

Endoscopic Spine Surgery Fellowship, IWAI Orthopedic Medical Hospital Tokyo, Dec 9th 2019 to Jan 31st 2020

I am a neurosurgeon with 25 year experience in both cranial and spinal procedures, of which in total I have performed maybe some 4000 procedures. In 1995 I have taken up my neurosurgical training at the University of Hamburg, became a consultant senior neurosurgeon at the University of Schleswig-Holstein and Director of the Neurooncology Laboratory in 2002. In 2006, I was appointed Full Professor, Vice Chairman of Neurosurgery and Director of Neurooncology at the University of Göttingen and in 2011 became the Director of the Neurosurgical University Hospital at the Johannes-Gutenberg University of Mainz.

Since 2009 clinically I have become involved in minimally invasive spine surgery and my research interest has focused on experimental spinal navigation, computer-aided and robot-assisted surgery, 3 D planning and simulation of motion and forces influenced by anatomical variants and surgically induced changes. The goal of this research was to minimize the impact of surgery and its consequences for degeneration following surgical procedures. However, our surgical approach till now had remained the classical open microsurgery combined with navigation and robot guided percutaneous instrumentation techniques (Kantelhardt SR 2016, Kantelhardt 2015, Kantelhardt 2011).

Since 2017 I am in private practice, now mainly focusing on spine in a department of interdisciplinary neuro-orthopedic spine surgery in close collaboration with orthopedic colleagues. For a number of degenerative conditions the classical microsurgical approach is of course feasible (Hansen Algenstaedt N 2019, Hansen Algenstaedt N 2017a, Hansen Algenstaedt N 2017b), but we feel that many such conditions can be managed with smaller procedures, reducing both the tissue trauma and the peri- and postoperative risks, shorten postoperative hospital stay, which in private practice is a very important factor. Patients are requesting endoscopic spine surgery increasingly now in my country. Even though Hamburg has a large number of hospitals offering spine surgery including a University Hospital, no endoscopic procedures are offered by any of the hospitals in Hamburg. We feel that we have to complete our spectrum and portfolio by offering endoscopic spine surgery.

In 2019 I had the privilege to be accepted into IWAI Orthopedic Medicals Hospitals international training course on endoscopic surgery for a two months program. Having had no previous exposure to endoscopic spine surgery, for me this was an entirely new and challenging technique. The high volume of procedures handled at IWAI allowed me to see a very broad spectrum of procedures, understand the preoperative diagnostic requirements and choice of procedure for a different pathologies.

Minimally invasive endoscopically assisted surgery is closest to what I am familiar with from open microscopic procedures. Yet the positioning of the self-retaining tubular speculum using dilators appears less traumatic than the Caspar retractor system we use requiring a certain degree of soft tissue preparation and trauma. Since combination of the tubular speculum and the microscope facilitates use of the optics of modern operating microscopes with 3D perception, high resolution und magnification, yet allows familiar surgical strategies and to practically use all microsurgical operating instruments, implementation into our practice seems straight forward.

Full endoscopic spine surgery for us is highly attractive because selecting cases for endoscopic procedures will significantly reduce the invasiveness compared to microscopic procedures we offer now (Fujita M 2019, Ishibashi K 2018, Markovic M 2016). Due to the detailed discussion of preoperative cases with Dr. Koga at IWAI I quickly became familiar with the pathologies that may be addressed by endoscopic surgery and I learned how to select the different approaches and strategies. The extremely helpful and patient operating room personal allowed me to get familiar with setup

and handling of the complex equipment, which for me is an essential step in establishing endoscopic surgery at our institution. The large number and the broad spectrum of cases I was allowed to be part of clearly demonstrated what full endoscopic surgery can achieve. It also became clear that being a young discipline full endoscopic procedures may benefit from further development of instruments and, personally I think navigation guidance has the potential of advancing this type of surgery further. Being the "motor" of full endoscopic spine surgery, at IWAI both the development of endoscopes, instruments and navigation optimized for endoscopy is promoted and advanced. To me this is very interesting because it may foster future cooperation and collaboration and may allow to contribute my specific field of expertise in 3D planning and navigation-guidance (Archavlis E 2016, Archavlis E 2018, Kosterhon M 2017, Kosterhon M 2016, Keric N 2016).

Because the training course at IWAI provided detailed instruction and allowed extensive hands-on work for me as a surgeon who has never had exposure to endoscopic surgery it became clear, that establishing full endoscopic surgery at our institution in Hamburg will have to be done slowly and carefully, selecting suitable cases for the beginner and learn gradually. Once the technique is established and a number of own cases have been performed a second stage "advanced" course may be very productive and I hope that I can continue to learn at IWAI in the future.

I thank IWAI Medical foundation, Dr. Inanami, Dr. Iwai, Dr. Takano and Dr. Koga, very much for accepting me to the program and the generous fiscal support. I hope that our institutions will have a long and productive interaction. I also would like to thank Dr. Koga for the generous opportunity to establish contacts with colleagues of the Keio University, Tsukuba University and Tokyo University which allowed me to present our work.

Sincerely,

Prof. Dr. med. Alf Giese

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