Anaesthesia for Thoracic Surgery

Is There Any New Useful Equipment?

Chris Richardson
Wickham Terrace Anaesthesia QLD
Greenslopes Private Hospital
Anaesthesia for Thoracic Surgery

Is There Any New Useful Equipment?

Chris Richardson
Wickham Terrace Anaesthesia QLD

NO DISCLOSURES
Evaluating new stuff…

• What is “new”

• Is it safer

• Is it better
  – Better job
  – Easier to use

• Costs the same or less

Behringer & Kristensen. Evidence for the benefit vs novelty in new intubation equipment. Anaesthesia 2011, 66 (Suppl.2); 57-64
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Evidence for benefit vs novelty in new intubation equipment

E. C. Behringer¹ and M. S. Kristensen²

NEW DEVICE:

• How does it compare to the current (gold) standard?

• What is the learning curve?

• What is the best method to teach proficiency?
Evidence for benefit vs novelty in new intubation equipment

E. C. Behringer¹ and M. S. Kristensen²

NEW airway DEVICE: CHALLENGES IN ASSESSING

- Equal proficiency
- Experienced
- Difficult conditions
- Manikin studies
- Blinding
New Stuff

• Video laryngoscopes
• Advances in monitoring
  – Haemodynamic: eg Picco, FlowTrac
  – Coagulation: POC testing
• Drugs
  – Sugammadex: roc/SGX combo
  – Coagulation: PTX, Fibrinogen
New Stuff

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  – Haemodynamic: eg Picco, FlowTrac
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• Drugs
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• Lung Isolation
  – DLTs
  – Blockers
  – Bronchoscopy
Ambu aScope
Ambu

- Headquarters in Copenhagen, Denmark
- Ambu bag 1956
Ambu aScope

ORIGINAL ARTICLE
Evaluation of the novel, single-use, flexible aScope® for tracheal intubation in the simulated difficult airway and first clinical experiences

T. Piepho,1 C. Werner2 and R. R. Noppens3

1 Senior Registrar, 2 Professor of Anaesthesia and Chairman, 3 Consultant, Department of Anaesthesiology, University Medical Centre of the Johannes Gutenberg-University, Mainz, Germany
Summary
Flexible fibreoptic intubation is widely accepted as an important modality for the management of patients with difficult airways. We compared the aScope®, a novel, single-use, flexible video-endoscope designed to aid tracheal intubation, with a standard flexible intubating fibrescope, by examining the performance of 21 anaesthetists during an easy and difficult intubation simulation in a manikin. Intubation success, time for intubation, and rating of the devices (using a scale from 1, excellent to 6, fail) were documented. Intubation times were similar for both flexible 'scopes in the scenarios (p = 0.59). Successful intubation rates were higher for the standard intubating fibrescope (17/21, 81%) than the aScope (14/21, 67%; p = 0.02) in the difficult intubation scenario. The median (IQR[range]) ratings for the standard fibrescope vs the aScope were respectively: overall, 2 (1.75–2 [1–2.5]) vs 3 (2–3.25 [1–5]) (p < 0.0001); picture quality 2 (1.5–2 [1–3]) vs 3 (2–4 [1–5]) (p < 0.0001). The aScope was also successfully used to facilitate tracheal intubation in five patients with anticipated or unanticipated difficult airways. Picture quality was sufficient to identify the anatomical landmarks. Although the performance of the aScope is acceptable, it does not meet the current quality of standard flexible intubation fibrescopes.
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Flexible fibreoptic intubation is widely accepted as an important modality for the management of patients with difficult airways. We compared the aScope®, a novel, single-use, flexible video-endoscope designed to aid tracheal intubation, with a standard flexible intubating fibroscope, by examining the performance of 21 anaesthetists during an easy and difficult intubation simulation in a manikin. Intubation success, time for intubation, and rating of the devices (using a scale from 1, excellent to 6, fail) were documented. Intubation times were similar for both flexible 'scopes in the scenarios (p = 0.59). **Successful intubation rates were higher for the standard intubating fibroscope (17/21, 81%) than the aScope (14/21, 67%; p = 0.02)** in the difficult intubation scenario. The median (IQR[range]) ratings for the standard fibroscope vs the aScope were respectively: overall, 2 (1.75–2 [1–2.5]) vs 3 (2–3.25 [1–5]) (p < 0.0001); picture quality 2 (1.5–2 [1–3]) vs 3 (2–4 [1–5]) (p < 0.0001). The aScope was also successfully used to facilitate tracheal intubation in five patients with anticipated or unanticipated difficult airways. Picture quality was sufficient to identify the anatomical landmarks. Although the performance of the aScope is acceptable, it does not meet the current quality of standard flexible intubation fibrescopes.
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ORIGINAL ARTICLE

