

The Airway Gazette

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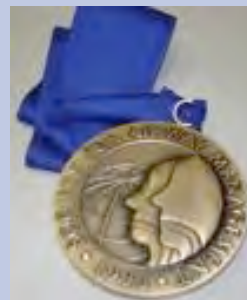
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**SAM's Official
Journal !**

**The Journal of
Clinical Anesthesia**

The Society for Airway Management



*Distinguished Service
Award*

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Editorial Expressions

Dear SAM Colleagues,
This issue is jam-packed with interests for everyone. Dr. Elizabeth Behringer has all ten of her fingers on the pulse of our society. In her Presidential Letter:

- Details include reciprocal interactions between SAM, the Chinese Society for Airway Management and the Difficult Airway Society of the United Kingdom.
- SAM's focus on education and research is illustrated by the simultaneous development of the SAM Trainee Travel Awards, SAM Resident Committee, and SAM Annual Meeting Trainee Roundtable session.
- There is good news for those sitting 24 hours a day looking at SAM Forum emails — a SAM Forum Journal Blog.

Next in the Gazette is a fascinating microcosm of Dr. John Doyle's world, clearly identifying why he was chosen as the recipient of the 2009 Distinguished Service Award and why we are grateful to be associated with him.

The following article by Dr. Allan Goldman, reveals similar success rates of insertion (98%) with i-gel™ and LMA Supreme™. Both have gastric drains and are supraglottic airways (GD-SGA). GD-SGA have firmer tips for a better fit but cost ~1.5-2x most **non-GD-SGA**. The author reflects on the possibility that GD-SGA-use may become a new standard of care. If GD-SGA **are** more likely to be better placed and associated with fewer problems, is it possible there may be



recrimination against airway care-givers and manu-facturers in the event that *use of a **non-GD-SGA** results in a complication?* Should

only production of GD-SGA be undertaken to drive down costs and allow for universal use of "better" types of devices? In the USA, will society push for airway device changes just as it has for safer cars, etc? Back again is the Resident Review section, featuring Dr. Olga Pawelek's summary of Takenaka's study on the value of bougie with Airway Scope to minimize cervical spine motion. Returning is our Tips & Tricks section, with Dr. Edward Fohrman's "intubation made easy with use of an LTA" as a variation on Bourke et al's (A&A 1999) use of LTA capnography. Lastly, devastating events in January 2009 touched the hearts of many people including members of our society. SAM members personally assisted in care of Haitian earthquake victims and we are thankful for their actions. If any of you is interested in putting your experience on paper, the editors of the Airway Gazette would like to hear from you in order to inform and educate SAM members with regard to your activities in a severe traumatic situation.

Best regards,
Katherine Gil, M.D.
Editor-in-Chief

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Welcome New Members to SAM!!! (mostly alphabetical)

<http://www.samhq.com>

Society for Airway Management (2009) Presidential Address

Elizabeth Cordes Behringer, M.D.

The Society for Airway Management begins its fifteenth year! As current SAM President, I would like to review some of the Society's accomplishments in 2009 and update you on several remarkable events in store for SAM throughout my term in 2010.

Over the past year, SAM has grown to include nearly 600 members in 35 countries across the globe. SAM is a truly multidisciplinary society and includes anesthesiologists, emergency room physicians, intensivists, surgeons, nurse anesthetists and corporate individuals as members. This unprecedented and diverse growth of SAM is due in part to the enthusiasm of existing members, the quality of the annual meeting, the SAM Forum, the Airway Gazette as well as global interest in advanced airway management.

Highlights of the 2009 calendar year included:

The 13th Annual Meeting and Workshop was held at the Venetian Hotel in Las Vegas, Nevada. Dr. Ashu Wali (Baylor College of Medicine, Houston, TX) did a fantastic job as Program Chair. Dr. Wali and the members of the Annual Scientific Meeting Committee should be commended for the quality of the speakers, sessions and workshops in Las Vegas. In addition, Dr. Wali succeeded in garnering an unprecedented amount of corporate support towards the success of the conference.

SAM continues its collaboration with the Difficult Airway Society (www.das.uk.com). Dr. Anil Patel (Royal National Throat, Nose, and Ear Hospital, London, U.K.) delivered the DAS lecture at the 2009 SAM meeting. He gave a fantastic lecture on his vast experience with post-intubation laryngo-tracheal stenosis in adult patients.

SAM members, including myself, Dr. Richard Cooper (Toronto General Hospital, Toronto, Canada) and Dr. Thomas Mort (Hartford Hospital, Hartford, CT) were invited to give a variety of lectures at the 2009 DAS annual meeting in Perth, Scotland in November 2009.

The DAS meeting was excellent, well organized

and informative. The reciprocity between our two airway societies remains an ideal forum for the international growth of airway management through research and education. DAS President, Dr. Ellen O'Sullivan and I have discussed the importance of fostering exchange and collaboration between our two societies. This tradition will continue in 2010. Dr. Barry McGuire, (Ninewells Hospital, Dundee, Scotland, U.K.) Program Chair of the 2009 DAS meeting, will bring his enthusiasm and expertise to the 2010 SAM annual meeting as a guest speaker. Dr. David Ball (Dumfries and Galloway Royal Infirmary, Scotland, U.K.) will deliver the DAS lecture entitled "Patients, Principles and Paradigms" at the 14th Annual SAM meeting in Chicago.

The first exchange between SAM and the newly formed Chinese Society for Airway Management took place in 2009. This landmark exchange was due to the efforts of Past Presidents P. Allan Klock, M.D and Chandy Verghese. This exchange is supported by an unrestricted educational grant from Verathon Inc. Immediate Past President Klock (University of Chicago, Chicago, IL) and Executive Director Carin Hagberg (U.T. Houston, Houston, TX) were invited speakers at the Chinese Society of Anesthesiologists annual meeting in Shanghai China in 2009 where they lectured to standing room only audiences. In exchange, Dr. Ming Tian (Chairman, Department of Anesthesia- Beijing Friendship Hospital) was an invited speaker at the SAM meeting in Las Vegas.

Dr. Tian gave a phenomenal lecture on Airway Management in China, a survey of nearly 1800 hospitals in his country from 2004-2006. SAM is fortunate to continue this exchange program in 2010. Dr. Thomas Mort and I have been invited to speak at the first National Meeting for Airway Management in Zheng Zhou, Henan China in October 2010. SAM is honored to participate in this inaugural international conference. In exchange, Dr Mingzhang Zuo (Beijing Hospital, Beijing China) will be a guest lecturer in Chicago to discuss: "Use of the LMA in China".

In 2009, the second SAM educational grant was awarded to Dr. Richard Cooper. Dr. Cooper will present the preliminary findings of his research at the 2010 SAM meeting in Chicago.

The Airway Gazette, under the helm of Editor-in-Chief, Dr. Katherine Gil (Northwestern University, Chicago, IL), published phenomenal quarterly newsletters in 2009. The SAM website has links to past editions of this educational and entertaining publication. SAM members are encouraged to contribute to future editions.

Lastly, the new Society for Airway Management exhibit booth debuted at the 2009 American Society for Anesthesiologists annual meeting in New Orleans, LA. The new booth was located on the exhibit floor and was instrumental in recruiting 50 new members to join SAM!

The Society for Airway Management continues to focus on education, research and growth in 2010.

The 14th Annual Meeting and Workshops: The Swissôtel, Chicago, Illinois, September 24-26, 2010. Preparations for the 14th Annual Meeting of SAM are well underway. Program Chair, Gail Randel (Northwestern University, Chicago, IL) and Co-Chair Lauren Berkow (Johns Hopkins, Baltimore, MD) have been working diligently with the Annual Scientific Meeting committee to provide another fantastic educational and networking experience. Please save the date!

The SAM Forum Journal Blog (SJB): SAM Past President, Dr. Will Rosenblatt (Yale School of Medicine, New Haven, CT) and Dr. Felipe Urdaneta (University of Florida, Gainesville, FL) have organized this new venture on the SAM forum. Each month, SAM members will be invited to submit recently published literature on airway management to the SJB editors, Drs Rosenblatt and Urdaneta. The SJB editors will post a link to 2 articles each month for discussion by current members of the SAM forum. Specifics of the SJB may be found on the SAM Forum.

Redesign of the SAM website: The newly designed SAM website will be up and running by summer 2010. The Website Redesign Committee, under the helm of Past President and SAM Webmaster, Dr. John Doyle (Cleveland Clinic, Cleveland, OH) is

dedicated to a revised SAM website which will be a truly innovative resource for airway management.

Growth of Resident/Trainee Involvement in SAM:

One of my personal missions as SAM President is to foster the growth of trainee involvement in the Society. To that goal, I am pleased to announce the following:

- SAM Board of Directors unanimously approved the institution of the ***SAM Trainee Travel Awards***.
—Please see P. 9 for a complete description—

- The 2010 SAM Annual Meeting will include a Trainee Section Roundtable session. On Saturday September 25, 2010, Dr. Richard Cooper and I will chair a roundtable ***session expressly for trainees***: “How to Incorporate Videolaryngoscopy into Your Clinical Practice”. It will include a box lunch for trainee members registered for the annual meeting.

- The SAM Board of Directors accepted an amendment to the bylaws forming the ***SAM Resident Committee***. This committee is charged with involving residents, fellows, student nurse anesthetists and trainees in allied health professions with the Society for Airway Management. This Committee will also be charged with a long-term goal: Development of a model airway management curriculum for anesthesia and emergency medicine residency programs.

I am honored to serve as President of the Society for Airway Management during the fifteenth year of this remarkable organization. I wish to thank all the individual SAM members who have generously donated their time, interest and expertise towards the continued growth and development of SAM. I look forward to seeing everyone at the 14th Annual SAM Meeting in Chicago!



Best Wishes in 2010...

Elizabeth Behringer M.D.
Cedars Sinai Medical
Center
Los Angeles, CA

**Society for Airway Management
Distinguished Service Award
2009 Medalist**

**D. John Doyle, M.D., Ph.D.
Cleveland Clinic Foundation
Cleveland, Ohio**



Dr. Doyle received his MD and PhD degrees from the University of Toronto, Canada. Upon completion of his fellowship training at Toronto General Hospital, he joined the University as an Assistant Professor in the Department of Anesthesiology. In 1991, he was awarded the Toronto General Hospital Anesthesia Department Annual Teaching Award for excellence in clinical teaching. In 2002, he was appointed Staff Anesthesiologist and Associate Professor in the Department of General Anesthesiology at the Cleveland Clinic. In 2003, he was awarded the Arthur Barnes, MD Teaching Award from the School of Nurse Anesthesia, Cleveland Clinic Foundation. In 2006, Dr. Doyle was promoted to Professor of Anesthesiology.



In the 27 years since he graduated from medical school, he has been active in teaching, research, clinical activities in anesthesiology, and in biomedical engineering. Dr. Doyle has had a long interest in the application of instructional technology as applied to medical education. This interest has led to his development of a variety of educational web pages, CDs (compact discs), and similar materials for medical education for use with full-size and hand-held computers. In addition, his interest in education has led to his completion of postgraduate certificate programs in education from two Canadian Universities.

