



# Start and development of uniportal video-assisted thoracic surgery (VATS) in Dominican Republic: surgeries and training experience

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**Abstract:** Video-assisted thoracic surgery (VATS) through a uniportal approach its actually successfully performed for several diseases and gaining adepts everywhere. By 2016 more than 10 thousand reports in literatures reviews and evidence revision. The benefits of this technique support the great interest globally and the Dominican Republic, a non-continental Caribbean country of the 3rd world is already taking steps to get onboard performing the procedure. Since 2016 under the guidance of the pioneer Dr. Diego González-Rivas in this country have been performed close to 50 cases of benign and low complexity procedures. Recently, to continue learning and developing this technique in the country, a right upper lobectomy in a cancer patient was made in the context of the 1st masterclass of uniportal VATS.

**Keywords:** Uniportal video-assisted thoracic surgery (uniportal VATS); lobectomy; masterclass; Dominican Republic

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## Introduction

As technology has advanced, better images, new instruments, less invasive procedures tendency the video-assisted thoracic surgery (VATS) started as a better experimental option instead of traditional accesses. The use of multiportal video techniques allowed minor, mayor and complex procedures for thoracic, lung and mediastinal pathologies with small incisions and opened the doors to the progress of these minimally invasive surgeries (1). Nowadays it has become the gold standard in many diseases.

After a long-term use of wide and traditional surgeries in the thoracic pathologies in early 1990 VATS was introduced; with the new endoscopic instruments, cameras multiport promptly demonstrated the benefits when compared with open conventional access. Lesser complications reduced acute and chronic pain, shorter stays and minor scarring.

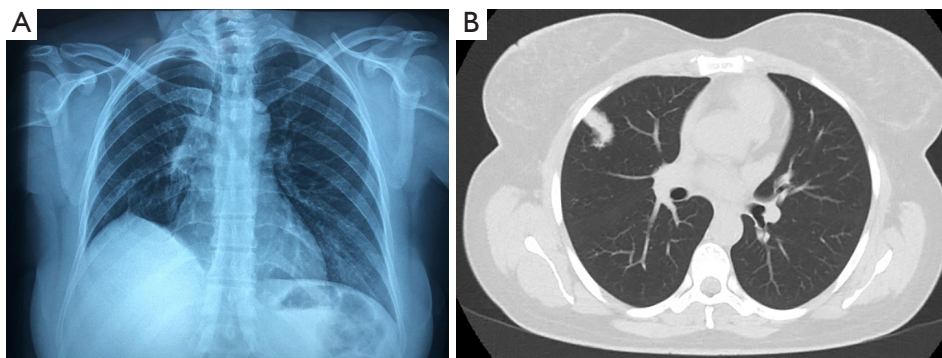
The single portal or uniportal access is the best example

of how every procedure can be improved and opens field to better progress in the future. Its global interest in the latest generations of thoracic surgeons and the development of more suitable instruments allows continue and progressive practice of this technique. By 2016 more than 9,545 procedures reports in literatures reviews and evidence revision in English language had been published (2).

Uniportal approach was first stated by Migliore *et al.* in 2000 with a series of 58 procedures for benign pathologies such as pleural effusions, empyema and pneumothorax (1,3).

In 2010 the first procedure for lung cancer was performed by Hernandez-Arenas *et al.*, the first Uni-VATS lower lobectomy (4,5).

From that moment the progress of uniportal has extended to high complexity surgeries that includes lobectomies, segmentectomy, pneumonectomy and carinal resections; the use of different access sites as trans-subcostal, transaxillary



**Figure 1** Radiological findings: tumor in upper right lobe. (A) Chest X-ray; (B) chest CT. CT, computed tomography.



**Figure 2** Wound plus drainage at the end of procedure.



**Figure 3** First VATS uniportal lobectomy in the Dominican Republic (9). VATS, video-assisted thoracic surgery.

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and the ultimate achievement; subxiphoid, and the employ of anesthesia techniques as awake nonintubated patients.

