



Kocaeli Üniversitesi
Tıp Fakültesi



Tek Akciğer Ventilasyonunda Bronşiyal Bloker Ne zaman Kullanılmalı?

Alparslan Kuş



Tek Akciğer Ventilasyonu (TAV)

- Sağlam akciğeri kontaminasyon ve hemorajiden korumak
- Cerrahi görüş açısını arttırmak

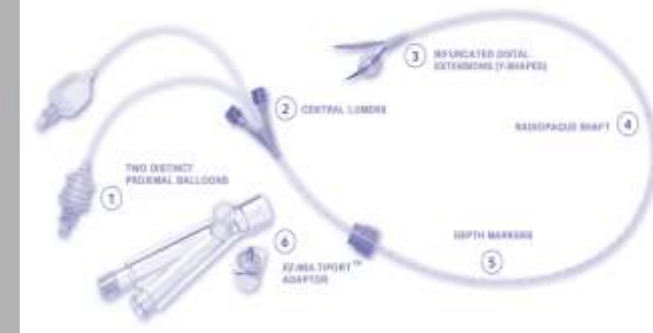
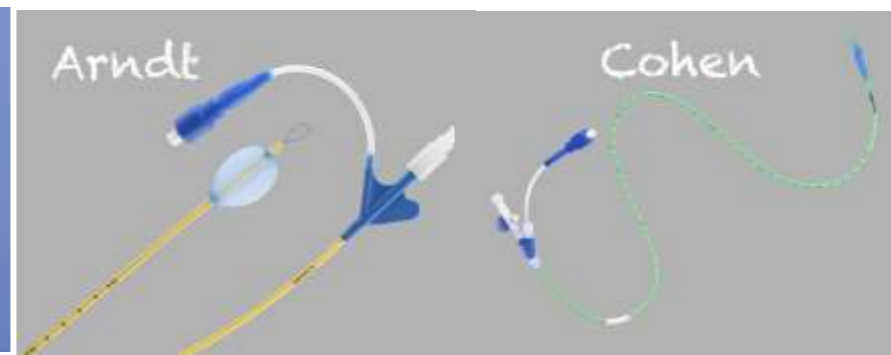
Bu amaçla;

- Çift Lümenli Tüpler (ÇLT)
- Bronşial Blokerler (BB)

Tek Akciğer Ventilasyonu

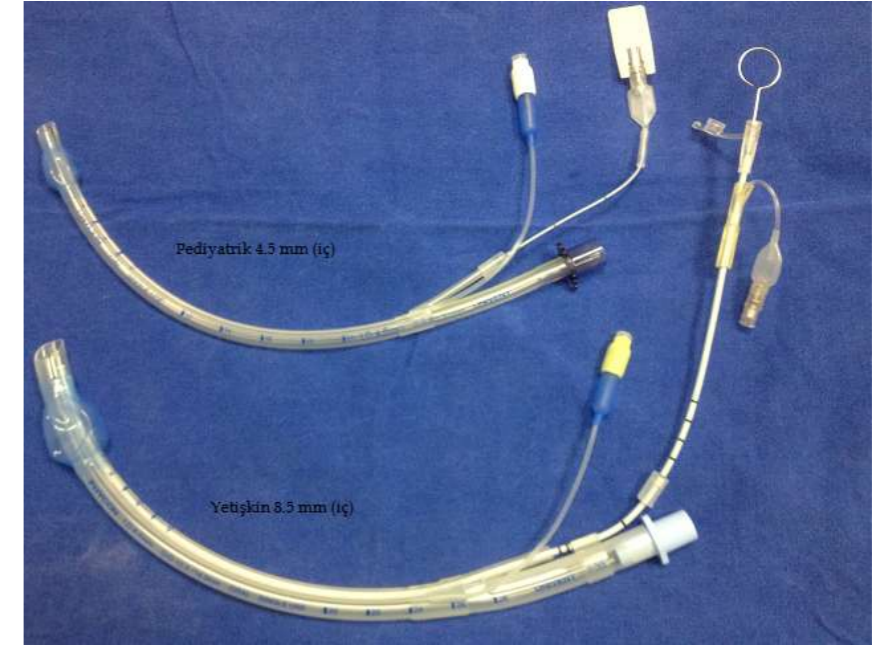
Tarihçe

- 1936, Magill
- Fogarty kateterleri
- Univent tüp
- Uni-bloker
- Arndt
- Cohen
- Coopdech
- EZ BB

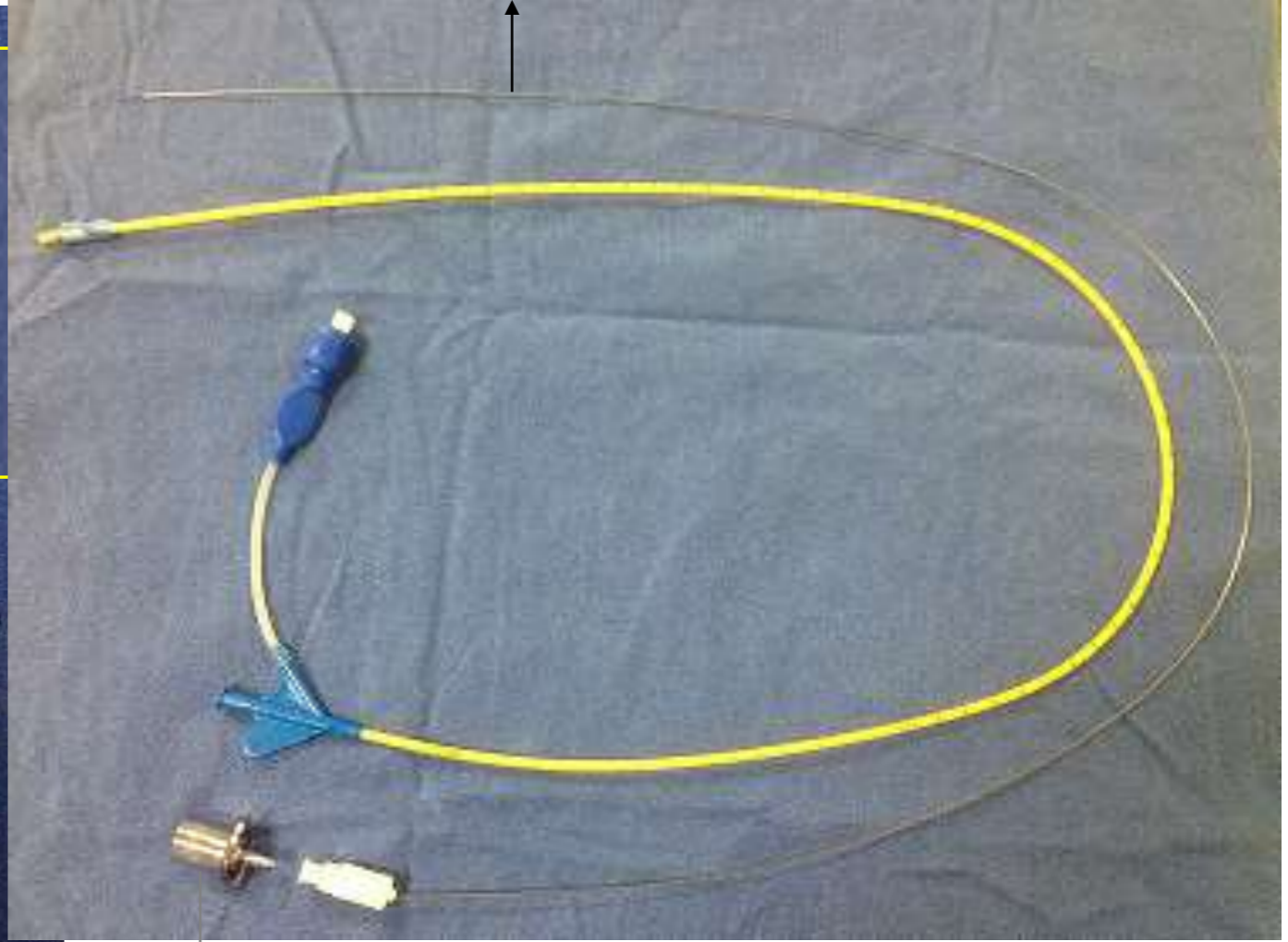
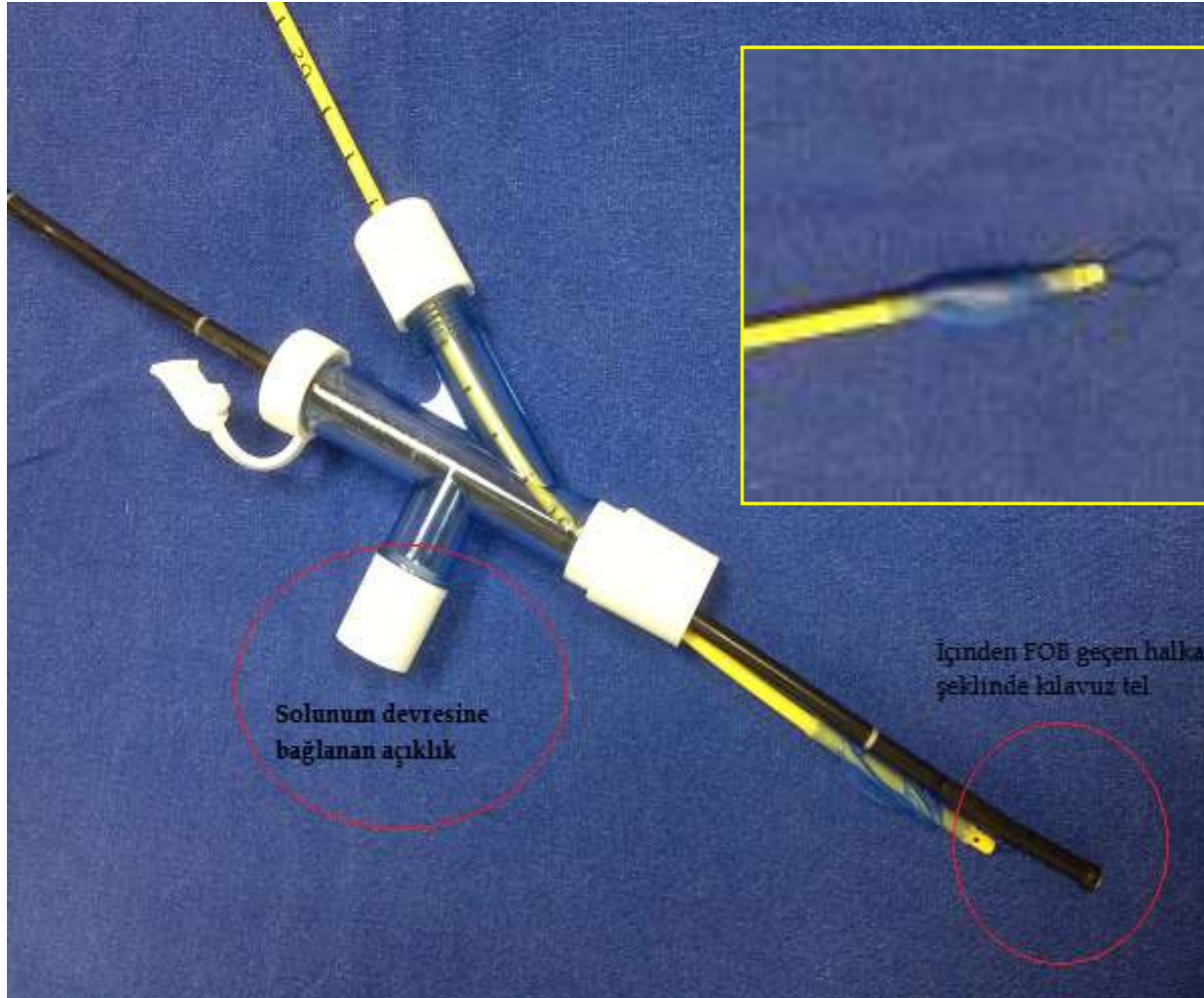


Univent Tüp

- Tek lümenli endotrakeal tüpe entegre, bükülebilir silikon kaflı BB içerir.
- BB tüpün içine çekildiğinde stile görevi görür.



