



**GÖĞÜS KALP DAMAR ANESTEZİ  
VE YOĞUN BAKIM DERNEĞİ**

**27. Ulusal  
Kongresi**

**24 - 25 Eylül 2021 Wyndham Grand İzmir Özdilek**



**Toraks cerrahisinde uyanık VATS**

**Ali Sait Kavaklı**



# UYANIK/NONENTÜBE HASTADA VATS

Dr. Ali Sait Kavaklı  
Sağlık Bilimleri Üniversitesi  
Antalya Eğitim ve Araştırma Hastanesi  
Anesteziyoloji ve Reanimasyon Kliniği



## minimally invasive techniques

### Thoracoscopic Wedge Resection of Blebs Under Local Anesthesia With Sedation for Treatment of a Spontaneous Pneumothorax\*

*Ikashi Tojo, MD;  
Mura, MD, FCCP*

### Local analgesia in thoracic surgery

PROFESSOR V. I. PSCHENICHNIK

(Ann Thorac Surg 2004;78:1761-8)

From the A. V. Vishnev  
U.S.S.R., Director, Pr  
of Medical Scie

*Frenik sinir bloğu-  
hilusuna lokal ane*

## Feasibility and Results of Awake Thoracoscopic Resection of Solitary Pulmonary Nodules

327

Eugenio Pompeo, MD, Davide Mineo, MD, Paola Rogliani, MD,  
Alessandro F. Sabato, MD, and Tommaso C. Mineo, MD

Division of Thoracic Surgery and Multidisciplinary Pulmonary Program, Policlinico Tor Vergata University, Rome, Italy

(Ann Thorac Surg 1

## Thoracoscopic Pneumothorax Under Local and Epidural Anesthesia in High-Risk Patients

Takahiro Mukaida, MD, Akio Andou, MD, Hiroshi Date, MD, Motoi Aoe, MD, and Nobuyoshi Shimizu, MD

Department of Surgery II, Okayama University School of Medicine, Okayama, Japan

**thoracic**  
**20 years experience**  
**with 3265 cases\***

PROFESSOR B. K. OSSISOV, D.M.S.  
Moscow, USSR†

Case Report

## Arytenoid cartilage dislocation caused by a double-lumen endobronchial tube

I. Mikuni<sup>1\*</sup>, A. Suzuki<sup>1</sup>, O. Takahata<sup>1</sup>, S. Fujita<sup>2</sup>, S. Otomo<sup>3</sup> and H. Iwasaki<sup>1</sup>

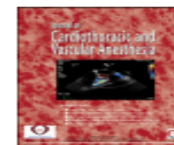
Journal of Cardiothoracic and Vascular Anesthesia 000 (2021) 1–4



Contents lists available at ScienceDirect

Journal of Cardiothoracic and Vascular Anesthesia

journal homepage: [www.jcvaonline.com](http://www.jcvaonline.com)



Case Report

## Tracheobronchial Trauma From Double-Lumen Tube Placement in Patients Undergoing Lung Transplantation

Sunny S. Lou, MD, PhD<sup>\*</sup>, Michael Bethel, MD<sup>†</sup>,  
Andrea B. Reidy, MD<sup>\*</sup>, Mohammad A. Helwani, MD, MSPH<sup>\*,1</sup>

Can J Anesth/J Can Anesth  
<https://doi.org/10.1007/s12630-018-1072-8>



CrossMark

CORRESPONDENCE

## Avoidable tracheal injury using a double-lumen endotracheal tube: a case report

Judith Lemay, MD · Massimo Conti, MD · Jacques Somma, MD, BEng · Louise Vigneault, MD, BSc ·  
Jean S. Bussières, MD, FRCPC

# Acute lung injury in thoracic surgery

*Giorgio Della Rocca<sup>a</sup> and Cecilia Coccia<sup>b</sup>*

The goal of ventilation is to minimize lung trauma by avoiding overdistension and repetitive alveolar collapse, while providing adequate oxygenation. Protective ventilation is not simply synonymous of low tidal volume ventilation, but it also involves positive end-expiratory pressure, lower  $\text{FiO}_2$ , recruitment maneuvers, and lower ventilatory pressures.

