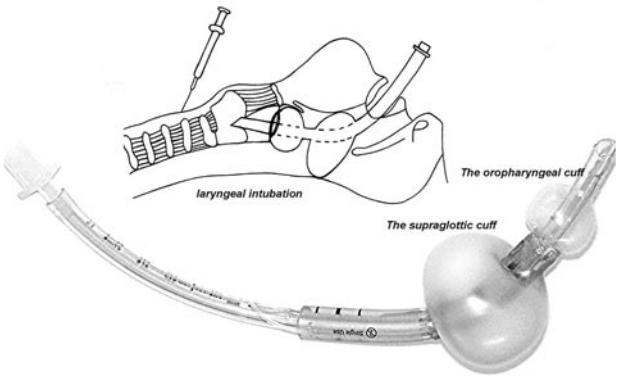

FIGURE The "Aretube": 1) the distal, supraglottic cuff; 2) the proximal, oropharyngeal cuff.

introducer with the new tube, on which the distal, supraglottic cuff has been inflated with 10 mL of air. The distal tip of the tube should be located at the level of the larynx, just through the vocal cords, providing laryngeal intubation while the cuff remains in a supraglottic position. The proximal, oropharyngeal cuff is next inflated with 100 mL of air. This fixes the cuff in the oropharynx and acts as a mask to maintain the seal of the distal cuff around the glottis by pushing it towards the larynx.

We have had successful initial experience with this new device. A percutaneous tracheostomy was indicated in a 68-yr-old male who required long-term ventilation for respiratory decompensation secondary to exacerbation of chronic obstructive pulmonary disease. His family was informed of the the risk-benefits of long-term ventilation and consented to the procedure. Withdrawing and positioning the end of the endotracheal tube in the larynx under direct laryngoscopy before the percutaneous tracheostomy resulted in bronchospasm and increases in airway pressures > 45 mmHg. Very rapidly, significant air leaks developed with oxygen desaturation and hypercapnia. The endotracheal tube was rapidly returned to the endotracheal position using laryngoscopy, and the bronchospasm was treated. In view of these difficulties, the new two-cuff tube was inserted using a Cook airway exchange catheter.[5] While some bronchospasm occurred during this procedure with an increase in insufflation pressures, there were no longer audible air leaks and no episodes of oxygen desaturation. Using the "Aretube", a percutaenous tracheostomy was performed uneventfully, while $EtCO_2$ values remained < 51 mmHg.

In conclusion, the need to perform percutaneous tracheotomy as efficiently as possible to avoid hypoxia and alleviate hypercapnia may present a potential source of complications whenver there are difficulties in accessing the trachea. Preliminary expereience with the Aretube is encouraging. Clinical studies are warranted to confirm the efficacy and safety of the Aretube in comparison to current approaches to airway managemnt during percutaneous tracheotomy.

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Competing interests: Dr. Arezki is the inventor of the Aretube, but holds no equity position in any company associated with its manufacture.

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Another complication associated with videolaryngoscopy

To the Editor:
We were interested to read the first report of complications arising from routine use of the Glidescope® videolaryngoscope (GVL)[1] and describe a similar complication associated with the device. A 62-yr-old female presented for right ureteroscopy for renal stone treatment under general anaesthesia. A 7.5-mm internal diameter cuffed endotracheal tube (ETT) was used for intubation with the GVL. After uncomplicated

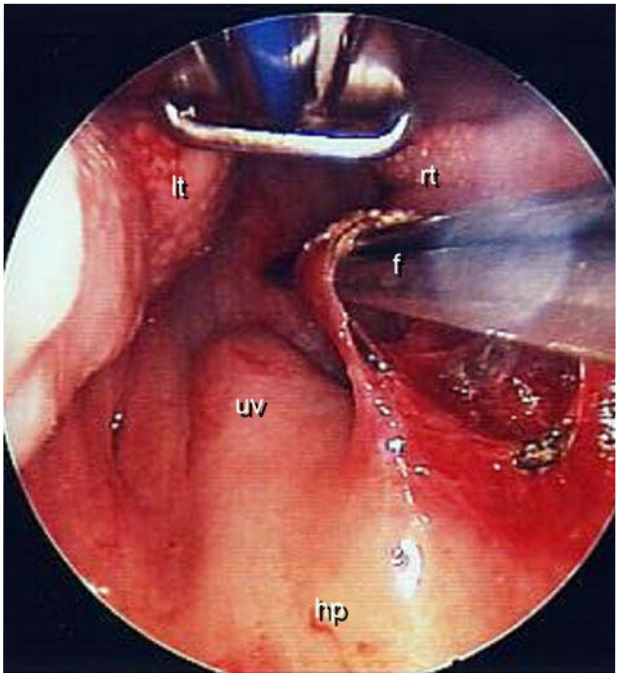

FIGURE Oropharyngeal view under anesthesia with a tonsillectomy gag *in situ*. The original endotracheal tube was removed and the patient's trachea was re-intubated. The forceps reveal a false mucosal tract through the right palatopharyngeal fold.

induction of anesthesia, a standard midline approach with the GVL was used, and a stylet facilitated tracheal intubation. Other than encountering slight resistance as the ETT passed the laryngeal inlet, the remainder of the intubation sequence was unremarkable. Of special note, no resistance was encountered while passing the ETT into the oropharyngeal cavity.

However, at the end of the case, it was discovered that the ETT had perforated the right palatopharyngeal fold (Figure). An otorhinolaryngologist was consulted and hemostasis was established with electrocautery; there was minimal bleeding. Thereafter, residual neuromuscular block was reversed, the patient was allowed to awaken while breathing 100% oxygen, and her trachea was extubated. The patient experienced a sore throat postoperatively, but had an uneventful recovery. She remained in hospital overnight for observation, and was discharged the following day with no sequalae. At outpatient follow-up six weeks later, good wound healing of the palatopharyngeal laceration was observed, and throat discomfort had fully resolved.