Arndt BB

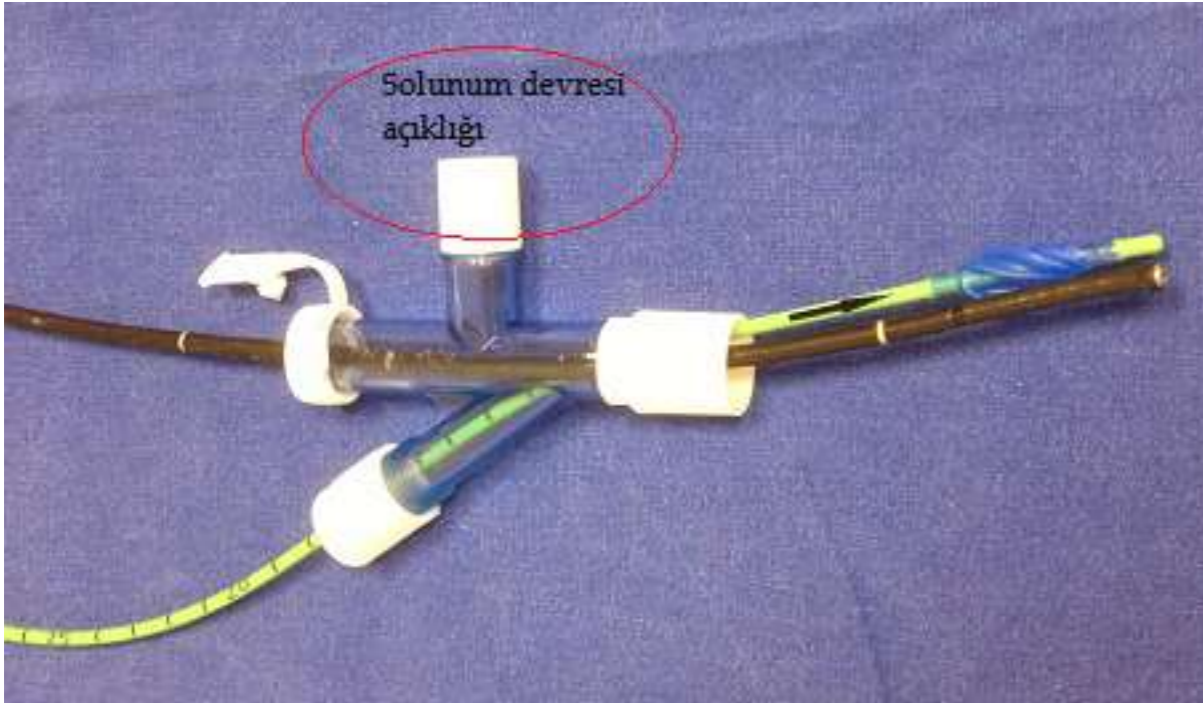


Naylon tel çıkarıldıktan sonra tekrar kullanılamaz

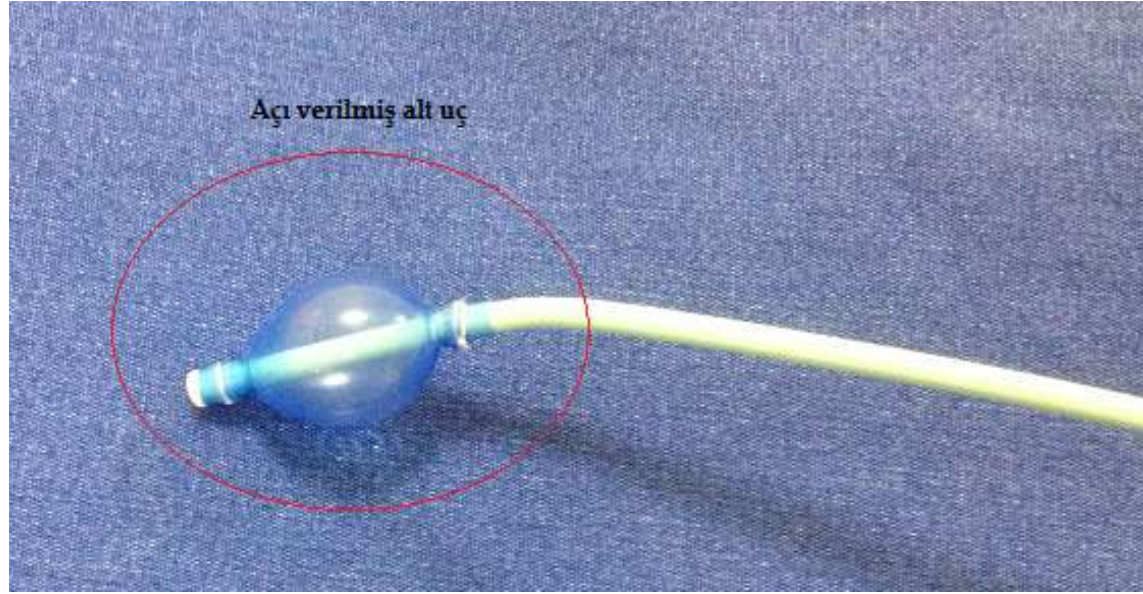
CPAP adaptörü

Cohen BB

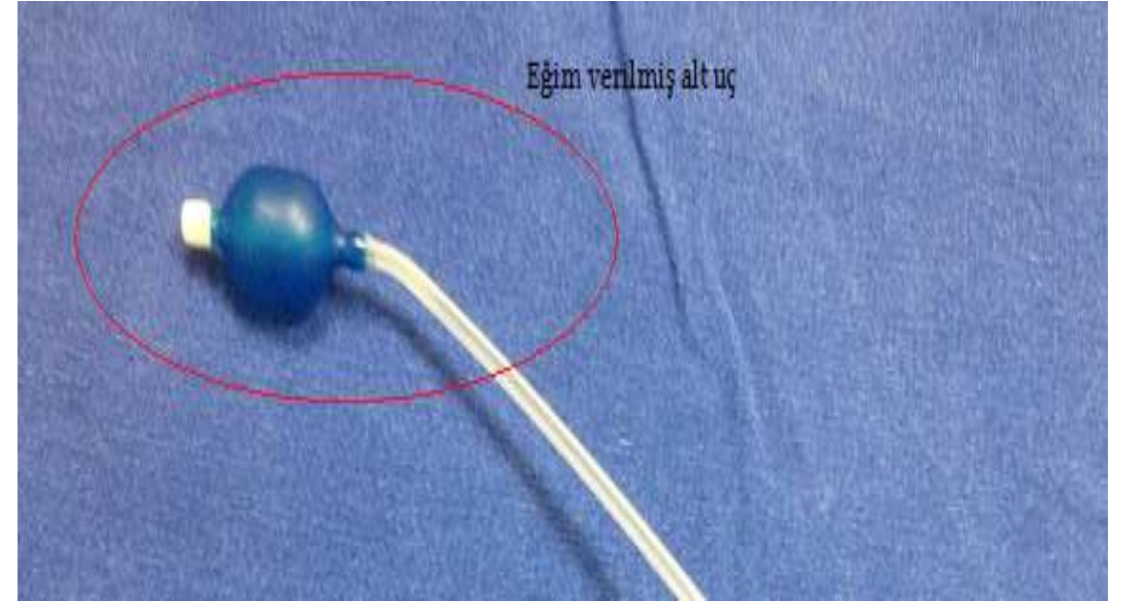
- 3 cm'lik 30 derece dönebilen esnek uç.
- Üst uçta bulunan hareketli düğme ile istenilen bronşa yönlendirilir.



Uni-Bloker

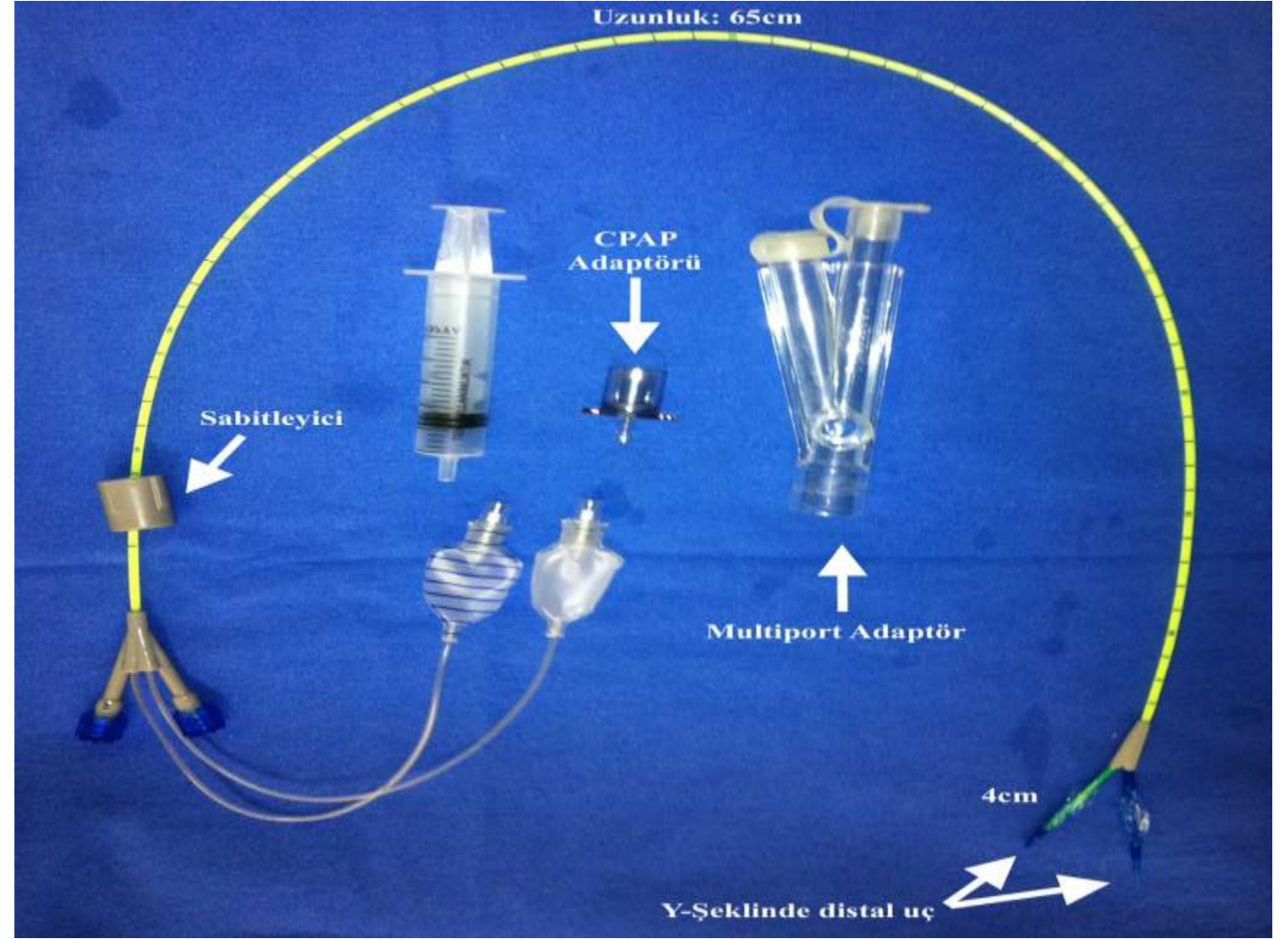


Coopdech BB



EZ Bloker

- Y şeklindedir
- 4 cm uzunlukta iki uç
- 7 Fr, 4 kanallı kateter



Journal of Cardiothoracic and Vascular Anesthesia
A Comparison of the EZ-Blocker with a Cohen Flex-Tip Blocker
for One-Lung Ventilation