Comparison of the manoeuvrability and ease of use of the Ambu aScope and Olympus re-usable fibrescope in a manikin*

M. Vijayakumar,1 A. Clarke,2 A. R. Wilkes,3 N. Goodwin4 and I. Hodzovic5

1 Specialist Registrar, 4 Consultant Anaesthetist, Department of Anaesthetics, Intensive Care and Pain Medicine, Cardiff and Vale University Health Board, Cardiff, UK
2 Specialist Registrar, 5 Consultant, Department of Anaesthetics and Intensive Care Medicine, Royal Gwent Hospital, Newport, UK
3 Senior Research Fellow, 5 Senior Lecturer, Department of Anaesthetics, Intensive Care and Pain Medicine, Cardiff University, Cardiff, UK

Summary

In this study, we compared the manoeuvrability and ease of use of the indwelling Ambu aScope with the Olympus re-usable fibrescope in a manikin. The Ambu aScope was found to be more manoeuvrable and easier to use than the Olympus fibrescope.
CASE REPORT

Use of the Ambu® aScope™ in 10 patients with predicted difficult intubation

E. Pujol,¹ A. M. López² and R. Valero³

¹ Resident, 2 Senior Specialist, 3 Consultant, Anaesthesiology Department, Hospital Clínic de Barcelona, Barcelona, Spain
Ambu aScope

The disposable Ambu aScope vs. a conventional flexible videoscope for awake intubation – a randomised study

M. S. Kristensen and B. B. Fredensborg
Department of Anaesthesia, Center of Head and Orthopaedics, Rigshospitalet, University Hospital of Copenhagen, Copenhagen, Denmark

• 40 patients; aScope vs Olympus videobronch
• All successfully intubated; no difference in intubating times (91 vs 77 secs)
• Image quality was “acceptable to good” vs “good to very good”
• aScope: 2 cases of blurring after lignocaine injection that was not retrievable, with new disposable scope used in each case
• The aScope camera lens had to be cleaned more often
Comparison of the single-use Ambu® aScope™ 2 vs the conventional fibrescope for tracheal intubation in patients with cervical spine immobilisation by a semirigid collar

V. Krugel,1 I. Bathory,2 P. Frascarolo3 and P. Schoettker4

1 Staff Anaesthetist, 2 Consultant, 3 Biologist and Statistician, 4 Senior Consultant, Anaesthesiology Department, University Hospital Centre and University of Lausanne, Lausanne, Switzerland

Summary

Fibreoptic intubation remains a key technique for the management of difficult intubation. We randomly compared the second generation single-use Ambu® aScope™ 2 videoscope with a standard re-usable flexible intubating fibrescope in 50 tracheal intubations in patients with a difficult airway simulated by a semirigid collar. All patients’ tracheas were successfully intubated with the Ambu® aScope™ 2 videoscope. Clinical Airway Management (CAM) scores did not change...
Ambu aScope

- 100 patients, anaesthetised, neck collar
- aScope vs Pentax FOB
- Time to intubation: 98 vs 65 seconds
- More jaw thrust manoeuvres were needed
- Visual quality was less excellent

Discussion

The main results of this study offer little support for the use of aScope 2 as an alternative to the conventional device. The median time to intubate was longer with the aScope 2, more jaw thrust manoeuvres were needed, and there were fewer ‘excellent’ ratings of quality of vision. Yet, overall success rates for intubation were similar, perhaps suggesting that anaesthetists use their skills to overcome intrinsic technical difficulties of the device.

