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WuScope *versus* Conventional Laryngoscope in Cervical Spine Immobilization

To the Editor:—We greatly appreciate and commend the recent study by Smith *et al.*[1] comparing intubation difficulties in cervical spine immobilization with the use of the conventional laryngoscope and the WuScope (Achi Corp., Fremont, CA, and Asahi Optical Co.-Pentax, Tokyo, Japan).[2] As the inventors of this relatively new device, we feel obligated to respond to issues raised by Smith *et al.*[1] and to share our understanding and experience regarding this device.

First, although Smith *et al.*[1] demonstrated that the WuScope was easy to use and had an excellent success rate, despite their relative inexperience with the device (10 WuScope intubations *vs.* 3,000 conventional intubations), we would like to stress that WuScope intubation is very different from conventional methods. We recommend that the practitioner exert a conscientious effort to learn and master this new technique. One should watch the instruction video, read the manual, practice assembly and disassembly, and use the WuScope for routine intubations until he or she is proficient with the device.

Second, as pointed out by Smith *et al.*,[1] the WuScope has a flexible fiberscope portion that is traditionally a high-cost item and requires careful handling and proper assembly and disassembly with the rigid blade portion. The manufacturer now has made the WuScope fiberoptic portion less expensive, more durable, and battery operated. Nevertheless, the practitioners should again be reminded to exert the same degree of care as with any traditional flexible fiberscopes to avoid costly repairs.

Third, the conclusion of the study by Smith *et al.*[1] should not be taken to mean that the overall effectiveness of the conventional laryngoscope and the WuScope are similar in cervical spine immobilization cases. We must remember that Smith *et al.*[1] excluded from the study patients with abnormal or difficult airways. The study of Smith *et al.*[1] showed that applying the "immobility" factor to "normal" patients would result in poor laryngeal visualization (39%) and lead to possible difficult, esophageal, or failed intubations with the conventional laryngoscope. In contrast, WuScope intubation is a "visually guided" procedure, and "one can continuously view the endotracheal tube (ETT) as it advances through the glottic opening into the trachea."[3]

In summary, the WuScope is specifically designed to intubate with the patient in the neutral head position, and its tubular blade and fiberoptic imaging create space and overcome immobility in "difficult airways."[2,3,4]

Tzu-lang Wu, M.D.
Staff Anesthesiologist
Department of Anesthesia
Kaiser Permanente Medical Center
Hayward, California
Hsiu-chin Chou, M.D.
Former Anesthesiologist
WuScope Technical Support
Achi Corporation
Fremont, California
hsiuchin.chou@achi.com

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In Reply:—We appreciate the comments of Drs. Wu and Chou, the inventors of the WuScope device. Although we have found the WuScope to be a valuable tool for intubating the tracheas of patients with anatomic risk factors for difficult intubation, such as cervical spine injury,[1,2] there are technical limitations to using the device, such as blood and secretions in the airway (*e.g.*, in trauma cases) and anatomic derangements of the airway, such as abscess and tumor.

Use of any intubating device is not foolproof; accidental esophageal intubation can occur even in the best of hands, and the physician must always have a backup plan (or two), should the original plan fail.

We are certainly eager to have a portable battery-operated WuScope

for use in the intensive care unit, in the emergency department, and in the operating room.

Charles E. Smith, M.D.
Associate Professor
csmith@metrohealth.org
Alfred C. Pinchak, M.D.
Assistant Professor
Tejbir S. Sidhu, M.D.
Assistant Professor
Department of Anesthesiology
MetroHealth Medical Center
Case Western Reserve University, Cleveland, Ohio

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Cardiac Arrest in Multiple Visceral Organ Transplantation: Successful Treatment with Continuous Venovenous Hemodiafiltration

To the Editor:—Think about hemofiltration in a situation like this. We would like to report the resuscitation of a patient during a multiorgan transplant. During reperfusion, this patient experienced a sudden cardiac arrest associated with a serum potassium concentration of almost 9. Extensive mechanical and chemical resuscitation efforts were started immediately, but no regular heartbeat could be reestablished.

High-flow continuous venovenous hemodiafiltration was instituted (Baxter Blood Monitor 11–Balancing Monitor 14 and Polysulfon Hemofilter 1,200 Renoflo II hemofilter; Baxter Deutschland GmbH, Unterschleißheim, Germany; 200 ml/min blood flow; 3.0 l/h dialyzate flow with Schiwa SH 04; B. Braun Schiwa GmbH & Co. KG, Glandorf, Germany [this solution contains 138 mM sodium, 2 mM potassium, 2 mM calcium, 0.75 mM magnesium, 111.5 mM chloride, and 34 mM lactate]). Ten minutes later, the patient's cardiac rhythm stabilized, and spontaneous circulation resumed.

Postreperfusion syndrome was the most likely cause of this cardiac arrest. Aggarwal *et al.*[1] described postreperfusion syndrome as a constellation of cardiovascular responses, including hypotension, bradycardia, conduction defects, and low systemic vascular resistance. Several factors contribute to this syndrome. In approximately 30% of the liver transplant recipients studied, profound hypotension (mean arterial pressure $<$ 70% of baseline) developed within 5 min of reperfusion, lasting for more than 1 min. In fact, in the Pittsburgh series,[1] the degree of hypothermia and acidosis was similar in patients with or without reperfusion hypotension; severe hyperkalemia ($>$ 7 mM) occurred independent of hypotension, and hypocalcemia did not occur during reperfusion.[2]

Why our high-flow continuous venovenous hemodiafiltration worked may be because of the findings that were demonstrated by Marino *et al.*[3] in pigs. This study found a lower incidence of cardiac arrest after recirculation of venous blood pretreated with dialysis, suggesting that the release of unknown vasodilating or myocardial depressant factors from the grafted liver or other viscera may play a major role in the cardiovascular effects of the reperfusion syndrome.

We cannot be certain that the successful resuscitation in this complex situation was related to hemofiltration, but if one encounters cardiac arrest in a situation such as this that cannot be managed conservatively, one should consider and switch to an early continuous venovenous hemodiafiltration.

Wolfram J. Schummer, M.D.
Consultant
Departments of Anesthesiology and Intensive Care Medicine
cwsm.schummer@gmx.de
Claudia Schummer, M.D.
Resident
Department of Anesthesiology
Friedrich-Schiller University Jena
Jena, Germany

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