ROBOTIC LOBECTOMY FOR EARLY STAGE LUNG CANCER : EXPRIENCES AT CHO RAY HOSPITAL

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Lobectomy is standard procedure for the treatment of early stage lung cancer.

Since 1990 introduced, VATS lobectomy has replaced open lobectomy

Now: preferred choice of thoracic surgeon for early stage lung cancer surgery

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ORIGINAL ARTICLE

Video-Assisted Thoracoscopic or Open Lobectomy in Early-Stage Lung Cancer

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VATS is the standard approach for early-stage lung cancer

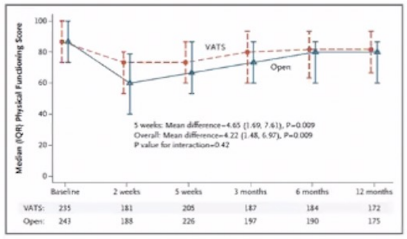
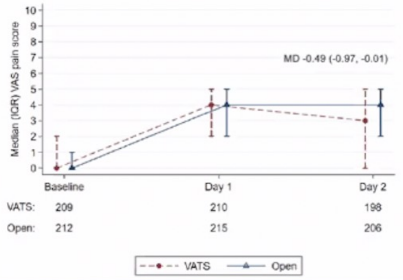


Figure 2. Primary Outcome Measure — QLQ-C30 Physical Functioning.



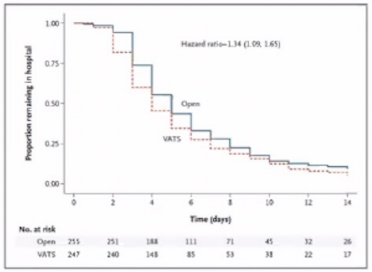


Figure 4. Length of In-Hospital Stay.

VATS LOBECTOMY

Advantages

- Less postoperative pain
- Early return to normal activity
- Shorter chest tube duration and hospital length of stay
- Fewer overall complications

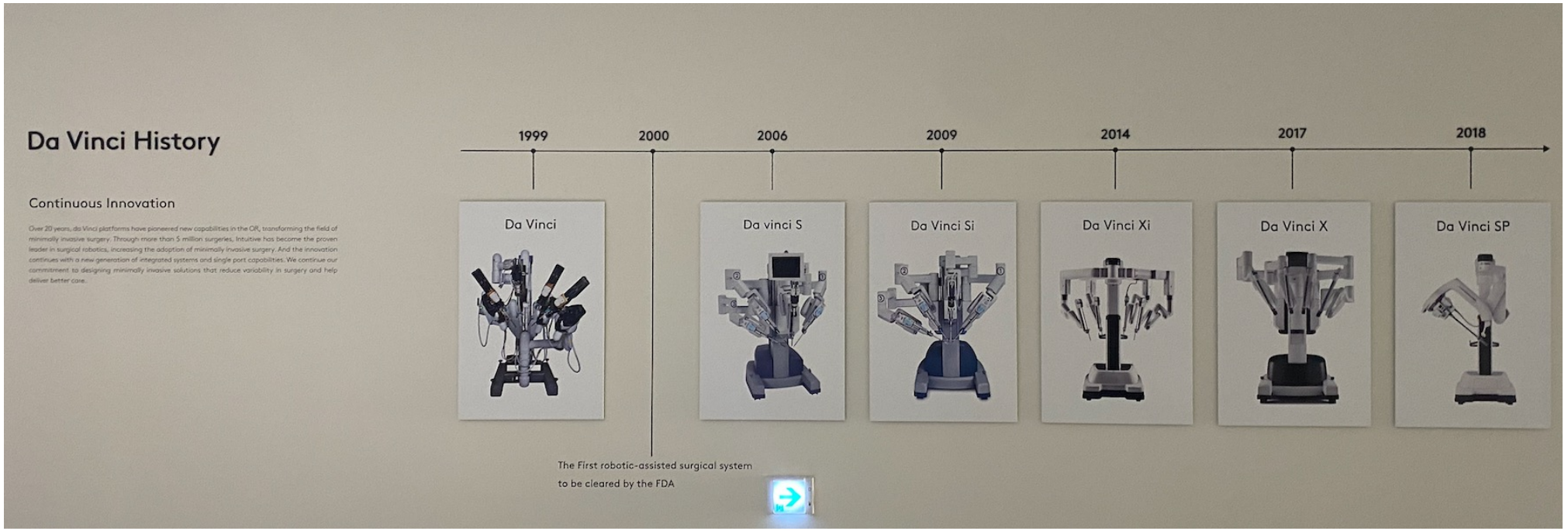
Limitation

- 2 D visualization
- Non wristed instruments
- Ergonomic discomfort

RATS LOBECTOMY

2000: Robotic technique has evolved. RATS become performed in many places in the world