The longer intubation times with the aScope 2 were essentially due to an increased time to identify the
**Ambu aScope**

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The longer intubation times with the aScope 2 were essentially due to an increased time to identify the
Clinical evaluation of the Ambu® aScope™

In their recent study, Krugel and colleagues [1] claimed that times to obtain a view of the carina and intubate the trachea were significantly longer with the single-use Ambu® aScope™ videolaryngoscope (Ambu UK Ltd, St. Ives, UK) than the re-usable Penta® fibrescope, and therefore the authors could not support the use of the aScope in place of the fibrescope. Other studies, carried out with mandibles and patients [2, 3], suggest that the times to complete particular scenarios were close between the aScope and re-usable fibrescopes.

When reporting the results of their study, Krugel et al. stated five different times (the median, lower quartile, upper quartile, minimum and maximum) to identify the carina with each device. It was intriguing that the five times quoted for the aScope (28, 22, 16, 18 and 206 s, respectively) were almost exactly double those for the re-usable fibrescope (15, 12, 22, 7 and 110 s, respectively) in each case. There is clearly something that causes a consistent, systematic difference between the two devices and we are

- Underpowered
- Systematic bias
Ambu aScope

1.1 The case for adopting the Ambu aScope2 for use in people with unexpected difficult airways needing emergency intubation is supported by the evidence. This shows that the Ambu aScope2 is an acceptable alternative, where a multiple-use fibre optic endoscopy is unavailable. There are also advantages during replacement of dislodged tracheostomy tubes in the intensive care setting. Making the Ambu aScope2 available for use across settings is likely to improve outcomes and patient safety.

1.2 Adoption of the Ambu aScope2 is supported by cost modelling for a range of common clinical settings in which there is no multiple-use endoscope or where...
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Adoption of the Ambu aScope2 is supported by cost modelling for a range of common clinical settings in which there is no multiple-use endoscope or where...
Ambu aScope

A potential technique for flexible scope-assisted intubation using an Ambu aScope 2 inserted via a supraglottic airway device.

Figure 1: The cable of the Ambu aScope 2 was transected using trauma shears at its junction with the handle.
A potential technique for flexible scope-assisted intubation using an Ambu aScope 2 inserted via a supraglottic airway device.

The scope was turned off and the cable transected using trauma shears at its junction with the handle.

Figure 1: The cable of the Ambu aScope 2 was transected using trauma shears at its junction with the handle.
A potential technique for flexible scope-assisted intubation using an Ambu aScope 2 inserted via a supraglottic airway device.

**Figure 1:** The cable of the Ambu aScope 2 was transected using trauma shears at its junction with the handle.
Ambu aScope

A potential technique for flexible scope-assisted intubation using an Ambu aScope 2 inserted via a supraglottic airway device

Figure 1: The cable of the Ambu aScope 2 was transected using trauma shears at its junction with the handle.
Ambu aScope

Ambu® aScope™ 3 5.0/2.2
The single-use flexible videoscope

Key Benefits

- **Instant accessibility**
  Always at hand when needed, saving valuable time and enhancing patient airway safety.

- **High degree of usability**
  The portable, plug and play system is easy to transport and set up. It is ready for use in no time.

- **Cost efficiency**
  Eliminates repair costs as well as any limitations caused by complex reprocessing.

- **No risk of cross-contamination**
  Sterility straight from the pack reduces the risk of cross-contamination.
Ambu aScope

- High resolution video technology
- Better LED illumination
- Better tip flexibility range
- Working channel width of 2.2mm
- Suction channel
- No maximum operation time
Ambu® aScope™ 3 Slim 3.8/1.2
The ultra slim single-use flexible videoscope

Key Benefits

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# Ambu aScope

## Specifications

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<thead>
<tr>
<th><strong>Optical system</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Field of View</td>
<td>85°</td>
</tr>
<tr>
<td>Direction of View</td>
<td>0° (forward viewing)</td>
</tr>
<tr>
<td>Depth of Field</td>
<td>8-19 mm</td>
</tr>
<tr>
<td>Illumination method</td>
<td>LED</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Insertion portion</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bending section</td>
<td>130° up, 130° down°</td>
</tr>
<tr>
<td>Insertion cord diameter</td>
<td>3.8 mm (0.15&quot;)</td>
</tr>
<tr>
<td>Distal end diameter</td>
<td>4.2 mm (0.16&quot;)</td>
</tr>
<tr>
<td>Maximum diameter of insertion portion</td>
<td>4.3 mm (0.17&quot;)</td>
</tr>
<tr>
<td>Minimum endotracheal tube size (inner diameter)</td>
<td>5.0 mm</td>
</tr>
<tr>
<td>Minimum double lumen tube size (inner diameter)</td>
<td>37 Fr</td>
</tr>
<tr>
<td>Working length</td>
<td>600 mm (23.6&quot;)</td>
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</table>

