVasive, Inc., San Diego, CA, USA

7. Kinematic Evaluation of the Decade™ Lateral Plate in XLIF® Single-Position Supplemental Fixation
   William D. Smith, MD¹; Stephen Ryu, MD¹; Thomas M. Sweeney, II, MD, PhD¹; Daveed D. Frazier, MD¹; Alexander W.L. Turner, PhD⁴
   ¹University Medical Center, Las Vegas, NV, USA
   ²Palo Alto Medical Foundation, Stanford University Hospital, Palo Alto, CA, USA
   ³Southeastern Spine Center & Research Institute, Sarasota, FL, USA
   ⁴Orthopaedic Associates of New York P.C., New York, NY, USA

DISCUSSION

*Young Investigator Award Submission
9:10-9:40am
Choice of Fixation—Techniques

8. Navigated Bilateral Pedicle Screws in the Lateral Decubitus Position as an Adjunct to eXtreme Lateral Interbody Fusion (XLIF®)
   Tyler G. Smith, MD
   Sutter Medical Foundation, Roseville, CA, USA

   Sharon Yson, MD*; Jonathan Sembrano, MD; Peter Sanders, MD; Edward Rainier Santos, MD; Charles Gerald Ledonio, MD; David Polly, Jr., MD
   University of Minnesota, Minneapolis, MN, USA

10. The Bendini® Spinal Rod Bending System for Long Percutaneous Pedicle Screw Constructs: Cadaveric Utility Study and Early Clinical Experience
    Richard M. Wupperman, MD; Robert E. Isaacs, MD; William R. Taylor, MD
    1Central Texas Spine Institute, Austin, TX, USA
    2Division of Neurosurgery, Duke University Medical Center, Durham, NC, USA
    3Division of Neurosurgery, University of California, San Diego, CA, USA

DISCUSSION

9:40-10:00am
Coffee Break
Foyer

SCIENTIFIC SESSION II
Ballrooms B & C
Moderator: Luiz Pimenta, MD, PhD

10:00-10:45am
Choice of Fixation

11. Vertebral Body Fracture Following Lateral Interbody Fusion
    Timothy Ryken, MD; Steven Dillavou, PA; Marek Rozek, PA; Gerald Wait, MD
    Iowa Spine and Brain Institute, Covenant Medical Center, Waterloo, IA, USA
    Department of Neurosurgery, University of Iowa Healthcare, Iowa City, IA, USA

12. Subsidence with Stand-Alone Lateral Interbody Cages: Biomechanical Advantage with Wider Cages
    Ram R. Vasudevan, MD; Stefan Alexa Mindea, MD; Ioana Irime, MD; Bogdan Lapustea, MD
    Department of Neurosurgery, Stanford University Medical Center, Stanford, CA, USA

13. Subsidence Following XLIF in 360 Fusion Setting
    Josip Buric, MD; Pedro Berjano, MD, PhD; Massimo Balsano, MD; Domenico Bombardieri, MD; Carmine Del Gaizo, MD
    1Neuro spine Team, cdc Villa Torri, Bologna, Italy
    2Uo Chir. Vertebrale-IRCCS Galeazzi, Milano, Italy
    3Regional Spinal Department, Schio, Vicenza, Italy

14. Intervertebral Subsidence After LLIF Can Lead to Loss of Correction After Two Years
    Edward Nomoto, MD*; Paul Stanton, DO; Robert Eastlack, MD; Nima Kabirian, MD; James Bruffey, MD; Jeff Pawelek; Gregory M. Mundis, Jr., MD; Behrooz Akbarnia, MD
    1San Diego Center for Spinal Disorders, La Jolla, CA, USA
    2Scripps Clinic, La Jolla, CA, USA

