

# Single port training in Latin-America – first uniportal video-assisted thoracoscopic surgery masterclass in Santiago, Chile

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**Abstract:** Video-assisted thoracoscopic surgery (VATS) surgery has become the standard technique in Thoracic Surgery since its introduction 20 years ago. Single port VATS appeared as the next step in its evolution, with rapid development since the first uniportal video-assisted thoracoscopic surgery lobectomy (VATS lobectomy) by Dr. Diego Gonzalez-Rivas. During the last 5 years, the approach has been simplified, standardized and taught in many countries, courses, live surgery and dedicated programs, with reproducible results. Hands-on courses represent the best way to learn a new surgical technique, as it shortens learning curves and decreases complications. We present the first training course in single port VATS in our country, which became the first hands course in Thoracic Surgery in Chile.

**Keywords:** Video-assisted thoracoscopic surgery lobectomy (VATS lobectomy); uniportal VATS; VATS training; VATS animal model

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## Introduction

Since the first descriptions of video-assisted thoracoscopic surgery lobectomy (VATS lobectomy) in the early nineties, a rapid widespread of the technique occurred over the past two decades. Its clear advantages over open surgery, including among others, reduced post-operative pain, lower complication rates, lower LOS and faster recovery, made video-assisted thoracoscopic surgery (VATS) become the standard approach in the majority of thoracic surgical procedures (1).

Two ports VATS technique and single port approach appeared as the next step in reducing tissue trauma and pain (1,2).

Dr. Gaetano Rocco made the first descriptions of single port VATS surgery for wedge resections and pneumothorax (3,4), performed the first awake single port VATS for pneumothorax (5), and described the advantageous spatial features of uniportal VATS (6).

Dr. Diego Gonzalez-Rivas refined the technique and described the first single port VATS lobectomy in 2010 (7), rapidly expanded the indications of the single port VATS to more complex procedures (8,9), and used the awake

technique for single port VATS lobectomy (10).

Since its first description, the single port approach has been safely used in almost every possible scenario and has proven to be comparable to multi-port VATS in expert hands (11). Its advantages related to traditional VATS are yet to be proven, but appear to be the expected ones due to lesser surgical trauma: less post-operative pain, and lower LOS, with similar oncologic outcomes compared with traditional VATS, and open surgery (12).

A remaining issue with single port VATS was the teaching and reproducibility of the technique. Dr. Gonzalez-Rivas has dictated many courses around the world and created a Single Port VATS Program in Spain and China for this purpose. The technique has been learned by surgeons around the globe, who have started single port VATS programs in different countries with similar results (13,14).

## First uniportal masterclass in Chile

The President of the Department of Thoracic Surgery of ALAT (Thoracic Latin-American Society), Dr. Sara



**Figure 1** Hands-on session.



**Figure 2** Wet-lab.

Salvatierra proposed a Pre-Congress Single Port VATS Course, under the 10<sup>th</sup> Congress of ALAT to be hosted in 2016 in Santiago, Chile.

Along with the participation of Dr. Diego Gonzalez-Rivas, renowned Latin-American surgeons would participate. As hosts of the Congress, we enthusiastically agreed to coordinate the Course. These were days of intense preparation for the Pre-Congress Course, which would become the first practical theoretical course of Thoracic Surgery held in our country, and the first uniport masterclass in Chile.

ALAT Congress Single Port VATS Course “Curso pre Congreso de ALAT: lobectomía VATS Unipuerto” was held on July 6, 2016, at the Clinical Simulation Center of the Catholic University of Chile. It consisted of morning theoretical activities, practice in a perfused lung model and finally single port VATS practice in a swine model. A review of the course can also be found on the ALAT website ([www.alatorax.org/cirugia-toracica/boletin-noticias-cirugia-toracica/resena-del-curso-pre-congreso-lobectomia-vats-unipuerto](http://www.alatorax.org/cirugia-toracica/boletin-noticias-cirugia-toracica/resena-del-curso-pre-congreso-lobectomia-vats-unipuerto)).