Alparslan Kus, MD,* Tulay Hosten, MD,* Yavuz Gurkan, MD,* Aslı Gul Akgul, MD,† Mine Solak, MD,* and
Kamil Tokar, MD*

- Klinik performansı benzer
- Malpozisyon EZ bloker ile daha az
- Yerleştirme süresi: EZ; 2.5 dk, Cohen; 4 dk

Table 2. Number and Variety of Malpositioning and Surgeon Satisfaction for OLV in EZ Group and Cohen Group

	Cohen Group (n = 20) Right/Left Lung Isolation	EZ Group (n = 20) Right/Left Lung Isolation
Malpositioning		
Blocker balloon herniation into the trachea	1/1	0
Blocker balloons not visible below the carina	3/0	0
Both balloons of EZ-Blocker going into the same main bronchus	—	2/1
Surgeon Satisfaction		
Good	14	18
Fair	6	2
Poor	0	0

	Cohen	Arndt	Uni-bloker	EZ
Ebat	9F	5F, 7F, 9F	5F, 9F	7F
Balon şekli	Sferik	Sferik veya eliptik	Sferik	Sferik
Yerleştirme yöntemi	Üstte alt ucu yönlendiren makara sistemiyle	Naylon telin içinden geçirilen FOB ile	Açı verilmiş uç Tork kontrollü	yok
Ko-aksial kullanımda tavsiye edilen en küçük ETT	9F (8.0 ETT)	5F (4.5 ETT) 7F (7 ETT) 9F (8 ETT)	5F (4.5 ETT) 9F (8 ETT)	7 F (7.5 ETT)
Murphy gözü	var	9F' te var	yok	yok
Merkezi kanal iç çapı	1.6 mm	1.4 mm	2.0 mm	1.4 mm

Endikasyonlar

Çift Lümenli Tüp	Çift Lümenli Tüp ve Bronşiyal Bloker
Sağlam akciğeri kontaminasyondan korumak için Ac absesi Ac kisti Pulmoner hemoraji	Göğüs boşluğunda gerçekleştirilecek vakalarda cerrahi görüşü artırmak için VATS Lobektomi bilobektomi Mediastinal kitle rezeksiyonu Özefagus cerrahisi Omurga cerrahisi Minimal invaziv kardiyak cerrahi
Bronkopulmoner lavaj Pulmoner alveoler protozis	
Gaz değişiminin kontrolü ve sürdürülmesi için Bronkoplevral fistül Bronşial hasarlanma Pnömetomi	

Bronşiyal Bloker

Zor hava yolu

Ağız açıklığının kısıtlı olduğu vakalar (nazotrakeal entübasyon)

Uyanık orotrakeal entübasyon

Zaten entübe hastada tek akciğer gereksinimi

Trakeostomize hastada

Selektif lobar blokaj

Postoperatif mekanik ventilasyon gereksinimi

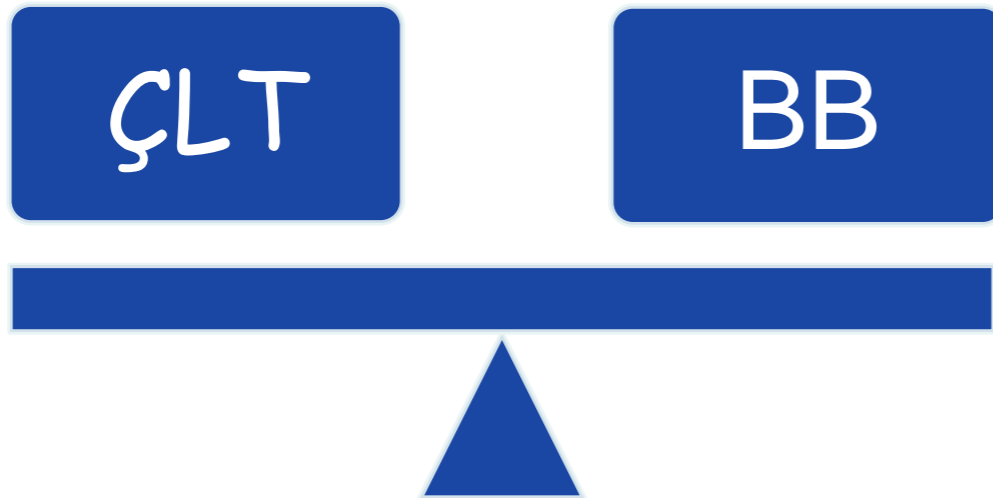
ÇLT-BB Karşılaştırma

	ÇLT	BB
Uygun yerleşim için gereken süre	1.5-6 dk	4-8 dk
Malpozisyon sıklığı	Az	Sık
Fiberoptik gereksinim sıklığı	Az	Mutlak
Akciğerin sönmesi için gereken süre	1.5-17dk spontan	4 -20 dk aspirasyonla
Klinik performans	Yeterli	Yeterli
Postoperatif komplikasyonlar	Fazla ve Ciddi	Az

Campos JH , Anesthesiology 2006;104:261-6
Campos JH, Anesth Analg. 2003;96:283-9
Narayanaswamy M Anesth Analg. 2009;108:1097-101.
Bauer C, Acta Anaesthesiol Scand, 2001;45:250-4

Tek Akciğer Ventilasyonunda Bronşiyal Blokerler ile Çift Lümenli Tüplerin Karşılaştırılması

- N=40 hasta
- ÇLT (sol) veya Arndt BB (randomize, prospektif)
- Amaç : Yerleştirme süresi
Akciğerin sönmesi
Komplikasyonlar



A Comparison of the Efficacy and Adverse Effects of Double-Lumen Endobronchial Tubes and Bronchial Blockers in Thoracic Surgery: A Systematic Review and Meta-analysis of Randomized Controlled Trials

Ana Clayton-Smith, Kyle Bennett, Robin Peter Alston, FRCA, MbChB, MD, George Adams, Greg Brown, Timothy Hawthorne, May Hu, Angus Sinclair, and Jay Tan

Objective: To compare the efficacy and adverse effects of using bronchial blockers (BBs) and double-lumen endobronchial tubes (DLTs).

Design: Systematic review and meta-analysis of randomized controlled trials (RCTs) comparing BBs and DLTs.

Setting: Hospital units undertaking thoracic surgery

Participants: Patients undergoing thoracic surgery requiring lung isolation.

Interventions: BBs and DLTs.

Measurements and Main Results: A systematic literature search was conducted for RCTs comparing BBs and DLTs using Google Scholar, Ovid Medline, and Cochrane library databases up to October 2013. Inclusion criteria were RCTs

measures was performed using RevMan 5 software. The search produced 39 RCTs published between 1996 and 2013. DLTs were quicker to place (mean difference: 51 seconds, 95% confidence intervals [CI] 8-94 seconds; $p = 0.02$) and less likely to be incorrectly positioned (odds ratio [OR] 2.70; 95% CI 1.18-6.18, $p = 0.02$) than BBs. BBs were associated with fewer patients having a postoperative sore throat (OR 0.39, 95% CI: 0.23-0.68, $p = 0.0009$), less hoarseness (OR: 0.43, 95% CI 0.24-0.75, $p = 0.003$), and fewer airway injuries (OR 0.40, 95% CI 0.21-0.75, $p = 0.005$) than DLTs.

Conclusion: While BBs are associated with a lower incidence of airway injury and a lower severity of injury, DLTs can be placed quicker and more reliably.

CONCLUSION

Although DLTs are easier and quicker to place for lung isolation than BBs, they are associated with more adverse effects. However, there is no significant difference in the quality of lung isolation that the 2 devices provide, and both techniques have advantages in specific clinical situations. Therefore, thoracic anesthesiologists should be skilled in both techniques.

Endikasyonlar

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Sağlam akciğeri kontaminasyondan korumak için Ac absesi Ac kisti Pulmoner hemoraji	Göğüs boşluğunda gerçekleştirilecek vakalarda cerrahi görüşü artırmak için VATS Lobektomi bilobektomi Mediastinal kitle rezeksiyonu Özefagus cerrahisi Omurga cerrahisi Minimal invaziv kardiyak cerrahi
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Bronşiyal Bloker

Zor hava yolu

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- Uyanık orotrakeal entübasyon

Zaten entübe hastada tek akciğer gereksinimi

Trakeostomize hastada

Selektif lobar blokaj

Postoperatif mekanik ventilasyon gereksinimi

Zor hava yolu riski taşıyan hastalar

Üst hava yolu	Alt hava yolu
Kısa boyun ve artmış boyun çevresi	Trakeostomi varlığı
Uzun üst kesici dişler geride kalmış alt çene ile	Bozulmuş anatomi (trakea/bronş)
Sınırlı boyun hareketleri	Sol ana bronş girişinin kompresyonu
Geçirilmiş cerrahi nedeni ile sınırlı çene açıklığı	(inen torasik aort anevrizması, intraluminal ve ekstraluminal kitleler)
Boyun bölgesine radyoterapi	
Hemiglossektomi, hemimandibulektomi	
Tümörler (ağız, dil, epiglottis)	

ASA-DAS-EAMS-.....

Entübasyon Rehberleri

Ekstübasyon Rehberleri

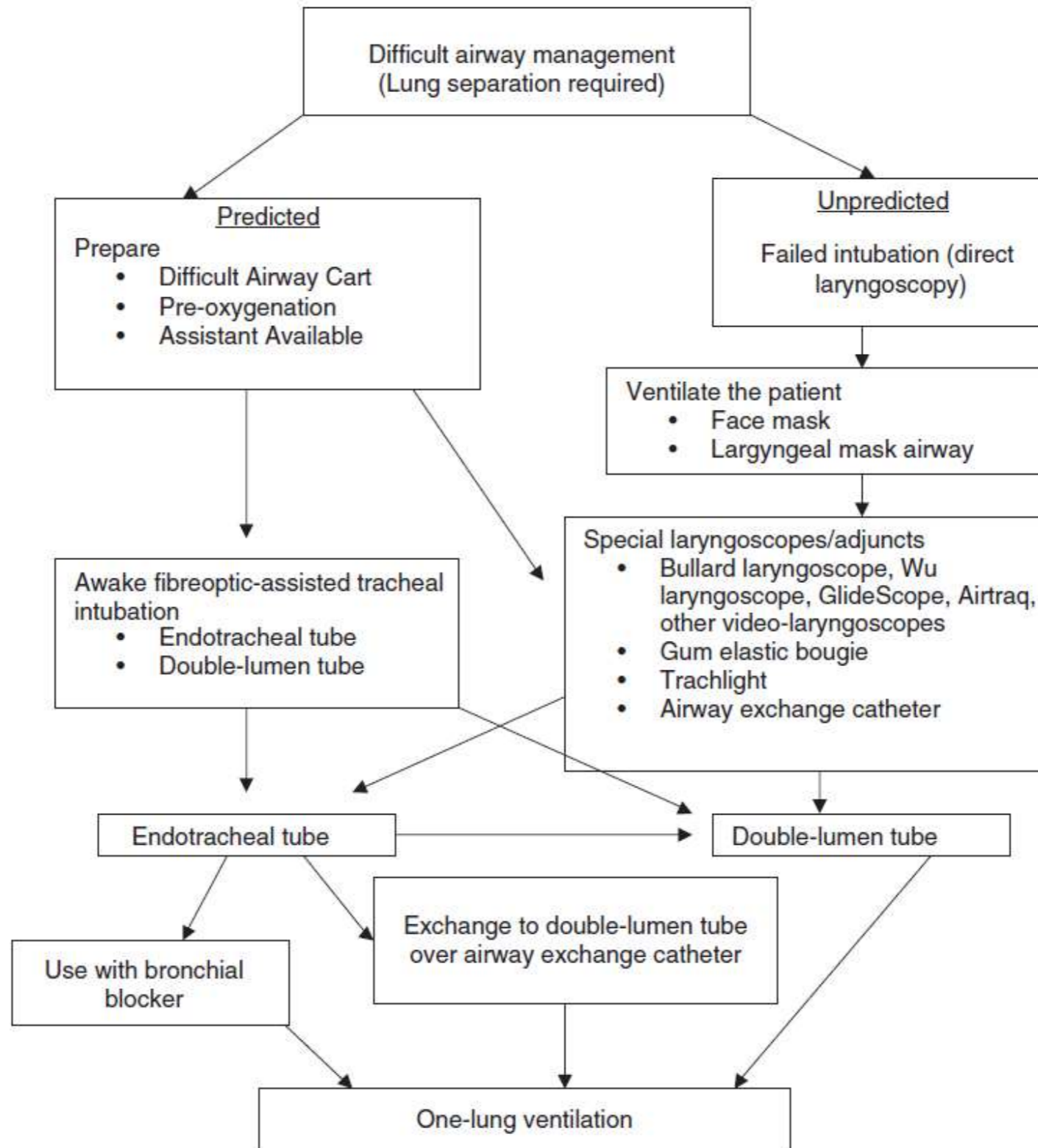
Hava yolu rehberleri?