Dr. Doyle's interest in biomedical engineering has lasted over two decades; he entered the

University of Toronto PhD program in Biomedical Engineering in 1977. Since that time, he has had an ongoing interest in applying engineering techniques to physiological modeling, to patient monitoring, as well as to solving practical clinical problems. He has also participated in numerous standards committees related to acute care, respiratory care, and anesthesiology, as well as engaging as an active member of the Society for Technology in Anesthesia, for which he served as Chairman of the Education Committee.

In 1991, John Doyle founded the Toronto Airway Symposium, an annual meeting with a clinical airway theme. In 1994, he founded an open-access Internet-based anesthesia education journal called the Online Journal of Anesthesia. From 1999 to 2002, he served as the New Medical Editor for the Canadian Journal of Anesthesia. He is on the Advisory Board of Anesthesiology News.

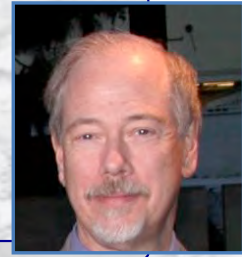
Dr. Doyle's primary clinical interests include management of the patient with a difficult airway and perioperative fluid therapy. He has written numerous chapters and participated in the Canadian Airway Focus Group initiative that developed a set of clinical management guidelines designed to complement the American Society of Anesthesiologists difficult airway algorithm. Dr. Doyle is a founding member of SAM, serving on numerous committees, task forces, and most recently as its President in 2004. Dr. Doyle created and continues to maintain the SAM website. Additionally, he began the SAM newsletter, the Airway Gazette. His contributions to SAM are numerous and significant.

Dr. Doyle's hobbies are scuba diving, travel, writing, bioethics, computers and educational website development. He and his wife, JoAnne, have a son.

Talk to the experts, friends, experienced airway specialists on the SAM

Comparison of the LMA Supreme™ and the Intersurgical i-gel™: A Prospective Study

Allan J. Goldman, MD, Darwin Viernes, MD,
and Michael Flacco, MD
University of Washington Medical Center
Seattle, Washington



Introduction

The LMA Supreme™ (SLMA) and the Intersurgical i-gel™ (i-gel) are two new disposable supraglottic airways (SGAs) that separate the alimentary and respiratory tracts. The SLMA combines features of the LMA Fastrach™—a fixed curve shaft for easy insertion and the LMA Proseal™ (PLMA)—gastric access. The i-gel cuff is filled with thermoplastic gel and does not require inflation. Both device manufacturers claim easy insertion and a high oropharyngeal leak pressure (OLP). We tested these claims in a prospective study. An additional focus of our study was identifying which adjustment maneuvers improved the SLMA and the i-gel's fit.



Method:

With IRB approval and informed consent, we prospectively collected insertion data from 100 patients: 50 i-gel insertions and 50 SLMA insertions. After a propofol induction (2-3 mg.kg-1), we waited until there was lack of response to a jaw thrust, before inserting the i-gel or SLMA¹. A proper fit was determined to be: a tidal volume >8 ml/kg, an OLP >20 cm H₂O, and a positive suprasternal notch test². If the fit was poor, one of the following maneuvers was performed: deeper insertion, an up-down maneuver (slowly withdrawing the inflated mask 5-6 ml and reinserting) while performing a jaw thrust, or exchanging the device for a different size. For study consistency, one experienced anesthesio-

logist performed all the insertions.

Results

Insertion success rate - First-attempt insertion success rate was 98% for both the SLMA and the i-gel. One SLMA was exchanged out successfully for a bigger size. One i-gel was exchanged out for a Classic LMA™.

Oropharyngeal leak pressure - OLP was >20 cm H₂O in all 98 successful insertions. OLP was >30 cm H₂O in 58% of the SLMA group and 62% of the i-gel group.

Maneuvers performed - The up-down maneuver was performed and gave a better fit in 40% of the SLMA group and 10% of the i-gel group.

Discussion

Both the i-gel and the SLMA had a high first-pass insertion success rate and a high OLP. Their 98% first-pass insertion success compares favorably to a first-pass success of 88% and 93% for the LMAs Proseal™ and Classic™ respectively³. The up-down maneuver improved SLMA and i-gel's fit in 40% and 10% of the patients respectively. This maneuver is performed with the LMAs (Fastrach™ & CTrach™) to reposition a downfolded epiglottis⁴, and may also work similarly with the SLMA. Further studies to confirm this maneuver's efficacy with the SLMA and i-gel are needed.

When the LMA Classic™ was first introduced, its advantages, compared to the tracheal tube, were soon apparent: e.g. avoidance of laryngoscopy, less bronchospasm, tolerated at lighter planes of anesthesia, and less coughing during emergence. However, a potential design limitation of the LMA Classic™ was that it might not protect the respiratory tract from the aspiration of gastric contents. Brimacombe et al. reported the incidence of pulmonary aspiration to be 2.3/10,000, which was comparable to the incidence in non-LMA™ general

Please contact the SAM headquarters amprince@peds.bsd.uchicago.edu,
or any of the SAM officers with your ideas for future meetings

anesthetics³. Others reported that the overall risk from aspiration was found to range from 1/9,299 patients in elective ASA 1 patients, to a high of 1/1,401 patients in elective ASA 4 and 5 patients. In cases where aspiration was present while using an LMA Classic™, many were attributed to device malposition.

Although the risk of clinically significant pulmonary aspiration with the LMA Classic™ is low, the PLMA was introduced to improve on its design by the addition of a drain tube, separation of the gastric and respiratory tracts, and a larger cuff for higher seal pressures. There are currently no large studies of the PLMA that provide comparable aspiration data to the LMA Classic™. However, there have been case reports and cadaver studies that have shown that the PLMA is superior to the LMA Classic™. Keller et al reported in cadaver studies that a properly placed PLMA was able to provide a more effective seal than the LMA Classic™. In addition, they were able to demonstrate that in a properly placed PLMA, fluid in the esophagus bypassed the pharynx and mouth via the drainage tube³. An added benefit of the drainage tube was to allow rapid clinical diagnosis of correct PLMA placement. Given that many previous LMA mishaps were attributed to device malposition, the added drainage tube offered a significant clinical advantage in confirming correct device placement.

The SLMA and the i-gel are two examples of the ongoing evolution of the SGA. These devices contain most of the advantages of the PLMA, with several additional key features. Their tips have been reinforced to prevent folding, and their bodies have

been made more rigid to prevent rotation and to allow easier insertion. These features make a high first-pass insertion rate possible, while allowing rapid diagnosis of correct device position. For these reasons, the SLMA and i-gel can offer a greater margin of safety for routine cases over SGAs without a drain tube. They are also preferable in high-risk patients, such as patients who have delayed gastric emptying (i.e. diabetics), patients who are obese, and patients who need positive pressure ventilation. In these patients, aspiration pneumonia, though rare, may have dire consequences.

The SLMA and the i-gel are at the cutting-edge of SGA design. Routine use of these types of devices may become a new standard of care.

References

1. C. Drage MP, Nunez J, Vaughan RS, Asai T. Jaw thrust as a clinical test to assess the adequate depth of anesthesia for insertion of the laryngeal mask. *Anaesthesia* 1996; 51: 1167-70
2. O'Connor, C. Borromeo, M. Stix. Assessing ProSeal Laryngeal Mask Positioning: The Suprasternal Notch Test. *Anesthesia and Analgesia* 2002; 94: 1374-75
3. Brimacombe J. Laryngeal Mask Anesthesia: Principles and Practice. Saunders, 2005: 469–504.
4. Goldman A, Rosenblatt W, Liu E, Goy R, Theil D. Evaluation of the LMA CTrach™: what can it teach us about the use of Intubating LMAs? *Anesthesiology* 2007; 107: A946

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CALL FOR ABSTRACTS: 2010 SCIENTIFIC ABSTRACT SUBMISSION

for the upcoming Society for Airway Management Annual Meeting in Chicago, September 24-26, 2010.

Be a part of one of the most rewarding sections of the annual meeting.

- Plan to submit your abstract for consideration for poster presentation.
- In addition, a select group of abstracts will be nominated for oral presentation during the meeting.
- The top three abstracts will be awarded a SAM plaque in recognition for their outstanding contribution to the meeting and the advancement of airway management.

SAM Trainee Travel Awards: We encourage residents/fellows in training in any medical or allied medical field to submit their scientific works.

The top four trainee abstract/posters will be awarded a **\$500 travel award**. Award winners will also receive **free meeting registration**.

The trainee must be the first author and the presenting author of the accepted abstract at the annual meeting.

A letter from the Program Director, confirming that the trainee is in good standing, must accompany the submission.

Submission details on SAM website and as follows:

1. 250 words maximum excluding title, authors, tables, figures or pictures
2. Send in WORD file format via e-mail
3. Identify presenter by ***author's name***
4. Submission deadline is June 1, 2010
5. Presenter will be notified via e-mail
6. Submit to Thomas C. Mort MD at tmort@harthosp.org

RESIDENT'S REVIEW ... by Olga Pawelek, M.D., CA-3,
The University of Texas Medical School at Houston
Houston, Texas

of an original article:

**Approach Combining the Airway Scope and the Bougie for Minimizing
Movement of the Cervical Spine during Endotracheal Intubation**

Takenaka I, Aoyama K, Iwagaki T, Ishimura H, Takenaka Y, Kadoya T.

Anesthesiology 2009; 110:1335–40

Type of Study

Prospective, observational case-control

Goal:

The goal was to compare cervical spine movement during intubation with the Airway Scope (AWS) with and without the use of the bougie. As the bougie is smaller and its tip can be manipulated even within the preloaded ETT, it can be advanced into the glottis with only a minimal glottic view which is likely to require less movement of the cervical spine in comparison with needing to obtain a full view to be able to advance the preloaded ETT.

Methods

The setting is one hospital; Nippon Steel Yawata Memorial Hospital in Kitakyushu, Japan.

The study was approved by the hospital's Institutional Ethics Committee and written consent obtained. Thirty ASA 1–2 patients who were scheduled for elective orthopedic surgery under fluoroscopy without cervical spine abnormality were randomized into two groups: intubation with AWS only and intubation with the AWS and the bougie.

Exclusion criteria: BMI > 30, cervical spine abnormality, pharyngolaryngeal pathology, anticipated difficult airway, and an increased risk of aspiration. One anesthesiologist performed all intubations with the time points being collected by the same assistant. Everyone was induced with propofol/rocuronium and positioned the same. With the AWS the glottis was exposed and the target symbol was aligned with it, and the ETT was passed through the vocal cords. When combined with the bougie, elevation of the epiglottis was stopped when the minimal glottic view necessary to allow passage of the bougie was obtained.

The cervical spine motion between the occiput (C0)

and the fourth cervical vertebra (C4) was observed fluoroscopically, and change in movement between adjacent vertebrae created by each intubation method was compared. Two radiologists who were blinded to the study interpreted the radiographs.

