Difficult airway management (DAM) is one of the most fascinating tasks for anaesthesiologists, in a certain sense a continuous challenge which requires solutions for potentially life-threatening problems.

A large amount of literature confirms that DAM-related problems are the first cause of severe anaesthesia-related accidents [1] and that difficulties and fatal accidents are increased in the emergency setting [2-4]. Conversely, few studies have explored the role of extubation in both normal and difficult airways, while all agree that many critical situations and fatal accidents occur during this phase of anaesthesia.

Interestingly enough, the recently published American Society of Anesthesiologists (ASA) Closed Claims Analysis [5] compared data regarding airway accidents during the ten years before and after the introduction of 1993 ASA guidelines [6]. While fatal accidents (death or brain damage) occurring mainly during anaesthesia induction (the incidence in this phase being twice that of the intraoperative, extubation and postanaesthesia phases) after the introduction of the guidelines the incidence of fatal accidents was reduced by half for this phase, while it remained unchanged for all other phases. In other words, this suggests that many things are yet to be done to increase the safety of extubation and the postanaesthesia course.

Extubation, no less than intubation, is a critical moment in general anaesthesia. To our knowledge there are no algorithms or ordered sequences of steps for extubation, although the Italian Society of Anaesthesia, Analgesia, Reanimation and Intensive Care (SIAARTI) Difficult Airways Study Group is currently working on the publication of ICU Difficult Airways Guidelines, including notes on extubation management.

According to the few data available, and taking into account the “near misses phenomenon” [7], difficult extubation is probably a main concern in the postanaesthesia care unit (PACU) or the intensive general care unit (ICU), with a lower occurrence in the operating room (OR), as generally difficult-to-intubate patients are cautiously extubated in protected settings and difficult to extubate patients are currently made up of patients receiving lengthy or peculiar surgery.
The current approach when expecting a difficult extubation, at least theoretically, is to closely observe the patient in a setting equipped with monitors, material for managing the difficult airway, and staffed by experienced personnel who should be able to establish an airway access immediately, provide oxygen, and facilitate gas exchange, keeping the airway open and safeguarding it in case of a failed extubation attempt [8].

In the following paragraphs some practical aspects for managing difficult extubation will be discussed, after the analysis of factors influencing extubation and of data regarding incidence of this phenomenon.

What Makes an Extubation Difficult?

Although relatively common, intubation is not an atraumatic procedure, especially whenever it is not performed correctly [9]. The literature confirms that different degrees of trauma might occur during the procedure [10] and that the more difficult the intubation is, the higher the possibility of developing oropharyngeal (19%), temporomandibular joint (10%), oesophageal (18%), tracheal (15%) and laryngeal (87.3%) trauma [11], including vocal cord palsy, which has been demonstrated to be more frequent in elderly, hypertensive and diabetic patients [12]. Much more importantly, unexpected or misdiagnosed minor laryngeal trauma might occur in up to 80% of “normal” and “easy” intubations [11].

With these data in mind, the first practical recommendation might include the need to consider factors of potential difficult extubation (such as pre-existing oral, pharyngeal or laryngeal pathology), comorbidities (severe diabetes, severe hypertension, severe pulmonary pathology such as asthma or severe COPD, or obstructive sleep apnoea syndrome [13]) and to consider that a difficult intubation always provides traumatic consequences in proportion to the number and quality of attempts.

Even when correctly performed, translaryngeal intubation is known to generate complications such as mechanical or biochemical lesions [14]; the first signs of laryngeal lesion can be seen 3 h after intubation; transient laryngeal injury or chronic stenosis have been described to appear 6 days after intubation (5%), rising to 12% after 11 days [15]. Acute upper airway obstruction secondary to laryngeal oedema is one of the primary causes of respiratory distress after extubation (2-16% of cases), and it can be a dramatic event requiring emergency reintubation in rather difficult circumstances. Unfortunately, no pharmacological strategies seem to be currently available to prevent or treat this occurrence [16], nor does a reliable method for identifying patients at risk of laryngeal oedema before extubation exist, although great hopes seem to be placed in the measurement of cuff leak test to avoid this eventuality [15, 17].

These last considerations are more appropriate for the ICU setting rather than the OR, where only lengthy surgery or the use of particularly invasive devices such as double-lumen tubes seem responsible for acute complications at extubation [18].

These finding make the role of extra-glottic devices (EGDs) critical for rescue