Pediyatrik Rehberler

*Obstetrik zor hava
yolu rehberi*

Lung separation and the difficult airway

J. B. Brodsky*



GUIDELINES

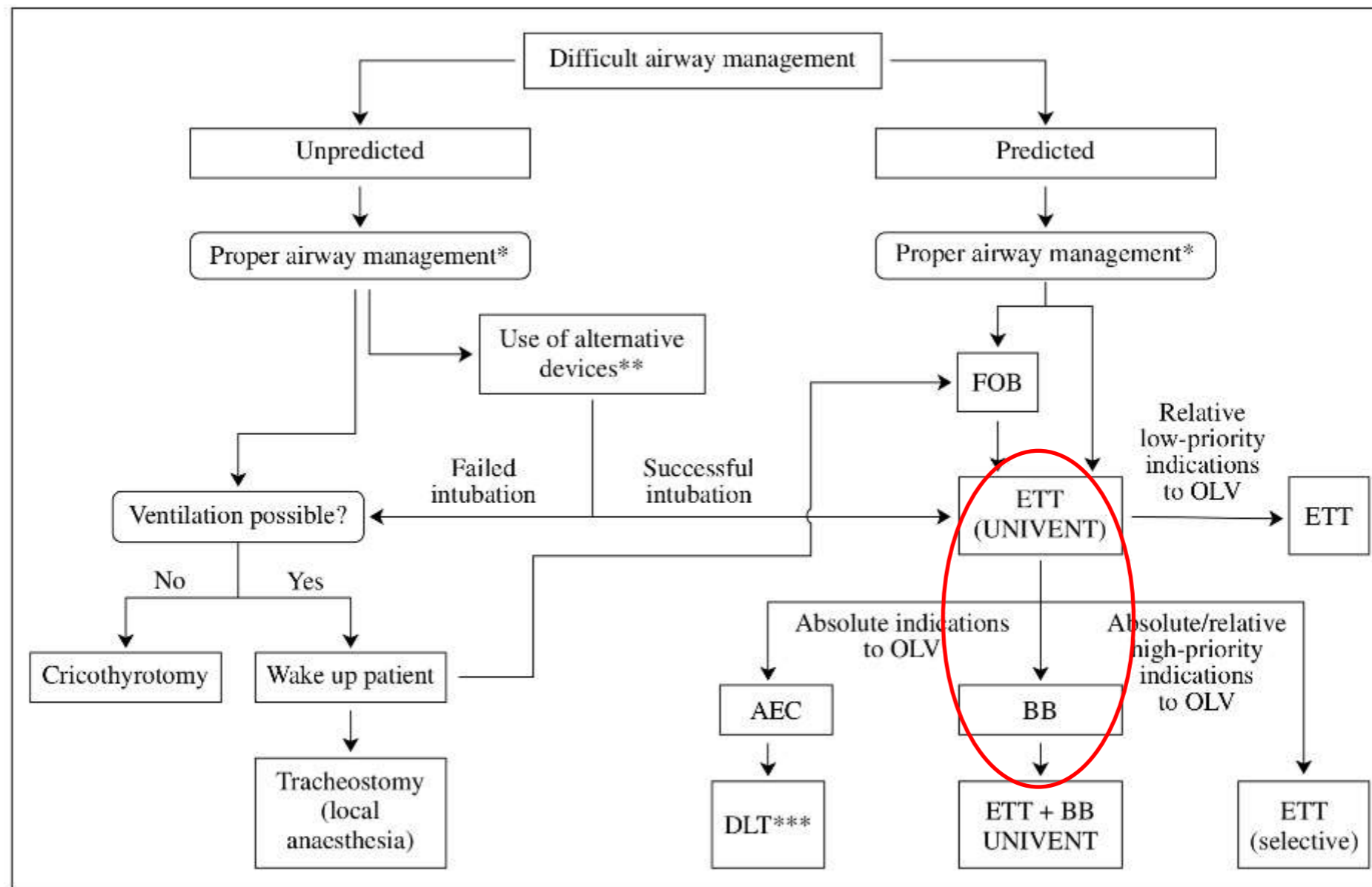
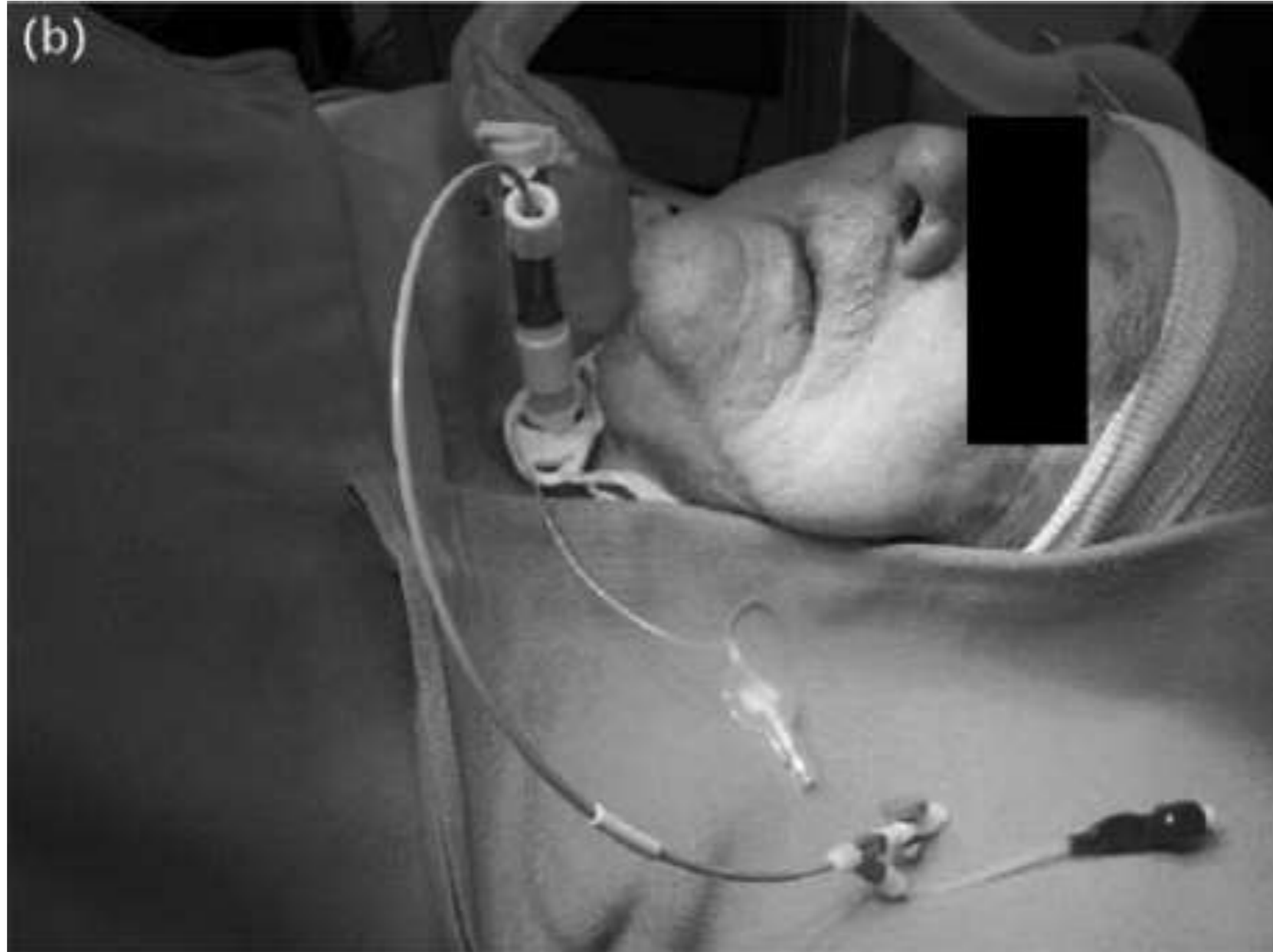
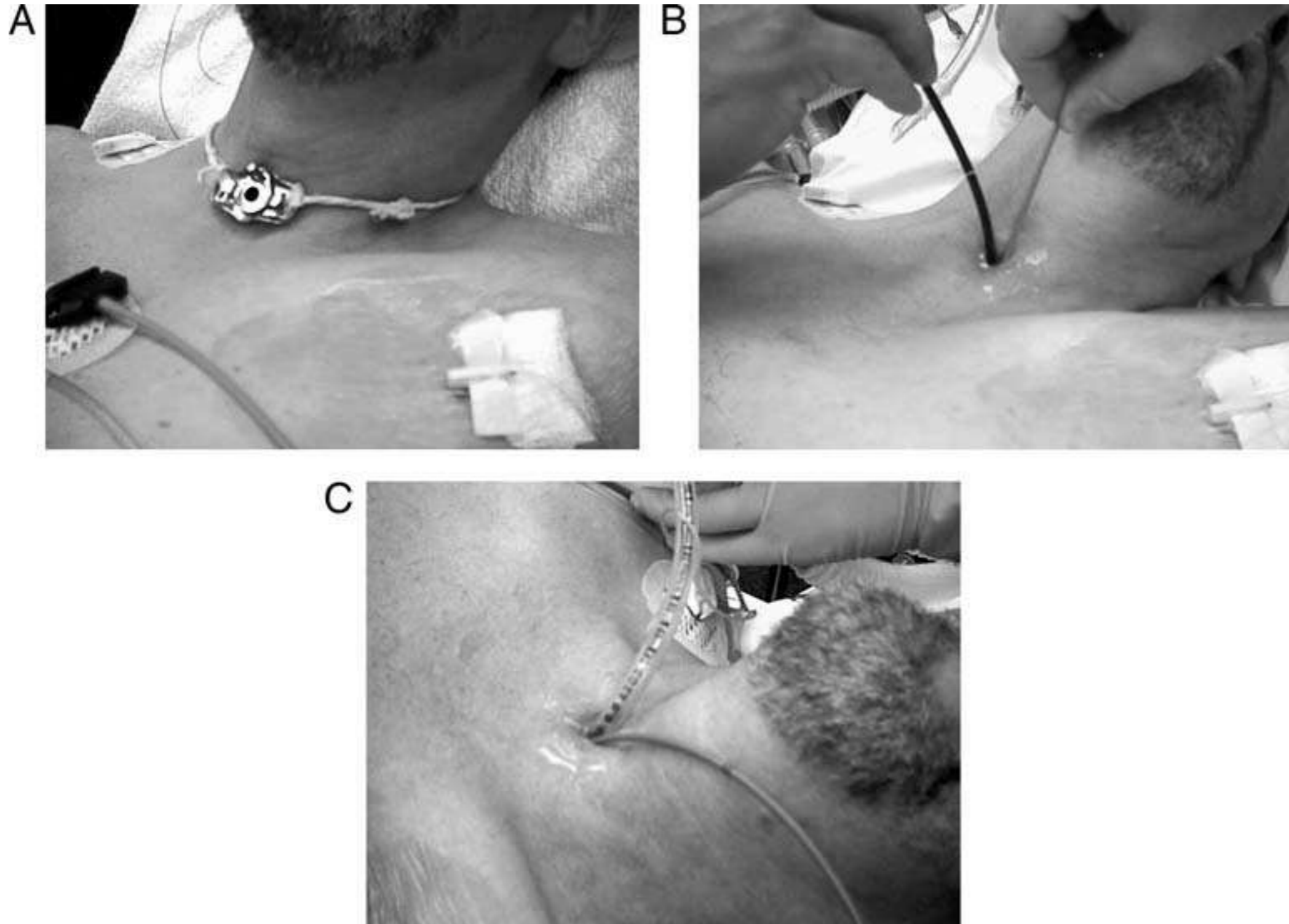