- Mekanik ventilasyon ile ilişkili
  - ALI (%2.5-7.9)
- Postoperatif bulantı kusma
- Rezidual nöromüsküler blok

Interactive CardioVascular and Thoracic Surgery 23 (2016) 31–40  
doi:10.1093/icvts/iww055 Advance Access publication 16 March 2016

ORIGINAL ARTICLE – THORACIC

Cite this article as: Deng H-Y, Zhu Z-J, Wang Y-C, Wang W-P, Ni P-Z, Chen L-Q. Non-intubated video-assisted thoracoscopic surgery under loco-regional anaesthesia for thoracic surgery: a meta-analysis. *Interact CardioVasc Thorac Surg* 2016;23:31–40.

## Non-intubated video-assisted thoracoscopic surgery under loco-regional anaesthesia for thoracic surgery: a meta-analysis

Han-Yu Deng<sup>a†</sup>, Zi-Jiang Zhu<sup>b†</sup>, Yun-Cang Wang<sup>a</sup>, Wen-Ping Wang<sup>a</sup>, Peng-Zhi Ni<sup>a</sup> and Long-Qi Chen<sup>a,\*</sup>

**RESULTS:** Four randomized controlled trials and six observational studies with a total of 1283 patients were included. We found that in the overall analysis, patients treated with non-intubated video-assisted thoracoscopic surgery under loco-regional anaesthesia achieved significantly shorter global in-operating room time [weighted mean difference =  $-41.96$ ; 95% confidence interval (CI) =  $(-57.26, -26.67)$ ;  $P < 0.001$ ] and hospital stays [weighted mean difference =  $-1.24$ ; 95% CI =  $(-1.46, -1.02)$ ;  $P < 0.001$ ] as well as a lower rate of postoperative complications [relative risk = 0.55; 95% CI =  $(0.40, 0.74)$ ;  $P < 0.001$ ] than patients treated with intubated video-assisted thoracoscopic surgery under general anaesthesia. Subgroup meta-analyses based on study design achieved the same outcomes as overall analysis. In our meta-analysis, no perioperative mortality was observed in patients treated with non-intubated video-assisted thoracoscopic surgery under loco-regional anaesthesia.

**Postoperatif komplikasyon ↓ Mortalite %0 !!!!**

interleukin (IL)-6, IL-8 and C-reactive protein (CRP). Moreover, NIA patients showed lower levels of fibrinogen, cortisol, procalcitonin and epinephrine.

# Hasta Seçimi

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- **Nodül rezeksiyonları:** *Pompeo 2004, Tseng 2012, Ambrogi 2014*
- **Plevral ve perikardiyal efüzyonlar:** *Pompeo 2013, Mineo 2014*
- **Dekortikasyon:** *Takkoni 2010*
- **Pnömotoraks:** *Pompeo 2007, Noda 2012, Pompeo 2013*
- **Akciğer biyopsisi/plevral biyopsi:** *Katlic 2010, Ambrogi 2014*
- **Timektomi:** *Matsumuoto 2008*
- **Hacim küçültme cerrahileri:** *Pompeo 2012, Mineo 2006*
- **Metastatektomi:** *Pompeo 2007*
- **Segmenter akciğer rezeksiyonları:** *Hung 2013, Guo 2014,*
- **Lobektomi:** *Chen 2011, Wu 2013, Liu 2015, Gonzales-Rivas 2015*

## Non-intubated video-assisted thoracoscopic lung resections: the future of thoracic surgery?

2016 Mar;49(3):721-31. doi: 10.1093/ejcts/ezv136.

Diego Gonzalez-Rivas<sup>ab,\*</sup>, Cesar Bonome<sup>c</sup>, Eva Fieira<sup>b</sup>, Humberto Aymerich<sup>d</sup>, Ricardo Fernandez<sup>ab</sup>,  
Maria Delgado<sup>b</sup>, Lucia Mendez<sup>b</sup> and Mercedes de la Torre<sup>ab</sup>