Robotic surgery: improve VATS limitations



RATS LOBECTOMY

Advantages

Visualization:

- 3 D high-definition imaging
- Magnified view
- Main surgeon adjusts the camera

Instrumentation

- Endo wrist of robotic instruments with 7 degrees of freedom

Manipulate complex surgical procedures with precision, better lymph nodes dissection

Compare RATS & VATS LOBECTOMY

- Similar outcome 30 day mortality rate
- Longer mean operative time (25 minute)
- Lower conversion to open rate
- Lower 30 day complication rate

Robotic-Assisted Versus Thoracoscopic Lobectomy Outcomes From High-Volume Thoracic Surgeons

Check for updates

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Background. Reports of surgical outcomes comparing proficient surgeons who perform either robotic-assisted or video-assisted thoracoscopic lobectomy are lacking. We evaluate the comparative effectiveness of robotic-assisted and video-assisted thoracoscopic lobectomies by surgeons who performed 20 or more annual surgical procedures in a national database.

Methods. Patients 18 years or older, who underwent elective lobectomy by surgeons who performed 20 or more annual lobectomies by robotic-assisted or thoracoscopic approach from January 2011 through September 2015, were identified in the Premier Healthcare database with the use of codes from the ninth revision of the International Statistical Classification of Diseases and Related Health Problems. Propensity-score matching based on patient and hospital characteristics and by year was performed 1:1 to identify comparable cohorts for analysis (n = 838 in each cohort). All tests were two-sided, with statistical significance set at p less than 0.05.

Results. A total of 23,779 patients received an elective lobectomy during the study period: 9,360 were performed by video-assisted thoracoscopic approach and 2,994 were by robotic-assisted approach. Propensity-matched comparison of lobectomies performed by surgeons who performed 20 or more procedures annually (n = 838) showed that robotic-assisted procedures had a longer mean operative time by 25 minutes (mean 247.1 minutes vs 222.6 minutes, $p < 0.0001$) but had a lower conversion-to-open rate (4.8% vs 8.0%, $p = 0.007$) and a lower 30-day complication rate (33.4% vs 39.2%, $p = 0.0128$). Transfusion rates and 30-day mortality rates were similar between the two cohorts.

Conclusions. When surgical outcomes are limited to surgeons who perform 20 or more annual procedures, the robotic-assisted approach is associated with a lower conversion-to-open rate and lower 30-day complication rate when than video-assisted thoracoscopic surgeons, with a mean operative time difference of 25 minutes.

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RATS LOBECTOMY

62 206 pts (I – IIIA): open, VATS, RATS

RATS
- Similar outcome
- Length of stay shorter open
- Lymph nodes dissection improved compare to VATS

Nationwide Assessment of Robotic Lobectomy for Non-Small Cell Lung Cancer

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Background. Robotic lobectomy has been described for non-small cell lung cancer (NSCLC). Our objectives were to (1) evaluate the use of robotic lobectomy over time, (2) identify factors associated with its use, and (3) assess outcomes after robotic lobectomy compared with other surgical approaches.

Methods. Stage I to IIIA NSCLC patients were identified from the National Cancer Data Base (2010 to 2012). Trends in robotic lobectomy were assessed over time, and multivariable logistic regression models were developed to identify factors associated with its use. Propensity-matched cohorts were constructed to compare postoperative outcomes after robotic lobectomy with thoracoscopic and open lobectomy.

Results. Lobectomy was performed in 62,206 patients by open (n = 45,527), thoracoscopic (n = 12,990), or robotic (n = 3,689) procedures at 1,215 hospitals. Between 2010 and 2012, robotic lobectomy significantly increased, from 3.0% to 9.1% ($p < 0.001$). Academic (odds ratio, 1.55; 95% confidence interval, 1.04 to 2.33) and high-volume hospitals (odds ratio, 1.49; 95% confidence interval, 1.04 to 2.14) were associated with increased use of robotic lobectomy. Length of stay was shorter in robotic lobectomy compared with open lobectomy (6.1 vs 6.9 days; $p < 0.001$). Fewer lymph nodes (9.9 vs 10.9; $p < 0.001$) and 12 or more nodes were examined less frequently (32.0% vs 35.6%; $p = 0.005$) in robotic resections than in thoracoscopic resections. There was no difference between robotic and open or robotic and thoracoscopic lobectomy patients in margin positivity, 30-day readmission, and deaths at 30 and 90 days.