Figure 5.—Decisional algorithm for difficult airway management in thoracic anesthesia and lung separation during elective procedures. FOB: fiber optic bronchoscope; ETT: endotracheal tube; OLV: one lung ventilation; AEC: airway exchange catheter; BB: bronchial blocker; DLT: double lumen tube. *SIAARTI Recommendations, 2005⁷; **introducer catheter, EGDs, videolaryngoscopes, videostylets, etc.; ***mandatory only in case of BAL for pulmonary alveolar proteinosis.

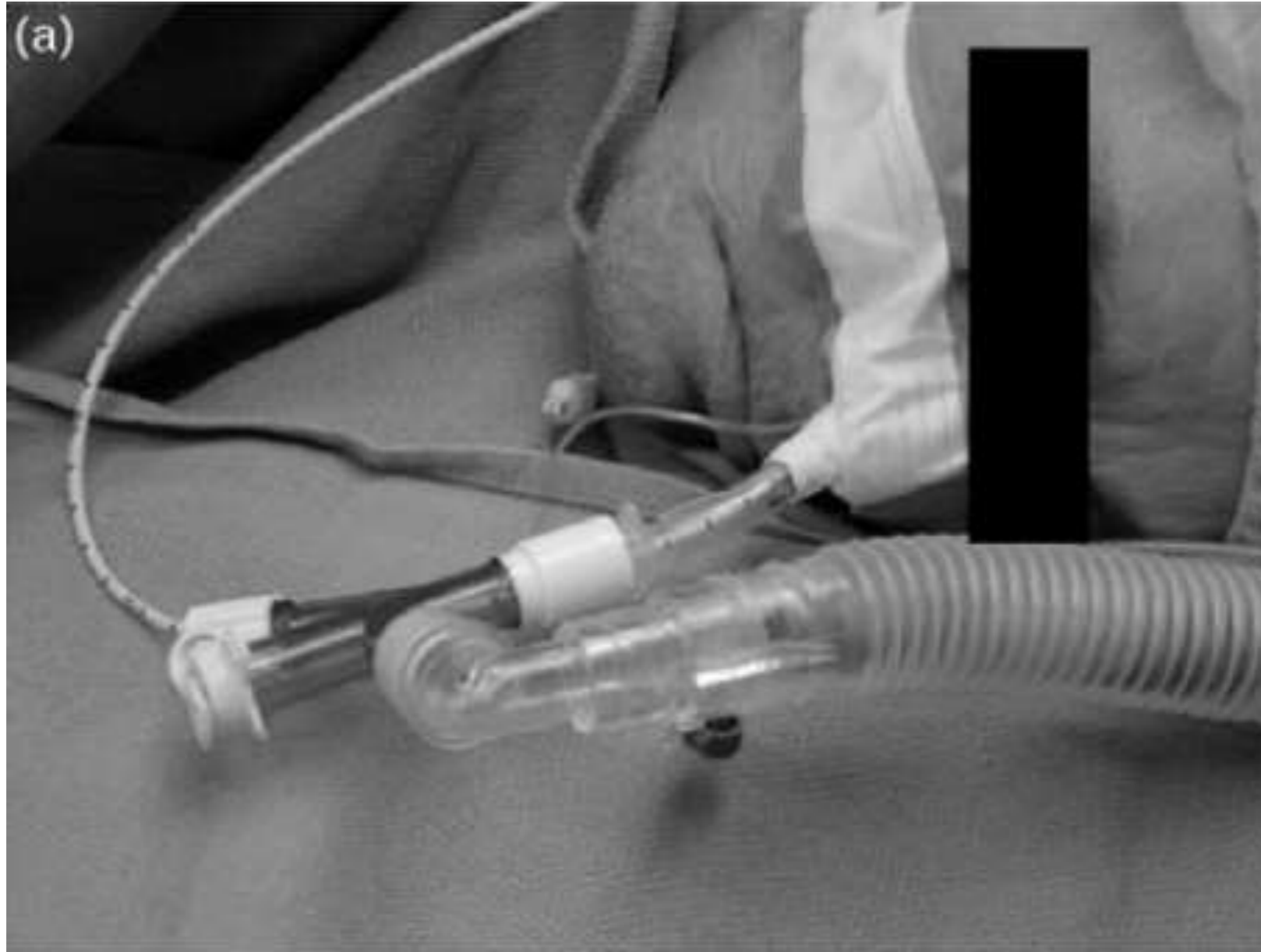
Trakeostomi ve BB



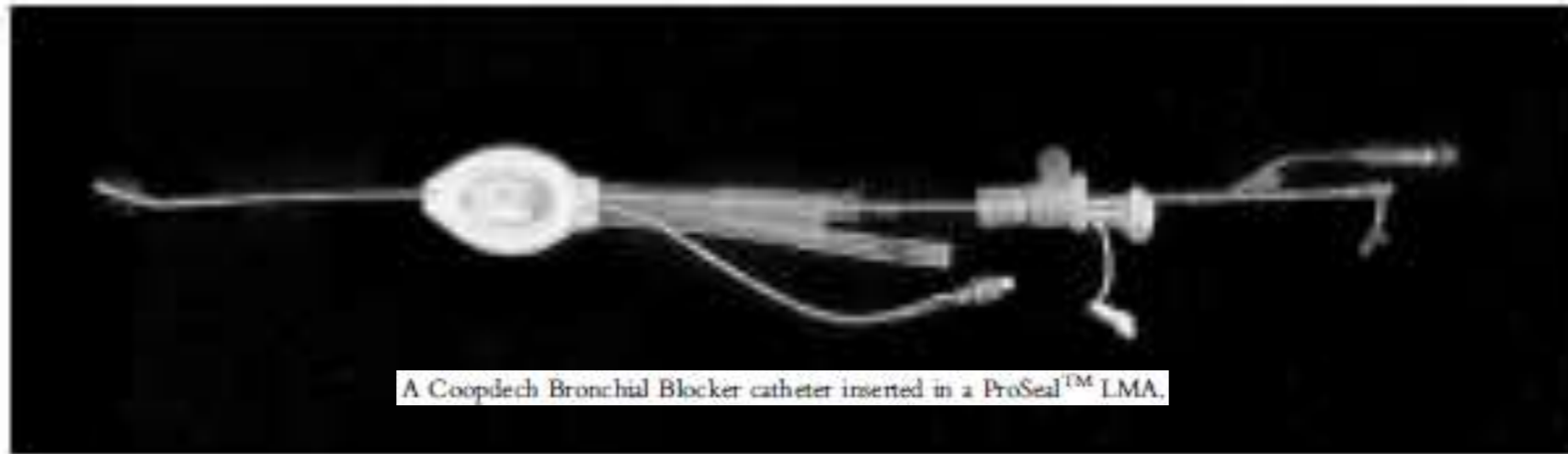
Trakeostomi ve BB



Nazotrakeal Entübasyon ve BB



One-lung ventilation using the ProSeal laryngeal mask airway



- 76y, erkek hasta
- Plevral biyopsi

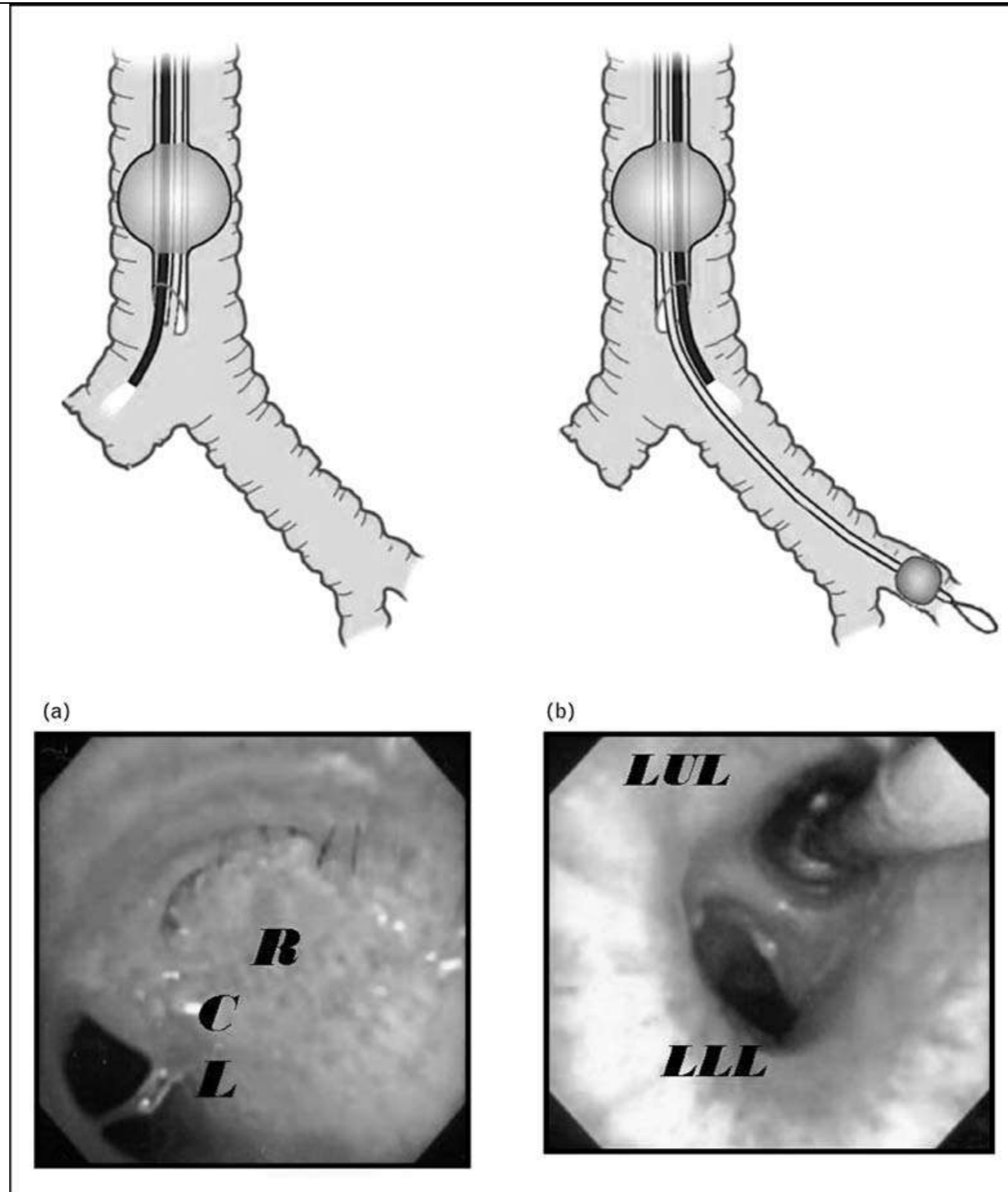
Selektif Lober Blokaj-BB

- Daha önceden pnömenektomi geçirmiş tekrar akciğer cerrahisi geçirmesi planlanan hastalar
- Azalmış pulmoner rezervlerinden dolayı TAV tolere edemeyecek hastalar
- Cerrahi işlem planlanan tarafın karşısında daha önceden lobektomi yapılmış hastalar