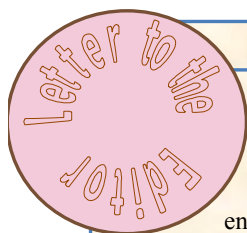
Results

Student t-test and the Mann-Whitney U test were used for statistical analysis. A P value of less than 0.05 was considered significantly different. The C 0-4 cervical spine segments were assessed for extension during laryngoscopy with the AWS. Median extension angle of the C0-4 was 16.0 degrees during intubation using only the AWS and 6.5 degrees with the combination of the AWS and the bougie (P < 0.01). There was no significant difference in time to intubation.

Discussion

Use of the bougie resulted in significantly reduced extension of the cervical spine during intubation attempt with the AWS in patients with a normal cervical spine. Hirabayashi et al and Maruyama et al demonstrated that extension of the cervical spine between the C0 and the fourth cervical vertebra (C4) was reduced from 38.6 degrees and 32.3 degrees using the Macintosh laryngoscope to 23.4 degrees and 22.3 degrees using the AWS, respectively. Sawin et al have demonstrated that extension angle of the C0-4 required to obtain a minimal glottic view for successful intubation with a Macintosh laryngoscope is 14.3 degrees.

The use of a bougie with standard direct laryngoscopy still requires a degree of glottic exposure so that it may not reduce cervical spine motion to the extent reduced by combining the AWS with the bougie. This is a quick method once familiar with the use of the AWS and based on other studies results in the greatest reduction of cervical motion.



Why Airway Management and SAM Are Unique

Writing about airway management and its uniqueness and importance, to a group of expert enthusiasts like members of the Society of Airway Management (SAM) and the readers of the Airway Gazette seems not just inappropriate, but also redundant and unnecessary. It seems like an invitation to have your piece rejected by the editors of this periodical. Hopefully this article would not be rejected.

If there is anything we have heard in the past year in the news, it is about economical issues, recession, deficits, inflation, debt etc. By the time of writing this article, the projected U.S deficit may rise to a whopping \$9 trillion dollars in the next decade; which means the U.S is more dependent than ever on the aid of international lenders such as China¹. While I do not claim to know or understand enough about macroeconomics or microeconomics, this number is mind-boggling. So what does it have anything to do with the airway, as some of you might be wondering?

At the latest SAM meeting in Las Vegas, Professor Ming Tian from China, gave a wonderful overview of airway management in China, in which he summarized very elegantly where they are in terms of airway management and training in the largest and most populous country in the world. In his report, which is the product of a countrywide survey from 2004 to 2006, it was determined that there are 80,000 anesthesia providers in Mainland China. They performed a little over 6 million cases during this period of time and depending on the type of hospital surveyed, at least half to 2/3 of cases are done under conditions of general anesthesia. Although he did not get into specific statistics about the incidence of difficult airways (DA) it was obvious there is considerable interest in this topic by the accounts he gave about his experiences, around the world at the many conferences in which he has participated as a representative of the Chinese Society of Anesthesiologists (CSA).

This is where SAM comes into the picture. In 2008, the connection between SAM officers and the CSA materialized, and friendships, collaboration and bonds were established between both organizations, even leading to a visit to China by Carin Hagberg (Executive Director of SAM) and Allan Klock (President of SAM, now Past-president). Both gave conferences and participated in hands-on airway workshops and collaborated in the creation of the CSA DA Algorithm. Dr. Hagberg's Airway Management book also was translated into Chinese and not unsurprisingly, is gaining popularity.

So going back the title of this message, I could not help but feel amazed, about recent achievements and progress in airway management that sometimes we U.S doctors take for granted. I am humbled by how, in terms of airway management, we are light years away from other regions in the world (not just China but perhaps South America and Africa) particularly concerning the achievements and prestige of SAM, of some its members, and by the ease with which we can have an "expert" testimony and help within minutes of asking a question with many of the resources that SAM provides, such as the Airway Forum. I could not help but see the paradox, in that we currently are dependent on China's economic assistance, but in terms of airway management SAM is providing support and aid.

¹ Solomon D, Weisman J. Decade of Debt: \$9 Trillion, in Wall Street Journal 2009 (SIC)

Felipe Urdaneta M.D., University of Florida

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E – LIGHTS OF THE SAM FORUM

Felipe Urdaneta, MD
MRVAMC/University of Florida
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TIVA= total intravenous anesthesia
ICU= intensive care unit
C-L =Cormack-Lehane
MEP= motor evoked potentials
MAC=minimum alveolar concentration
FOB=flexible fiberoptic bronchoscope
DL/VL=direct/videolaryngoscopy

We have been notified that there will be a shortage of Propofol. One concern will be our common use of LMA's and the major advantages of Propofol over the other drugs. I would interested in everyone's approach to this concern and any recommendations they might have at this time.

Doug Flores, M.D

~ Propofol has two properties making it unique among intravenous anesthetics: being an antiemetic and blunting the reactions to airway manipulation. To conserve propofol, one might consider using other intravenous anesthetics, including methohexital, for indications not requiring either of the above properties. Propofol can then be reserved for TIVA and insertion of supraglottic airways.

Sam Metz, M.D.

~ I think the propofol could best be saved for those lovely, short outpatient general anesthetics like GI procedures and some cardioversions. We certainly have other alternatives in the ICU. The problem is that we have a generation of anesthesiologists and anesthesiologists who have never seen other drugs used as ultra-short acting hypnotics for anesthetic induction, balanced "TIVA", and deep sedation. It makes a difference to our practice!

Charles Watson, M.D.

Is the epidural catheter the recommended catheter for the spray as you go awake fiberoptic?

Tracey Straker, M.D.

~I use this technique in ALL of my awake - fiberoptic aided intubations. To my knowledge, it was first described by Dr. Ovassapian. It has several advantages:

1) control of direction of local anesthetic application, 2) maintenance of view of anatomy during the application, 3) simultaneous application of suction or oxygen through the working channel 3) extension of the catheter through a tight stenosis or into anatomy that is not yet prepared to accept a larger body like the fiberscope itself. Disadvantages include 1) increased preparation time, 2) cost of accessory epidural catheter

3) cost of a diaphragm luer-lock valve on the working channel.

Will Rosenblatt, M.D.

If intubation without a muscle relaxants can be done easily, is there a necessity to routinely using them in the majority of cases?

Ivan Hronek, M.D.

~ Most of us are dependent upon our voices, in subtle or overt ways. If you're looking at more subtle things, it might matter. Even seemingly atraumatic intubations can result in vocal cord sequelae that may not be apparent without sensitive tools like laryngeal videostroboscopy. (See Mencke et al. Anesthesiology 2003; 98(5):1049). Patients with normal airways were randomized to atracurium or saline. Saline (no muscle relaxant) patients had sequelae (immediate sore throat, vocal cord hematomas and swelling) that persisted for at least 72 hours, effects seen when examined by video laryngostroboscopy. These were not career-ending injuries, but if this is what happens with apparently normal visualized intubations, what happens when the larynx cannot be seen (C-L III/IV) or when multiple attempts are required or when force must be applied to advance or railroad an ETT.

Richard Cooper, M.D.

~ For routine anesthetic care and intubation there is no reason not to use muscle relaxant.

On the other hand, for compromised or difficult airway if the use of muscle relaxant is dangerous, so will be large induction dose of induction agent. Avoiding muscle relaxant will be far more problematic than the use of it under most common conditions.

Andranik Ovassapian, M.D.

~ If MEP monitoring will be required in any spinal cases, we only give a short-acting paralytic for intubation (rocuronium or succinylcholine, depending on the patient's history). We use a combination of sufentanil and propofol or sufentanil and dexmedetomidine for maintenance in these cases, along with an inhalational agent (0.5 MAC).

Carin Hagberg, M.D.

Talk to the experts, friends, experienced airway specialists on the SAM

~ I have done many intubations for TIVA neurosurgery cases without muscle relaxants, because the neurophysiology techs like to get baseline readings right after intubation. It works fine as long as you give a big enough dose of propofol. I don't remember that you could do it very easily with thiopental. I don't think I have ever tried it with etomidate, but I have tried placing a couple of LMAs in with etomidate and it did not go very well. Beth Ann Traylor, M.D.

Case Vignette: 27 y. o woman was brought emergently to the OR after suffering a severe craneoencephalic trauma after falling from an undefined height. Prior to admission, the patient had been intubated. On initial physical exam exam chest auscultation was billaterally clear with some thick rales. A reddish foam appeared over her mouth and bubbled with each ventilation, the tracheal tube (7.5 mm ID) was 23 cm deep from the teeth, and the cuff-valve was extremely inflated. There was no crepitation or signs of subcutaneous emphysema in the neck. The air-leak was interpreted as an orogastric tube erroneously placed in the trachea, reason why it was removed, but the air-leak persisted. DL was tried and stopped after getting the blade inside the bloody mouth, as the maxillae was moving freely. An airway exchange catheter was then used to exchange the ETT. What explanations would you suggest for an air leak when the tube is deep enough and the cuff inflated?

Julio Cortiñas, M.D.

~ This is a potentially life threatening problem. This is a commonly seen scenario that is often missed by

many well trained personnel. This is basically a "cuff leak with an intact pilot balloon". We have seen morbidity and mortality from this situation that was misdiagnosed. One must act relatively quickly to make the diagnosis. The location of the ETT at the lip or teeth has no correlation with its depth within the trachea. FOB is a near absolute since DL often proves worthless. VL is very helpful due to improved visualization but one must be careful since placement of the blade can and has punctured the overinflated cuff that is located in the hypopharynx or the oropharynx. The volume of air in the cuff can be 20-50 cc though I have frequently removed upwards of 80-140 cc. FOB is the most important therapeutic and



diagnostic maneuver to perform to make the diagnosis and to help reposition the ETT in the correct place. While airway exchange catheters can be used I have learned

not to pass a catheter via the ETT if you do not know where the tip lies since it may not even be close to the airway. Thomas Mort, M.D.

Follow-up: We used an airway exchange catheter to exchange the tube for another 7.5 ID. Blood was everywhere, we didn't ask for a FOB (but can't disagree with the recommendation of using it). Once the tube was removed we saw that a ribbon bandage, used to fix the tube, was strongly tied over the flexed little tube that ends in the cuff-valve. (See picture) Julio Cortiñas, M.D

(SIC)

e-mail address for letters to the editor and articles for the Gazette:
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Talk to the experts, friends, experienced airway specialists on the SAM

TIPS and TRICKS

LTA Slider Technique Can Make Difficult Intubations Easy!

Edward Fohrman, M.D.
Northwestern University Feinberg School of Medicine
Chicago, Illinois



The “unexpected difficult airway” is probably the most feared situation in all of airway management. There are those who have devoted their entire careers to developing techniques for successful endotracheal tube insertion in patients deemed to be “difficult” or “impossible”.

