“Low Cost” Simulation in Emergency Surgical Airway can Save Lives in a Level - 1 Italian Major Trauma Center

Emiliano Gamberini*, Emanuele Russo, Costanza Martino, Laila Portolani and Vanni Agnoletti

Anesthesia and Intensive Care Department, Romagna Trauma Center “Maurizio Bufalini” Hospital, Viale Ghirotti 286, Cesena, Italy

Received Date: May 17, 2017, Accepted Date: June 08, 2017, Published Date: June 15, 2017

*Corresponding author: Emiliano Gamberini, Anesthesia and Intensive Care Department, Romagna Trauma Center “Maurizio Bufalini” Hospital, Viale Ghirotti 286, zip code 47521, Cesena, Italy, E-mail: emiliano.gamberini@auslromagna.it.

Keywords: Cricothyroidotomy; Emergency Surgical Airway; Gum Elastic Bougie; Trauma Center; Trauma System; Rapid Sequence Intubation

Abbreviations

CVCI: Cannot Ventilate/Cannot Intubate; ICU: Intensive Care Unit

Dear Editor,

Fourth National Audit project of The Royal College of Anesthetists and the Difficult Airway Society [1] outlines 'cannot intubate/cannot ventilate (CVCI) as a serious clinical case is facing by physicians in Emergency Departments, Intensive Care Units or wards. Cricothyroidotomy is a crucial issue in CVCI, indeed the aforementioned audit demonstrates that surgical techniques were consistently effective in accessing the airways, albeit not always with a good patient outcome. This is probably due to inappropriate delays in deciding to establish an emergency surgical airway. The contrast between the apparently high failure rate of needle cricothyroidotomy and the success of formal surgical techniques is a topic worthy of considerably more study [1].

In 2015 the Difficult Airway Society published new guidelines for the management of unanticipated difficult intubation in adults, describing and indicating the emergency surgical bougie-aided technique as the first choice for establishing an emergency surgical airway [2].

Our institution, the “Maurizio Bufalini” Hospital in Cesena, is a level - 1 Trauma Center serving a population of approximately 1,250,000 which grows to over 2,000,000 during the summer due to coastal tourism. The Trauma Team’s leader doctor and nurse coordinator are always intensive care physicians and intensive care nurses, with a background in anesthesia and defined educational path. In this context, a bougie-aided surgical airway training program was specifically conceived for all intensive care physicians and nurses, and continued during 2016. “Low cost” simulation with handcrafted trachea models (Figure 1), enabled all ICU physicians and nurses to perform at least two simulations during 2016.

About two months into the program, a male trauma victim was transported to the emergency department by helicopter medical emergency service after an accident. The on-scene patient Glasgow Coma Scale was six and the helicopter doctor decided to perform tracheal intubation. Repeated rapid sequence intubation attempts were performed due to difficult laryngoscopy and finally a tracheal tube was placed in the trachea, with the tube cuff between the vocal cords because of impossible further progression. Good oxygenation was achieved and the patient was transferred to the Trauma Center, with communication of compromised airway control and ineffective end-tidal capnography monitoring. Immediately after admission to the Shock Room, a fibroscopy through the tracheal tube revealed tube occlusion due to mucous material, so an emergency bougie-aided surgical airway was rapidly and successfully performed. A total body CT scan revealed severe traumatic brain injury without hypoxic induced lesions, and by hospital discharge the patient had regained consciousness while presenting focal neurological deficits. The day after the aforementioned case, a recently extubated ICU patient suddenly became dyspneic, with huge laryngeal stridor. An attempt at rapid sequence intubation by direct laryngoscopy was unsuccessful due to severe laryngeal edema. Oxygenation rapidly worsened and bag-mask ventilation was proving ineffective, therefore an emergency bougie-aided surgical airway was rapidly and successfully performed. The patient was sedated for 24 hours for neuroprotection purposes, and a percutaneous tracheostomy was performed. The patient fully recovered their normal neurological condition after withdrawal from sedation.

The emergency cricothyroidotomy is a rescue technique with approximately a 65% failure [1] rate in anesthesiologists’

![Figure 1: Handcrafted tracheal models set up with mechanical ventilator tube, silk strip and pressure lesions dressings.](Image)
hands. Training of staff who might be involved in performing this procedure should include manikin practice and high fidelity simulations. The occurrence of such a rare event the day before (first cricothyroidotomy) meant that the team was better prepared and ready to face the second event. In line with the “black swan theory” [3], the first unexpected event became relevant, with extensive psychological consequences on the team which put into practice homemade and low-cost simulations of this methodology completed during training.

**Conflicts of Interest**

The authors declared no conflict of interest.

**References**