<table>
<thead>
<tr>
<th><strong>Channel</strong></th>
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<tbody>
<tr>
<td>Average inner diameter</td>
<td>1.2 mm (0.047&quot;)</td>
</tr>
<tr>
<td>Minimum instrument channel width</td>
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<th><strong>Suction connector</strong></th>
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<tr>
<td>Connecting tube inner diameter range</td>
<td>0.7mm +/- 1mm</td>
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<th><strong>Operating environment, storage &amp; transportation</strong></th>
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<tr>
<td>Temperature</td>
<td>10 ~ 40° C (50 to 104° F)</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>20 ~ 80%</td>
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<td></td>
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</tr>
<tr>
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- **Channel**: 1.2 mm (0.047")
- **Suction connector**: 0.7 mm +/- 1 mm
- **Operating environment, storage & transportation**: 10 ~ 40° C (50 to 104° F)
Ambu aScope

COST
Ambu aScope

IS IT COST EFFECTIVE.....?

COSTS OF A RE-USABLE SCOPE

• Initial Purchase Cost
• Maintenance & Repair
• Sterilisation & Storage
Ambu aScope

IS IT COST EFFECTIVE.....?

COSTS OF A RE-USABLE SCOPE PER USE

• **USA**: 130 - 170 AUD

• **Europe**: 250 – 291 AUD

• **UK**: 650 AUD
  McCahon and Whynes. Anaesthesia 2015, 70, 699–706
Ambu aScope

IS IT COST EFFECTIVE....?

COSTS OF A RE-USABLE SCOPE

• Initial Purchase Cost
• Maintenance & Repair
• Sterilisation & Storage
Ambu aScope

IS IT COST EFFECTIVE.....?

COSTS OF A RE-USABLE SCOPE – REPAIR COSTS per use

• LIU 2012: 67%
• McCahon 2015: 43%
Ambu aScope

Cost Identification Analysis of Anesthesia Fiberscope Use for Tracheal Intubation

Steven S. Liu*, Jay B. Brodsky and Alex Macario
Professor, Department of Anesthesia, Stanford University School of Medicine

Conclusions

Repair/replacement costs were the major contributor to the total incremental costs of utilizing reusable fiberscopes in an academic anesthesia department. These results may vary at other hospitals due to differences in purchase and repair arrangements with vendors, clinical practice and fiberscope use, and frequency of damage. When making purchase decisions on these devices, costs downstream from the initial capital monetary outlay need to be assessed.

$7000 AUD per repair episode
Ambu aScope

IS IT COST EFFECTIVE.....?

COSTS OF A RE-USABLE SCOPE – REPAIR COSTS per use

• LIU 2012: 67%
• McCahon 2015: 43%
Fibrescopes are expensive and notoriously easy to damage...despite the fact that the majority of damage is easily avoided, the problem of repeatedly damaged scopes has resisted all our attempts at training.
Ambu aScope

- 14 Scopes
- 42 repair incidents over 5 years
- Ratio of procedures to repairs – 18:1
- Annual repair bill of $40,000 AUD

Cost comparison of re-usable and single-use fibrescopes in a large English teaching hospital

R. A. McCahon¹ and D. K. Whynes²
Figure 1  Variation in the cost per fibreoptic intubation as the procedure:repair ratio and number of intubations vary. Each line represents a different procedure:repair ratio (○ = QMC at 18:1, ■ = 27:1, ♦ = 36:1, ▲ = 54:1); the dashed reference line represents the cost of using the Ambu aScope 3.
Figure 1 Variation in the cost per fibreoptic intubation as the procedure:repair ratio and number of intubations vary. Each line represents a different procedure:repair ratio (● = QMC at 18:1, ■ = 27:1, ♦ = 36:1, ▲ = 54:1); the dashed reference line represents the cost of using the Ambu aScope 3.
Ambu aScope

- Higher rates of usage make re-usable scopes more cost effective but...
- The rates required to make an important difference are much higher than might be expected
• Repair rate should be kept low...