Laryngotracheal anesthesia (LTA) devices have classically been used for topicalization of the vocal cords at the time of intubation or as an adjunct to prevent bucking/coughing during surgery or upon emergence. They have also been used for the prevention of postoperative sore throat. (Fig.1)



Shortly after my residency at UCLA, I was faced with an unexpected difficult airway and was saved by one of my senior partners who used a nifty trick utilizing the LTA tip through the Murphy eye of the endotracheal tube to intubate my patient. At the time, the only thing that could have made me feel worse would have been him whistling while he did it! Since then, I have used this technique to intubate countless patients with unexpected difficult airways due to suboptimal visualization of the vocal cords.

If you can barely see the arytenoid cartilages, the unique curve of the LTA is such that it may fit perfectly through the small glottic area where passing a standard stylet-loaded endotracheal tube (ETT) is otherwise impossible.

The technique is very simple to employ. It is essentially the same as a standard direct laryngoscopy except the tip of an LTA is passed from “outside-in” through the Murphy eye of the ETT. (Fig.2)



Maintain the laryngoscope so there is no movement of the view of the glottis or arytenoids.



(Fig.3)

With the LTA held in place, you then railroad the ETT forward along the LTA catheter, which guides it precisely through the vocal cords. (Fig.4)

After going through at least several centimeters, remove the LTA while advancing the ETT forward.

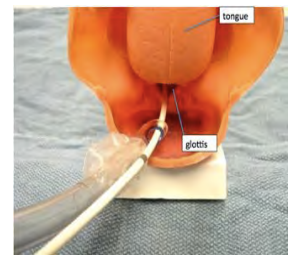
There is one caveat, which sometimes requires you to use your hand/finger to help guide the ETT through the trachea and avoid getting the tip of the ETT “hung up” on the larynx.

Although it may be possible to damage any of the laryngeal structures including the vocal cords, given the rigidity of the LTA, I am unaware, at least anecdotally, of any such complication.

There have been many improvements in the field of airway devices and techniques to intubate patients more reliably. I am not advocating this LTA technique as being superior to any of them, but I can attest to the fact that I have found this technique extremely helpful for the unanticipated difficult airway while waiting for the Glidescope, fiberscope, or other airway adjunct to arrive.

Keep the ETT proximal and advance both the LTA and ETT until the LTA tip seems to be approaching where the glottic aperture should be.

Then carefully facilitate sliding the tip of the LTA through the vocal cords.



SAM Gazette Publishing Guidelines:

The Airway Gazette Editorial Board invites all authors to submit reviews, investigations, original articles, tips and tricks, letters, etc according to these Guidelines.

Katherine S.L. Gil, MD, Editor - in - Chief

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Graphics (tables or pictures) should be submitted in a separate file or scan. Identify them in the text by a reference number with suitable captions to avoid text duplication. Allowances are made for more words/space on an individual basis. (See old issues.)

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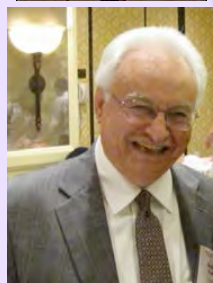
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**Andranik Ovassapian, M.D.
(1936-2010)
In Memoriam**

By Katherine S.L. Gil, M.D.

Andranik Ovassapian, one of the most recognized airway management specialists in the world, passed away on June 17, 2010 as a result of a cerebral hemorrhage. This occurred in Helsinki, Finland while in pursuit of one of his favorite tasks — educating others. Andy was not just a giant in the field of flexible fiberoptic intubation and methods of airway control — he was extraordinary. Andy's charming, inclusive, openhearted attitude and humility, while demonstrating a love for teaching, were awe-inspiring. His passing has left us stunned and in tears with the awareness of the personal loss of his presence felt by family, friends, colleagues, and all those he had educated toward the goal of improved patient safety and care. All of our sympathies and prayers go out his family to whom he was very devoted, including his dearly loved wife Ashghen, his daughter Nora, and twin sons Armen and Vahe.

Andy was a young 74-year old. He was vibrant; full of vigor and (entertainingly at meetings) sometimes fiery... particularly if anyone "dared" to express the idea that fiberoptic intubation was not a superior technique in most difficult airway circumstances.

Of Armenian ancestry, Dr. Ovassapian was born on January 27, 1936 in Arak, one of the main industrial cities on a fertile plain in Iran. He graduated from medical school at Pahlavi

University (presently named Shiraz University) at Shiraz in 1961. He began clinical training at the very-advanced Nemazee Hospital. Pahlavi University transformed into an institution based on American-style higher education (one of the few in the area) due to the influence of invited officials from the University of Pennsylvania. In view of this association, it was no surprise that in 1963, Dr. Ovassapian transferred to the University of Pennsylvania Hospital, where he finished his residency and research fellowship.

Motivated by the historically well-known occurrences of fatalities in difficult airway patients, Dr. Ovassapian acquired a profound interest in improving the science of airway management. After teaching at the University of Pennsylvania, Dr. Ovassapian returned to Pahlavi University in 1968, eventually becoming Chairman of the Department of Anesthesiology. In 1974, while pursuing opportunities for more research and technological advances, he joined Northwestern Memorial Hospital, affiliated with Northwestern University in Chicago, Illinois. In 1975, he became Chief of Anesthesia Service at its Lakeside Veterans Administration Chicago Healthcare System. He advanced to a full professorship at Northwestern in 1983. In 1991, he invented the Ovassapian Fiberoptic Airway, to facilitate intubation and protect delicate flexible fiberscopes. In 1998, he joined the University of



Chicago Hospitals faculty. There, he built an Airway Study and Training Center and until recently, supervised internationally renowned airway management courses.

Dr. Ovassapian's teaching included extensive involvement in: assembly of the first fiberoptic intubation workshops; assistance with scores of airway workshops; presentations and advice for the evolution of countless airway programs; lectures at hundreds of national/international institutions and conferences; and of course, clinical instruction. Andy's restrained demeanor was a favorite of residents. Even if they had taken the wrong course of action, he would only question: "Why you do that?" in his puzzled fashion beloved by all, and proceed to explain a better choice without disparaging them.

Andy's leadership was profound. He envisioned the international and multidisciplinary aspects needed when he founded the Society for Airway Management in 1995. He served SAM as President (1995-1997) and Executive Director (1998 - 2008) in addition to numerous other roles. Since his own very first Ovassapian Lecture presentation at the SAM annual meeting in 2000, some of the greatest names in the field of airway management and anesthesiology continue to give exceptional Ovassapian Lecture discussions. Andy was Associate Editor of the Airway Gazette (1997-2010) and an endless source of encouragement and advice. Airway enthusiasts (experienced and inexperienced) were frequently able to seek his opinion and discuss airway problems with him on the SAM Forum. He was always available to anyone needing help.

He served on the Editorial Boards of the American Journal of Anesthesiology and the Journal of Bronchology & Interventional Pulmonology and as guest editor for Anesthesia and Analgesia. He was one of a leading group

of researchers and clinicians who evaluated the most important articles in biology and medicine (the Faculty of 1000). He was President of the Illinois Society of Anesthesiologists (1996-1997).

Dr. Ovassapian was an integral part of the American Society of Anesthesiologists' task force in the development of the Practice Guidelines for Management of the Difficult Airway. Additionally, he was involved in the production of the ASA Practice Guidelines for Preoperative Management of Patients with Obstructive Sleep Apnea.

Dr. Ovassapian's writings are voluminous. He wrote over fifty abstracts, forty peer-reviewed articles, and fifty book chapters. He was instrumental in the production of three books: authoring *Fiberoptic Airway Endoscopy in Anesthesia and Critical Care*, *Fiberoptic Endoscopy and the Difficult Airway*, and co-authoring *New Developments in Airway Management*, an issue of *Anesthesiology Clinics*.

The respect he showed to others was easily returned to him. Andy has been the only recipient of the Patriarch Award, bestowed by the Society for Airway Management in 2006. Of note, this award was intended to recognize a "very special individual whose contributions to the Society are, in every sense of the word, unique". He received the William O. McQuiston, M.D. Award from the Illinois Society of Anesthesiologists and the Outstanding New Citizen Award from the Citizenship Council of Metropolitan Chicago.

We'll miss Andy's broad smile with his crinkly, twinkling eyes and his depth of airway management knowledge, but this memory provokes a smile on our own faces, in spite of ourselves. Will there ever be anyone again as significant, humble, and gracious as Andy Ovassapian? Of course... we already know that miracles can happen!

SAM serves over 500 members from 34 countries. Please consider how you can make a difference. Take up the invitation to participate in the pursuit of airway education and patient safety through meetings, grants, the SAM Forum, and the Airway Gazette.

The Airway Gazette



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*Be sure to save the date!!
September 24-26, 2010*

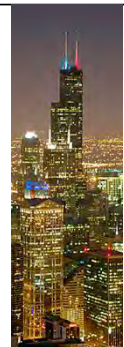


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Editorial Expressions

Dear fellow colleagues: Excitement is building! For stress-inducing, tension-building situations, few can beat having to deal with a difficult airway (DA). But, our excitement is anticipation for the SAM Annual Meeting starting on September 24th in Chicago. There we can get expert advice for handling the DA and see newer airway devices and techniques.

In this regard, interesting developments have transpired: In the desire to optimally manage airways with the latest devices, we have suffered disappearing skills. E.g. how often do “younger practitioners” perform blind nasal intubations or even insert soft nasal airways during difficult mask ventilation?

Many experienced practitioners feel that younger ones are less able to handle one of the oldest, most prevalent techniques: face mask ventilation (FMV). Chalk up this skill’s erosion to use of the laryngeal mask airway (LMA). No more laborious FMV for up to two hours; dealing with the vagaries of trying to maintain a patent airway. The result is “disuse atrophy”. How can this be reversed? Although often requests are made for invasive techniques in other realms for “educational purposes” that is not a concept to which many subscribe. But, use of FMV during longer periods for “educational purposes” is one I would accept, as long as the patients are not precarious and my attention is not diverted by other duties.

Similarly, fear of another loss of skill has cropped up, even among younger practitioner...i.e. erosion of conventional laryngoscopic intubation skill secondary to video/optical laryngoscopes usage. How of-

ten do we hear the phrase in a potentially DA scenario, “We should look first with a conventional laryngoscope, to ‘evaluate’ the difficulty of intubation.” The difference to me here is that the video/optical laryngoscopes usually give better laryngoscopic views with greater success and less morbidity, so why reverse engines? Imagine asking a surgeon to use an older technique just to see if it can be done as well as a newer, improved one. Anyone have ideas on these topics? Letters to the Editor are welcome!

This Gazette issue has a number of articles that discuss “changes in established techniques”. Dr. Francisca Llobell details steps in the “Dénia model” for DA identification, alerting, registration, and follow-up, in our International section. Dr. Davide Cattano describes saline for supraglottic airway cuff inflation, comparing dynamics in LMA Unique™ and Supreme™. Another article, in our Resident’s Review section (Dr. Ronen Harris), illustrates how measurement of intra-cuff pressure demonstrates the prevalence of cuff over-inflation and possible morbidity.

