SINGLE-INCISION VATS LOBECTOMY

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SKILLS AND DECISION MAKING COURSES
Saturday 4th May 2013
• NO DISCLOSURES
To improve is to change; to be perfect is to change often.

-Winston Churchill
ERGONOMY
DIRECT VIEW
ABSENCE OF DIHEDRAL OR TORSION ANGLE

• Mathematic and physical demonstration

Conventional Triangulation makes a forward motion of VATS camera to the vanishing point. It's a volume Packaged. This creates a new optical plane with the genesis of dihedral or torsion angle not favorable with standard two-dimension monitors. Instruments inserted parallel to videothoracoscope mimic inside the chest maneuvers performed during open surgery.

Luca Bertolaccini, Physic and thoracic surgeon
Naples, 26 Oct 2012- Uniportal VATS meeting
Video-assisted thoracic surgery lobectomy: 3-year initial experience with 200 cases

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Abstract

Objective: To analyse the evolution of the video-assisted thoracoscopic (VATS) approach for lobectomy and results during the first 3 years of program. Methods: From 1st July 2007 to 31st July 2010 we carried out 200 lobectomies by VATS. In February 2009 we started performing VATS lobectomies with only 2 incisions. We have analyzed both annual and overall outcomes regarding type of approach, conversion rate, surgical time, lymphadenectomy and overall survival. Results: Distribution of the cases per year were as follows: first-year 32, second-year 65, third-year 103. Overall conversion rate was 14.5% (first-year 25%, second-year 20%, third-year 7.8%; p = 0.017). Surgical approach: 4 ports (1 case), 3 ports (99 cases, 100% in first-year), 2 ports (99 cases, 80% in third-year), single-port (1 case, third-year) Mean surgical time in successful VATS was 193.8 min (210.8 first-year, 207.9 second-year, 181.1 third-year; p = 0.011), mean number of lymph nodes were 11.9 (9.3 first-year, 10.1 second-year, 13.9 third-year; p = 0.003) and mean explored stations was 4.2 (3.6 first-year, 3.8 second-year, 4.5 third-year; p < 0.001). Globally median chest tube duration was 3 days. Median length of stay was 4 days. The disease-free survival at 30 months was 85% for Stage I patients and 62% for non-stage I patients. Conclusions: As we gain more experience over time, with more cases performed each year and less invasive approaches, results improve in terms of less surgical time and more extended lymphadenectomies. Furthermore, we have observed a clear evolution in our surgical approach to a less invasive 2-port approach. In selected cases we have implemented the single-port lobectomy.

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Keywords: Thoracoscopy/VATS; Lobectomy; Lung cancer surgery; Surgical approach
Uniportal VATS lobectomy: technical aspects

- Double-port and anterior thoracotomy
- Utility incision: 4-5 cm (5th ie)
- No rib spreading, no trocar
- Lung exposure, move the table
- Direct visualization target tissue

- One screen, 30 degree, 1 or 2 surgeons
- Camera: posterior part of incision
- Bimanual instrumentation, coordination
- Upper lobes: Artery first, then vein.
- Vascular clips (click aV), curved-tip staplers
Uniportal / Single-Incision Scanlan® VATS Instruments
As recommended by Diego Gonzalez-Rivas, MD, FECTS

Uniportal (single-incision) VATS surgery
“Avoiding the trocar improves the instrumentation and minimizes the compression of the intercostal nerve.”
Dr. Gonzalez-Rivas

“Although uniporal video-assisted thoracoscopic (VATS) lobectomy can be performed with conventional instruments, the use of specially adapted conventional material (such as instrumentation with both proximal and distal articulations) seems to be more fitted for successful single-port lobectomy.”

Information on Uniportal VATS at the VATS University of Single Incision Thoracosurgery: www.ScanlanVATS.com

Photo courtesy of Dr. Gonzalez-Rivas

This product information is intended for healthcare professionals. It is not suitable for use in human subjects or to illustrate a procedure for human use. This procedure is to be performed by a trained surgeon who addresses the unique needs of the individual patient.
Incision size

RUL

PNEUMONECTOMY
Single-Incision Thoracoscopic Right Upper Lobectomy With Chest Wall Resection by Posterior Approach

Diego Gonzalez-Rivas, MD,*† Ricardo Fernandez, MD,*† Eva Fieira, MD,* and Lucia Mendez, MD*

Abstract: Lobectomy requiring chest wall resection is usually performed by thoracotomy, but thanks to the advances in the field of thoroscopic surgery, this procedure can be performed by video-assisted thoracoscopic surgery (VATS). Recent improvements in surgical devices and previous VATS experience have allowed us to perform this complex surgery for advanced stages to be undertaken safely. Most of the thoracoscopic lobectomies with rib resection are performed using three to four incisions. We report a different minimally invasive technique for chest wall resection (minimally invasive posterior approach) and VATS right upper lobectomy (single-incision anterior approach).