### Göreceli

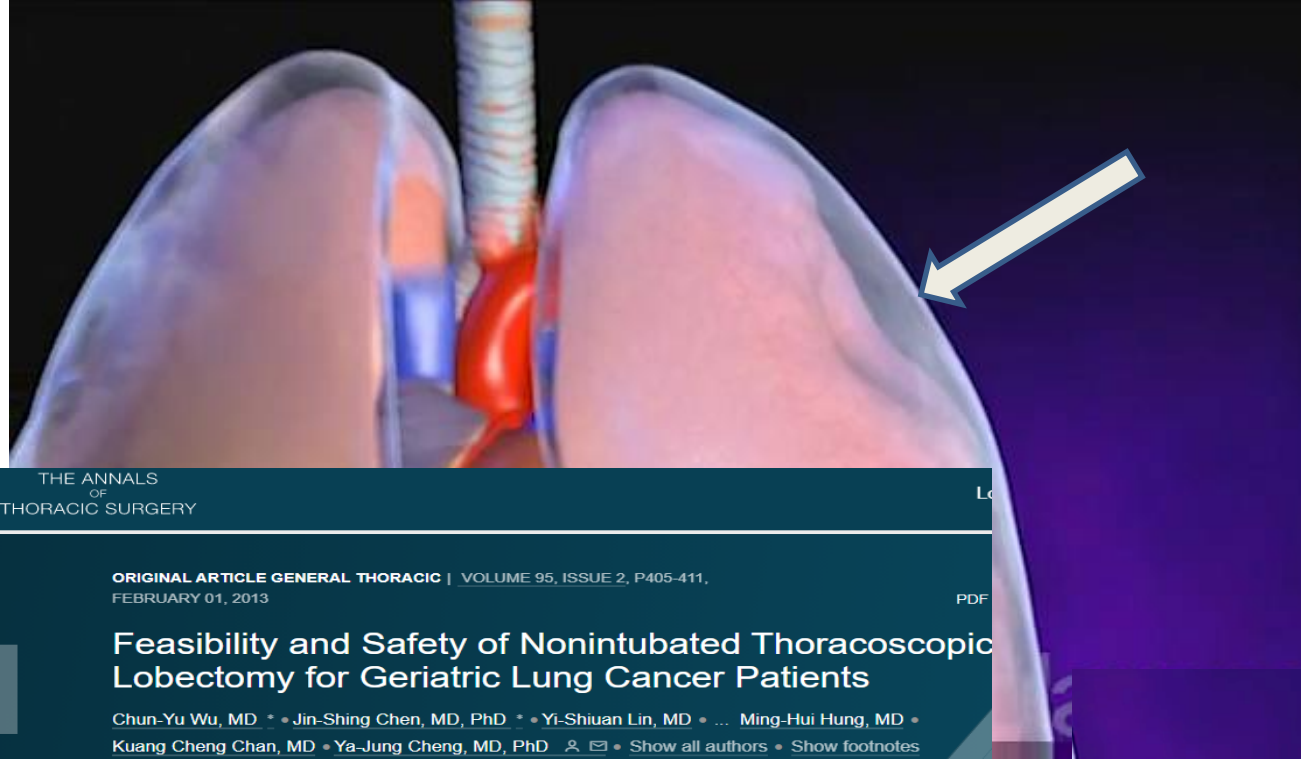
- Obesite
- Hipoksemi ( $\text{PaO}_2 < 50$  mmHg), hiperkarbi ( $\text{PCO}_2 > 50$  mmHg)
- Hemodinamik instabilite
- Persistan öksürük veya havayolunda aşırı sekresyon varlığı
- Geçirilmiş toraks cerrahisi
- Plevral yapışıklıklar
- Rejyonal anestezi için kontraendikasyon oluşturan durumlar (koagülopati vs...)