Conclusions. Robotic lobectomies have significantly increased in stage I to IIIA NSCLC patients, with outcomes similar to other approaches. Additional studies are needed to determine if this technology offers potential advantages compared with video-assisted thoracoscopic operations.

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HOW WE DO

2018: beginning

Training & cooperating

Attending workshop

Simple procedures: mediastinal tumor, wedge resection

Early stage lung cancer lobectomy

ROOM SET UP


ROBOT Si

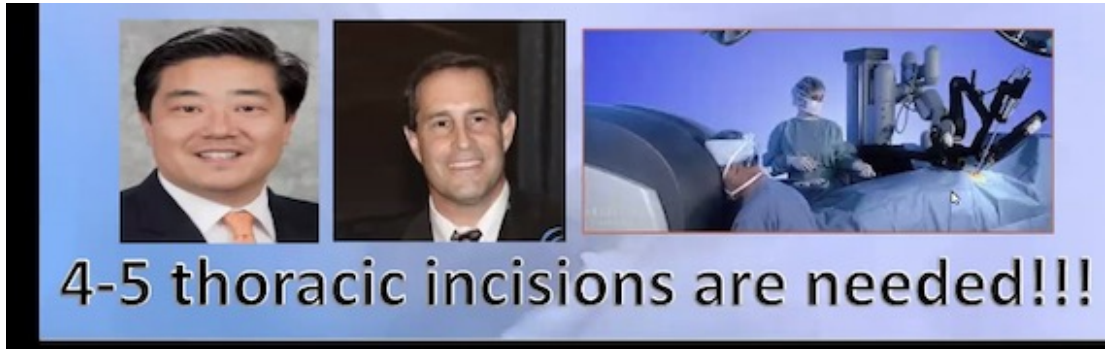
Patient position

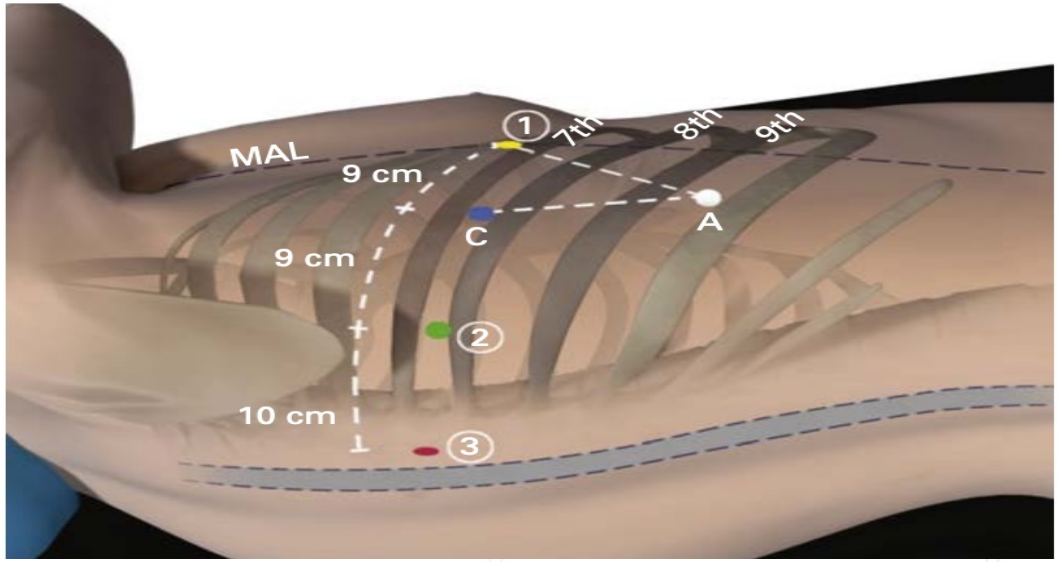
- The lateral decubitus position

Open the rib space, don’t interfere the thoracoscope

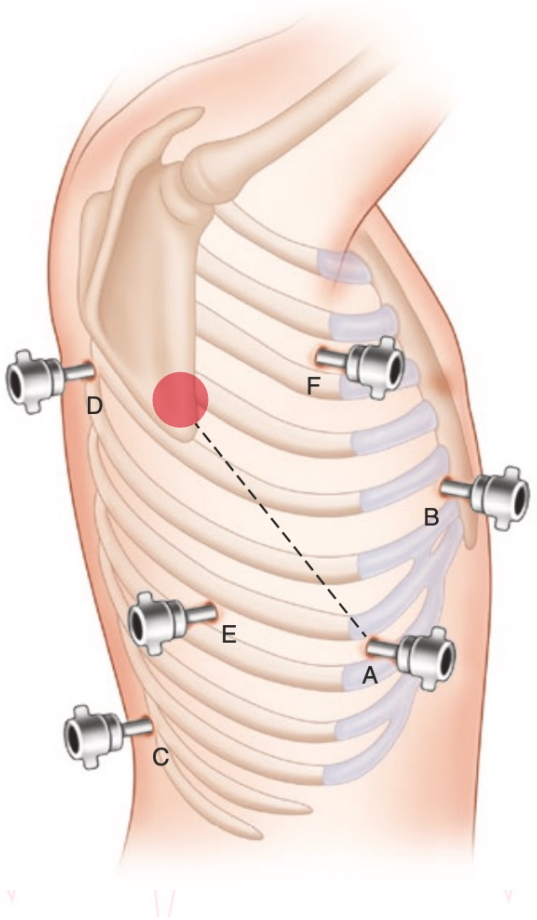
PORT PLACEMENT

