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FRACTURE OF A GLIDESCOPE® COBALT GVL® STAT DISPOSABLE BLADE DURING AN EMERGENCY INTUBATION

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□ **Abstract—Background: Emergency airway management is a diverse discipline, often utilizing advanced equipment with video technology to enable the intubator to visualize a patient's vocal cords that would be difficult or impossible to see with routine direct laryngoscopy. The GlideScope® Cobalt (Saturn Biomedical Systems, Inc., Burnaby, BC, Canada) is one type of video laryngoscope with disposable plastic GVL® Stat blades (Saturn Biomedical Systems) that can improve glottic view over direct laryngoscopy. It also benefits from rapid turnaround time and few infection control issues due to its disposable blade. Objective: To report what we believe to be the first GlideScope® blade failure to be reported in the medical literature. The circumstances surrounding the blade failure may raise awareness of GVL® Stat usage in obese patients with limited mouth opening. Case Report: During a standard emergency intubation, insertion of the GVL® Stat into the patient's mouth resulted in breakage of the distal segment of the blade. The patient was severely obese and had limited mouth opening, which required the blade to be inserted obliquely, rather than in the midline, into the patient's mouth. As the handle was repositioned back to midline, the distal segment of the blade broke off. No excessive force was used during blade repositioning when breakage occurred. Conclusion: Twisting forces on the distal flat segment of the GVL® Stat may have caused its failure. Because this was only a single occurrence of breakage, it is not clear if design issues or atypical insertion of the blade was responsible for breakage. Care must be exercised when midline insertion is not possible, which can occur in obese patients with limited mouth opening. © 2012 Elsevier Inc.**

□ **Keywords—GlideScope®; GVL® Stat; difficult intubation; emergency intubation; blade failure**

INTRODUCTION

The spectrum of acute life-threatening airway disorders presenting to the emergency department (ED) is diverse and requires an advanced skill set to respond effectively. Increasingly, such skills have included the use of advanced airway equipment, beyond the use of the familiar direct laryngoscope blades. Recently, a number of adjunctive devices that incorporate video or fiberoptic technology have become available. These devices can be particularly helpful in patients with limited mouth-opening ability or limited range of neck motion. The advent of such technology has allowed non-line-of-sight intubation in circumstances where direct laryngoscopy is expected to be very difficult or impossible. One such device is the GlideScope® (Saturn Biomedical Systems, Inc., Burnaby, BC, Canada), which consists of a small video camera built into a novel laryngoscope handle. Intubation attempts rely entirely on images of the glottis that are transmitted to the adjacent video monitor, and no line-of-sight laryngoscopy is attempted. The GlideScope® was first evaluated in the operating suite in 2005, with preliminary data showing that an equal or improved grade of glottic view was obtained compared to conventional direct laryngoscopy (1,2). Since then, multiple studies have evaluated

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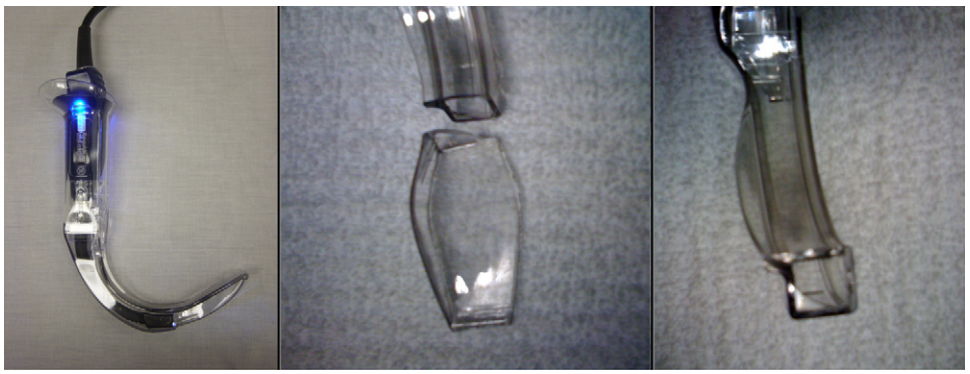

Figure 1. New GlideScope® Cobalt with GVL® Stat (left), fractured GVL® Stat (middle and right).

its use in both real and simulated patients, and confirmed the previous findings, even in difficult airway scenarios (3–7). To date, however, we were unable to find published studies of its use in the ED setting.

The GlideScope® is currently available with reusable (i.e., requiring cleaning) as well as single-use (i.e., disposable) adult-sized blade formats. The single-use option provides benefits in terms of rapid turnaround time and infection control. The single use format, GlideScope® Cobalt, relies on a reusable video wand that fits inside a disposable clear plastic GVL® Stat sleeve (Figure 1). We present a case of a GlideScope® Cobalt with a single-use GVL® Stat sleeve that broke off in a patient's mouth during the initial intubation attempt.

CASE REPORT

A 59-year-old woman with a history of asthma was found unconscious on the floor of her residence. She was unresponsive to family members, and paramedics were called. On paramedic arrival, asystole was noted on the monitor. Paramedics were unable to establish intravenous access so they placed an intraosseous line in the anterior proximal tibia. They attempted to intubate the patient using a standard laryngoscope, but were unsuccessful after two attempts. Bag mask ventilation was performed along with standard cardiopulmonary resuscitation for approximately 20 min during transport to the ED. Multiple doses of epinephrine and atropine were administered via the intraosseous line before arrival. Upon arrival, there had been no significant change in the rhythm, and no pulses were palpable.

The patient's body habitus was severely obese, with a body mass index estimated to be > 40. Importantly, she had a number of redundant skin folds on the anterior neck that limited jaw and neck movement. The mouth was relatively small in size, and most of the teeth were present. There was no swelling of the lips or tongue. Bag mask ventilation was difficult but resulted in audible breath sounds bilaterally. Given the patient's features, a difficult airway was anticipated, and the decision was made to use the GlideScope® Cobalt with a large-size GVL® Stat disposable plastic sleeve, with a backup plan of a laryngeal tube extraglottic airway. The patient's neck folds and chest size made it impossible to insert the blade directly midline into the oropharynx, because the handle hit the neck and chest tissue before the blade portion could be angled vertically enough to enter the oropharynx. Instead, the tip of the blade was advanced into the right side of the patient's mouth with the handle of the GlideScope® oriented obliquely, about 30 degrees to the right of the patient's midline. When the blade was in the posterior pharynx, the handle was turned towards midline in preparation of advancing the tip of the blade toward the glottis. During midline reorientation of the handle, the distal flat tip of the blade pushed against the tongue and broke off. It remained slightly connected to the rest of the blade at a corner of the fracture line, which facilitated manual removal. Bag mask ventilation was re-initiated, and a second GVL® Stat disposable plastic sleeve was mounted on the scope. Intubation was then re-attempted, using a similar technique of placing the blade into the patient's mouth. However, this time a second operator assisted the process by manually lifting the mandible, translating it anteriorly, and opening it widely with two hands to provide improved access to the oropharynx. The blade was then advanced into the vallecula in standard fashion. A Cormack-Lehane grade 2 view was obtained on the video monitor. An endotracheal tube was then passed from the right side of the patient's mouth under video visualization. Proper tube position was confirmed by routine methods, including breath sounds and end-tidal CO_2. Resuscitative efforts continued following standard Advanced Cardiac Life Support algorithms. Ultimately, resuscitative efforts were discontinued and the patient was declared deceased. The case was referred to the county coroner's office.