# Monitorizasyon

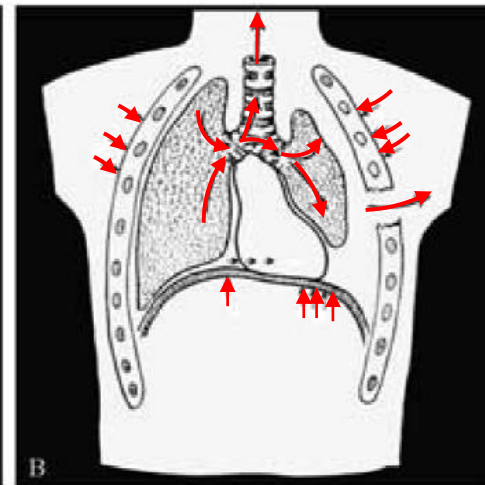
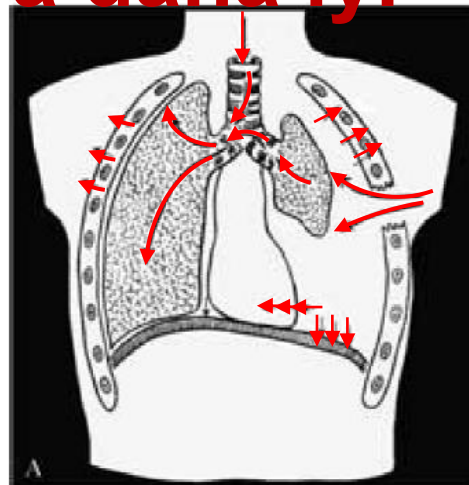
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- EKG
- Pulse oksimetre
- Non-invaziv/invaziv kan basıncı
- EtCO<sub>2</sub>
- Nöromonitorizasyon (BIS/PSI)



# PaCO<sub>2</sub> genel anesteziye göre daha yüksek Oksijenasyon eşit veya daha iyi

- Hipoksemi
- Hiperkapni





# Anestezi Teknikleri

BRIEF RESEARCH REPORT

The Journal of Thoracic and Cardiovascular Surgery • Volume 146, Number 2 August 2013

PDF [174]

Is there any benefit in using awake anesthesia with thoracic epidural in thoracoscopic talc pleurodesis?

Eugenio Pompeo, MD   • Mario Dauri, MD Awake Thoracic Surgery Research Group

- **Torakal epidural anestezi**
  - T4 seviyesinden
  - T1-T8 arası blok
  - Kateter yerleştirmesinde zorluklar
  - Komplikasyonlar ???
  - İdrar sondası????

# Anestezi Teknikleri



Anaesthesia

Journal of the Association of Anaesthetists of Great Britain and Ireland

Anaesthes

CAS  
The  
Thor

F. Picci

British Journal of Anaesthesia 96 (4): 418–26 (2006)

doi:10.1093/bja/ael020 Advance Access publication February 13, 2006

BJA

## REVIEW ARTICLE

### A comparison of the analgesic efficacy and side-effects of paravertebral vs epidural blockade for thoracotomy—a systematic review and meta-analysis of randomized trials

R. G. Davies<sup>1</sup>, P. S. Myles<sup>1 2 3\*</sup> and J. M. Graham<sup>4</sup>

We identified 10 trials that had enrolled 520 thoracic surgery patients. All of the trials were small ( $n < 130$ ) and none were blinded. There was no significant difference between PVB and epidural groups for pain scores at 4–8, 24 or 48 h, WMD 0.37 (95% CI: –0.5, 1.21), 0.05 (–0.6, 0.7), –0.04 (–0.4, 0.3), respectively. Pulmonary complications occurred less often with PVB, OR 0.36 (0.14, 0.92). Urinary retention, OR 0.23 (0.10, 0.51), nausea and vomiting, OR 0.47 (0.24, 0.53), and hypotension, OR 0.23 (0.11, 0.48), were less common with PVB. Rates of failed block were lower in the PVB group, OR 0.28 (0.2, 0.6). PVB and epidural analgesia provide comparable pain relief after thoracic surgery, but PVB has a better side-effect profile and is associated with a reduction in pulmonary complications. PVB can be recommended for major thoracic surgery.