• Reserve disposable scopes for less experienced operators, operators-in-training
Ambu aScope

IS IT COST EFFECTIVE....?
MDH Video System

Zhuhai Mindhao Medical Technology Company

A30 – 3.2 mm

Re-usable

Combined light source, battery, and LCD
...video double-lumen tube (VDLT) that has an embedded camera and light source between the tracheal and bronchial cuffs, enabling continuous airway visualization on a portable external proprietary monitor that is connected via a mini-USB adapter...

VivasightTM (ET View Ltd, Misgav, Israel)
A Retrospective Evaluation of the Use of Video-Capable Double-Lumen Endotracheal Tubes in Thoracic Surgery

Jagtar Singh Heir, DO, Ron Purugganan, MD, Timothy A. Jackson, MD, PhD, Peter H. Norman, MD, Juan P. Cata, MD, Alyssa Kosturakis, BA, and Dilip Thakar, MD


- Retrospective 6 month chart review
- 29 patients; all with successful lung isolation
- 27 did not “need” separate bronchoscopy
- Additional benefit of continuous visualisation
Fig. 1 from Heir et al., JCVA, Vol 28, No 4 (August), 2014: pp 870–872
Fig. 2 from Heir et al., JCVA, Vol 28, No 4 (August), 2014: pp 870–872
Evaluation of a new double-lumen endobronchial tube with an integrated camera (VivaSight-DL™): a prospective multicentre observational study


- Left sided only
- Standard French sizes 35 – 41
- Extra side port for flushing lens
Evaluation of a new double-lumen endobronchial tube with an integrated camera (VivaSight-DL™): a prospective multicentre observational study

E. M. Koopman,1 M. Barak,2 E. Weber,3 M. J. A. Valk,4 R. T. I. de Schepper,5 R. A. Bouwman3 and J. M. Huitink1
Evaluation of a new double-lumen endobronchial tube with an integrated camera (VivaSight-DL™): a prospective multicentre observational study

E. M. Koopman,¹ M. Barak,² E. Weber,³ M. J. A. Valk,⁴ R. T. I. de Schepper,⁵ R. A. Bouwman³ and J. M. Huitink¹

- 151 consecutive patients
- Successful placement in 148, 122 easy, 29 difficult
- Average time 60 seconds
- Successful lung isolation in 147
Evaluation of a new double-lumen endobronchial tube with an integrated camera (VivaSight-DL™): a prospective multicentre observational study

E. M. Koopman,¹ M. Barak,² E. Weber,³ M. J. A. Valk,⁴ R. T. I. de Schepper,⁵ R. A. Bouwman³ and J. M. Huitink¹

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Right-sided surgery*</th>
<th>Left-sided surgery*</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of view via tube camera</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>106 (72%)</td>
<td>68 (72%)</td>
<td>35 (71%)</td>
<td>0.91</td>
</tr>
<tr>
<td>Moderate</td>
<td>31 (21%)</td>
<td>20 (21%)</td>
<td>9 (18%)</td>
<td>0.68</td>
</tr>
<tr>
<td>Poor</td>
<td>11 (7%)</td>
<td>6 (6%)</td>
<td>5 (10%)</td>
<td>0.42</td>
</tr>
<tr>
<td>Vision lost during surgery</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fibreoptic bronchoscope needed</td>
<td>45 (30%)</td>
<td>30 (30%)</td>
<td>15 (30%)</td>
<td>0.03</td>
</tr>
<tr>
<td>After endobronchial intubation</td>
<td>14 (10%)</td>
<td>10 (10%)</td>
<td>4 (8%)</td>
<td>0.74</td>
</tr>
<tr>
<td>Intra-operatively</td>
<td>11 (7%)</td>
<td>7 (7%)</td>
<td>4 (8%)</td>
<td>0.41</td>
</tr>
<tr>
<td>Total</td>
<td>19 (13%)</td>
<td>13 (13%)</td>
<td>6 (12%)</td>
<td>0.33</td>
</tr>
</tbody>
</table>
Intubation and lung isolation was fast and effective