Cerfolio & Bernard Park: the same intercostal space





Kemp Kenstine St: 4 or 5 port



OUR THORACOPORT PLACEMENT: 3 PORT

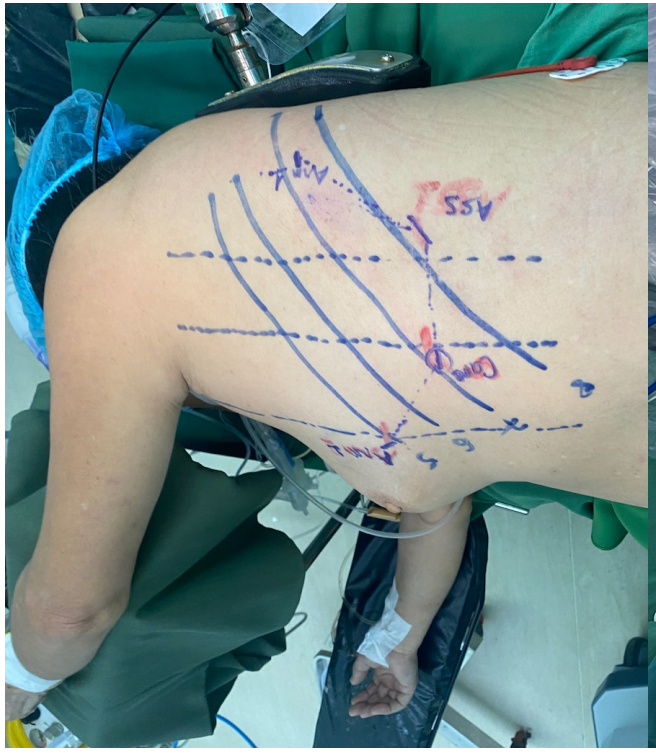
1.Camera port: 7th intercostal space on the pos axillary line

2.Arm 2: 5th intercostal space on the ant axillary line

3.Arm 1: 7th intercostal space away from assistant port 8cm

4.Assistance port: 8th intercostal space, between arm 1 and camera port.

Distance between ports: 8cm (a handbreath)



Thoracoport placement marking

Port placement

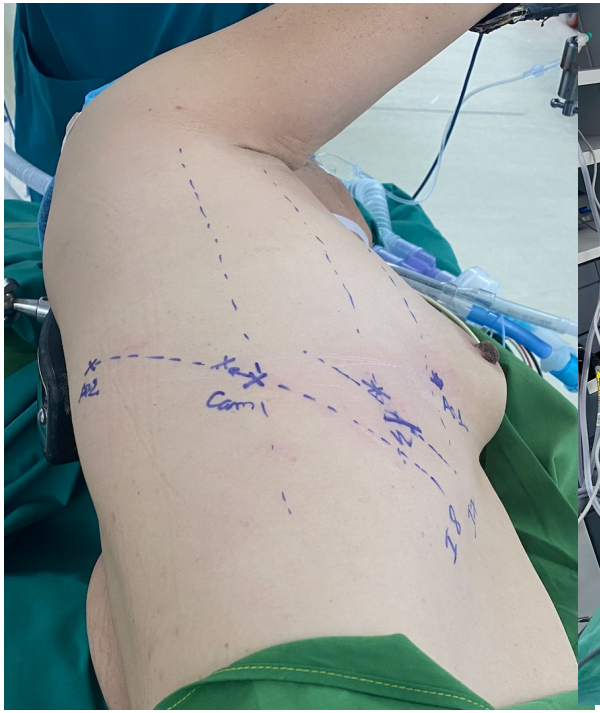
ON THE LEFT SIDE

OUR THORACOPORT PLACEMENT: 3 PORT

1. Camera port: 7th intercostal space on the pos axillary line
2. Arm 2: 7th intercostal space, away from camera port 8cm
3. Arm 1: 6th intercostal space on the ant axillary line

