

First uniportal video assisted thoracic surgery masterclass in Ecuador

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Abstract: Currently video-assisted thoracic surgery (VATS) and the evolution Uniportal VATS have a worldwide acceptance and Ecuador is not exception when we decided invited to Dr. Diego Gonzalez-Rivas pioneer surgeon in the world of single-port video-assisted thoracoscopic procedures, with the aim to provide a faster recovery of the patients compared to those who received a conventional thoracotomy. We thanks the opportunity to present a report to the first Masterclass in Uniportal VATS with live surgery, performed on February 23rd to 24th of 2017 at the Luis Vernaza Hospital in Guayaquil-Ecuador. In addition to demonstrate the efficacy and safety of the uniportal VATS technique we presented a video of uniportal VATS left lower lobectomy performed by Dr. Diego Gonzalez-Rivas during the first uniportal masterclass in Guayaquil, Ecuador.

Keywords: Video-assisted thoracic surgery (VATS); uniportal VATS technique; minimally invasive thoracic surgery; uniportal VATS left lower lobectomy

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Introduction

Despite widespread worldwide acceptance of video assisted thoracic surgery (VATS), there is still discussion in Ecuador regarding minimally invasive approaches, especially in the management of intraoperative complications, but due to technological advances, the evolution of the technique called uniportal VATS arises as an alternative for the thoracic surgeons of the country, so the training in this approach is very important (1,2).

Currently exists scientific support and experience published in the medical literature, in which the uniportal VATS technique can replicate almost all open thoracic procedures and comparative studies of the technique with conventional or multiportal approaches with encouraging

results (3-5).

In 2010, Dr. Diego Gonzalez-Rivas in A Coruña, pioneer in the uniportal VATS technique, performs major pulmonary resections with excellent outcomes, showing also a control of the complications in a safe and effective way by the geometric characteristics that allows one direct and ergonomic vision of the videothoracoscopic surgical field, thus initiating a new era in the evolution of thoracic surgery (6-8).

Through the uniportal approach, all pulmonary lobectomies, bronchial and sleeve resections, vascular, bronchovascular and carinal reconstructions can be performed in highly complex patients, and currently, major pulmonary resections are being reported in awake patients



Figure 1 Drs. John Barba Pacheco, Diego Gonzalez-Rivas and Gutenberg Navarro in the opening of Uniportal Masterclass.



Figure 2 Dr. Diego Gonzalez-Rivas during the Uniportal Masterclass of Luis Vernaza Hospital to Guayaquil, Ecuador.

without orotracheal intubation (9-13).

In 2014 during the 9th Latin American Congress of ALAT in Medellin - Colombia, the author had the opportunity to know Dr. Diego Gonzalez-Rivas and exchange knowledge.

One year later, we received training about vats single port in animal models at the JJMII (Johnson & Johnson Medical Institute) in Sao Paulo-Brazil, led by Dr. Diego González-Rivas, reported as initial training (14-17).

In 2016, at the Latin American Congress of ALAT 2016 in Santiago de Chile, we invited Dr. Diego González-Rivas to our first Masterclass in uniportal VATS, being the author designed as academic coordinator in Ecuador.

On February 23rd to 24th of 2017, Dr. Diego Gonzalez-Rivas performed successfully the first Masterclass in uniportal VATS and Live Surgery at the Luis Vernaza Hospital in Guayaquil-Ecuador.

To demonstrate that the uniportal VATS technique is safe and replicable, we present a video of a complex uniportal VATS left lower lobectomy and bleeding control performed by Dr. Diego Gonzalez-Rivas in the uniportal Masterclass.

First uniportal masterclass with live surgery in Ecuador

The Health Teaching and Research Department, with the Department of General Surgery and Cardiothoracic Surgery of the Luis Vernaza Hospital, organized for the first time in the country on February 23rd to 24th of 2017, the first masterclass in uniportal VATS with live surgery transmission, where Dr. John Barba Pacheco was designed as academic coordinator (*Figure 1*).

Dr. Diego Gonzalez-Rivas began the uniportal masterclass talking about the origin and evolution of the technique in the main auditorium of the Luis Vernaza Hospital, the oldest in the country founded in the period of King Charles II of Spain on November 25th of 1564 (*Figure 2*).

Patient selection and workup

We present a male patient with 51 years old, non-smoker with symptomatology characterized by paraneoplastic syndrome consisting of headaches and seizures, without evidence of intracerebral mass or distant metastases. The high resolution computed tomography with three dimensional (3D) image reconstruction and the video assisted bronchoscopy brushed reported diagnosis of pulmonary adenocarcinoma located in the upper segments of the left lower lobe.

Preoperative preparation

Complete preoperative assessment was performed, including cardiology and anesthesiology assessments, the seizures were controlled by neurological treatment, the cardiorespiratory functions were normal, and the



Figure 3 Dr. Diego Gonzalez-Rivas giving instructions to the scrub nurse about specific VATS instruments.

uniportal VATS left lower lobectomy were decided in the cardiothoracic staff.

Equipment preference card

- (I) Video System LED 9000 HD Stryker (Inc., USA).
- (II) Ultrasonic Scalpel Harmonic ACE +7 (Ethicon Endo-Surgery Inc., USA).
- (III) Endostapler Powered Echelon Flex 45 (Ethicon Endo-Surgery Inc., USA).
- (IV) Endo GIA Ultra Universal Stapler (Covidien Inc., USA).
- (V) Alexis Wound Retractor/Protector 1–3 cm (Applied Medical Inc. USA).
- (VI) VATS-MICS instruments (Wexler Surgical—Houston Texas, Inc., USA).