No additional bronchoscopy in 87%

Observation of correct placement in real-time

Teaching

Continuous view

Cost: £59 vs £135

Separate bronchoscopy not completely eliminated
Intubation with VivaSight or conventional left-sided double-lumen tubes: a randomized trial

Intubation avec VivaSight ou tubes conventionnels à double lumière gauche: un essai randomisé

Rolf Schuepbach, MD · Bastian Grande, MD · Giovanni Camen, MD · Alexander R. Schmidt, MD · Henrik Fischer, MD · Daniel I. Sessler, MD · Burkhardt Seifert, PhD · Donat R. Spahn, MD · Kurt Ruetzler, MD

- Randomised, comparison with conventional DLT
- 2 groups of 20 patients
- Predicted that time to intubation would be faster with vivasight
- One patient excluded in the vivasight group
Intubation with VivaSight or conventional left-sided double-lumen tubes: a randomized trial

<table>
<thead>
<tr>
<th>Primary Outcome</th>
<th>DLT (n = 20)</th>
<th>VivaSight DLT (n = 19)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intubation time (sec)</td>
<td>97 (84)</td>
<td>63 (58)</td>
<td>0.03</td>
</tr>
<tr>
<td>Secondary Outcomes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intubation without flexible bronchoscopy</td>
<td>17 (85%)</td>
<td>19 (100%)</td>
<td>1.00</td>
</tr>
<tr>
<td>Tube dislocation during placement</td>
<td>4 (20%)</td>
<td>2 (11%)</td>
<td>0.66</td>
</tr>
<tr>
<td>Tube dislocation during surgery</td>
<td>2 (10%)</td>
<td>3 (16%)</td>
<td>1.00</td>
</tr>
<tr>
<td>Ease of insertion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>13 (65%)</td>
<td>13 (65%)</td>
<td>0.87</td>
</tr>
<tr>
<td>2</td>
<td>3 (15%)</td>
<td>3 (15%)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>3 (15%)</td>
<td>1 (5%)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1 (5%)</td>
<td>2 (10%)</td>
<td></td>
</tr>
<tr>
<td>5 (excluded)</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Lung collapse quality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>18 (90%)</td>
<td>16 (84%)</td>
<td>0.36</td>
</tr>
<tr>
<td>2</td>
<td>2 (10%)</td>
<td>3 (16%)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Intubation duration (min)</td>
<td>155 ± 104</td>
<td>144 ± 75</td>
<td>0.87</td>
</tr>
</tbody>
</table>

- 34 seconds faster
- 3 out of 20 conventional DLTs were malpositioned at initial bronchoscopy
- Displacement rates were similar
Intubation with VivaSight or conventional left-sided double-lumen tubes: a randomized trial

- No differences in coughing hoarseness or sore throat
- More but minor airway injuries with Vivasight
- $300 vs $150
Lung isolation with a new Y-shaped endobronchial blocking device, the EZ-Blocker®

- 7Fr catheter, distal y-shape
- Insufflation/suction lumina
- Multiport adaptor

H. E. Mungroop*
P. Tjong Yoe Wai
M. N. Morei
B. G. Loef
A. H. Epema
Groningen, The Netherlands

Mungroop et al., BJA 2010, 104: 119 -120
The symmetrical design facilitates introduction and positioning of the device with the extensions in both main bronchi... owing to its Y shape, the blocker remains in position.
Lung isolation with a new Y-shaped endobronchial blocking device, the EZ-Blocker®

- 11 consecutive patients
- Successful positioning in all in 70 secs
- No displacement during surgery or with lateral decubitus
- Good isolation

Mungroop et al., BJA 2010, 104: 119 -120
Lung isolation with a new Y-shaped endotracheal tube, the Ruetzler tube

- 11 consecutive patients
- Successful positioning in all in 70 secs
- No displacement during surgery or with lateral decubitus
- Good isolation

Fig 1. Ruetzler et al., BJA 2011, 106(6): 896-902
Lung isolation with a new Y-shaped endobronchial blocking device, the EZ-Blocker®