4. Assistant port: 7th or 8th intercostal space

Distance between ports: 8cm (a handbreath)



Thoracoport placement marking

Port placement

ON THE RIGHT SIDE

OUR PORT PLACEMENT

Advantage

- Cheaper (only 3 arm, no CO2)
- Shorter set-up time
- Faster conversion to open
- Available with our patients (thin pts)

Disvantage

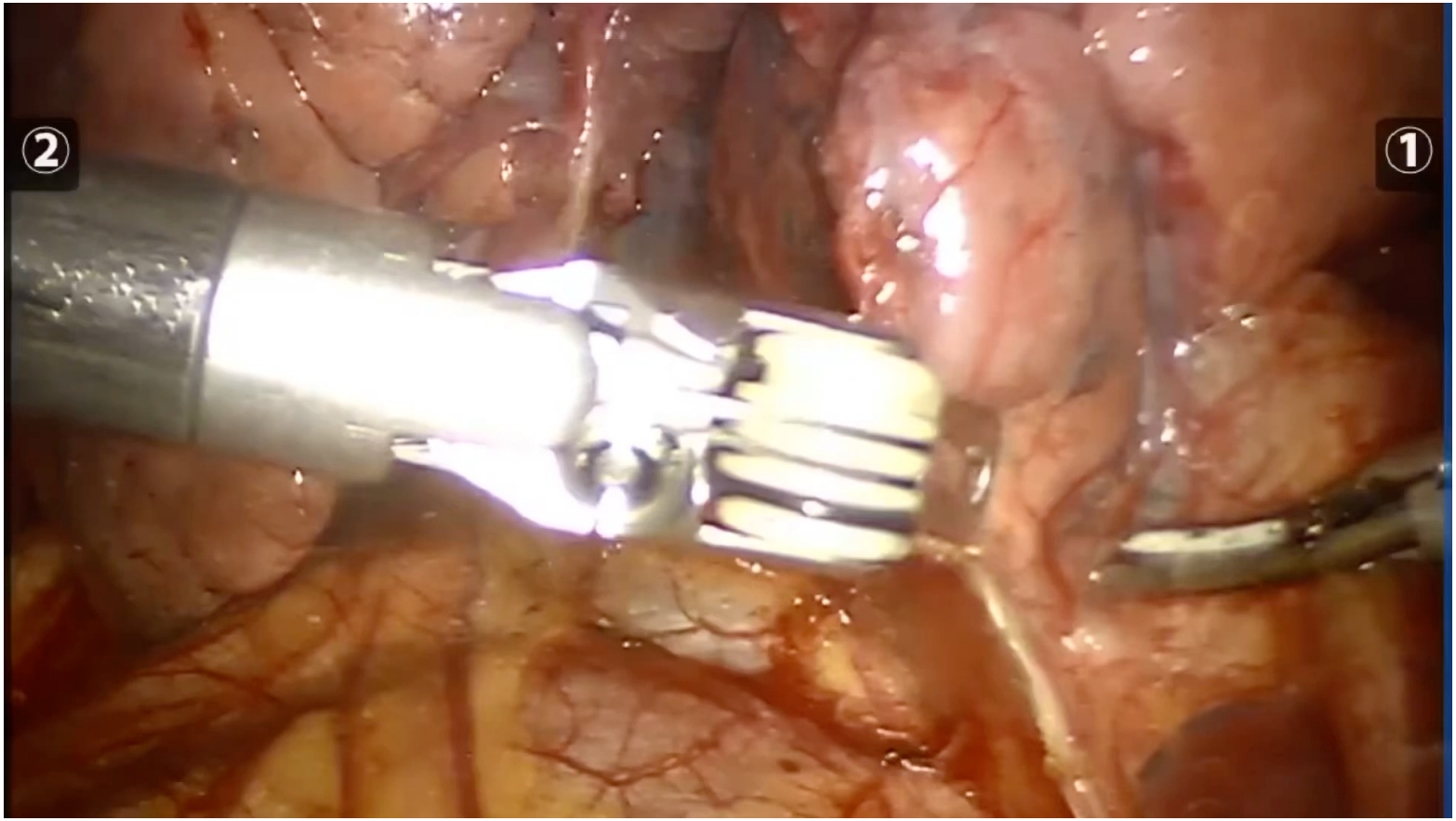
- Depent on the assistant.
- Learning curve

