EMERGENCY CASEBOOK

Out of hospital difficult intubation resolved with nasotracheal use of a gum elastic bougie

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We report the case of a 30 year old man managed in an out of hospital setting for a cardiorespiratory arrest. The patient was impossible to intubate under direct laryngoscopy because of a severe mouth opening limitation associated with a buffalo neck. After failure of direct laryngoscopy and intubating laryngeal mask airway, an Eschmann tracheal tube introducer (gum elastic bougie) was introduced through a nostril. The bougie could be blindly inserted into the trachea, and the patient was intubated using the bougie as a guide. Tracheal intubation was then confirmed using the syringe aspiration test and end tidal carbon dioxide detection.

A prehospital mobile emergency medical unit from the French emergency medical service (SAMU), was called for a 30 year old man who was in cardiac arrest at home. The SAMU was alerted by the patient's wife, who had witnessed the cardiac arrest. The patient's medical history included an operation for a brain neoplasm 2 years previously. Since the brain surgery, the patient had been on chronic oral corticosteroids, which lead to severe Cushing-like syndrome. His weight was about 120 kg, height 1.70 m, and he had a typical "buffalo" neck. When the medical team arrived to the scene, the patient was lying on the floor with basic life support being provided by a firefighter medical team. It was noted early that facemask ventilation was difficult, with an obvious major noisy gas leak. The first cardiac rhythm visualised was asystole.

Direct laryngoscopy was attempted in order to intubate the patient, but mouth opening was extremely limited, preventing introduction of a laryngoscope blade. An attempt at introducing an intubating laryngeal mask airway (ILMA) was made, but also failed because of the limitation in opening the mouth.

An Eschmann tracheal tube introducer (gum elastic bougie; GEB) inserted through the right nostril and advanced. After 250 mm, clicks were felt by the operator and the GEB was advanced to 400 mm. A tracheal tube, 7 mm internal diameter, was passed over the GEB. Resistance preventing the passage of the tube into the trachea was felt on advancement, probably caused by dropping of the epiglottis, which was overcome with jaw lift. After GEB withdrawal, tracheal intubation was confirmed using syringe aspiration test and end tidal carbon dioxide detection while cardiopulmonary resuscitation was under way.

Resuscitation was then continued with mechanical ventilation, external cardiac massage, and intravenous epinephrine, but was unsuccessful, and was discontinued 30 minutes after the arrival of the medical team. No bleeding from the nostril was observed during or after intubation procedure.

DISCUSSION

We report here a case of GEB use with nasal introduction of the device because of the impossibility of direct laryngoscopy. The GEB is a classic device that has been used in cases of unexpected difficult intubation for more than 50 years.¹ This aid to difficult intubation is very popular in Europe, and in the UK it remains the first alternative device when difficult intubation is encountered, either in the operating room or emergency department.² Use of GEB by the nasotracheal route is very uncommon and to our knowledge has not been reported previously in the emergency setting.³ Most of the cases reported where the GEB has been used concern patients in whom only the epiglottis could be visualised during direct laryngoscopy. Historically, GEB use has been described during direct laryngoscopy, and a view of the epiglottis was considered as mandatory to perform GEB assisted intubation. Our experience shows that the GEB can be used successfully even if direct laryngoscopy is not performed during the intubation process.

In our patient, the airway management was very problematic. Usually in our department we apply a very strict algorithm in case of unexpected difficult intubation occurring in an emergency. This algorithm is derived from an operating room management strategy of difficult intubation situations, which we have already validated.⁴ The first step is use of the GEB. In case of failure of GEB assisted intubation, we use the ILMA to perform ventilation and then perform blind tracheal intubation through it. Lastly, in the case of ILMA failure, cricothyroidotomy is performed. In our patient because of restricted mouth opening, neither direct laryngoscopy with or without use of the GEB, nor use of an ILMA were possible. Thus, theoretically, the last possibility to definitely secure the airway was to perform a cricothyroidotomy for direct tracheal access. However, the difficulty of this procedure in a patient with morbid obesity, particularly with a buffalo neck related to a Cushing-like posed an unacceptably high risk. The anatomical landmarks (the notch and cricoid cartilages), which are essential to locate before performing cricothyroidotomy were impossible to identify with certainty. However, if blind nasotracheal GEB assisted intubation had failed, cricothyroidotomy would have been the only way to manage the airway in this patient, as not only was he impossible to intubate but he was also difficult to ventilate through a face mask.

In conclusion, use of the GEB allowed rapid and non-traumatic nasotracheal intubation in a patient on whom it was impossible to perform direct laryngoscopy. Although the GEB is not specifically designed for nasotracheal intubation, it can be used in this uncommon way when direct laryngoscopy is impossible.

Abbreviations: GEB, gum elastic bougie; ILMA, intubating laryngeal mask airway (ILMA)

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