Procedure

Live surgery transmission: uniportal VATS left lower lobectomy

Previous indications in the operating room were given by Dr. Diego Gonzalez-Rivas to the scrub nurse about

the VATS instruments to be used during surgery, as well as energy devices and staplers with their respective loads (*Figure 3*).

General anesthesia and selective double lumen endobronchial intubation were required, the patient was placed in the right lateral decubitus position and the left hemithorax flexed to facilitate the opening of the intercostal spaces.

A single 3 cm incision was placed on the 5th intercostal space in the middle of the anterior axillary line, dissection by planes until the opening parietal pleura and a soft tissue retractor was placed, then a 10 mm videothoroscopic camera of 30 degrees vision was inserted into the upper edge of the surgical wound and specific instrumental articulated for uniportal VATS were used.

After initial exploration and identification of the lesion in the left lower lobe, the lobectomy began with the pulmonary ligament section using ultrasonic scalpel and advanced instrumentation technique until the inferior pulmonary vein was identified.

Fissure dissection showed aberrant vessels, which were controlled with proximal titanium clips and advanced ultrasonic distal hemostasis, vessels larger than 7 mm were stapler sectioned, achieving the exposure of the segmentary arteries blocked by lymph nodes with tumor infiltration.

Next step the lower pulmonary vein and segmentary bronchus were sectioned, achieving a better exposure to try unblocking of the arterial branches with monopolar diathermy. During dissection of the infiltrated vessels and try the section with the stapler complex bleeding occurs, which is controlled quickly applying direct pressure with a gauze swab.

The blood from the operative field was aspirated, a better control of the arterial lesion was achieved with a thoracoscopic DeBakey vascular clamp, completing hemostasis and lobectomy with the stapler.

The surgical specimen was removed with a protective bag and mediastinal lymphadenectomy was performed, the surgery concludes by placing a 28 FR thoracic drainage through the same incision and observing adequate pulmonary expansion. The wound synthesis was performed in a conventional way and the skin closed with intradermic stitch of absorbable suture (*Figure 4*).

During the live surgery, Dr. Diego Gonzalez-Rivas and the surgical team maintained communication with the participants of the auditorium at all time, explaining the surgical maneuvers and answering questions (*Figures 5,6*).



Figure 4 Video of complex uniportal left lower lobectomy and bleeding control in 51 years old male patient with diagnosis of pulmonary adenocarcinoma performed in uniportal masterclass (18). Available online: <http://www.asvide.com/articles/1540>



Figure 5 Drs. Diego Gonzalez-Rivas, John Barba Pacheco and Fernando Polit during uniportal VATS left lower lobectomy—live surgery.



Figure 6 Dr. Diego Gonzalez-Rivas and surgery team.

Role of team members

- (I) Dr. Diego Gonzalez-Rivas: Main Surgeon.
- (II) Dr. John Barba Pacheco: Second Surgeon.
- (III) Dr. Fernando Polit: Assistant Surgeon.

- (IV) Dr. Manuel Romero: Assistant Surgeon.
- (V) Dr. Manuel Reyes: Anesthesiologist.
- (VI) Dr. Gutenberg Navarro: Moderator.
- (VII) Dra. Sara Salvatierra: Moderator.
- (VIII) Dra. Pamela Wong: Moderator.

Post-operative management

The early postoperative management of the patient was performed in the intensive care unit, the chest tube was placed in a drainage system with a water seal without suction. The chest tube was removed after 48 hours when the flow rate was less than 100 mL/day, no air leaks was evidenced and adequate pulmonary expansion in the chest X-ray was observed.

The pathological study reported a moderately differentiated infiltrating adenocarcinoma (8 cm stage T3), with lymph nodes metastases of the 7L group (2/2), the 5L group (2/5) and the 1/1 group 10L (stage N2). The hilar surgical border and the lymph nodes of the 9L group (0/2) were free of neoplasia.

The molecular pathology study reported a mutation in the EGFR (epidermal growth factor receptor exon 19 deletion) for the target treatment being proposed in this case.

Tips, tricks and pitfalls

Uniportal VATS bleeding control

Direct pressure on the vascular injury, clots aspiration and the use of thoracoscopic vascular clamp with remotion interposed tissue, for example in our patient the bronchial stump was separated at the moment of stapler closure, were the key to successful hemostasis.

During the vessels section with the stapler always must be introduced in flex mode to obtain a better angulation. We recommended the advanced instrumentation technique, to protect and separate the surrounding tissues and before stapler tip introduction in a safety way.

Conclusions

There is still discussion about the acceptance of video assisted thoracic surgery (VATS) in the country, but during the course thoracic surgeons observed how to resolve a complex intraoperative complication through the uniportal approach, observing a change of perspective in most of them.



Figure 7 Participants and Hospital authorities of the course.

A previous training in video assisted thoracic surgery is recommended to all thoracic surgeons before begin uniportal VATS approaches, know how to resolve complications as well as treatment alternatives and not to doubt converting the procedure if the complication can not be controlled in a few minutes (19-21).

The documentaries “This is Life” and “7 days 7 cities” have been very motivating, so in our department we have reinforced the uniportal VATS program performing our first cases in awake patients without endotracheal intubation with the technique learned from Dr. Diego Gonzalez-Rivas, thus beginning a new era of evolution and innovation in the history of thoracic surgery in the country.

At the end of the course with great satisfaction and enthusiasm all participants and authorities of the hospital met with Dr. Diego Gonzalez-Rivas to congratulate him for the high level presented of the scientific event (*Figure 7*).

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Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

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