15. Maintenance of Segmental Lordosis and Disc Height in Stand-Alone and Instrumented eXtreme Lateral Interbody Fusion (XLIF)
    Gregory M. Malham, MD; Ngaire J. Ellis, MD; Rhiannon M. Parker, MD; Carl M. Blecher, MD; Rohan White, MD; Kevin A. Seex, MD; Ben Goss
    1Neuroscience Institute, Epworth Hospital, Melbourne, VIC, Australia
    2Greg Malham Neurosurgeon, Melbourne, VIC, Australia
    3Radiology Department, Epworth Hospital, Melbourne, VIC, Australia
    4Department of Neurosurgery, Macquarie University, Sydney, NSW, Australia
    5NuVasive® Australia / New Zealand, Melbourne, VIC, Australia

DISCUSSION

10:45-11:20am
Subsidence II—Choice of Implant

16. Would Resting a Lateral Interbody Cage Across the Ring Apophysis in the Lumbar Spine Mitigate Endplate Violation?
    Joseph M. Zavatsky, MD; Hassan Serhan, PhD; Anand Kumar Agarwal, MD; Manoj Kumar Kodigudla, MS; Aakash Agarwal
    1Ochsner Medical Center, New Orleans, LA, USA
    2Depuy Spine, Inc., Raynham, MA, USA
    3Department of Orthopaedic Surgery, University of Toledo, Toledo, OH, USA
    4Department of Bioengineering, University of Toledo, Toledo, OH, USA

17. The Impact of the Cage Height, Diameter, and Positioning on Clinical and Radiographic Outcome of the eXtreme Lateral Interbody Fusion
    Christoph C. Hofstetter, MD, PhD; Marijan Alimi, MD; Eric Elowitz, MD; Roger Härtl, MD
    Department of Neurological Surgery of Weill Cornell Medical College, New York-Presbyterian Hospital, New York, NY, USA

18. Radiographic Evaluation of XLIF: Comparison of 22mm vs. 18mm Wide Cages and Pedicle Screw Instrumentation vs. Anterolateral Plates with a Minimum of 1 Year Follow-Up
    Derek Khorsand, BS; Antoine Tohmeh, MD; Xavier Zielinski, MD
    1University of Washington, Seattle, WA, USA
    2Northwest Orthopaedic Specialists and Spine Research Institute of Spokane, Spokane, WA, USA
    3Inland Imaging, Spokane, WA, USA

Presenting speaker’s name in bold.
*Young Investigator Award Submission
19. Interbody Cages with Wide Contact Area in Lateral Interbody Fusion—Clinical Experience
Luiz Pimenta, MD, PhD; Luis Marchi, MSc; Rodrigo Amaral, MD; Thiago Coutinho, MD; Carlos Castro, MD; Leonardo Oliveira, BSc; Rubens Jensen, MD
Instituto de Patologia da Coluna, São Paulo, Brazil

DISCUSSION
11:20am-12:00pm
Radiographic Results—Fusion Studies

Brad S. Waddell, MD; Joseph M. Zavatsky, MD
Ochsner Medical Center, New Orleans, LA, USA

S. Craig Meyer, MD
Columbia Orthopaedic Group, Columbia, MO, USA

22. A Comparison of Radiographic and Clinical Outcomes of Extreme Lateral Interbody Fusion Performed with Allograft Cellular Bone Matrix or rhBMP-2 Graft Material
Antoine G. Tohmeh, MD1,2; Cheri Somers, RN1; Mirna Tohmeh, DDS, MBA1; Derek Khorsand, BS3
1Northwest Orthopaedic Specialists, Spokane, WA, USA
2Spine Research Institute of Spokane, Spokane, WA, USA
3University of Washington School of Medicine, Seattle, WA, USA

23. Early Experience with Titanium Cages and AttraX® in XLIF®
Dr. med. Axel Reinhardt; Dr. med. Ulf Muzzulini
Oberlinklinik, Potsdam, Germany