Key Words: Single-port VATS lobectomy, Chest wall resection, Rib involvement, Thoracoscopic approach, Chemotherapy.

CASE REPORT

A 57-year-old male smoker with chronic obstructive pulmonary disease was admitted to our department for right upper lobe (RUL) adenocarcinoma surgery. Computed tomographic scan revealed a 3.6-cm adenocarcinoma in the RUL with chest wall involvement (Fig. 1A). The findings from the bronchoscopy were normal. After induction chemotherapy, the patient was proposed for surgery.

The patient was placed in a right-lateral decubitus position. A 4-cm incision was made in the fifth intercostal space through the fifth rib spreading (no soft tissue retractor and no incision). A complete paraesthesial and subcostal incision was also undertaken. We performed VATS with 4-mm instruments and a 4-mm video camera placed in the axillary zone (Fig. 2B). The posterior pleura was dissected and a 2-cm incision was made in the posterior chest wall. The dissection of the posterior pericardium caused the diaphragm to rise in the left hemithorax. Once the lung dissection was complete, the chest tube was placed posteriorly (Fig. 2B), and the patient was discharged from the hospital on the seventh postoperative day (prolonged air leak).

The chest tube was removed 7 days later, and the patient was discharged that same day with no complications (Fig. 2A).

The final pathological examination revealed a 3.3-cm squamous cell carcinoma with no lymph node involvement. The thoracoscopic surgery was performed in a single incision through the fifth intercostal space with no rib resection and no chest tube placement.

DISCUSSION

When feasible, sleeve resection is preferred to pneumonectomy to preserve pulmonary function in patients with small tumors. Although most centers use a utility incision in the 3rd or 5th intercostal space, we performed a single-incision VATS lobectomy with chest wall resection.

Video clip is available online.
Thoracoscopic lobectomy through a single incision

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...with a video-assisted thoracoscopic approach, with no rib spreading.

The surgeon and the assistant must to be placed in front of the patient in order to have the same thoracoscopic vision during all steps of the procedure and be more coordinated with the movements (Fig. 9.1).

The camera must be of 30° in order to enable us to achieve a panoramic view (10 mm scope high definition preferred). Instruments must preferably be long and curved to allow the insertion of 3 or 4 instruments simultaneously.

Optimal exposure of the lung is key in order to facilitate the dissection of the structures and to avoid instrument malposition. Even though the...
Teaching. Wetlab: Uniportal VATS courses
Upper Lobectomy
LUL Bronchial management technical aspects
Minor fissure - Camera down
Curved-tip stapler  Vascular clips
Uniportal Video-Assisted Thoracoscopic Lobectomy: Two Years of Experience

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Background. A video-assisted thoracoscopic approach to lobectomy varies among surgeons. Typically, 3 to 4 incisions are made. Our approach has evolved from a 3-port to a 2-port approach to a single 4- to 5-cm incision with no rib spreading. We report results with single-incision video-assisted thoracic major pulmonary resections during our first 2 years of experience.

Methods. In June 2010, we began performing video-assisted thoracoscopic lobectomies through a uniportal approach (no rib spreading). By July 12, 2012, 102 patients had undergone this single-incision approach.

Results. Of 102 attempted major resections, 97 were successfully completed with a single incision (operations in 3 patients were converted to open surgery and 2 patients needed 1 additional incision). Five uniportal pneumonectomies were not included in the study. We have analyzed early outcomes of successful uniportal lobectomies (92 patients studied). Right upper lobectomy was the most frequent resection (28 cases). Mean surgical time was 154.1 ± 46 minutes (range, 60–310 minutes), mean number of lymph nodes was 14.5 ± 7 (range, 5–38 nodes), and mean number of explored nodal stations was 4.6 ± 1.2 (range, 3–8 stations). The mean tumor size was 2.8 ± 1.5 cm (0–6.5 cm). The median duration of time a chest tube was in place was 2 days and the median length of hospital stay was 3 days. There were complications in 14 patients; no perioperative 30-day mortality was reported.

Conclusions. Single-incision video-assisted thoracoscopic anatomic resection is a feasible and safe procedure with good peroperative results, especially when performed by surgeons experienced with the double-port technique and anterior thoracotomy.