Update on selective lobar blockade during pulmonary resections

Javier H. Campos

Current Opinion in Anaesthesiology 2009;22:18-22



Postoperatif Mekanik Ventilasyon Gereksinimi

- Hava yolu yaralanmaları
- YBÜ'lerinde deneyim eksikliği

Airway Exchange Failure and Complications with the Use of the Cook Airway Exchange Catheter® : A Single Center Cohort Study of 1177 Patients

Sheron McLean, MD, Carolyn R. Lanam, BS, Wendy Benedict, BS, Nathan Kirkpatrick, BS, Sachin Kheterpal, MD, MB, and Satya Krishna Ramachandran, MD, FRCA

There are limited data on rates of failure and airway injury with the use of airway exchange catheters. We performed a single-center retrospective analysis of airway exchange catheters to determine the incidence and associated factors for tube exchange failure and airway injury. Among 1177 cases, failed intubation during attempted tube exchange was noted in 73/527 (13.8%). Airway exchange failure rates were greatest during exchange catheter use for double-lumen tube insertion and when intubation was attempted over the catheter postoperatively. Pneumothorax was noted after 1.5% of attempted tube exchanges. Difficult tube exchange was encountered in 6 of 8 patients with pneumothorax. (Anesth Analg 2013;117:1325–7)

- N=1177
- Retrospective
- Tüp deęiřtirici ile bařarısız entübasyon % 13.8

Pediatric Hastalarda TAV

- Çocuklarda TAV için kullanılan teknikler
 - Tek lümenli endotrakeal tüp
 - Bronşiyal blokerler
 - Univent tüp
 - Çift lümenli tüp

Çocuklarda TAV

< 2 yaş

ETT ile endobronşiyal entübasyon

Fogarty embolektomi veya Swan ganz kateteri

2 – 6 yaş

Arndt Bronşiyal Bloker (5 F)

Fogarty embelektomi kateteri

6 – 10 yaş

Arndt Bronşiyal Bloker (5 F)

Univent tüp

10 yaş üstü

Arndt Bronşiyal Bloker (7 F)

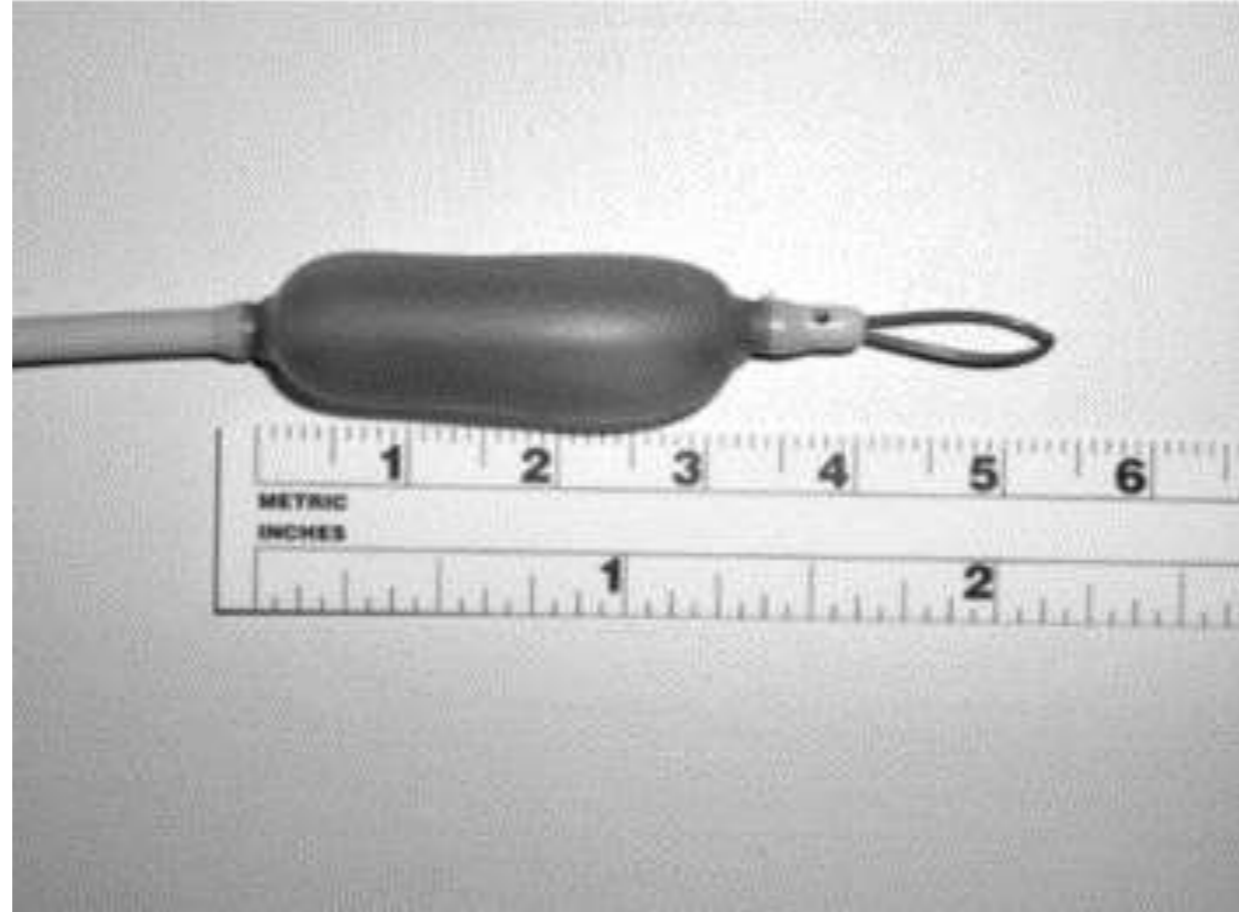
Univent tüp

Çift Lümenli tüp

15 Aylık Pediyatrik Bronşiyal Bloker ile Tek Akciğer Ventilasyonu

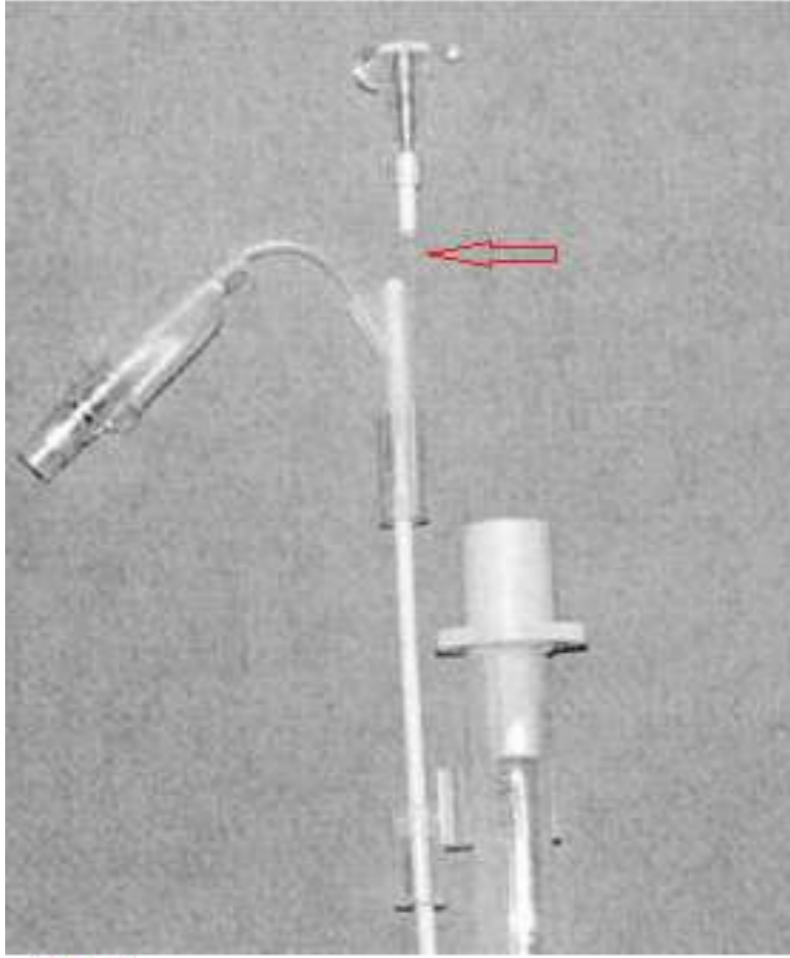


BB ilgili Komplikasyonlar



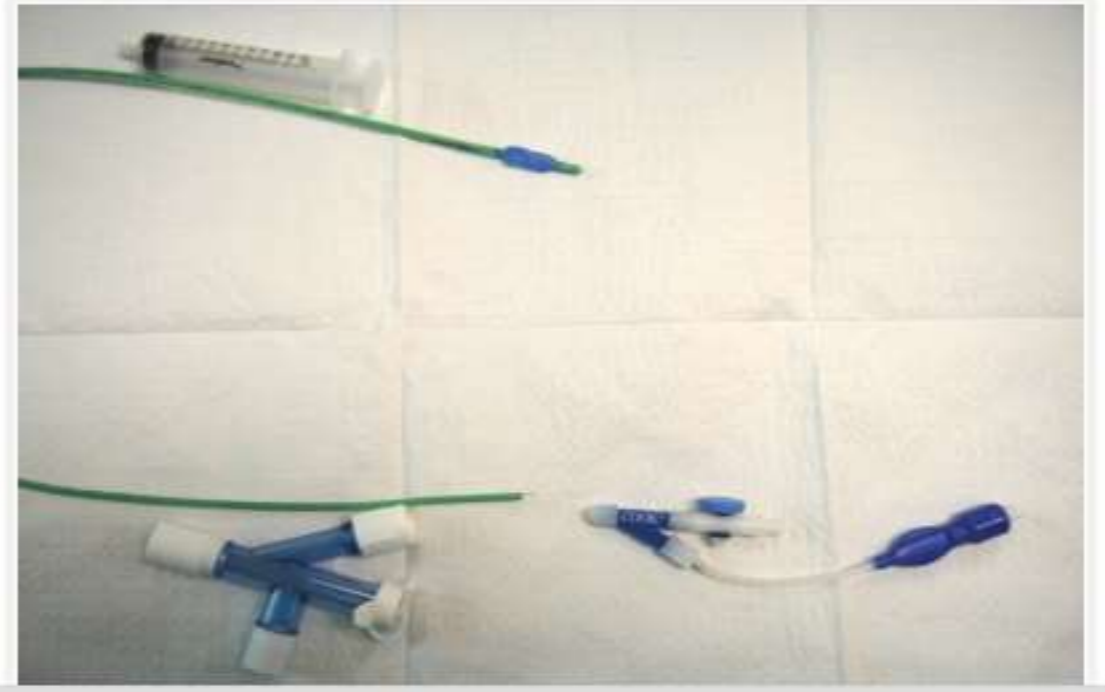
Arndt BB alt ucunun stapler hattında kalması

BB ilgili Komplikasyonlar



Uni- Bloker

Figure 1: Separated bronchial blocker lumen from the controller



Cohen BB

BB bağlantı ucunun kırılarak ayrılması.

Anesth Analg. 2003 Feb;96(2):630-1.

A structural complication in the torque control blocker Univent: fracture of the blocker cap connector.