Dr. Diego Gonzalez-Rivas was the main guest speaker. Leading Latin-American surgeons with extensive experience in minimally invasive thoracic surgery and single port

VATS also participated as speakers and instructors: Drs. David Smith from Argentina, Ricardo Terra and Fernando Vanucci from Brazil, and Cristián González from Chile.

During the morning theoretical lectures, the evolution of VATS to the single port approach, the requirements of the technique, its use in different surgeries, and the management of intraoperative complications were presented.

A detailed description of technical aspects of single port VATS, OR distribution, instruments, and required equipment was made by Dr. Smith. Single port VATS use in sublobar resections was presented by Dr. Vanucci, while single port lymphadenectomy was presented by Dr. Terra.

Finally, Dr. Gonzalez-Rivas shared with us his extensive experience in single port lobectomy, pneumonectomy, and management of complications, with detail in technical aspects, critical points, and resolution of challenges and complications.

During the afternoon we had the hands-on course, starting on a dry-lab with a perfused pig heart-lung *ex vivo* model, allowing greater surgical practice during the course. The model was designed by investigators of the Clinical Simulation Center of the Catholic University of Chile, and was evaluated as a good experimental model for VATS and single port surgery. The characteristics of this model are described in another issue of the Journal.

The final and most important part of the course was the hands-on session in the wet-lab, using a standard vivo swine model (15). Anesthesia and monitoring of the animals were carried out by Veterinary Doctors of the Simulation Center throughout all the procedures. After the preparation of the animals according to the protocol of care and use of animals for investigation of the Clinical Simulation Center, complying with international standard (16), swine were anaesthetized, and a tracheostomy was performed for single lumen intubation. The animals were placed in lateral decubitus and the skin prepared.

Participants were divided in groups and had the opportunity to perform right and left single port lobectomies under direct supervision of the instructors. All aspects of the single port approach discussed during the morning session were addressed at this stage.

The assistants had the opportunity to use dedicated instruments for single port VATS, different staplers, energy devices, and sealing materials. Instructors helped with their experience allowing a wide practice by all the attendees (*Figures 1,2*).

Dr. Gonzalez-Rivas rotated with all groups, showing tips and details of the technique, and answering the most



**Figure 3** Dr. Gonzalez-Rivas during the hands-on session.



**Figure 4** Participants of the course.



**Figure 5** Drs. Jose M. Clavero and Diego Gonzalez-Rivas during the uniportal video-assisted thoracoscopic surgery (VATS) masterclass in Santiago, Chile.

frequent questions regarding the single port approach (Figure 3).

Like any first course, there were some shortcomings and mistakes that can be improved, but it was an overall

very helpful course. We had excellent evaluations from all attendees, Latin-American surgeons, as well as lecturers and instructors. This first uniport masterclass fulfilled all the expectations of the participants. In their evaluation they were enthusiastic in starting using this technique in their practice (Figure 4).

### Final reflections

After all the rush of the course, the ALAT meeting and a Single Port Surgery with Drs. Cristián Gonzalez and Diego Gonzales-Rivas, I have to say that this was an eye opening experience.

I must confess that despite performing the vast majority of my cases by VATS, and having taught minimally invasive thoracic surgery to my residents for more than 10 years, I long considered the single port approach as a difficult technique, hard to learn and difficult to reproduce.

I changed my point of view after this course. Dr. Gonzalez-Rivas has managed to standardize the technique. It is possible to learn how to do a standard case and how to overcome the difficulties of more complicated ones. With the normal learning curve of any surgical technique, this approach can be adopted for a wide variety of thoracic pathologies by trained thoracic surgeons.

I would like to emphasize the importance of this first hands-on course in Chile. In a time with increasing administrative restrictions and legal limitations, simulating models and wet-lab courses have helped to shorten learning curves and decrease complication rates in surgical procedures. This type of training constitutes the best way to learn a new surgical technique, like uniportal VATS. I would like to thank Drs. Salvatierra, Smith, Terra, Vanucci and González for their generous participation in the course, and of course my most sincere reconnaissance to Dr. Diego Gonzalez-Rivas for his incessant willingness to share his experience around the globe (Figure 5).

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### Footnote

*Conflicts of Interest:* JM Clavero has been Speaker in courses

sponsored by Ethicon since 2015.

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