Uniportal has been associated with decreased mortality and morbidity, reduces of intraoperative blood loss, less wound infections, shorter hospital stay, better pain and quality of life. Is highly considerate for even elderly patients or with multiples comorbidities (6).

The efficacy of these procedures relays in the surgeon's skills (surgeons that have passed the learning curve and visited a high volume training center) and the appropriate instruments use (adequate optics and articulated instruments, straight or curved but flexible). The employ of uniportal represents technical difficulties and greater risk that can only be surpass by an adequate planning and training (7,8).

### Case presentation

The surgery performed consisted in a right upper lobectomy, the patient a female, 44 years old diagnosed by thoracic computed axial tomography (CAT) scan and needle punch biopsy as a bronchioalveolar carcinoma of upper right lobe. The patient had a good lung functions by pulmonary function test (PFT), no other pathologies associated, negative smoking history and negative previous oncologic history (*Figure 1*).

During the surgery an uniportal approach through a 4-cm incision in the 5th intercostal space (ICE) (*Figure 2*: wound plus drainage at the end of procedure). The only variation in the technique was the level of resection, by the localization of the tumor close to the fissure was necessary to resect part of the middle lobe to achieve oncological margin (*Figure 3*). The anesthesia was an intubated patient with a blockage. The



**Figure 4** Dr. Diego González-Rivas and Dr. Jonathan Vargas Acevedo during the masterclass.



**Figure 5** Dr. Diego González-Rivas during a lecture.



**Figure 6** Surgeons at the 1st masterclass in Dominican Republic.

procedure was completed without any events or complications. The patient evolution was satisfactory and discharge 48 hours after de procedure. The final pathology report shows a

bronchoalveolar infiltrating carcinoma in a stage IA.

## Discussion

The uniportal VATS in Dominican Republic started in 2016 by the authors group following the guide and technique of Dr. González-Rivas. During the beginning the first step were guided to the realization of benign and low complexity procedures as decortications, pleural effusions drainage, pneumothorax.

Several publications of case reports and patient series has been made, but still there is some limitations and resistance in the medical and surgical personnel in our hospitals. Before the 2016 only antecedents were a publication of multiportal in 12 patients (10-12). In lung cancer this technique was never used in any Dominican Hospital.

In that context, to spread the technique and to teach how proven to be safe and reproducible it's the uniportal approach, in June the first masterclass uniportal VATS was held, took placed in CEDIMAT and included numerous conferences, lectures and video presentations and it was performed a live right upper lobectomy (*Figure 4*: Dr. Diego González-Rivas and Dr. Jonathan Vargas during the masterclass).

The concepts lectured in this event included the history, indications, complications and approaches of VATS by Dr. González-Rivas, renowned as a pioneer in this technique and acknowledged worldwide for being an expert and motivator for this surgery, teaching and promoting education in the formation of thoracic surgeons (*Figure 5*: Dr. Diego González-Rivas during a lecture).

The masterclass included 2 days with the participation of surgery residents, general surgeons, thoracic surgeons and anesthesiologist (*Figures 6,7*). Surgeons at the 1st masterclass in Dominican Republic).

The second day comprehended discussions, video presentations and the live surgery was performed.

## Perspective

In our country, thoracic surgery is still feared including by the conventional open approach, our group intends to change this perspective following the teachings of Dr. González-Rivas and continue diffusing the uniportal VATS techniques as the most beneficial, reproducible and safe even in a country with several limitations in the hospital and health care programs.

The support obtained by the attending surgeons to the masterclass, the media coverage and the result of the patient



**Figure 7** Surgeons at the 1st masterclass in Dominican Republic.

motivate us to keep working in future events like this masterclass, with high complexity patients and promote this technique everywhere in our country.

As part of the learning process of this technique and in order to pursue more challenging cases and taking advantage of the guidance of Dr. González-Rivas, and motivated after the masterclass, this year we have become the first Dominican surgeon to have trained in Shanghai Pulmonary Hospital.

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