DISCUSSION
12:00-1:00pm
Group Photo and Buffet Lunch
Aria Lawn

SCIENTIFIC SESSION III
Ballrooms B & C
Moderator: Frank M. Phillips, MD

1:00-1:40pm
Clinical Outcomes I—Single Cohort Studies

24. L4-5 XLIF: A Challenging Level
Ildemaro J. Volcan, MD1; Allan Goodrich, MD2
1West Augusta Spine Specialists, Augusta, GA, USA
2Champions Orthopaedics, Augusta, GA, USA

25. Stand-Alone XLIF: 1 Year Outcomes
Adam S. Kanter, MD; Gurpreet Gandhoke, MD; David O. Okonkwo, MD, PhD
University of Pittsburgh Medical Center, Pittsburgh, PA, USA

DISCUSSION
2:15-2:45pm
Coffee Break
Foyer

26. Low-Grade Lumbar Degenerative Spondylolisthesis Treated with the eXtreme Lateral Interbody Fusion (XLIF) and Ipsilateral Pedicle Screws: Outcomes and Experience After Two Years
Guillermo Bajas, MD, MBA1,2; Alejandro Pérez-Oliva, MD1,3; Nelson Cruz, MD1,2; Antonio Acosta, MD1; Andreina Montero, MD2; Erika Rojas, MD2
1Instituto de Columna Caracas, Hospital de Clínicas Caracas, Caracas, Venezuela
2Unidad de Columna, Centro Médico Docente la Trinidad, Caracas, Venezuela

27. Clinical Outcomes and Complications at One Year Follow-Up Following eXtreme Lateral Interbody Fusion at a Single Site
Jim A. Youssef, MD; Douglas O. Orndorff, MD; Casey C. Roberts, BA; Catherine A. Patty, MS; Morgan A. Scott, MS
Durango Orthopedic Associates, P.C./Spine Colorado, Durango, CO, USA

DISCUSSION
1:40-2:15pm
Clinical Outcomes II—Comparative Studies

28. XLIF vs. MAS® TLIF for the Treatment of Degenerative Spondylolisthesis: Early Clinical Outcomes from a Prospective Multi-Center Randomized Study
Robert E. Isaacs, MD1; Jonathan N. Sembrano, MD2; Antoine Tohmeh, MD3; The SOLAS® Degenerative Study Group
1Division of Neurosurgery, Duke University Medical Center, Durham, NC, USA
2University of Minnesota, Minneapolis, MN, USA
3Northwest Orthopaedic Specialists and Spine Research Institute of Spokane, Spokane, WA, USA

29. Endplate Preparation Differences Among Four Mini-Open Interbody Fusion Approaches
Robert L. Tatsumi, MD1; Kaveh Khajavi, MD, FACS2; Hyun W. Bae, MD2; Yu-Po Lee, MD2; Foster Chen, MD3; William R. Taylor, MD2
1Pacific Spine Specialists, Tualatin, OR, USA
2Georgia Spine and Neurosurgery Center, Atlanta, GA, USA
3The Spine Institute, Santa Monica, CA, USA

30. Comparison of Clinical Outcomes Following Minimally Invasive Lateral Interbody Fusion Stratified by Preoperative Diagnosis
Kaveh Khajavi, MD, FACS1; Alessandria Shen, MSPH2; Madeline Lagina, BS2; Anthony Hutchison, MSN
Georgia Spine and Neurosurgery Center, Atlanta, GA, USA

DISCUSSION
2:45-3:45pm
Symposium: 10 Years of XLIF® Experience—What Have We Learned?
Lateral Anatomy
Neuromonitoring—Past, Present, & Future
Indication-Specific Techniques
When is Supplemental Fixation Required?
When is Direct Decompression Required?

