ABSTRACT

Title of Abstract: Robotic Aided Minimally Invasive Spine Surgery (MISS)

Purpose: To demonstrate the ease and practical clinical application of new robotic aided system for microdecompressive endoscopic spinal discectomy.

Materials and Methods: The new robotic aided surgical system, AESOP (by Computer Motion, Santa Barbara, CA), is utilized as an endoscopic positioner and navigational device. The world's first FDA-cleared surgical robot provides a surgeon with direct control over the operative image. It is a voice-controlled robotic arm designed to replicate the form and function of a human arm. It holds the endoscope stable for the duration of any surgical procedure, maintaining a perfect still image of the surgical field with ability of fine adjustment for the critical task of endoscopic spinal surgery. The advanced speech control technology allows the surgeon to voice control and to navigate the endoscope's position. It provides a direct access to the surgical image leading to reduced procedure time, miscommunication, unintentional movements, and fewer scope cleanings. Herniated spinal (cervical, thoracic and lumbar) discs and lumbar stenosis are treated with this system. This system combined with conventional endoscopic system, or larger more advanced endoscopic assisted microdecompression system, micro endoscopic surgical instruments and laser probe carries out and facilitates minimally invasive spine surgery under clear endoscopic visualization for the MISS procedure.

Results: By using this robotic aided surgical system, endoscopic MISS in 39 clinical cases have been carried out with excellent visualization, precise navigation, and sturdy view for the purpose of performing MISS. AESOP exhibits its superiority in:

1. Ease in its application.
2. Operating room compatibility.
3. Compact system geometry.
4. Open system architecture.
5. Robotic precision

Conclusion: The AESOP robotic surgical system enhances the surgeon's performance in complex MISS endoscopic procedure with ease and effectiveness for treatment of herniated spinal discs and spinal stenosis.

ABSTRACT

Primary Author Name/ Degree:	John C. Chiu, M.D., Chief, Neurospinal Surgery.
Institutional Affiliation:	California Center for Minimally Invasive Spine Surgery.
Address:	1001 Newbury Road Thousand Oaks, CA 91320
Telephone:	(805) 375-7900
E-mail Address:	chiu@spinecenter.com
Facsimile:	(805) 375-7975
Contributing Authors, Including Degrees, Institutional, Affiliations and Addresses:	Thomas Clifford, M.D., Neurosurgeon California Center for Minimally Invasive Spine Surgery, Thousand Oaks, CA 91320 Romulo Sison, OPA-C, CST California Center for Minimally Invasive Spine Surgery, Thousand Oaks, CA 91320 Robert A. Princenthal, M.D., Director Musculoskeletal Diagnostics, California Center for Minimally Invasive Spine Surgery, California Spine Institute Medical Center