Postoperatif analjezi açısından TEA ile benzer  
Pulmoner komplikasyon, üriner retansiyon ve POBK daha az

# Anestezi Teknikleri

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## Uniportal video-assisted thoracoscopic left upper lobectomy under spontaneous ventilation

*Thorac Dis* 2015;7(3):494-495

Diego Gonzalez-Rivas<sup>1,2</sup>, Ricardo Fernandez<sup>1,2</sup>, Mercedes de la Torre<sup>1,2</sup>, Cesar Bonome<sup>3</sup>

- **İnterkostal sinir bloğu**
  - Sedasyon eşliğinde
  - Randomize kontrollü çalışma ???
  - Diğer rejyonal tekniklerle kombine

# Anestezi Teknikleri

## Anaesthesia and Intensive Care

### Type I and II Pectoral Nerve Blocks with Serratus Plane Block for Awake Video-Assisted Thoracic Surgery

R. M. Corso, S. Maitan, V. Russotto, C. Gregoretti

First Published September 1, 2016 | Other |

<https://doi.org/10.1177/0310057X1604400509>

- **Pektoral sinir bloğu + Serratus plan bloğu**
  - 1 olgu

# Anestezi Teknikleri

Journal of Clinical Anesthesia 60 (2020) 89–90



Contents lists available at ScienceDirect

Journal of Clinical Anesthesia

journal homepage: [www.elsevier.com/locate/jclinane](http://www.elsevier.com/locate/jclinane)

Correspondence

**Erector spinae plane block allows non-intubated vats-wedge resection**

- **Erektor Spina Plan Bloğu**
  - 1 olgu

# Anestezi Teknikleri

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- Propofol TCI: 1.5-3 mcg/mL
- Remifentanil: 0.1-0.2 mcg/kg/dk (cilt dikişinde STOP)

Veya

- Dexmedetomidin: 0.5-1 mcg/kg/sa (plevral kavite kapanırken STOP)
- ❑ BIS: 40-60 veya PSI: 25-50

## Spontan Ventilasyon

- Tidal Volüm: 3-4 mL/kg, f: 10-15 soluk/dk
- FiO<sub>2</sub>: %50-100
- SpO<sub>2</sub>>%90 (SIMV ???)
- PaCO<sub>2</sub><60 mmHg (<55 mmHg???)



# İntraoperatif Komplikasyonlar

---

- Öksürük

- ❖ Hilus gerilmesi

- ❖ Bronş kıkırdağına bası

- Nebulize lidokain

- Viseral plevraya lokal anestezi

- Vagus sinir bloğu

- Stellat ganglion bloğu ??? (Al-Abdullatif M, 2007)

- Frenik sinir bloğu ???

# İntraoperatif Komplikasyonlar

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## ➤ İntraoperatif hipoksemi

❖ Düşük insidans

➤  $SpO_2 < \%90$ , asiste solunum

➤  $FiO_2: \%100$ , TV:3-5 mL/kg, f:12-15 soluk/dk,  
Akış:4-5 L/dk)

# İntraoperatif Komplikasyonlar

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- İntraoperatif hiperkapni

- ❖ EtCO<sub>2</sub> ????

- PaCO<sub>2</sub>>55 mmHg (>60???), asiste solunum

- FiO<sub>2</sub>:%100, TV:3-5 mL/kg, f:12-15 soluk/dk, Akış:4-5 L/dk)

The lung and carbon dioxide: implications for permissive and therapeutic hypercapnia

D.A. Kregenow, E.R. Swenson

European Respiratory Journal 2002 20: 6-11; DOI: 10.1183/09031936.02.00400802

***Normal sağ ventrikülü olan uyanık, sedatize hastalarda PCO<sub>2</sub><70 mmHg***

Expert consensus on spontaneous ventilation video-assisted thoracoscopic surgery in primary spontaneous pneumothorax (Guangzhou)