Campos JH, Kernstine KH.

Bronşiyal Blokerler

Ac absesi

Ac kisti

Pulmoner hemoraji

Bronkopulmoner lavaj

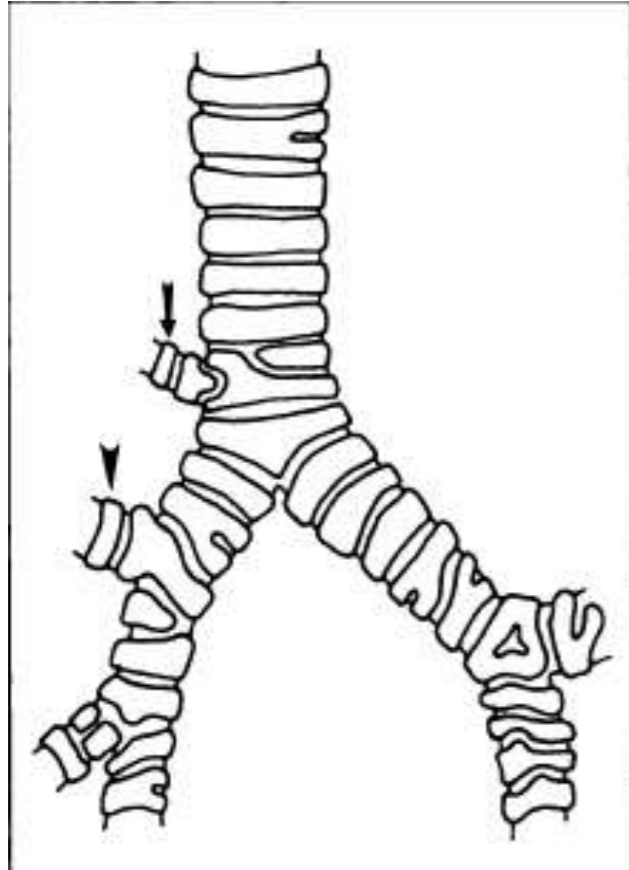
Pulmoner alveoler proteinozis

Pnöminektomi

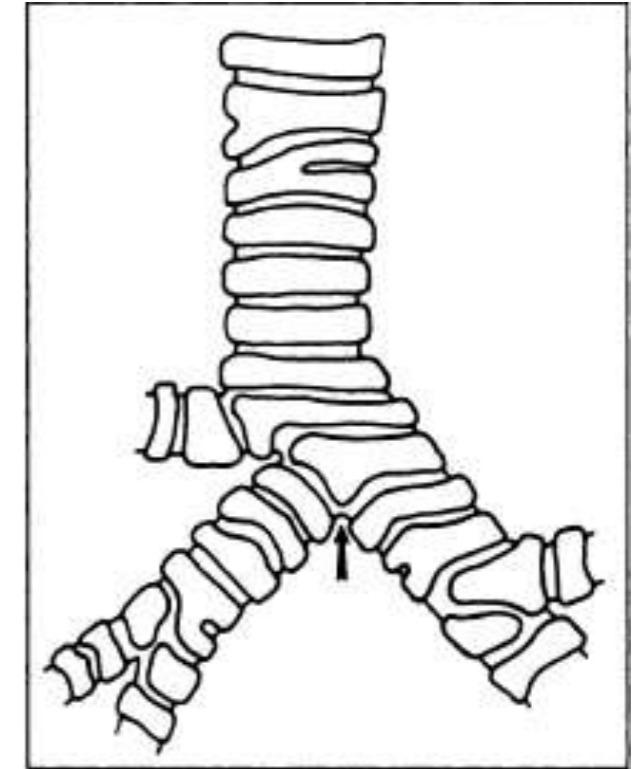


Konjenital anomaliler

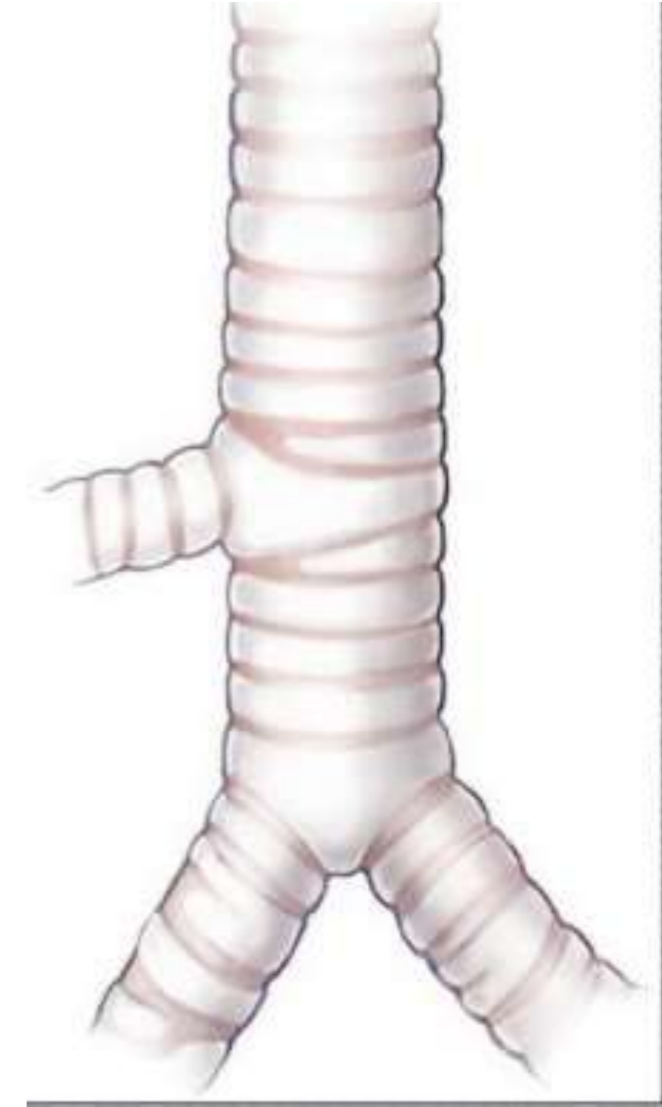
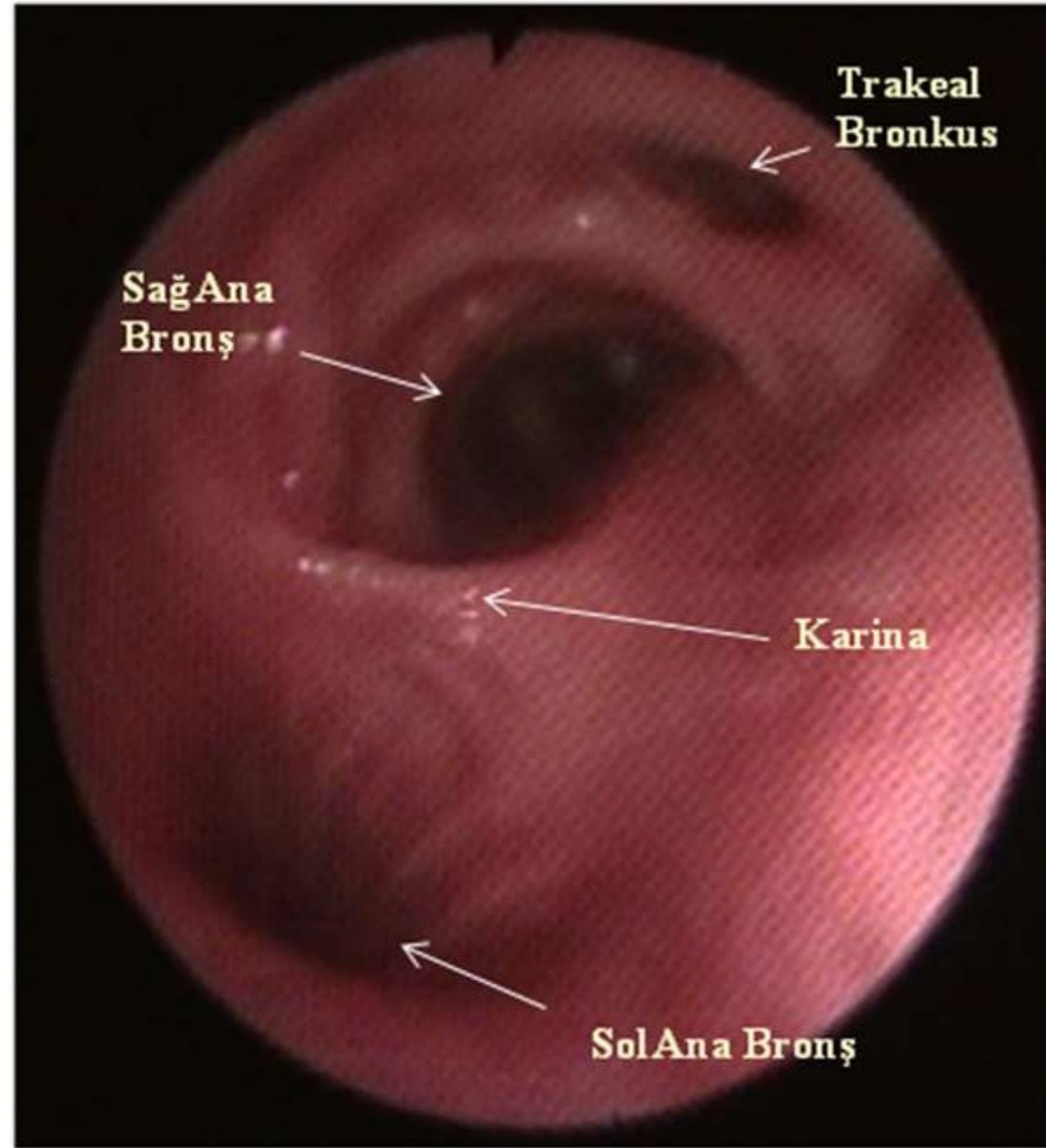
Trakeal Bronkus