For all airway enthusiasts, researchers, writers, and thinkers: please see guidelines in back issues of the Gazette via the SAM website and help fill our pages. Also, please contact Dr. Meltem Yilmaz (m_yilmaz@northwestern.edu) if you would like to write a synopsis of a session for the Gazette from the SAM meeting, for fellow members unable to attend.

Best regards,

Katherine S.L. Gil, M.D.
Editor-In-Chief



Welcome New Members to SAM!!!

Cory Adams, CRNA (Maryland)
Carmencita Castro, M.D. (Indiana)
Peter H. Cheng, D.O. (California)
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Mauricio Perilla, M.D. (Ohio)
Renato Terzi, M.D. (Brazil)
Witold Waberski, M.D. (Connecticut)
Gina Whitney, M.D. (Tennessee)

Clinical Pathway for Diagnostic Evaluation of the Difficult Airway in the 13th Health Department in Dénia Hospital, Spain

(Presented at the Valentin Madrid Opening Lecture at the First Symposium on Difficult Airway Management in 2009 Cediva Dénia Training Center and Anesthesia-ICU Department)

Francisca Llobell, MD, Patricia Marzal, MD, Daniel Paz, MD, Remedios Pérez, MD, Isabel Estruch, MD, and Juan Cardona, MD
Cediva Dénia Training Center, Dénia Hospital, Spain



I SYMPOSIUM DE MANEJO DE VAIA AEREA

Introduction: This project involved a multidisciplinary systematic focus on patients to derive the essential diagnostic evaluation of their degree of difficult airways (DA) and document airway management. For thirteen years at Dénia Hospital, Spain, we have been organized as a group of professionals in teaching, investigation, and development of airway management.

Beforehand, we didn't think it appropriate to develop such an approach because the DA patients didn't seem to present themselves with any great frequency in occurrence. The recent transformation of our hospital to a universal computerized system for recording patient history and physical examination provided us with the tool to realize DA consequences and occurrence rates and to tackle and implement protocols geared toward DA patient care. Subsequently, we realized that airway management of patients with DA is very important in consideration of risks to patients and costs due to the high morbidity/mortality that may ensue.

The Process of this project:

For this reason we designed an organized tool that permitted planning and coordination of the sequence of medical procedures, nursing, and administrative actions necessary to achieve maximum efficiency in dealing with these patients. Documentation of multiple points of patient data/information is the first step in the process of identifying DA patients and they are provided with an alerting wrist band (fig.1).

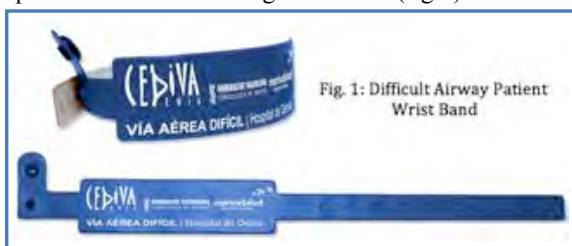


Fig. 1: Difficult Airway Patient Wrist Band

This band will accompany the patient through multiple phases during this process of airway management. This process is not meant to set specific techniques that must be used in DA patients or create an "algorithm of management in specific cases" of DA patients.

Our objective is to systematize the evaluation, treatment, and documentation they have undergone to help these patients every time they are in contact with a health system. An important phase is to form a committee of experts with at least one anesthesiologist, surgeon, otolaryngologist, and surgical nurse. This team will daily assume responsibility to follow the patient over each 24-hour period. If this method is patterned in other health care organizations, no doubt employment of the process will depend on their available personnel.

Questions and Answers:

1. Who is this system designed to reach? Fundamentally, it is geared toward airway management operators, and assisting teams whether hospital-based or not: nursing, critical care, operating room, primary care, admissions departments, and pharmacy personnel.

2. What patients are involved? Patients included in this program would be anyone:

- Who has had documented DA with or without descriptions of strategies that were used
- Who has a DA according to criteria
- Whose DA was encountered unexpectedly.

Design of the evaluation/documentation matrix:

(Table 1):

The temporal matrix is a form that remains part of the documentation of the patient's clinical process. It should show evaluations, guidelines, tests, medical treatments, nursing care, and other actions related to the patients' airway in chronological sequence. The abscissa (x), represents points in time, when occur-

rences happen in patient evaluation / diagnosis, and management. The ordinate (y), represents points of patient care.

7. Vigilance Post-extubation: Technique development; systematic registry of new information

8. End of Procedure: Revision and finalization of the

Table 1. Temporary Array Clinical Pathway Difficult Airway

Phases	INCLUSION	ACTIVATION	PREPARATION	PRE-ACCESS	ACCESS	EXTUBATION	VIGILANCE POST	END OF PROCEDURE
NURSING	- GIM - Gives informed consent for DAM	- Safety Assessment		- Monitoring - Collaborates with the plan	- Knowledge - Training		- Safety measures - Medication	
AIRWAY OPERATOR	- Assessment - Information - Education - One presentation - Photograph	- STAFF on ALERT	- Knowledge - Revision - Notifier (time) - Report - Design of the plan	- Assessment of situation - Approach plan - Start plan	- Use Safe Airway - Technique development - Documentation	- Extubation strategy - Decision to delay	- Continuous assessment - Supervised (blockage)	- Information confirmed
SYSTEMS	- Register - Documentation	- Message order - Positive committee			- Documentation	- Registry		
PATIENT	- Accepts - Consents - Documentation - Informed consent	- Contact with head system - Notifier				- Keep safe		- Review (signature & date)
ADMISSION	- Scoring and sharing of documents - Advance care directives - Scoring sheet	- Identify arrival - When time	- Protocol - Informed consent - NCAH-acting staff	- Availability protocols and documentation		- Accessible protocols	- Adverse reaction assessment	
MEDICATION		- Avoid CNS depressants	- Adrenaline - B2 agonist - Antibiotic - Steroid	- Local anesthetics - Vasodilators - Sedatives and ketone	- Approach assessment of other infection - Knowledge - Training	- Anesthesia - Anti-inflammatory	- Avoid CNS depressants	- Observe materials
AUXILIARY NURSE								- Materials available (bridge device)
STERILIZATION		- Material available		- Material available	- Material available	- Material available (bridge device)		- Monitoring
LOGISTICS		- Material available		- Intubation tray		- Extubation table		- Anesthesia assessment
COMMITTEE		- Committee notification		- Available	- Available and support	- Available		



Fig. 2 Difficult Airway Patient Card: Name, Alert, Cormack-Lehane grade

Table 1

Chronologically, these are the steps of the Dénia DA process (See Table 1 or website for details):

1. Inclusion: Steps needed for systematic evaluation and registration of DA information including informed consents. Create an alert.
2. Activation: Each team member is contacted; the alert is engaged and the responsible committee is informed; definite identification of the case is made.
3. Preparation: A thorough plan is made for airway management of the patient.
4. Pre-access: Previous protocols, materials, kits, and the ASA-DA algorithm are gathered; the layout for future management is designed.
5. Access: Development of the airway plan; systematic registry of all information.
6. Extubation: According to protocol, an extubation strategy is formed with plans for delayed extubation and ICU care.

whole procedure; administration of a difficult airway card for the patient (fig. 2)

Conclusions:

Anticipation based upon evaluation and diagnosis to detect the DA leads to the formation of a clinical process or protocol for each subsequent action. The development of a strategy of action according to the ASA-DA algorithm is followed by execution of the plan in defining the personnel and equipment needs. This process occurs under quality control with a constant dynamic vigilance of the phases of development. The process secures the registry of the patient and revision of the actions taken. It forms the basis of the patient's future identification and care.

In summary, we try to evaluate, inform, prepare, document, and provide an ALERT: Difficult Airway! We feel the DA should be given the same degree of importance as patient allergies. See: www.cediva.eu

Will Wants You!

Will Rosenblatt, MD is inviting SAM members planning to attend the 2010 ASA to participate.



Can you spare 1-2 hours to staff the SAM booth at the ASA meeting (to recruit members, discuss SAM, the Forum, etc)? E-mail Will before October 05, 2010 or sign up at the SAM Meeting in Chicago.

Welcome New Members to SAM!!!

e-mail address for letters to the editor and articles for the Airway Gazette: samgazette@gmail.com

Participate in our SAM on-line Forum

SAM serves over 500 members from 34 countries. Please consider how you can make a difference. Take up the invitation to participate in the pursuit of airway education and patient safety through meetings, grants, the SAM Forum, and the Airway Gazette.

SAM ANNUAL MEETING 2010

Dear SAM Forum members,

The deadline for preregistration for the 14th annual meeting and workshops is rapidly approaching. Pre-registration will be closed when space is full or on September 9, 2010 at the latest. SAM needs your help in making the 2010 annual meeting both a scientific and financial success for the Society.

Please consider forwarding information about the 2010 annual meeting to interested colleagues in Anesthesiology, Emergency Medicine, Critical Care, Surgery or Pre-hospital Medicine.

This year's meeting will feature special tributes to founding president, Andranik (Andy) Ovassapian M.D. Dr. John Doyle (Cleveland Clinic/ Past SAM President) will deliver a special lecture, highlighting the breadth of Andy's contributions to the advancement of airway management, on Friday, September 24th. In addition, Will Rosenblatt, M.D. (Yale University/Past SAM President) is hosting a tribute to Andy at the Saturday evening social event at the Metropolitan Club in Chicago.

Please check out the newly revised SAM website: www.samhq.com for registration information for the 2010 Annual Meeting

Alternatively, please contact the University of Mass-

achusetts Medical School, Office of Continuing Medical Education:

Telephone Registration 508-856-1671, Fax 508-856-6838, and on-line: www.umassmed.edu/cme/events

Please join us in Chicago for the preeminent scientific meeting concerning airway management. Your support of the annual meeting insures the continued growth of SAM and its mission to support multidisciplinary international education and research in the field of Airway Management.

We look forward to seeing you there!

President, SAM Elizabeth C. Behringer, M.D.
Executive Director, SAM Carin A. Hagberg, M.D.
Program Chair, 2010 Annual Meeting

Gail Randel, M.D.
Program Co-Chair, 2010 Annual Meeting
Lauren Berkow, M.D.

A short remembrance of Dr. Ovassapian will be held on Saturday night at the meeting reception. SAM members who would like to relate a short story about a significant interaction with Dr. Ovassapian may be invited to speak. If you're interested in speaking, please e-mail will.rosenblatt@yale.edu. A very limited number of members will be accommodated. We hope you will bring to the remembrance a specific story about how Andy touched your life or of an event that illustrates his persona.

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Laryngospasm Associated with Tracheal Extubation and LMA Insertion at Emergence

Stephanie Chiu, M4 and David T. Wong, MD
Glasgow Medical School, Glasgow, Scotland



In patients prone to reactive airway responses, removal of a tracheal tube followed by insertion of a supraglottic airway at emergence has been suggested to reduce coughing and bronchospasm.¹ We describe a case in which the above strategy was employed and laryngospasm ensued. Endoscopic images showing laryngospasm and its reversal with succinylcholine were captured.