SET UP OPERATING

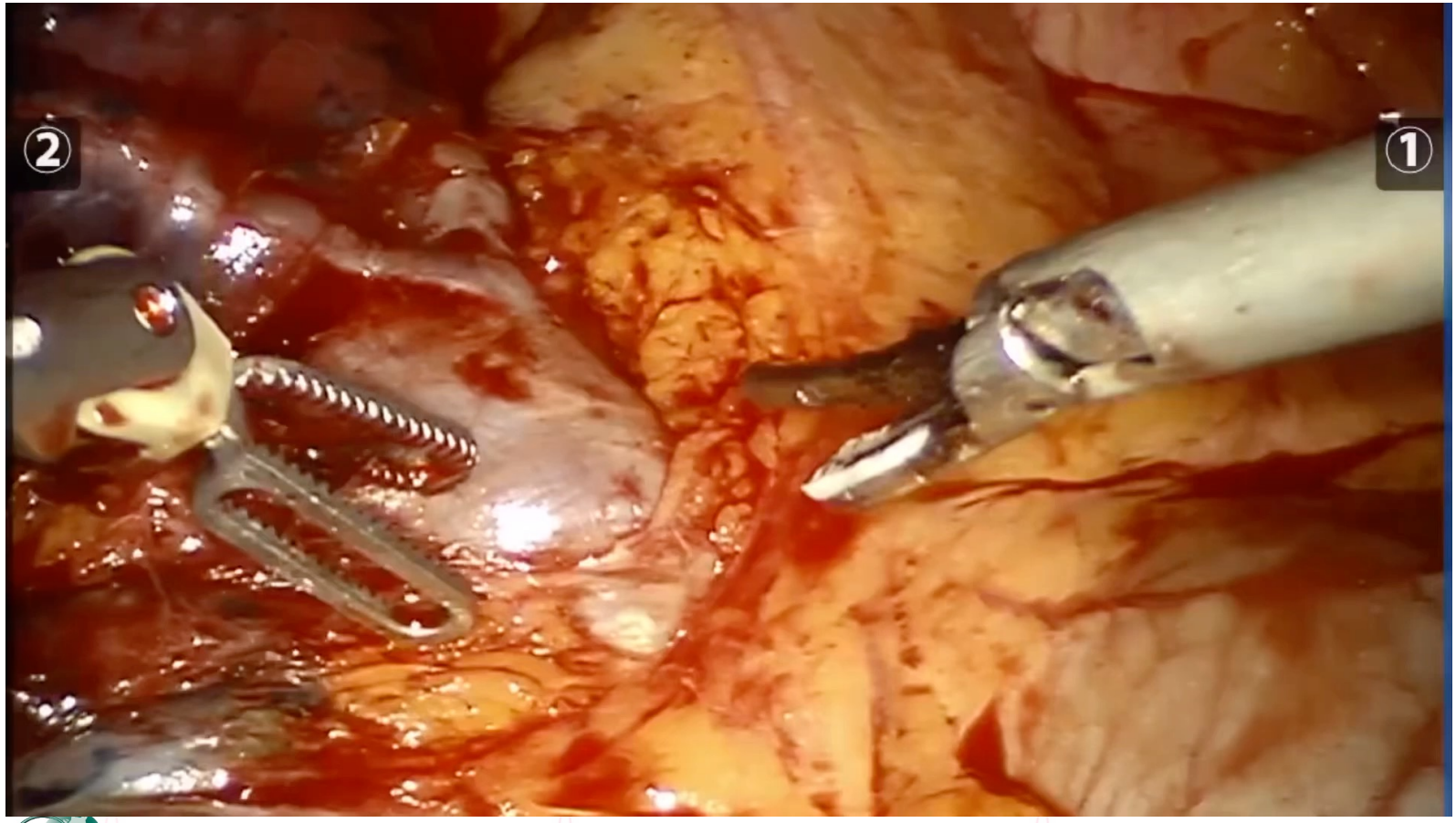
Robotic docking

Performance of the procedure

LEFT UPPER LOBECTOMY

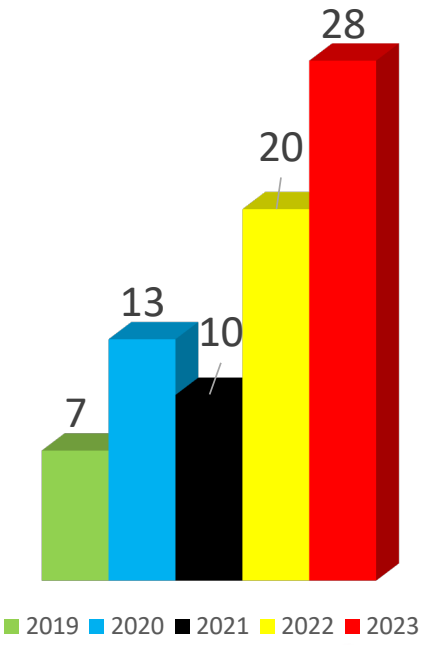


RIGHT UPPER LOBECTOMY

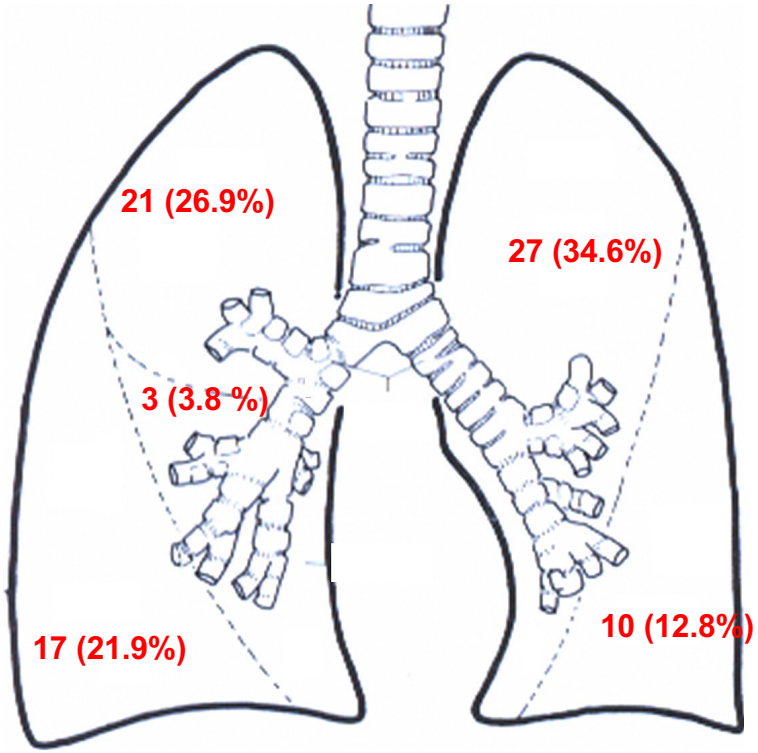


OUR RATS LOBECTOMY RESULT

9/2019 – 9/2023: 78 patients RATS lobectomy at Thoracic surgery Department, CHO RAY Hospital



