Why is Lung Isolation Difficult?

1. Look
2. Know What You are Looking At

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Disclosures:
Disclosures:

I’m
Cheering
For
Ottawa
Increasing Spectrum of One-lung Anesthesia:

- Lung Surgery
- Esophagus
- Thoracic Spine
- Autonomic Nerves
- Robotic Cardiac
Indications for Lung Isolation

**Absolute:**
- Blood
- Pus
- Air

**Relative:**
- Surgical exposure
Indications for Lung Isolation

**Absolute:**
- Blood
- Pus
- Air

**Relative:**
- Surgical exposure

**Surgical Exposure:**
- Lung Protection
- Blood
- Pus
- Fluid
- Ventilation
- BPF
- ILV
Techniques of Lung Isolation:

- Single Lumen Tubes
- Double-lumen Tubes
- Bronchial Blockers
FIG. 156. GALE AND WATERS ENDOBRONCHIAL INTUBATION FOR ONE-LUNG ANAESTHESIA (1931)
Single Lumen Endobronchial Tubes
Techniques of Lung Isolation:

- Single Lumen Tubes
- Double-lumen Tubes
- Bronchial Blockers
Carlens Double-lumen Endobronchial Tube
Techniques of Lung Isolation:

- Single Lumen Tubes
- Double-lumen Tubes
- Bronchial Blockers
8 Fr. Fogarty Venous Embolectomy Catheter, 10 cc balloon
UNIVENT TUBE
The “Arndt” Bronchial Blocker
Fuji “Uni-Blocker”
Bronchial Blockers – Cohen
New Bronchial Blockers

COHEN  FUJI  ARNDT
Bronchial Blocker compared to Double-lumen tube during VATS

<table>
<thead>
<tr>
<th>Method</th>
<th>Time for Placement</th>
<th>Placement Failure</th>
<th>Satisfactory Deflation</th>
</tr>
</thead>
<tbody>
<tr>
<td>DLT</td>
<td>2.3 min.</td>
<td>1/16</td>
<td>16/16</td>
</tr>
<tr>
<td>Left BB</td>
<td>4.2</td>
<td>3/10</td>
<td>10/10</td>
</tr>
<tr>
<td>Right BB</td>
<td>2.4</td>
<td>0/9</td>
<td>5/9</td>
</tr>
</tbody>
</table>
The ABC’s of Lung Isolation:

◆ Anatomy

◆ Bronchoscope

◆ Chest X-ray, CT Scan
38% Incidence of major malpositions of Double-lumen Tubes and Blockers

“The most critical factor in successful placement was the anesthesiologist’s knowledge of endoscopic bronchial anatomy”

The ABC’s of Lung Isolation:

- Anatomy
- Bronchoscope
- Chest X-ray, CT Scan
Left double-lumen tubes
Clinical experience with 1,170 patients.

◆ Positioning of DLTs with auscultation and observation of chest wall movement

◆ “The authors find bronchoscopy unnecessary in the majority of patients and do not use it routinely.”

Double-lumen Tubes:

- Placement Technique
- Size
Height 136-194cm (All Patients)

Brodsky JB, et al
Anesth Analg 73:570, 1991
Double-lumen Tubes:

- Placement Technique

- Size
Single- vs. Double-Lumen Tubes in Cross-Section

8.0  35 Fr  10.0  41 Fr
**Suggested Sizes for Double-lumen Tubes:**

<table>
<thead>
<tr>
<th>Sex</th>
<th>Height</th>
<th>Size of Tube (Fr.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>&lt; 160cm</td>
<td>35</td>
</tr>
<tr>
<td>Female</td>
<td>≥ 160cm</td>
<td>37</td>
</tr>
<tr>
<td>Male</td>
<td>&lt; 170cm</td>
<td>39</td>
</tr>
<tr>
<td>Male</td>
<td>≥ 170cm</td>
<td>41</td>
</tr>
</tbody>
</table>
“Tracheal Bronchus”
High takeoff of Right UL Bronchus
The ABC’s of Lung Isolation:

- Anatomy
- Bronchoscope
- Chest X-ray, CT Scan
55 y.o. Female Post-op. R Pneumonectomy

Post-op. Day 1

Post-op. Day 7
62 y.o. male, Left lower lobe Lung Cancer
Previous Failed Intubation
Video-Laryngoscope + Tube Exchanger

Glidescope
62 y.o. male, Left lower lobe Lung Cancer
Previous Failed Intubation

- ++ Drowsy at end of surgery
- ? Extubation
- ? Tube change
60 y.o. F, 2 hr. post-op. MVR

- Sudden onset
  massive
  hemoptysis

? dDx

? Rx
False Aneurysm
RLLobe PA

Embolization Coil
RLLobe PA
68 y.o. Female, Mid-esophageal Ca. TE Fistula
Tube Selection for Lung Isolation:

- **Double-Lumen Tube**
  - Excellent Isolation
  - Independent Lung Access
  - Fixed Anatomical Design
  - Adults

- **Bronchial Blocker or (Single-Lumen EBTube)**
  - Adaptability
  - Difficult airways
  - No need to change tube
  - Suctioning
The ABC’s of Lung Isolation:

- Anatomy
- Bronchoscope
- Chest X-ray, CT Scan
- Anatomy
The structure seen in the Yellow circle is?

A. Right Bronchus intermedius
B. Left upper lobe bronchus
C. Left mainstem bronchus
D. Right middle lobe bronchus
E. Right upper lobe bronchus
The structure seen in the Yellow circle is?

A. Right Bronchus intermedius
B. Left upper lobe bronchus
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E. Right upper lobe bronchus
Teaching Bronchial Anatomy

- In the OR
- Review articles/CD/DVD
- Workshops
- Virtual bronchoscopy simulator
- Online bronchoscopy simulator