3:45-4:10pm
Neural Complications

31. How Do I Avoid Lumbar Plexus Injury During XLIF Approach?
Josip Buric, MD; Domenico Bombardieri, MD; Carmine Del Gaizo, MD
Neurospine Team, cdc Villa Torri, Bologna, Italy

32. Motor and Neural Deficit Following Lateral Transpsoas Access
Luiz Pimenta, MD, PhD; Elder Camacho; Luis Marchi, MSc; Rodrigo Amaral, MD; Thiago Coutinho, MD; Carlos Castro, MD; Leonardo Oliveira, BSc
Instituto de Patologia da Coluna, São Paulo, Brazil

DISCUSSION

4:10-4:35pm
Complication Avoidance

33. Longitudinal Evoked EMG Neuromonitoring in eXtreme Lateral Interbody Fusion (XLIF): Interim Results of a Prospective Multicenter Study
Jim A. Youssef, MD; Kayeh Khajavi, MD, FACS; W. Blake Rodgers, MD; The SOLAS® Degenerative Study Group
1Durango Orthopedic Associates, P.C./Spine Colorado, Durango, CO, USA
2Georgia Spine and Neurosurgery Center, Atlanta, GA, USA

34. Evaluation of Transcutaneous Stimulation of the Thoracolumbar Conus: Interim Results of a Feasibility Study
Guy Fogel, MD; William R. Taylor, MD
1Spine Pain Be Gone, San Antonio, TX, USA
2Division of Neurosurgery, University of California, San Diego, CA, USA

DISCUSSION

4:35-5:00pm
Other Complications

35. Complications Associated with Lateral Plating at L4-5
Stephen Ryu, MD; Paul Jackson, MD
Palo Alto Medical Foundation / Stanford University Hospital, Palo Alto, CA, USA

36. Survey Results of MIS Lateral Interbody Fusion Complications in Experienced MIS Lateral Surgeons Across 12,024 Patients
Juan S. Uribe, MD1; W. Blake Rodgers, MD2; The SOLAS Degenerative Study Group
1Department of Neurosurgery and Brain Repair, University of South Florida, Tampa, FL, USA
2Spine Midwest, Inc., Jefferson City, MO, USA

DISCUSSION

5:00-6:00pm
Pre-Dinner Break

6:00-9:00pm
Group Dinner
Aria Lawn (inclement weather: Capella)

SATURDAY, MAY 11, 2013

6:30-7:30am
Breakfast
Ballroom A

SCIENTIFIC SESSION V
Ballrooms B & C
Moderator: William R. Taylor, MD

7:30-8:10am
Thoracic Disc & Corpectomy

Alex Zouzias, MD*; Juan S. Uribe, MD
Department of Neurosurgery and Brain Repair, University of South Florida, Tampa, FL, USA

38. Retrospective Outcome Analysis of Mini-Open vs. Standard Thoracic and High Lumbar Corpectomy
Wale Sulaiman, MD1; Gabriel Tender, MD2
1Department of Neurosurgery, Ochsner Health System, New Orleans, LA, USA
2Department of Neurosurgery, Louisiana State University, New Orleans, LA, USA

39. Lateral Minimally Invasive Corpectomy Using Expandable Cages with Wide Endplate Contact Area—Technique and Results
Rodrigo Amaral, MD; Luis Marchi, MSc; Thiago Coutinho, MD; Carlos Castro, MD; Leonardo Oliveira, BSc; Rubens Jensen, MD, Luiz Pimenta, MD, PhD
Instituto de Patologia da Coluna, São Paulo, Brazil

40. Acute and Hyper-Acute Corpectomy for Traumatic Burst Fractures Using a Mini-Open Lateral Approach
William D. Smith, MD1; Ginger Christian, BS
1University Medical Center, Las Vegas, NV, USA
2Nevada Neuroscience Institute Research Foundation, Las Vegas, NV, USA

DISCUSSION
8:10-8:40am
Debate: Adult Scoliosis Treatment Philosophy
Stick with What Works: Courtney W. Brown, MD
Broaden the Range of Possibilities: Frank M. Phillips, MD