## Genel Anesteziye Geçiř

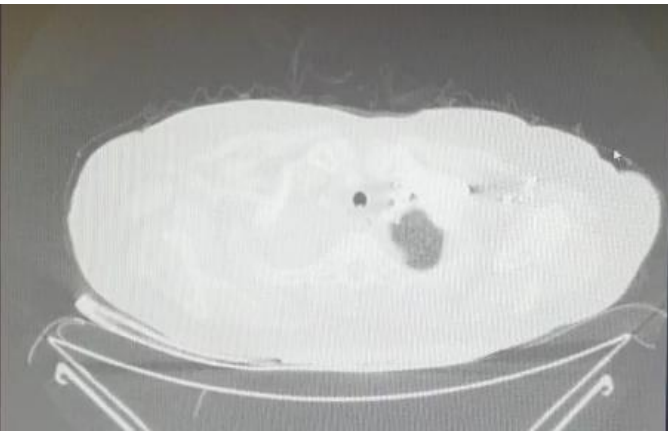
- $SpO_2 < \%85$  (asiste ventilasyona rađmen)
- $PaCO_2 > 70$  mmHg
  - Kalp hızı  $> 100$  vuru/dk
  - Atrial/ventriküler prematüre vurular ( $> 6$ /dk)
  - $pH < 7.15$  (15 dk ara ile iki AKG'da)
- Yeterli medikasyona rađmen akciđerde aşırı hareketlilik
- Aşırı kanama (cerrahi görüşü engelleyen)
- Aşırı sekresyon
- İnatçı öksürük (vagal sinir blođuna rađmen  $> 2$ /dk)

# Genel Anesteziye Geçiř

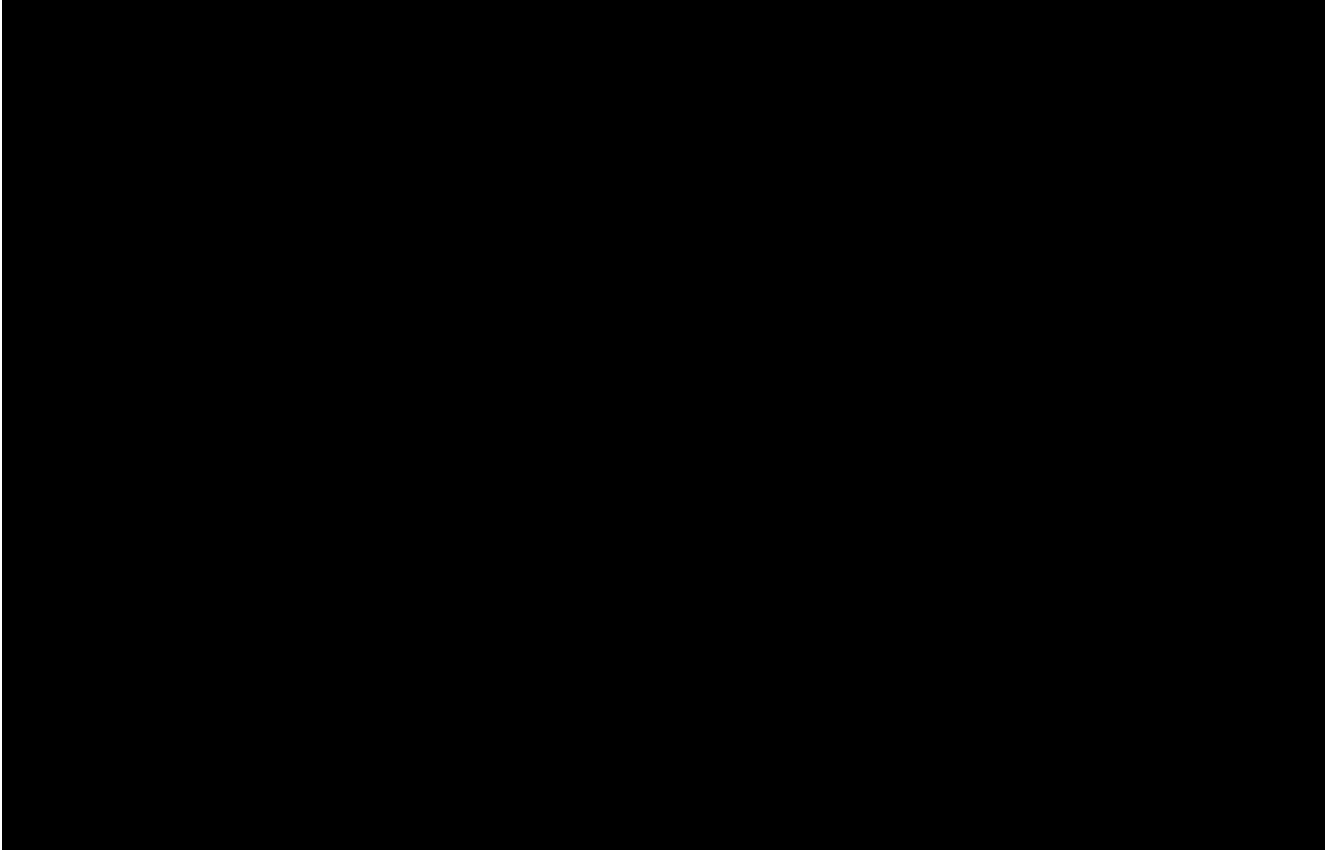
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- Lateral dekübit pozisyonda entübasyon ???
- İlk tercih tek lümenli tüp+bronşiyal bloker
- Aşırı kanama veya sekresyon sebebiyle akciğer izolasyonu gerekiyorsa çift lümenli tüp