The case involved a 90 year-old 72 kg female with a 100 pack-year smoking history and severe chronic obstructive pulmonary disease, who underwent surgery for fractured femur repair. As she declined spinal anesthesia, general anesthesia with tracheal intubation was performed. Intraoperatively, tracheal suction was performed once, and moderate amounts of clear secretions were obtained.

The plan for emergence was to allow her to wake up smoothly with a supraglottic airway. At the end of the case, neuromuscular blockade reversal was given, inhalational anesthesia was maintained, positive pressure ventilation was applied, and propofol 20 mg was given. The patient's tracheal tube was removed and a size 3 LMA ClassicTM was inserted. Subsequently, manual ventilation became difficult, and the airway pressure was noted to be greater than 50 cm H₂O. Her end-tidal carbon dioxide level (PetCO₂) was zero and her oxygen saturation (SpO₂) dropped to 85%. Performance of an up-down maneuver, application of positive pressure ventilation (PPV), positive end expiratory pressure (PEEP), and propofol 50 mg, were unsuccessful in achieving lung ventilation, and her SpO₂ decreased to 80%. A flexible fiberoptic bronchoscope from a difficult airway cart in the room was inserted via an elbow connector into the LMA. The glottic opening appeared closed by either edematous vocal cords or adduction of the false cords, suggesting laryngospasm (Figure 1, left side). Succinylcholine 20 mg was administered, after which ventilation became possible and the PetCO₂ waveform became visible. After 1 minute her SpO₂ increased to 97% and endoscopic imaging showed an open glottis with no evidence of laryngeal or supraglottic edema (Figure 1, right side). The laryngeal mask airway was successfully removed when the patient was awakened.

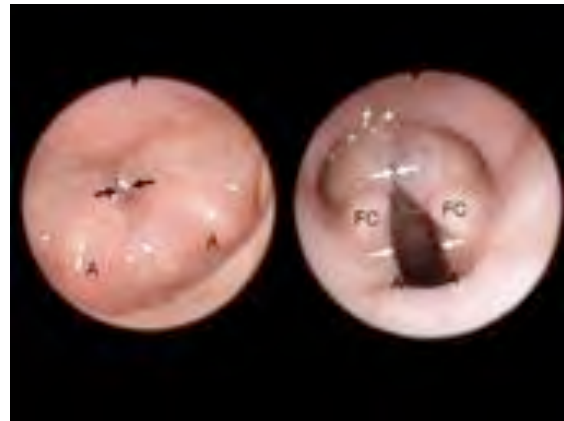


Figure 1. (Left) Endoscopic image of the glottic and supraglottic region during laryngospasm showing closure of the glottic opening (black arrows) and approximation of supraglottic structures, specifically the false vocal cords and the arytenoids (A). (Right) Endoscopic image of the glottic and supraglottic region after administration of succinylcholine, demonstrating a patent glottic opening (white arrows). A=arytenoids, FC=false cords.

Laryngospasm occurs more commonly during emergence than during induction of anesthesia.² The overall incidence of laryngospasm has been reported to be 0.87%, a figure that almost doubles in pediatric patients (0-9 years) and triples in infants (0-3 months).³ Laryngospasm involves adduction of the vocal cords and approximation of the false vocal cords and arytenoids above the level of the vocal cords.^{2, 4} It may be precipitated by nearby irritants (secretions, blood, regurgitated material, volatile agents), airway manipulation including suctioning, and inadequate anesthesia.^{2, 5} In our case, laryngospasm was likely caused by the stimulation of tracheal tube extubation, LMA insertion under inadequate levels of anesthesia, or the presence of secretions.

Recommended management of laryngospasm includes applying jaw thrust, delivering 100% oxygen, positive pressure ventilation with PEEP/PPV, deepening the level of anesthesia intravenously (e.g. propofol 1 mg/kg), suctioning (if periglottic fluid suspected), and/or administering succinylcholine (0.1-

0.3 mg/kg intravenously).² In our case, administration of succinylcholine was effective, and endoscopic images showed relief of laryngospasm.

References:

¹Koga K, Asai T, Vaughn RS, Latta IP. Respiratory complications associated with tracheal extubation. Timing of tracheal extubation and use of the laryngeal mask during emergence from anaesthesia. *Anaesthesia* 1998; 53: 540-4

²Al-alamy AA, Zestos MM, Baraka AS. Pediatric

laryngospasm: Prevention and treatment. *Curr Opin Anaesthesiol* 2009; 22: 388-95

³Olsson GL, Hallen B. Laryngospasm during anaesthesia. A computer-aided incidence study in 136,929 patients. *Acta Anaesthesiol Scand* 1984; 28: 567-75

⁴Holm-Knudsen RJ, Rasmussen LS. Paediatric airway management: Basic aspects. *Acta Anaesthesiol Scand* 2009; 53: 1-9

⁵Visvanathan T, Kluger MT, Webb RK, Westhorpe RN. Crisis management during anaesthesia: Laryngospasm. *Qual Saf Health Care*. 2005; 14/3/e3

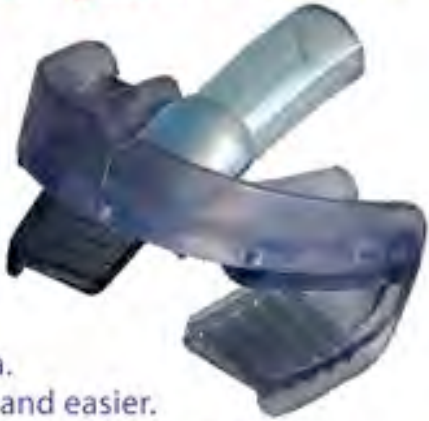
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A COMPARISON of the LMA UNIQUE™ and LMA SUPREME™ AIR VERSUS SALINE: A MANNEQUIN STUDY

**Davide Cattano, M.D., Ph.D.[†], Srikanth Sridhar, M.D.,
Meng Cheng*, M2, Jeremy R. Bates, M4, Carin A. Hagberg, M.D.**

**The University of Texas Medical School at Houston,
*Baylor College of Medicine, Houston, Texas**

([†]sponsored by the Society of Airway Management 2009 Research Award)



Introduction:

Initial studies on saline use for Laryngeal Mask Airway™ (LMA) cuffs demonstrated more stable cuff pressures and similar oropharyngeal leak pressures.¹

The LMA Classic™ (LMA North America, Inc.) made of silicone was the original and has since given way to newer devices, designed to improve placement and anatomical seal. Use of the LMA in positive pressure ventilation (PPV) requires higher oropharyngeal leak pressures than under spontaneous ventilation.² Applying PPV above the leak pressure would endanger patient to risks of esophageal or gastric insufflation, regurgitation, and aspiration.

Risks of LMA use include sore throat, hypoglossal and lingual nerve injury, and poor perfusion with subsequent edema and congestion of the pharyngeal wall.³ One potential option to overcome cuff pressure problems and improve airway sealing would be to fill the cuff with saline. This study's purpose was to assess mechanical features of the new disposable LMA Supreme™ and the LMA Unique™ during cuff inflation utilizing normal saline versus air in order to assess an experimental model.

Materials and Methods:

Experimental and control groups were divided based on use of saline or air to fill cuffs using both Unique™ and Supreme™ devices.

Phase 1: Cuff elastance was determined outside the mannequin by serially re-inflating them with air after complete emptying. After each 5 mL of air, cuff pressures were checked with an arterial line monitor. These data points were recorded with sizes 3, 4, and 5 for each device until a maximum volume 5 mL greater (25, 35, and 45 mL, respectively) than the manufacturer's suggested maximum volume. With the same methodology, but using saline to fill each cuff, data was obtained after every 5 mL of inflation in a similar way for both devices.

Phase 2: Using the Laerdal Airway Management Trainer (LAMT, Laerdal Medical) and the TruCorp Advanced (TCA, TruCorp Ltd., Northern Ireland) mannequins,^{4,6} cuff elastance was also tested with only size 3 and 4 LMAs used (according to manufacturer's recommendations (since size 5 devices were too large). The LAMT is a simple conduit with a higher oropharyngeal volume while the TCA has less oropharyngeal volume and an inflatable tongue. To create more physiologic soft tissue pressure conditions, we fully deflated the TCA tongue and re-inflated it with 40 mL of air. The devices within the two mannequins were serially re-inflated with air or saline in increments of 5 mL, again to a maximum volume 5 mL greater than the manufacturer's maximum suggested filling volume (sizes 3 and 4, 25 and 35 mL, respectively). Cuff pressures were determined at each 5 mL increment.

Phase 3: The oropharyngeal seal was tested. Using the TCA, each device was inserted and a fiberoptic bronchoscope was passed into each device to assess its proper placement to ensure a consistent Cormack-Lehane grade I view of the larynx. Once the device was placed into the mannequin's mouth, the cuff was inflated with saline (experimental group) or air (control group) as done previously (size 3 and 4, 25 and 35 mL, respectively). Airflow of 2 L/min was connected to the device with PEEP up to 30 cm H₂O. Subsequently the cuff was slowly deflated until an audible oropharyngeal air leak was detected and the volume was recorded. The cuff volume was then increased incrementally by 1 mL until the leak was no longer audible, so as to confirm the volume at which the leak occurred. The methodology was then repeated at PEEP levels of 5 cm H₂O decrements. For each volume-pressure and volume-leak pressure/PEEP point the mean of two measurements was recorded and rounded to the closest number. Analysis

of correlation and non-parametric test were applied as desirable ($p < 0.05$).

Results:

Phase 1: Cuff Elastance Outside Mannequins

When assessing cuff elastance, the Unique™ had higher cuff pressures than the Supreme™ at any given cuff volume, regardless of whether air (Fig. 1) or saline (Fig. 2) was used to fill the cuff.

Figure 1

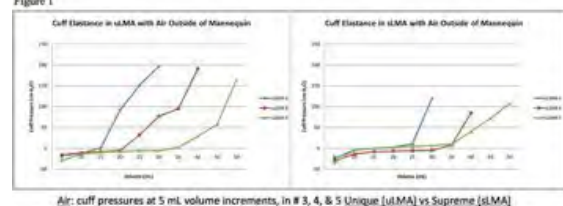
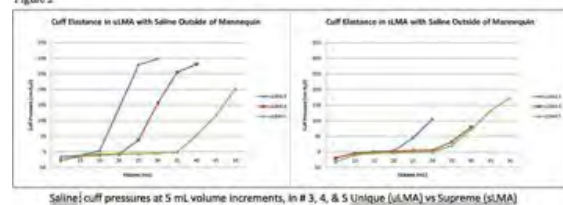


Figure 2

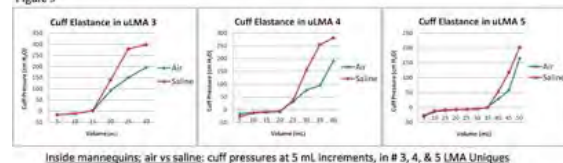


For both air and saline in the Unique™: the size 3 cuff pressures increased at the lowest cuff volumes. Size 4 cuff pressures increased at lower cuff volumes than the size 5 (Fig. 1, 2). Results showed that elasticity for size 3 > size 4 > size 5.