OUR RATS LOBECTOMY RESULT

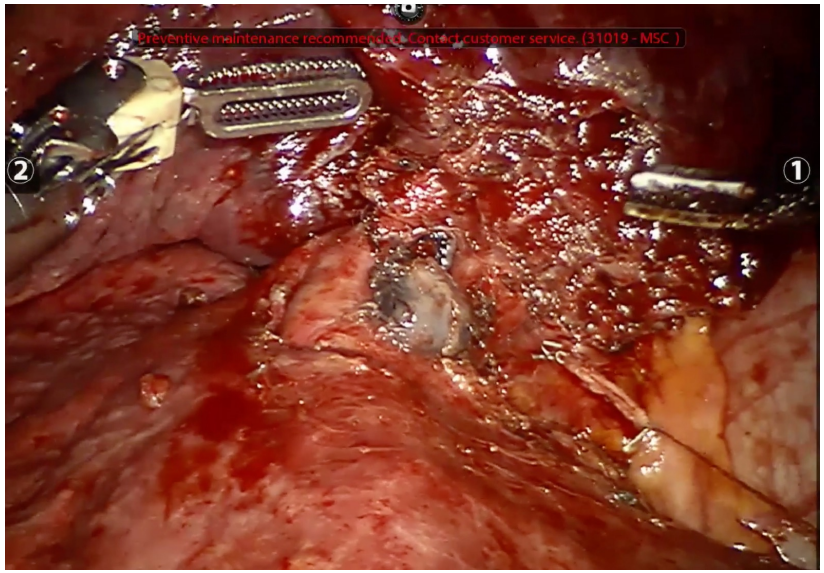


	n =78	%
Age	30 - 75	Median: 61.4 ± 8.7
Sex		
male	56	71.8 %
female	22	28.2 %
Lung cancer stage		
stage I	33	42.3 %
Stage II	45	57.7 %
Lung location		
Left upper lobe	27	34.6
Left lower lobe	10	12.8
Right upper lobe	21	26.9
Right middle lobe	3	3.8
Right lower lobe	17	21.9