- 74 yaş kadın
- Sağda masif plevral effüzyon
- İİAB: Bening sitoloji
- EKO: EF %65, Hafif MY





Video Destekli Torasik Cerrahide Geleneksel Tek Akciğer Ventilasyonuna Alternatif Bir Yöntem:  
Laringeal Maske Altında Spontan Solunum. Çok Merkezli Prospektif Randomize Kontrollü Çalışma.  
Ön Bulgular

Tayfun Sügür<sup>1</sup>, Ali Sait Kavaklı<sup>1</sup>, Hayri Fatih Metinyurt<sup>1</sup>, Hilal Yavuzel<sup>2</sup>, Şencan Akdağ<sup>3</sup>, Hacer Boztepe  
Yeşilçay<sup>3</sup>, Enes Eskin<sup>1</sup>, Türkan Kudsioğlu<sup>2</sup>, Nihan Yapıcı<sup>2</sup>, Sadık Özmen<sup>1</sup>,

<sup>1</sup>Sağlık Bilimleri Üniversitesi Antalya Eğitim Ve Araştırma Hastanesi Anesteziyoloji Ve Reanimasyon Kliniği,

<sup>2</sup>Dr. Siyami Ersek Göğüs Kalp Ve Damar Cerrahisi Eğitim Ve Araştırma Hastanesi Anesteziyoloji Ve Reanimasyon  
Kliniği

- Minör VATS
- PaO<sub>2</sub>/FiO<sub>2</sub> oranları benzer
- EtCO<sub>2</sub> değerleri LMA grubunda **yüksek**
- **Ameliyat odasında kalış süresi** LMA grubunda **kısa**
- **Derlenme odasında kalış süresi** LMA grubunda **kısa**
- Postoperatif komplikasyonlar benzer

## **Tubeless thoracic surgery: ready for prime time?**

Piergiorgio Solli, Jury Brandolini, Luca Bertolaccini

- Anestezi tekniklerinde standardizasyon???
- Hasta seçimi ve endikasyonlar???
- Genel anesteziye geçiş???
- Hastanede kalış süresi???
- Minör cerrahi/major cerrahi???



## Non-intubated video-assisted thoracoscopic lung resections: the future of thoracic surgery? FREE

Diego Gonzalez-Rivas ✉, Cesar Bonome, Eva Fieira, Humberto Aymerich, Ricardo Fernandez, Maria Delgado, Lucia Mendez, Mercedes de la Torre

*European Journal of Cardio-Thoracic Surgery*, Volume 49, Issue 3, March 2016, Pages 721–731, <https://doi.org/10.1093/ejcts/ezv136>

Uzun vadedeki faydaları belirsizliğini korusa da özellikle entübasyon açısından **yüksek riskli torasik cerrahi hastalarında** önemli bir yeri olacak.

# SONUÇ

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Her ne kadar genel anestezi altında tek akciğer ventilasyonu řu an için torasik cerrahide vazgeçilmez anestezi tekniđi olsa da deneyimler arttıkça uyanık/non-entübe hastalarda VATS torasik cerrahinin vazgeçilmez bir parçası olacak

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*TEŞEKKÜRLER...*