Mungroop et al., BJA 2010, 104: 119 -120

- 11 consecutive patients
- Successful positioning in all in 70 secs
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Clinical experience with a new endobrochial blocker: the EZ-blocker

Tamás Végh · Marianna Juhász · Attila Enyedi · István Takács · József Kollár · Béla Fülesdi

- 10 patients
- Positioned in 71 - 76 seconds
- Initial malposition in 2 patients
- Deflation time 755 seconds
Clinical experience with a new endobrochial blocker: the EZ-blocker

Tamás Végh · Marianna Juhász · Attila Enyedi · István Takács · József Kollár · Béla Fülesdi

<table>
<thead>
<tr>
<th></th>
<th>Left main bronchus</th>
<th>Right main bronchus</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung deflation time spontaneously through the lumen of the EZ-blocker with the cuff inflated (s)</td>
<td>755 ± 113</td>
<td>676 ± 61.7</td>
<td>0.180</td>
</tr>
<tr>
<td>Amount of air necessary for blocking under airway pressure of 25 cmH₂O (ml)</td>
<td>6.7 ± 1.16</td>
<td>8.0 ± 1.1</td>
<td>0.033</td>
</tr>
<tr>
<td>Cuff pressure during proper blocking under airway pressure of 25 cmH₂O (cmH₂O/mmHg)</td>
<td>54 ± 5.1</td>
<td>115 ± 7/84.6 ± 5</td>
<td>&lt;0.001</td>
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Clinical experience with a new endobronchial blocker: the EZ-blocker

Tamás Végh · Marianna Juhász · Attila Enyedi · István Takács · József Kollár · Béla Fülesdi

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<td>8.0 ± 1.1</td>
<td>0.033</td>
</tr>
<tr>
<td>Cuff pressure during proper blocking under airway pressure of 25 cmH$_2$O (cmH$_2$O/mmHg)</td>
<td>54 ± 5.1/39.8 ± 4</td>
<td>115 ± 7/84.6 ± 5</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>
Paediatric application of the EZ-Blocker for thoracoscopic sympathectomy

- 10 year old
- 35 kg
- VAT sympathectomies
- Satisfaction was “very good”
Randomized clinical trial comparing double-lumen tube and EZ-Blocker® for single-lung ventilation


1 Department of Cardiothoracic and Vascular Anesthesia and Intensive Care Medicine and 2 Department of Thoracic Surgery, Medical University of Vienna, Waehringer Guertel 18-20, 1090 Vienna, Austria; received from the Outcomes Research Consortium

* Corresponding author. E-mail: kurt.ruetsler@meduniwien.ac.at

- 40 patients, EZ vs DLT
- Blind placement was 21% vs 90%
- No differences in:
  - Quality of lung collapse rated by surgeon
  - Subjective ease of use rated by anaesthetist
  - Hoarseness or sore throat rated by patients
Randomized clinical trial comparing double-lumen tube and EZ-Blocker® for single-lung ventilation

K. Ruetzler¹*, G. Grubhofer¹, W. Schmid¹, D. Papp¹, S. Nabecker¹, D. Hutschala¹, G. Lang² and H. Hager¹

¹ Department of Cardiothoracic and Vascular Anesthesia and Intensive Care Medicine and ² Department of Thoracic Surgery, Medical University of Vienna, Waehringer Guertel 18-20, 1090 Vienna, Austria; received from the Outcomes Research Consortium

* Corresponding author. E-mail: kurt.ruetzler@meduniwien.ac.at

- Time to initial placement 85 vs 192 secs
- Secondary malpositioning 3 vs 7
- Obligagatory use of bronchoscope
- A “valuable alternative” to DLT
• 100 patients
• Blind placement with bronchoscopic assessment
• 50 vs 48
Time to initial placement: 25 vs 13 secs
Easier placement of EZ blocker
Initial malpositioning: 74% vs 85% (ns)
Initial repositioning: 11 vs 5 secs
Secondary malpositioning: 40% vs 27% (ns)
Efficiency, Efficacy, and Safety of EZ-Blocker Compared with Left-sided Double-lumen Tube for One-lung Ventilation