DISCUSSION

8:40-9:00am
Adult Deformity I—Classifications

41. A New Classification of Degenerative Disc Disease in Adults with Lumbar or Thoracolumbar Deformity as a Guide to XLIF® Surgical Strategy
Pedro Berjano, MD, PhD; Claudio Lamartina, MD
1Head, VI Spinal Surgery Division, IRCCS Istituto Ortopedico Galeazzi, Milano, Italy
2Head, II Spinal Surgery Division, IRCCS Istituto Ortopedico Galeazzi, Milano, Italy

42. Lateral Minimally Invasive Surgery for Adult Spinal Deformity: When and How
Amir Ahmadian, MD; Konrad Bach, MD; Juan S. Uribe, MD
Department of Neurosurgery and Brain Repair, University of South Florida, Tampa, FL, USA

DISCUSSION

9:00-9:30am
Adult Deformity IIa—Clinical Outcomes Following XLIF for Degenerative Scoliosis

43. XLIF in Adult Lumbar Scoliosis: What We’ve Learned
Massimo Balsano, MD; Pedro Berjano, MD, PhD; Josip Buric, MD
1Regional Spinal Department, Schio, Vicenza, Italy
2Uo Chir. Vertebrale-IRCCS Galeazzi, Milano, Italy
3Cdc Valdisieve, Pelago, Firenze, Italy

44. Clinical and Radiological Features of a Minimally Invasive Lateral Transpsoas Approach for the Treatment of Adult Degenerative Scoliosis
Carlos Castro, MD; Rubens Jensen, MD; Leonardo Oliveira, BSc; Rodrigo Amaral, MD; Thiago Coutinho, MD; Luis Marchi, MSc; Luiz Pimenta, MD, PhD
Instituto de Patologia da Coluna, São Paulo, Brazil

45. Findings from a Single Site Investigating the Use of eXtreme Lateral Interbody Fusion as a Treatment for Degenerative Lumbar Deformity at Two Year Follow-up
Jim A. Youssef, MD; Douglas O. Orndorff, MD; Casey C. Roberts, BA; Catherine A. Patty, MS; Morgan A. Scott, MS; Hannah L. Price, BS
Durango Orthopedic Associates, P.C./Spine Colorado, Durango, CO, USA

DISCUSSION

9:30-10:00am
Adult Deformity IIb—Clinical Outcomes Following XLIF for Degenerative Scoliosis

46. Staged Reconstruction of Adult Thoracolumbar Kyphoscoliotic Deformity with XLIF and Hybrid Posterior Instrumentation
Antoine Tohmeh, MD; Ashley Proctor; Derek Khorsand, BS
1Northwest Orthopaedic Specialists and Spine Research Institute of Spokane, Spokane, WA, USA
2Whitworth University, Spokane, WA, USA
3University of Washington, Seattle, WA, USA

47. Clinical and Radiographic Outcomes Following Combined XLIF with Posterior Segmental Stabilization in Spinal Deformity: One Year Follow-Up
Adam S. Kanter, MD; Zachary J. Tempel, MD; Surpreet Gandhoke MD; David O. Okonkwo, MD, PhD
Department of Neurological Surgery, University of Pittsburgh Medical Center, University of Pittsburgh School of Medicine, Pittsburgh, PA, USA

48. The Role of the Lateral Interbody Fusion in the Treatment of Adult Spinal Deformity: A Two-Year Follow Up Study
Gregory M. Mundis Jr., MD; Rodrigo Amaral, MD; Jeff Pawelek; Nima Kabirian, MD; Jayla Kyaw; Ramin Bagheri, MD; Behrooz A. Akbarnia, MD
San Diego Center for Spinal Disorders, La Jolla, CA, USA