Single-incision VATS major resections: Results

- June 2010 - April 2013: **207 Uniportal lobectomies (605 total uniportal VATS)**
- **200 successful major resections:**
  - 2 Additional incision (double port)
  - 5 Conversion (bleeding)-advanced cases
- Most frequent resection: RUL
- Mean surgical time: 157.6 min (80-310)
- Mean number of lymph nodes: 14.8 (5-38)
- Mean nodal stations: 4.5 (3-8)
- Median chest tube: 2 days
- Median hospital stay: 3 days
- Complications: 37 patients
• Huge Extrapulmonary mass
• Nodule Enucleation
• 8cm tumor prior induction chemo
• Strong adhesions-tuberculosis
• N2 cases (chemotherapy)
• Silicotic calcified hilar lymph nodes
• Bronchiectasis
• RUL-Anatomic Segmentectomy
• One or two anatomic segments
• Very Obese patients
• Severe COPD
• Situs inversus lobectomy
• CCAM with bronchial and arterial atresia
• Complex anatomy
Single incision challenging cases

- Sleeve lobectomy
- Angioplasty
- Atrium involvement
- Post chemo-radiotherapy (>60Gy)
- Pancoast tumor
- Huge mass
- Chest wall resection
- Completion pneumonectomy
- Situs Inversus lobectomy
- REVATS (x3)
- Bleeding control
IS UNIPORTAL THORACOSCOPIC SURGERY A FEASIBLE APPROACH FOR ADVANCED STAGES OF NON-SMALL CELL LUNG CANCER?

Objectives

Conventional video-assisted thoracoscopic (VATS) lobectomy for advanced lung cancer is a feasible and safe surgery in experienced centers. The aim of this study is to assess the feasibility of uniportal VATS approach in the treatment of advanced NSCLC and compare the perioperative outcomes with early-stage tumors.

Methods

From June-2010 to December-2012, we performed 163 uniportal VATS major pulmonary resections. Only NSCLC cases were included in this study. Patients were divided in two groups: A, early stage and B, advanced cases (> 5 cm, T3 or T4 tumors, or tumors requiring neoadjuvant treatment). A descriptive, prospective and retrospective study was performed, comparing perioperative outcomes obtained in both groups.

Results

A total of 130 cases were included: 87 (A) vs 43 (B) patients (conversion rate 1.1 vs 6.5%, p=0.119). Mean global age was 64.9 years and 73.6% were man. The patient demographic data were similar in the two groups.

Upper lobectomies (A,56 vs B,24 patients) and anatomic segmentectomies (A,4 vs B,0) were more frequent in group A while pneumonectomy was more frequent in B (A,1 vs B,6 patients). Surgical time was longer (144.8±41.6 vs 183.2±48.9, p<0.001), and median number of lymph nodes (14 vs 16, p=0.004) were statistically higher in advanced cases. Median number of nodal stations (5 vs 5, p=0.165), days of chest tube (2 vs 2, p=0.098), HOS (3 vs 3, p=0.072), and rate of complications (18.6 vs 16.3%, p=0.075) were similar in both groups. A total of 77.4% of patients (A) and 36.6% (B) were classified as stage I after pathological examination. One patient died on the 58th postoperative day.

Conclusions

Uniportal VATS lobectomy for advanced cases of NSCLC is a safe and reliable procedure that provides perioperative outcomes similar to those obtained with early stage tumors. Further analyses of survival for uniportal VATS lobectomy of advanced stage tumors are ongoing.
Contraindications

- Surgeon discomfort
- Huge tumors
Uniportal LUL segmentectomy and LLL 7,8 segmentectomy
Uniportal ReVATS right apical segmentectomy (segment 1)
Chest wall resection-RUL after chemo

SINGLE INCISION THORACOSCOPIC RIGHT UPPER LOBECTOMY WITH CHEST WALL RESECTION BY POSTERIOR APPROACH
Left lower lobe sleeve lobectomy
Postchemo-radiotherapy 66Gy
Angioplasty
Atrium involvement (previous cardiac surgery)
Post chemo-radiotherapy left intrapericardial pneumonectomy
Bleeding control
Think Uniportal!
Next Future

Single Port
Operation@Home

Our Technicians Still Make House Calls!

Medical Surgery Performed Telepathically by Real Surgeons at Half the Price!
SUMMARY

• Feasible, Safe and oncologic procedure
• Only one incision
• Instrumentation is like anterior thoracotomy
• The view is direct
• No trocar: less compresion to the nerve
• Advanced cases, complex resections
• NO LIMITS: PHYSIC EXPLANATION
THANKS !!

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