Jo Mourisse, M.D., Ph.D.,* Jordi Liesveld, M.D.,† Ad Verhagen, M.D.,‡ Garance van Rooij, M.D.,* Stefan van der Heide, M.D.,‡ Olga Schuurbiers-Siebers, M.D., Ph.D.,§ Erik Van der Heijden, M.D., Ph.D.§

Table 4. Quality of Collapse

<table>
<thead>
<tr>
<th></th>
<th>DLT (n = 48)</th>
<th>EZB (n = 50)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time to halfway collapse, s</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>120</td>
<td>90</td>
<td>0.751</td>
</tr>
<tr>
<td>Range</td>
<td>25–440</td>
<td>12–600</td>
<td></td>
</tr>
<tr>
<td>Duration of OLV, min</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median</td>
<td>63</td>
<td>83</td>
<td>0.248</td>
</tr>
<tr>
<td>Range</td>
<td>10–270</td>
<td>20–222</td>
<td></td>
</tr>
<tr>
<td>Quality of collapse after 10 min, n</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excellent</td>
<td>18</td>
<td>24</td>
<td>0.367</td>
</tr>
<tr>
<td>Good</td>
<td>23</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>NA</td>
<td>5</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Quality of collapse overall, n</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excellent</td>
<td>30</td>
<td>35</td>
<td>0.804</td>
</tr>
<tr>
<td>Good</td>
<td>11</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>NA</td>
<td>5</td>
<td>4</td>
<td></td>
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</table>
Efficiency, Efficacy, and Safety of EZ-Blocker Compared with Left-sided Double-lumen Tube for One-lung Ventilation

Jo Mourisse, M.D., Ph.D.,* Jordi Liesveld, M.D.,† Ad Verhagen, M.D.,‡ Garance van Rooij, M.D.,* Stefan van der Heide, M.D.,‡ Olga Schuurbiers-Siebers, M.D., Ph.D.,§ Erik Van der Heijden, M.D., Ph.D.§

<table>
<thead>
<tr>
<th>Table 5. Postoperative Complaints</th>
<th>DLT</th>
<th>EZB</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total No.</strong></td>
<td>45</td>
<td>47</td>
<td></td>
</tr>
<tr>
<td><strong>Sore throat on day 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No complaints or preexistent</td>
<td>34</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>Mild</td>
<td>5</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>5</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Severe</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>Sore throat on day 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No complaints or preexistent</td>
<td>35</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>Mild</td>
<td>7</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Severe</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>Hoarseness on day 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No hoarseness or preexistent</td>
<td>34</td>
<td>42</td>
<td>0.141</td>
</tr>
<tr>
<td>Noticed by patient</td>
<td>8</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Seen by observer</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Aphonia</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>Hoarseness on day 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No hoarseness or preexistent</td>
<td>44</td>
<td>41</td>
<td>0.643</td>
</tr>
<tr>
<td>Noticed by patient</td>
<td>1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Seen by observer</td>
<td>0</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Aphonia</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>
More tracheal and bronchial injury with the DLT

No difference in carinal injury
Efficiency, Efficacy, and Safety of EZ-Blocker Compared with Left-sided Double-lumen Tube for One-lung Ventilation

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- Easier to place
- Equally effective
- Caused less airway injury & sore throat
- EZ-B 7 Fr (spilt into 2 lumens) vs 9 Fr
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 Toker, MD*


- 40 patients; EZ vs 9 Fr Cohen
- Time to initial placement: 146 vs 241 secs
- Secondary malpositions: 3 vs 5
- Surgeon satisfaction: no difference
The Papworth BiVent Tube: Initial Clinical Experience

Sunit Ghosh, BSc, FRCA, Florian Falter, MD, PhD, FRCA, Andrew A. Klein, FRCA, and Joseph E. Arrowsmith, MD, FRCP, FRCA

Journal of Cardiothoracic and Vascular Anesthesia, Vol 25, No 3 (June), 2011: pp 505-508
The Papworth BiVent Tube: Initial Clinical Experience

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Journal of Cardiothoracic and Vascular Anesthesia, Vol 25, No 3 (June), 2011: pp 505-508

• 4 patients reported; 1 patient required repositioning of the BiVent