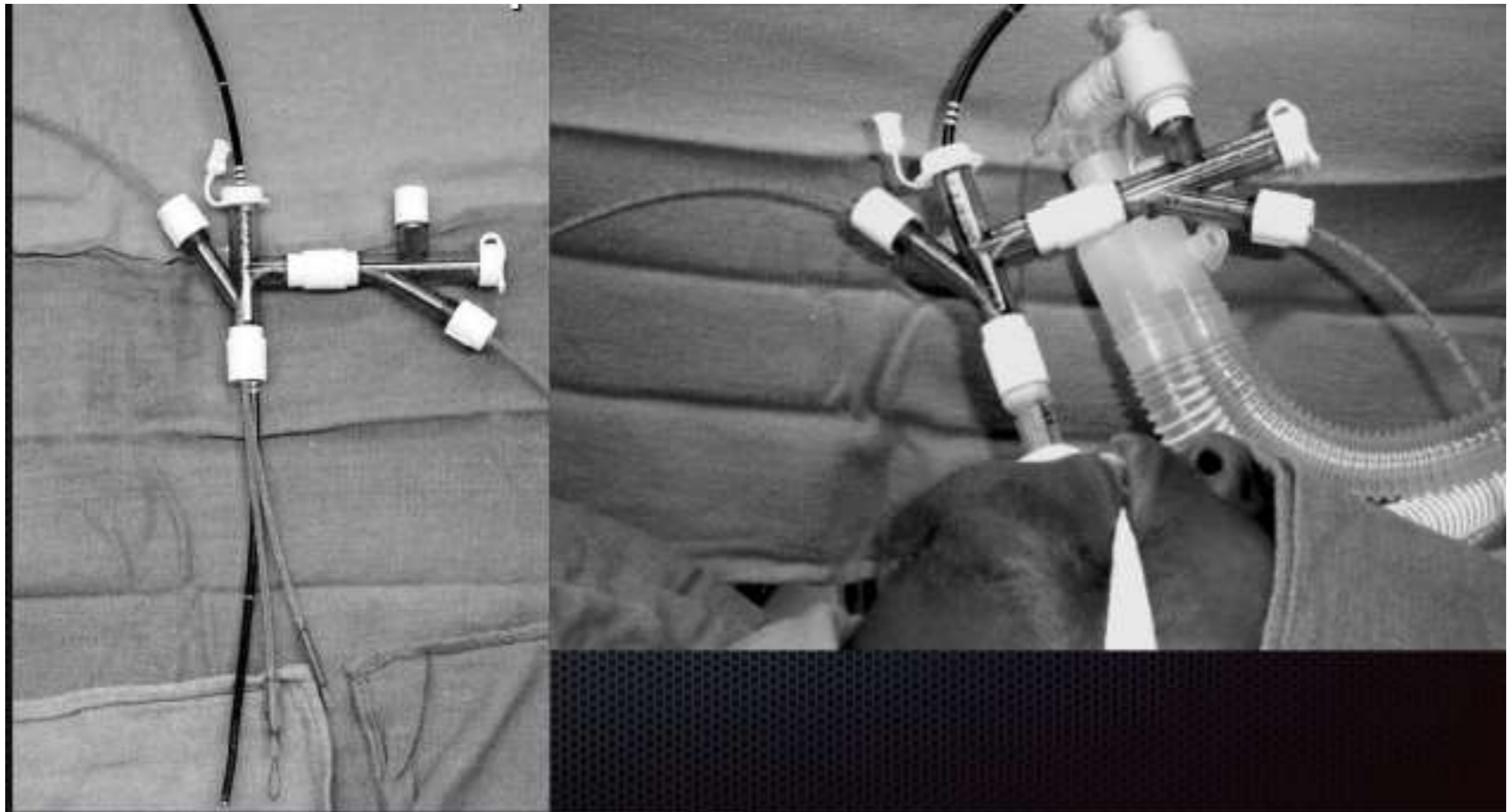
Köprüleşen Bronkus



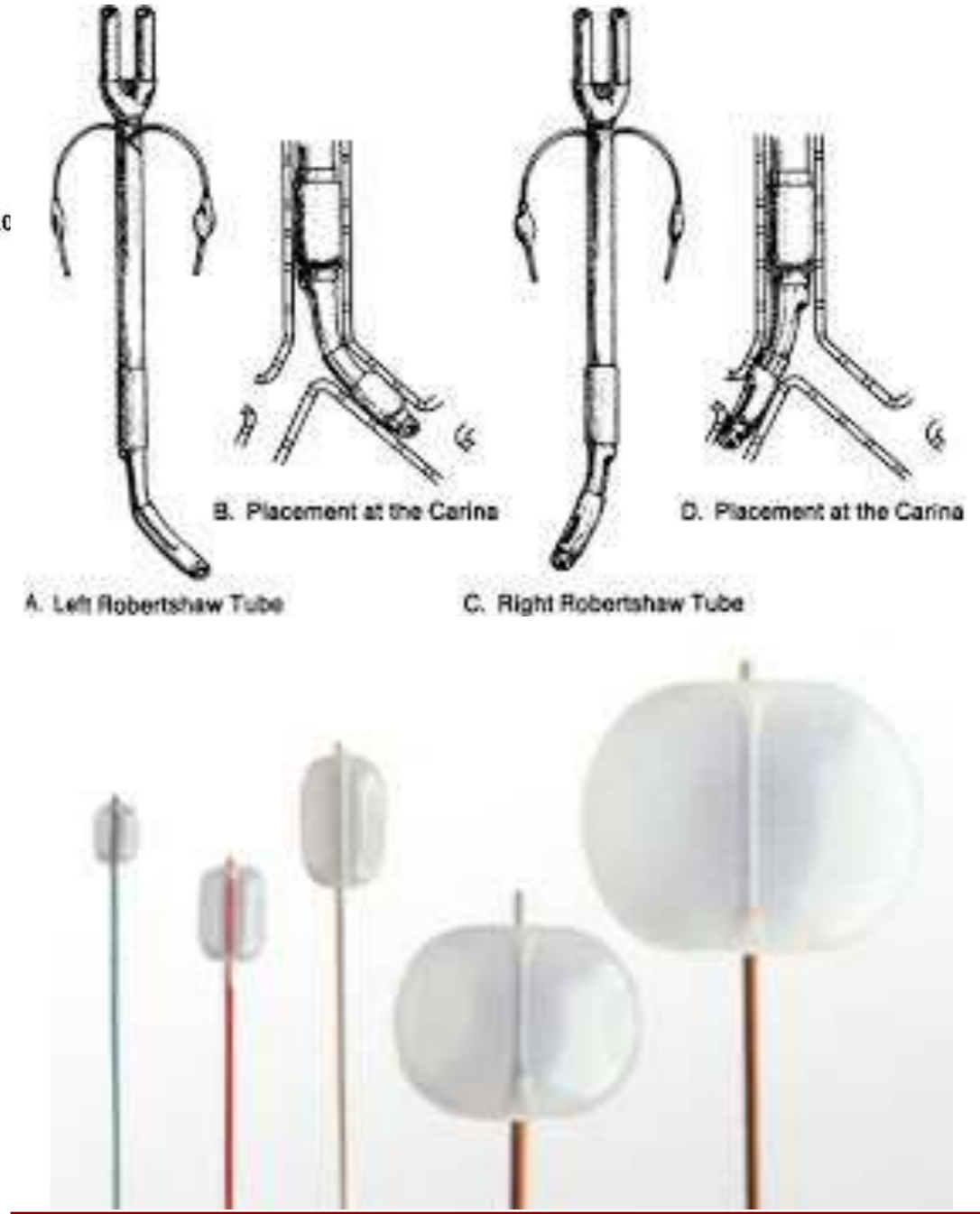
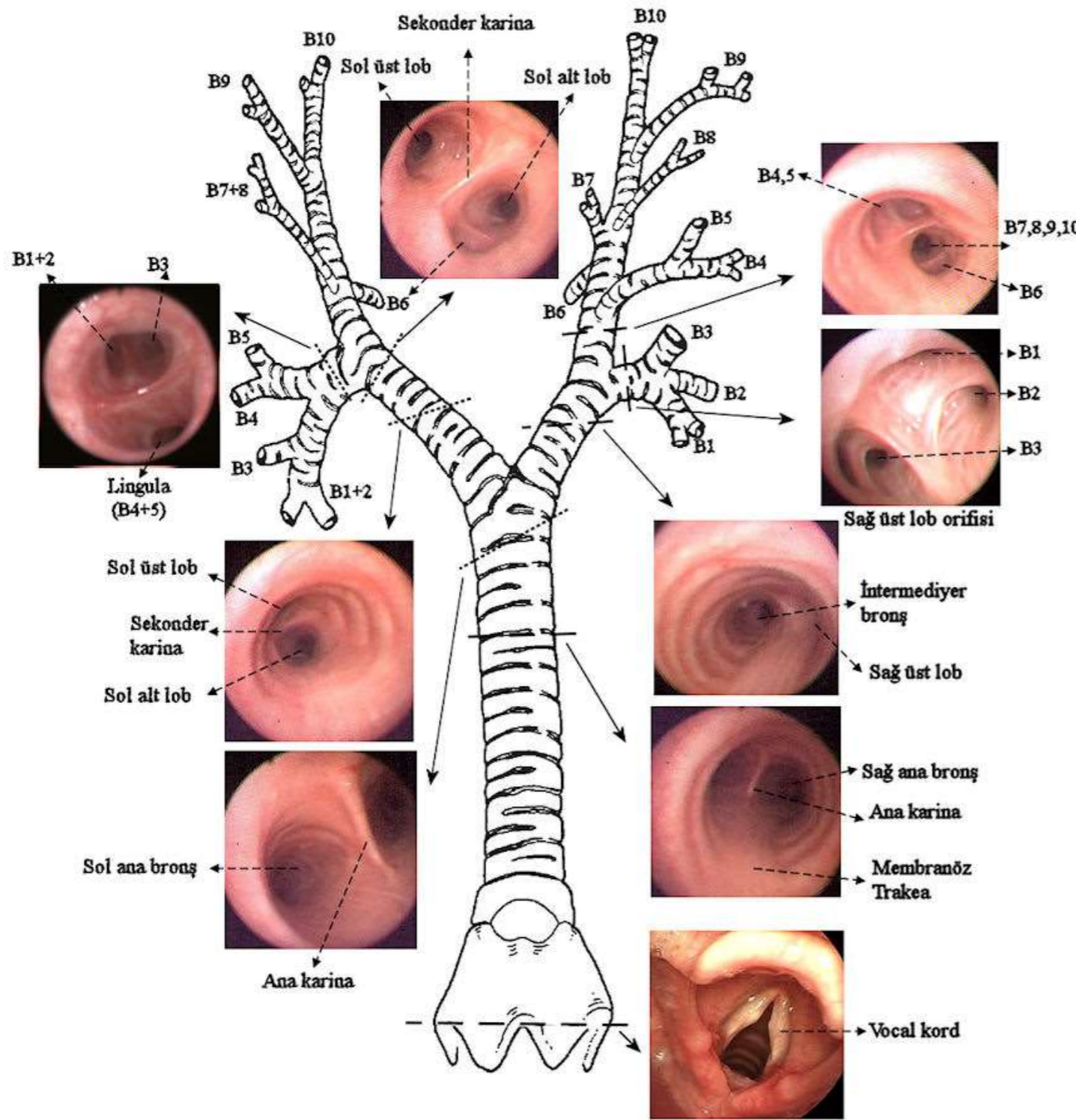
Konjenital Trakeal Bronkusta BB ile Yetersiz Sağ Akciğer İzolasyonu



Simultaneous use of 2 Arndt type endobronchial blockers to collapse the lung in congenital tracheal bronchus



SONUÇ



Anestezistler için bronkoskopik anatominin önemi

Tuberk Toraks. 2011;59(4):416-26.

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¹ Kocaeli Üniversitesi Tıp Fakültesi, Anesteziyoloji ve Reanimasyon Anabilim Dalı, Kocaeli,

² Kocaeli Üniversitesi Tıp Fakültesi, Göğüs Cerrahisi Anabilim Dalı, Kocaeli.

SONUÇ

Curr Opin Anaesthesiol. 2007 Feb;20(1):27-31.

Which device should be considered the best for lung isolation: double-lumen endotracheal tube versus bronchial blockers.

Campos JH.

University of Iowa Roy J. and Lucille A. Carver College of Medicine, Iowa City, Iowa 52242, USA. javier-campos@uiowa.edu

Abstract

PURPOSE OF REVIEW: This review is a clinical comparison between double-lumen endotracheal tubes and bronchial blockers to determine which device is considered the best for lung isolation.

RECENT FINDINGS: Double-lumen endotracheal tubes and bronchial blockers have been found to be clinically equivalent in terms of performance in providing lung collapse for patients with normal airways. In the last five years, however, numerous reports have indicated a preference for the use of bronchial blockers in patients with airway abnormalities. For nonthoracic anesthesiologists who have limited experience in thoracic anesthesia cases, none of the devices (double-lumen tubes or bronchial blockers) have been shown to provide any advantage while in use due to a high incidence of unrecognized malpositions. Overall, each device provides advantages depending upon the case, such as absolute lung separation with a double-lumen endotracheal tube or the use of a bronchial blocker in a difficult airway for a patient requiring lung isolation.

SUMMARY: Double-lumen endotracheal tubes and bronchial blockers should be part of the armamentarium of every anesthesiologist involved in lung isolation techniques and every device should be tailored to specific case needs.

Summary

Double-lumen endotracheal tubes and bronchial blockers should be part of the armamentarium of every anesthesiologist involved in lung isolation techniques and every device should be tailored to specific case needs.

Teşekkür Ederim