For the Supreme™, elasticity results were: size 3 > sizes 4 = 5 (Fig. 1, 2). Sizes 4 and 5 Supreme™ had almost identical flex points – the volume when pressure suddenly increases inside the cuff.

On all three sizes of Uniques™, flex points occurred at similar cuff volumes when air or saline were used. The increase in cuff pressure was steeper for saline than for air, suggesting saline increases the elasticity of Unique™ cuffs (Fig. 3). However, there were no statistical differences.

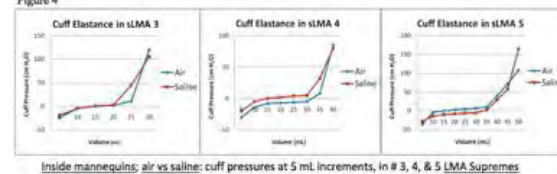
Figure 3



When comparing air versus saline for Supreme™,

saline resulted in a flex point occurring at slightly lower filling volumes than air (Fig. 4) for size 3, but was unchanged for sizes 4 and 5.

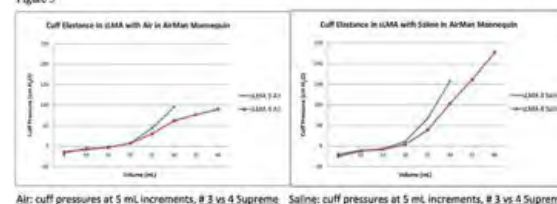
Figure 4



Phase 2: Cuff Elastance in the LAMT and TCA Mannequins

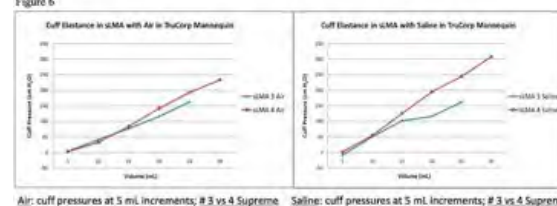
For the Unique™, elastance graphs inside the LAMT had a flex point occurring at lower cuff volumes for the size 4 (Fig. 5) compared to outside the mannequin setting (Fig. 1, 2).

Figure 5



When saline was used, higher cuff pressures were observed at given cuff volumes inside the LAMT mannequin compared to any other setting. In the TCA mannequin, cuff pressures started increasing at lower cuff volumes and increased at a steeper rate compared to outside the mannequin. Saline resulted in higher cuff pressures and steeper elastance curves than air (Fig. 6).

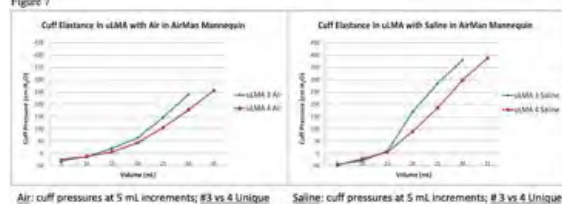
Figure 6



When comparing the Unique™ and Supreme™, higher pressures were observed in the Unique™ in both mannequins, regardless of which filling medium was used.

For the Supreme™, graphs for elastance inside LAMT (Fig. 7) are similar to the graphs outside the mannequin (Fig. 1, 2).

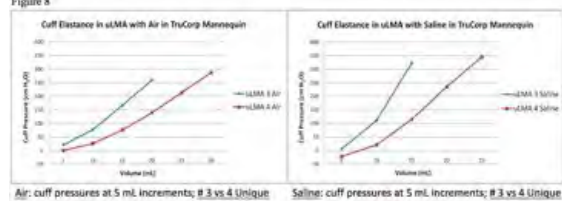
Figure 7



Air: cuff pressures at 5 mL increments; #3 vs 4 Unique Saline: cuff pressures at 5 mL increments; #3 vs 4 Unique

In the TCA mannequin, elastance graphs for the Supreme™ are shown in Fig. 8.

Figure 8



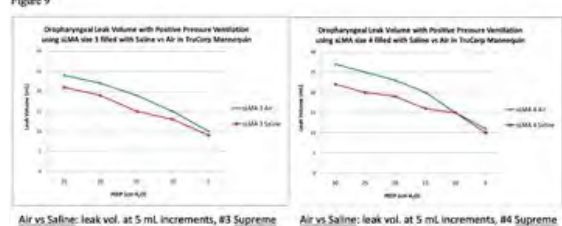
Air: cuff pressures at 5 mL increments; #3 vs 4 Unique Saline: cuff pressures at 5 mL increments; #3 vs 4 Unique

When comparing air vs saline in the Supreme™, cuff pressures generally increased at steeper rates with saline than with air inside both mannequins (Fig. 5, 6). This suggests that using saline increases the elastance of the cuff in Supreme™.

Phase 3: Cuff leak or minimum seal pressure

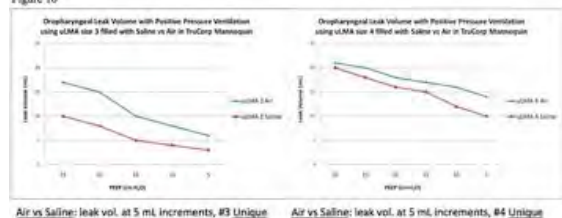
The last phase of the study was performed only in the TCA by documenting cuff volumes of air versus saline at which an oropharyngeal air leaks were detected using different PEEP levels. Saline showed lower leak volumes than air in all devices at all PEEP levels (Fig. 9, 10). The Unique™ had overall lower leak volumes than the Supreme™ at all PEEP levels (Fig. 9, 10).

Figure 9



Air vs Saline: leak vol. at 5 mL increments, #3 Supreme Air vs Saline: leak vol. at 5 mL increments, #4 Supreme

Figure 10



Air vs Saline: leak vol. at 5 mL increments, #3 Unique Air vs Saline: leak vol. at 5 mL increments, #4 Unique

Overall, there were no significant differences in cuff seals or cuff pressures between the Unique™ and Supreme™ in either the non-mannequin or inside-mannequin setting.

Discussion:

Our goal was to provide basic research for future tests in humans on whether saline might offer a better seal and better cuff stability. Essentially, changes in volume and the type of filling medium affected the Unique™ cuff pressure more so than the Supreme™. This in turn warrants exercising more caution when using the Unique™ when saline is used as the filling medium.

The ideal cuff inflation pressure in humans should not exceed 60 cm H₂O, which usually is achieved with 15 mL of air inflation in the Unique™ Size 4. Closer examination of the elastance curve for the size 4 Unique™ inflated with air inside the TCA does indeed show 15 mL of air achieving cuff pressures between 50-100 cm H₂O (Fig. 7). The elastance curve for the Supreme™ sizes 3 and 4 had similar results. Inside the TCA, 15 mL of saline achieves cuff pressures between 100 and 150 cm H₂O for the size 4 Unique™. Thus, a smaller volume of saline is needed to fill the cuff in order to reach the 60 cm H₂O of cuff pressure in the average device. Our data only reflects that saline might achieve higher cuff pressures than air at a given volume both outside and inside mannequins. The use of saline resulted in flex points occurring earlier than air (higher elastance).

In comparing saline versus air, oropharyngeal air leaks were detected at lower cuff volumes through all PEEP levels and for both devices, which indicates a smaller volume of saline than air was needed to maintain an oropharyngeal seal without any detectable air leaks.

A limitation of the study was the lack of information on peripharyngeal pressure⁷ as opposed to intracuff pressure, with resulting possible mucosal and nerve injury. This necessitates further investigation.

Conclusion:

Saline provided higher intracuff pressures with both LMA Unique™ and LMA Supreme™ within mannequins. Despite lower compliance by saline at higher inflation volumes, lower volumes are required to achieve comparable airway leak pressures.

References:

¹Coorey A, Brimacombe J, Keller C. Saline as an alternative to air for filling the laryngeal mask airway cuff. Br J Anaesth. 1998;81:398-400.

²Brimacombe J, Keller C. Laryngeal mask airway size selection in males and females: ease of insertion, oropharyngeal leak pressure, pharyngeal mucosal pressures, and anatomical position. Br J Anaesth. 1999;82(5):703-707.

³Ulrich-Pur H, Hrska F, Krafft P, Friehs H, Wulkersdorfer B, Köstler WJ, Rabitsch W, Staudinger T, Schuster E, Frass M. Comparison of mucosal pressures induced by cuffs of different airway devices. Anesthesiology. 2006;104(5):933-938.

⁴Jackson KM, Cook TM. Evaluation of four airway train

ing manikins as patient simulators for the insertion of eight types of supraglottic airway devices. Anaesthesia. 2007;62:388-393.

⁵Cook TM, Green C, McGrath J, Srivatsava R. Evaluation of four airway training Airway Management Trainer as patient simulators for the insertion of single use laryngeal mask airways. Anaesthesia. 2007;62:713-718.

⁶Silsby J, Jordan G, Bayley G, Cook TM. Evaluation of four airway training manikins as simulators for inserting the LMA Classic. Anaesthesia. 2006;61(6):576-9.

⁷Keller C, Brimacombe J. Mucosal pressure and oropharyngeal leak pressure with the ProSeal versus laryngeal mask airway in anaesthetized paralyzed patients. Br J Anaesth. 2000;85(2):262-66.

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E – LIGHTS OF THE SAM FORUM

Felipe Urdaneta, M.D.
MRVAMC/University of Florida

BMI = Body mass index
Mac = Macintosh blade
GVL = Glidescope videolaryngoscope
OG = Orogastric tube
ICU= intensive care unit
AEC = Airway exchange catheter
FOB = Fiberoptic bronchoscope
ED/ER = Emergency department/Room
DL = Direct laryngoscopy



Unfortunately on June 17, 2010 SAM and its Forum lost a giant/friend/champion/mentor/beacon/heart, and soul and world-renowned icon in the field of airway management, Dr. Andranik Ovassapian. This edition of E-lights includes his last recorded contribution to the Forum. Participants remember he lead most discussions in which he participated. His contributions were always expected and highly appreciated. Very few dared to challenge his statements that usually put an end to whatever discussion had taken place. Needless to say the Forum will never be the same without his contributions, experience and wisdom, but as I am sure he would have said "the show must go on".

•• As a frequent and generally successful user of the Supreme LMA I am still occasionally puzzled by device insertion difficulty in petite women. I planned to use a size 3 LMA Supreme in a 53 year old (BMI 22) women for an incision and drainage of a Right lower extremity wound. On exam the patient had a small but adequate two fingerbreadth mouth opening and was a Mallampati 2. After confirming that a size 3 Supreme was an appropriate size (by the Goldman Guedel test) the patient was induced with the head in neutral position. After an easy initial insertion of the LMA I could not get it to seat well in the posterior pharynx despite

chin lift maneuver. I then switched to a size 3 LMA Unique which was easily inserted on the first pass. Any similar experiences from Forum members? Any suggestions/tips for problem solving?