DISCUSSION

10:00-10:30am  Coffee Break
Foyer
49. Comparison of 3 Minimally Invasive Surgery (MIS) Strategies to Treat Adult Spinal Deformity (ASD)
Praveen V. Mummaneni, MD; Michael Y. Wang, MD; Virginie Lafage, PhD; John Ziewacz, MD; David O. Okonkwo, MD, PhD; Juan S. Uribe, MD; David O. Okonkwo, MD, PhD; Behrooz A. Akbarnia, MD; Neel Anand, MD; Richard G. Fessler, MD; Adam S. Kanter, MD; Paul Park, MD, Virginie Lafage, PhD; Christopher I. Shaffrey, MD; Richard G. Fessler, MD; Vedat Deviren, MD; Gregory M. Mundis, Jr., MD; International Spine Study Group

1Neurosurgery, University of California, San Francisco Medical Center, San Francisco, CA, USA
2Neurosurgery, University of Miami School of Medicine, Miami, FL, USA
3Orthopaedic Surgery, NYU Hospital for Joint Diseases, New York, NY, USA
4Neurosurgery, University of Pittsburgh Medical Center, Pittsburgh, PA, USA
5Neurosurgery, University of South Florida, Tampa, Tampa, FL, USA
6Orthopaedic Surgery, Scripps Clinic, San Diego, CA, USA
7Spine Institute, Cedars Sinai Medical Center, Los Angeles, CA, USA
8Neurosurgery, Northwestern University, Chicago, IL, USA
9Orthopaedic Surgery, University of California, San Francisco Medical Center, San Francisco, CA, USA
10Neurosurgery, University of Michigan, Ann Arbor, MI, USA
11Neurosurgery, University of Virginia Medical Center, Charlottesville, VA, USA
12Orthopaedic Surgery, University of California, San Francisco Medical Center, San Francisco, CA, USA
13ISSGF, Littleton, CO, USA

50. Is There a Patient Profile That Characterizes a Patient as a Candidate for Minimally Invasive Surgery (MIS) to Treat Adult Spinal Deformity (ASD)?
Robert Eastlack, MD; Gregory M. Mundis, Jr., MD; Michael Y. Wang, MD; Praveen V. Mummaneni, MD; Juan S. Uribe, MD; David O. Okonkwo, MD, PhD; Behrooz A. Akbarnia, MD; Neel Anand, MD; Adam S. Kanter, MD; Paul Park, MD; Virginie Lafage, PhD; Christopher I. Shaffrey, MD; Richard G. Fessler, MD; Vedat Deviren, MD; Gregory M. Mundis, Jr., MD; International Spine Study Group

1Orthopaedic Surgery, Scripps Clinic, San Diego, CA, USA
2San Diego Center for Spinal Disorders, La Jolla, CA, USA
3Neurosurgery, University of Miami School of Medicine, Miami, FL, USA
4Neurosurgery, University of California, San Francisco Medical Center, San Francisco, CA, USA
5Neurosurgery, University of South Florida, Tampa, Tampa, FL, USA
6Neurosurgery, University of Pittsburgh Medical Center, Pittsburgh, PA, USA
7Spine Institute, Cedars Sinai Medical Center, Los Angeles, CA, USA
8Neurosurgery, University of Michigan, Ann Arbor, MI, USA
9Orthopaedic Surgery, NYU Hospital for Joint Diseases, New York, NY, USA
10Neurosurgery, University of Virginia Medical Center, Charlottesville, VA, USA
11Orthopaedic Surgery, University of California, San Francisco Medical Center, San Francisco, CA, USA
12ISSGF, Littleton, CO, USA

51. Are Complications in Adult Spinal Deformity (ASD) Surgery Related to Approach or Patient Characteristics? A Prospective Propensity Matched Cohort Analysis of Minimally Invasive (MIS), Hybrid (HYB), and Open (OPEN) Approaches
Juan S. Uribe, MD; Gregory M. Mundis, Jr., MD; David O. Okonkwo, MD, PhD; Adam S. Kanter, MD; Robert K. Eastlack, MD; Michael Y. Wang, MD; Praveen V. Mummaneni, MD; Neel Anand, MD; Richard G. Fessler, MD; Frank La Marca, MD; Paul Park, MD; Virginie Lafage, PhD; Christopher I. Shaffrey, MD; Vedat Deviren, MD; Gregory M. Mundis, Jr., MD; International Spine Study Group