While advantages of GVL have been well demonstrated,[2,3] there is an inherent risk of trauma to the pharyngeal mucosa, as with any airway device. As highlighted by Cooper,[1] a potential blind spot exists at the point where the operator looses sight of the ETT tip at the back of the pharynx, until it resurfaces within the camera's visual field at the laryngeal inlet. The extent of the blind spot is very patient-dependent. We suspect that the pharyngeal mucosa of this patient was injured during ETT passage through this blind spot. This suggests the need for operator vigilance in viewing the tip of the ETT as it advances into the pharynx without causing any trauma. The operator should also examine the ETT as it 'resurfaces' to see if there are any blood, as possible evidence of trauma to the mucosal tissues. Another refinement might be to insert the ETT with the tip facing against the blade of the GVL. Once it is visualized on the monitor, the ETT can then be redirected with stylet *in situ*. This would be different from Cuchillo *et al.*'s technique of turning whilst inserting the ETT.[4] Passing the tube from the lateral side of the patient's mouth should also be avoided, as the palatopharyngeal fold may be taught. However, this technique has been suggested by others for tracheal intubation.[5]

In conclusion, complications for the GVL, while rare, are now being reported. Such complications mandate vigilance on the part of the anesthesiologist while the ETT is advanced, with consideration of preventive maneuvers as described.

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Accepted for publication December 21, 2006.

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Failure of an iv fluid warming device

To the Editor:

We recently experienced a failure of a fluid warmer (Level 1- H1000, Fast Flow Fluid Warmer, Smiths Medical, Rockland, MA, USA) which could have resulted in significant harm to a patient. Although we could find no other reports of this particular failure, it has been documented in other types of counter-current fluid warmers.[1] The incident occurred during the elective repair of an abdominal aortic aneurysm, under general anesthesia, with the placement of a thoracic epidural for postoperative analgesia. There were no problems during the case from either a surgical or anesthetic point-of-view. The patient was transfused with blood from the cell saver during the case. This blood was transfused through the Level 1, under pressure.

At the end of the operation, a small pool of blood was observed near the base of the Level 1 fluid warmer. Further investigation revealed that fluid in the reservoir of the Level 1 was mixed with blood. We assumed that a communication must have existed between the infused fluid, and the warming fluid within the counter-current aluminum heat exchanger of the warmer. We could not establish if the exchange of fluid occurred unidirectionally (from the *iv* infusate into the warming fluid), or if the patient had been transfused with fluid from the warming reservoir.

We were concerned about the potential for infection because the fluid reservoir is not sterile. Electrolyte disturbances and hemolysis were also potential problems, because of the hypotonicity of the warmer fluid. The patient was continued on prophylactic antibiotics, and cultures of the patient's blood, and the reservoir fluid were obtained. The patient experienced a transient bacteremia, however, the isolates from her blood did not match the isolates from the reservoir fluid. Fortunately, the patient did not suffer any ill effects from this mishap.

We reported the problem to our quality assurance officer, and to the manager of the anesthesia technicians. They involved the Biomedical Engineering Department of the hospital, whose investigators discovered a small hole in the aluminum tube of the counter-current heat exchanger (Figure). It did not appear that this hole was the result of mishandling

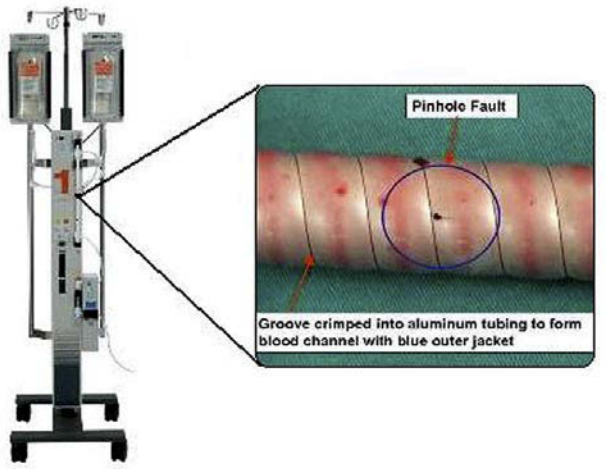

FIGURE The pinhole which allowed communication between the infused fluid and the warming fluid. The fault was found in the aluminum tube inside the heat exchanger disposable unit, as shown.

or faulty installation of the heat exchanger and tubing assembly prior to use. The source of the defect remains unresolved, and the Level 1 manufacturer has been advised of the issues.

This case highlights the importance of testing the integrity of the lines of fluid warming devices prior to their use. The testing is simple, as indicated by this excerpt from our departmental policy for this device:[A] *"attach the disposable set to the Level 1 Fast Flow Fluid Warmer at steps 1, 2 and 3. The unit may then be turned on before connecting the disposable set to any fluid intended for administration to the patient. The appearance of fluid in the disposable set, within a one-minute period, would indicate failure of the disposable and would require a replacement set with a re-test."* The anesthesia technician who set up the room could not recall with certainty that the set had been tested.

A larger issue that this incident raises relates to the safety of counter-current heat exchangers which use fluids as the heat transfer medium. While failures like the one reported are rare, the potential complications from an infection control perspective could be serious. Preoperative inspection and ongoing vigilance when using these devices are warranted. Further, as new technologies emerge which appear to be safer, and equally effective,[2–4] perhaps we could eliminate one more risk from the operating room environment by adopting alternative fluid-warming methods.

A Personal communication with Daniel Cashen, Manager, Department of Anesthesia, Queen Elizabeth II Health Sciences Center, Halifax, NS, Canada.