Elizabeth Cordes Behringer, MD

~ The rigid connection of the respiratory gas tubing (with respect to the bowl of the mask) is the culprit behind the inability to get the mask fully around the corner, as evidenced by the success with the LMA Unique. The connection between the respiratory gas tubing and the bowl of the mask needs to flex (to a variable degree, depending on the patient's anatomy) for the final phase of LMA insertion to be complete. Solution? Mac 3 to elevate the base of tongue and flatten the "angle of attack" to mask insertion. Mac 3.... the ultimate tongue depressor for the most Supreme airway.

James DuCanto, MD

~ A more aggressive triple-airway maneuver may also work. Pre-load the Supreme with a 14 F OG protruding about 5-8 cm. Then use your McGrath (or GVL) to place the Supreme, while watching the OG enter the esophagus. Because of the Supreme's fixed curve, a lateral approach may work best. I do this frequently for teaching purposes (even for a Bailey maneuver). It's also possible that the device just doesn't work all the

time. It's rigidity is a compromise to facilitate ease of insertion by novices.

Allan Goldman, MD

•• At my institution we have had discussions regarding what airway equipment should be stocked in ICU's. In the past each ICU had a tackle box with a basic selection of laryngoscope blades and tubes. This was abandoned because no one took ownership of restocking, cleaning, etc. We currently have a disposable laryngoscope and some tubes in each crash cart but people are reluctant to break the seal on the cart due to the patient charge that is produced. We have a well-stocked airway bag that our anesthesia resident brings to codes, intubations and extubations with anesthesia stand-by. What is done at other institutions? What airway equipment is stocked in your ICUs, and whether it is in every ICU or just select units? Who is responsible for purchasing, checking, restocking and cleaning the equipment.

Allan Klock, MD

~ We carry "boxes" to the Sites. We have two types Adult (red and much larger) and Peds (gray and smaller). When we are called we usually get a sense of whether it is an adult or Peds situation, but there are times when we take both boxes. Each box is stock with emergency meds, laryngoscope handles and blades, colorimetric ETCO2 detectors, AEC's and LMA's and Supreme's, ETT's, stylets (appropriate for each box), FOB, Bullard, Glidescope, and other non-disposables, Jet ventilator, Intubating Oral Airways, Cricothyrotomy sets, nebulizers. Used non-disposable equipment are returned to central supply for "sterilization" (Hospital pays for this and for the techs) Boxes are restocked by resident-attending team each call and after each use.

Francis Stellaccio, MD

~We have difficult Airway Cart's in ICUs and in the ED. This took "several years" to get together. As with the code cart it is somewhat easier to have, it all there than to carry it on your shoulders....

Charles Watson, MD

~ All ICU/ED/ PACU areas as well as a few high traffic surgical floors/medical wards, and all remote locations (GI suite, cardiac catheterization lab, neuro radiology, interventional radiology, MRI) have the same DA cart as the OR. Portable battery FOB are on the carts (suboptimal but good in a pinch). FOB towers with digital capabilities are available within a few minutes of waiting time. Anesthesia stocks all carts. An "Airway team" carries the "yellow airway bag" that contains a

Ranger scope, SGA (LMA, ILMA, supreme), bougie, melker kit, jet set, combitube, Airtraq. We started this concept of "airway bag" about 14 years ago and at first we were considered "airway geeks" and many times we got ridiculed, but we saved lives. It is not a perfect system but is functional. We are always tweaking it to make improvements.

Thomas Mort, MD

•• The optimal approach to difficult airway management and failed DL for emergency intubations in ED/ICU's is unclear. There are obviously big considerations regarding cost effectiveness and skill of the provider. It seems to me that a separate algorithm for these environments is needed and the algorithms for operative airway management carry limitations (can't just wake them up and cancel the case, don't necessarily have an "airway cart"). What is lacking is data to guide these algorithms as many of our rescues (FOI, rigid video, extraglottic airway) have been poorly evaluated in these settings. Anyone know of any literature for ICU/ED of large series or prospective evaluation of rescue techniques? If so, it can guide some new algorithms. If not, I see an opportunity...

Michael Aziz, MD

~ I am going to play "devil's advocate" in defense of the ASA DA guidelines. The current ASA Practice Guidelines on the Management of the Difficult Airway are Evidence Based, therefore the recommendations of these guidelines (including the algorithm) are either literature based and/or the opinion of the ASA task force and their expert consultant group. Furthermore it is statistically analyzed. There is a reasonable amount of literature in the ICU to suggest that the ASA Practice Management guidelines are applicable outside the OR setting (Mort TC: J Clin Anesth. 2004 Nov;16(7):508-16).

I believe that the issue is one of publicity. I do not think we need additional algorithms to explore this issue. Many ER physicians and Many ICU physicians are unfamiliar with the ASA DA Guidelines. Spreading the word to colleagues who manage the airway outside the OR in addition to broader studies of the ASA DA Guidelines in the Non-OR setting are warranted. As a multidisciplinary society, SAM remains an ideal forum for this goal.

Elizabeth Cordes Behringer M.D.

~ I fully agree with Dr. Behringer's statements regarding the ASA difficult airway guidelines. Although at first glimpse they look simple, the reality is they need to

be studied many times to fully understand them and be able to apply them properly. These guidelines cover all aspects of airway management from the evaluation and decision making to the mechanical act of securing the airway. For each individual case scenario the basics of the airway management remains the same, however the approach, equipment used, medications used will vary

from case to case and individual to individual. As all of us know, there also is more than one way to approach or manage any particular difficult airway. The proper selection and plan of action is critical. The ASA guidelines is not a recipe from cook book and does not tell the practitioner what device to use and does not provide step-by-step description of each technique.

Andy Ovassapian, MD
(SIC)

Talk to the experts, friends, experienced airway specialists on the SAM Forum

**by ... Ronen Harris, M.D.
Northwestern University Feinberg School of Medicine
Chicago, Illinois**

Use of Manometry for Laryngeal Mask Airway Reduces Postoperative Pharyngolaryngeal Adverse Events: A Postoperative, Randomized Trial

**Seet E, Yousaf F, Gupta S, Subramanyam R, Wong D, Chung F.
Anesthesiology. 2010;112(3):652-7**



Introduction:

How much air should be introduced into the cuff of the laryngeal mask airway (LMA) after insertion? Until recently, my answer would have been vague, "enough to prevent a leak," perhaps. Although the manufacturer of the LMA North America recommends limiting intra-cuff pressure to 44mmHg (60 cm H₂O),¹ I suspect that many of us wouldn't know this number, let alone know what it feels like.

Study Type:

Double-blinded randomized control trial.

Hypothesis:

That the routine use of manometry to limit LMA intracuff pressure to less than 44 mmHg, may reduce the incidence of pharyngolaryngeal adverse events.

Methods:

After approval from the Hospital Ethics Board, 203 patients undergoing outpatient orthopedic, urologic, ophthalmologic, plastic, and general surgeries under general anesthesia were enrolled. Inclusion criteria: age 18-80 years, ASA PS Class I-III. Exclusion criteria: recent upper respiratory tract infection, contraindication to LMA use such as body mass in-

dex >40 kg/m², symptomatic hiatus hernia or gastroesophageal reflux disease.

Group randomization was computer-generated. One group was designated the pressure-limiting group (PLG), meaning that shortly after anesthetic induction, a research assistant recorded cuff pressure with a hand-held Pressostabil manometer, and if necessary, deflated it to achieve a pressure between 40-44 mmHg. The other group, termed the routine care group (RCG), had LMA intra-cuff pressure recorded but not adjusted. Both groups had standardized methods for induction (propofol and fentanyl), ventilation (spontaneous), maintenance (desflurane in air/O₂ at 0.8-1.4 MAC), analgesia (fentanyl), and LMA removal (when the patient was sufficiently awake to open his or her mouth to command).

The method for LMA insertion differed according to each attending anesthesiologist's preference. This anesthesiologist was blinded to the group and cuff pressures.

A research assistant, blinded to the group, collected data 1, 2, and 24 hours post-operatively to determine symptoms and satisfaction scores (using a predetermined questionnaire). Data collected included: demographics, anesthesiologist experience, information on anesthetic techniques, LMA insertion/removal, and post-operative pain requirements,

but it was unstated if this collection was blinded... I assume it was.

Results:

Of the 203 patients enrolled, three were excluded because they required an endotracheal tube ... two in the PLG, one in the RCG.

Using the chi-square test, comparisons were made of the primary outcome variable: the incidence of composite pharyngolaryngeal adverse events defined as any combination of sore throat (independent of swallowing), dysphonia (difficulty/pain with speaking), or dysphagia (difficulty/pain with swallowing) at the one, two, or 24-hour points.

Regarding age, gender, height, weight, anesthetic duration, LMA size, number of insertion attempts, ease of LMA insertion, attending experience, and use of suctioning, etc, the groups were statistically similar.

Initially, the groups had statistically similar intra-cuff pressure readings: RPG mean 112 ± 59 mmHg, RCG mean 114 ± 57 mmHg. With deflation, the PLG's pressure dropped to 40 ± 6 mmHg. The incidence of composite pharyngolaryngeal events was significantly lower in the PLG versus the RCG (13.4% vs. 45.6%, $p < 0.0001$). Sore throat was lower in the PLG at two and 24 hours, dysphonia at one hour, and dysphagia at one, two, and 24 hours. Patient satisfaction scores were identical between groups.

Resident Discussion:

Excessive intra-cuff pressure can adversely affect mucosal perfusion. However, in the literature it is controversial whether limiting LMA cuff pressure leads to a decrease in pharyngolaryngeal complications. Reiger et al² studied two groups where LMA removal was performed in asleep patients and found

no difference in pharyngolaryngeal complications even though one group had ~30mmHg LMA intra-cuff pressures and the other had ~180mmHg.

Seet et al felt that a safe, relatively inexpensive intervention could have a large impact on the frequency of pharyngolaryngeal complications. The manometer costs ~\$100, and would presumably have costs associated with its upkeep. However, if it significantly decreases the incidence of pharyngolaryngeal adverse events, it may be quite a bargain (as the authors argue.)

The positive aspects of the study were that it was double-blinded, had a relatively large sample size, had a simple design, and examined adverse events over time.

Lack of standardization of the method of LMA insertion was a potential limitation.

The initial LMA intra-cuff pressure for both groups was 112-114 mmHg, well over the manufacturer's recommended upper limit of 44mmHg, suggesting that in many cases LMAs are significantly over-inflated.

I believe that anesthesiologists need either further training or perhaps just a reminder that we may be routinely overinflating our LMA cuffs.

Regarding the authors' assertion that the routine use of manometers after LMA insertion should become "best practice", I believe that more research is needed before this can be firmly established.

References:

¹LMA™ *Airway Instruction Manual*, LMA North America Inc., San Diego 2005

²Rieger A, Brunne B, Striebel HW. Intra-cuff pressures do not predict laryngopharyngeal discomfort after use of the laryngeal mask airway. *Anesthesiology*. 1997;87:63-67

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