1Neurosurgery, University of South Florida, Tampa, Tampa, FL, USA
2San Diego Center for Spinal Disorders, La Jolla, CA, USA
3Neurosurgery, University of Pittsburgh Medical Center, Pittsburgh, PA, USA
4Orthopaedic Surgery, Scripps Clinic, San Diego, CA, USA
5Neurosurgery, University of Miami School of Medicine, Miami, FL, USA
6Neurosurgery, University of California, San Francisco Medical Center, San Francisco, CA, USA
7Spine Institute, Cedars Sinai Medical Center, Los Angeles, CA, USA
8Neurosurgery, Northwestern University, Chicago, IL, USA
9Orthopaedic Surgery, NYU Hospital for Joint Diseases, New York, NY, USA
10Neurosurgery, University of Virginia Medical Center, Charlottesville, VA, USA
11Orthopaedic Surgery, University of California, San Francisco Medical Center, San Francisco, CA, USA
12ISSGF, Littleton, CO, USA

Presenting speaker’s name in bold.
*Young Investigator Award Submission
DISCUSSION

11:00-11:30am
Adult Deformity IIIb—Comparative Analyses

Praveen V. Mummaneni, MD; Michael Y. Wang, MD; Virginie Lafage, PhD; John Ziewacz, MD; Jamie S. Terran, MD; David O. Okonkwo, MD, PhD; Juan S. Uribe, MD; Neel Anand, MD; Richard G. Fessler, MD; Adam S. Kanter, MD; Frank La Marca, MD; Gregory M. Mundis, Jr., MD; International Spine Study Group1
1Neurosurgery, University of California, San Francisco Medical Center, San Francisco, CA, USA
2Neurosurgery, University of Miami School of Medicine, Miami, FL, USA3Orthopaedic Surgery, NYU Hospital for Joint Diseases, New York, NY, USA
4Neurosurgery, University of Pittsburgh Medical Center, Pittsburgh, PA, USA
5Neurosurgery, University of South Florida, Tampa, FL, USA
6Spine Institute, Cedars Sinai Medical Center, Los Angeles, CA, USA
7Neurosurgery, Northwestern University, Chicago, IL, USA
8Neurosurgery, University of Michigan, Ann Arbor, MI, USA
9Neurosurgery, University of Virginia Medical Center, Charlottesville, VA, USA
10Orthopaedic Surgery, University of California, San Francisco Medical Center, San Francisco, CA, USA
11San Diego Center for Spinal Disorders, La Jolla, CA, USA
12ISSGF, Littleton, CO, USA

53. Comparison of Radiographic Results after Minimally Invasive [MIS], Hybrid [HYB] and Open [OPEN] Surgery for Adult Spinal Deformity (ASD): A Multicenter Study of 184 Patients
Raqeeb Haque, MD; Gregory M. Mundis, Jr., MD; Yousef M. Ahmed, MD; Michael Y. Wang, MD; Praveen V. Mummaneni, MD; Juan S. Uribe, MD; David O. Okonkwo, MD, PhD; Neel Anand, MD; Adam S. Kanter, MD; Frank La Marca, MD; Virginie Lafage, PhD; Jamie S. Terran, MD; Richard G. Fessler, MD; Vedat Deviren, MD; International Spine Study Group1
1Neurosurgery, Northwestern University, Chicago, IL, USA
2San Diego Center for Spinal Disorders, La Jolla, CA, USA
3Neurosurgery, University of Miami School of Medicine, Miami, FL, USA
4Neurosurgery, University of California, San Francisco Medical Center, San Francisco, CA, USA
5Neurosurgery, University of South Florida, Tampa, FL, USA
6Neurosurgery, University of Pittsburgh Medical Center, Pittsburgh, PA, USA
7Spine Institute, Cedars Sinai Medical Center, Los Angeles, CA, USA
8Neurosurgery, University of Michigan, Ann Arbor, MI, USA
9Orthopaedic Surgery, NYU Hospital for Joint Diseases, New York, NY, USA
10Orthopaedic Surgery, University of California, San Francisco Medical Center, San Francisco, CA, USA
11ISSGF, Littleton, CO, USA