OUR RATS LOBECTOMY RESULT

- Median operative time: 3.34 ± 0,29 hour.
- Length of hospital stay: 4.9 ± 0,52 day

Complication	Pts (n=88)
Subcutaneous emphysema	6 (7.6%)
Pneumonia	1 (1.3%)
Air leak	5 (6.8%)
Convertion to thoracotomy	3 (3.8%)
Mortality	0



Convertion to thoracotomy
3 pts: invasive lymph nodes to pulmonary vessels

OUR RATS LOBECTOMY RESULT

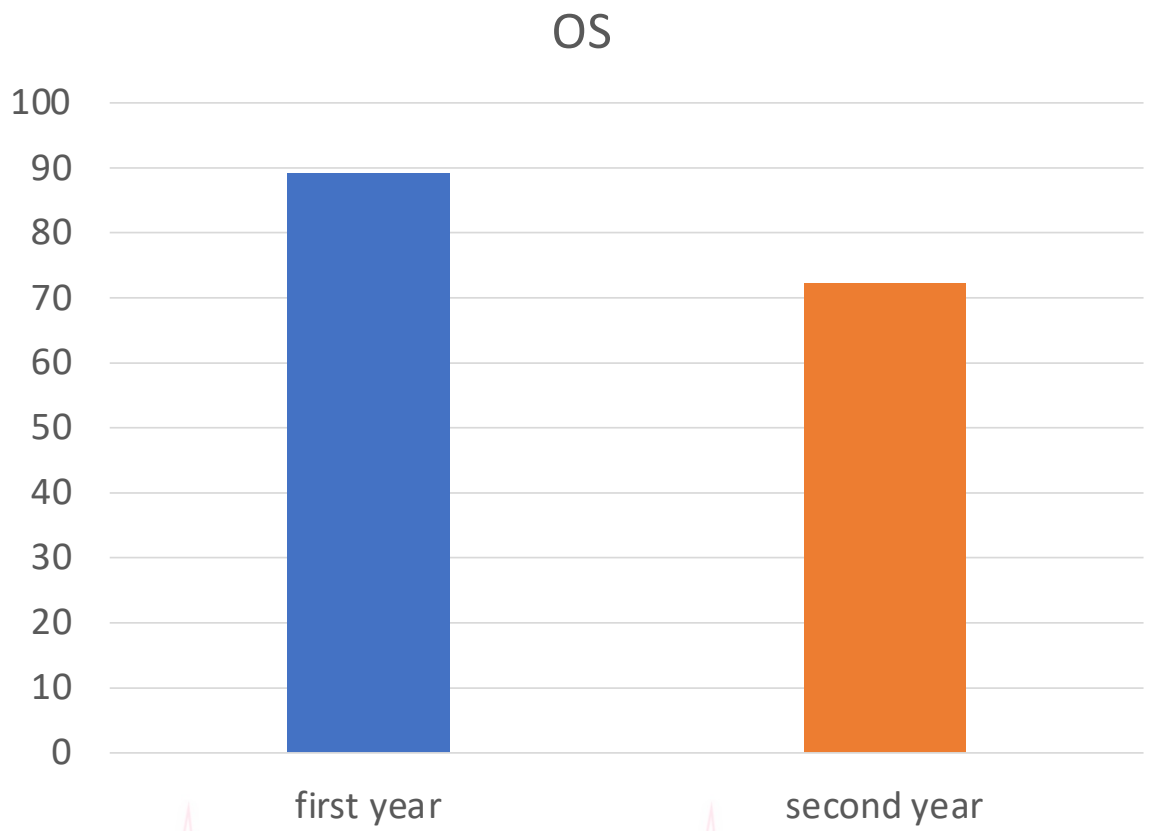
Need more long – term time to follow up

More precision study

Folow up: 61 pts. 24 months

Recurrent: not evaluate

OS 1 year: 89.2%, 2 years: 72.2%



SUMMARY

- RATS Lobectomy: safe and feasibility, similar outcome.
- Build a skill team
- Select appropriate patients for the beginning
- Choose your suitable (favorite) set up: 3 arm port placement

THANK YOU FOR YOUR ATTENTION