54. A Prospective Propensity Matched Cohort Analysis of Minimally Invasive [MIS], Hybrid [HYB], and Open Spine Surgery [OPEN] for the Treatment of Adult Spinal Deformity [ASD]
Gregory M. Mundis, Jr., MD; Virginie Lafage, PhD; Behrooz A. Akbarnia, MD; Robert K. Eastlack, MD; Michael Y. Wang, MD; Juan S. Uribe, MD; Neel Anand, MD; Praveen V. Mummaneni, MD; David O. Okonkwo, MD, PhD; Adam S. Kanter, MD; Frank La Marca, MD; Richard G. Fessler, MD; Christopher I. Shaffrey, MD; Vedat Deviren, MD; International Spine Study Group1
1San Diego Center for Spinal Disorders, La Jolla, CA, USA
2Orthopaedic Surgery, University of Virginia Medical Center, Charlottesville, VA, USA
3Orthopaedic Surgery, University of Michigan, Ann Arbor, MI, USA
4Orthopaedic Surgery, University of Michigan, Chicago, IL, USA
5Neurosurgery, University of Virginia Medical Center, Charlottesville, VA, USA
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DISCUSSION

Presenting speaker’s name in bold.
*Young Investigator Award Submission
55. Multi-Level XLIF® and Posterior Three Column Osteotomies for Three Dimensional Severe Lumbar Deformity—30 Consecutive Cases
Paul C. McAfee, MD, MBA; Erin Shucosky, RN; Liana Chotikul, RN, CRNP
University of Maryland St. Joseph Medical Center, Towson, MD, USA

56. Staged Multi-Level Lateral Lumbar Interbody Fusion in the Treatment of Sagittal Deformity
Todd Lansford, MD*; Jorge Cuellar, MD1; Christopher Ames, MD2; Gregory M. Mundis, Jr., MD1; Vedat Deviren, MD1
1Department of Orthopedics, University of California, San Francisco, CA, USA
2Department of Neurosurgery, University of California, San Francisco, CA, USA

57. ALL Release by Lateral Approach for Anterior Column Reconstruction—Anatomy, Technique, and Early Results
Luiz Pimenta, MD, PhD; Luis Marchi, MSc; Leonardo Oliveira, BSc; Thiago Coutinho, MD; Rodrigo Amaral, MD; Carlos Castro, MS; Rubens Jensen, MD
Instituto de Patologia da Coluna, São Paulo, Brazil

58. Transpsoas Anterior Longitudinal Ligament Release for Sagittal Imbalance: Segmental Correction Differences with Disc Space Height Variation
Richard M. Wupperman, MD
Central Texas Spine Institute, Austin, TX, USA

59. Anterior Column Realignment (ACR) has Similar Results to Pedicle Subtraction Osteotomy (PSO) in Treating Adults with Sagittal Spinal Deformity: A Multicenter Study
Gregory M. Mundis, Jr., MD1; Behrooz A. Akbarnia, MD1; Nima Kabirian, MD1; Jeff Pawelek1; Robert K. Eastlack, MD1; Christopher I. Shaffrey, MD1; Eric Klineberg, MD1; Shay Bess, MD1; Christopher Ames, MD1; Vedat Deviren, MD1; Virginie Lafage, PhD8; International Spine Study Group8
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DISCUSSION
12:30-12:45pm Announcements & Close
6th ANNUAL SOLAS® RESEARCH MEETING

Event Floor Plan