PROCEEDINGS BOOK

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INTRODUCTION

Failure in airway management still has the biggest impact on mortality and morbidity in patients requiring respiratory support either in the field of anesthesia and intensive care or in emergency medicine, despite the numerous advances made in developing new techniques and strategies or guidelines released in the past years.

However COVID-19 pandemic proves to us, that other medical specialists such as surgeons, internal medicine etc. must be included in airway management.

This full day course provides an intensive hands-on learning experience with 7 stations covering the most important techniques to secure the airway in the patients. Accompanying lectures build the frame to understand which situations requires special attention and which strategy is the most appropriate. In addition, aspects of non-technical skills with special regards to airway management will be covered.

The course will be run by internationally and nationally well-known experts having published in high - ranked journals and involved in airway management teaching for many years. Some of lectureres will be connected online

The course fulfills the criteria of the “Advanced airway management course”, according to the requirements of the European Airway Management Society (EAMS). Course is also endorsed from EAMS.

More details about the course will also be available on www. skmerf.org .

Target audience: Medical staff working in the field of anesthesia, intensive care medicine, emergency medicine, surgery and internal medicine.

PROGRAMME

08:00-08:30	**Registration**
08:30 – 08:45	**Welcome and introduction** ***Antigona HASANI (Prishtina/Kosova) & Rifat LATIFI (New York/USA)***
08:45-09.00	**Coffee break**
09:00-09:30	**Surgical airway in COVID-19 patients** *Rifat LATIFI (New York/USA)*
10:00-10:30	**Airway management in COVID-19 patients** *Vedat ELJEZI (Clermont-Ferrand/France)*
10:30-11:00	**Supraglottic airway devices** *Gamze ÇABAKLI (Istanbul/TURKEY)*
11:00 – 11:30	**Lighted stylets in difficult airway management** *Ruslan ABDULLAYEV (Istanbul/TURKEY)*
11:30 – 12:00	**Pediatric difficult airway in anatomic abnormalities** *Ayten SARAÇOĞLU (Istanbul/Turkey)*
12:00 – 13:30	**Lunch**
13:30-14:00	**Difficult airway in emergency department and intensive care unit** *Kemal Tolga SARAÇOĞLU (Istanbul/Turkey)*
14:30 – 15:00	**Changing priorities C before A** *Bellal JOSEPH (USA)*
15:00 – 15:30	**Surgical management of difficult airway** *Mentor AHMETI (USA)*
15:30 – 16:00	**Discussion**
16:00-17:00	**Remarks & Closing** **Delivery of certificate of attendance**

PRESENTATIONS

Airway management in Covid-19 patients

Prof. Assoc. Dr Vedat ELEZI MD PhD

Gabriel Montpied University Clinical Center. Department of Anesthesiology and Intensive

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Sars COVID-19 disease is highly contagious. The secretions of the upper respiratory tract have a high viral load. Transmission is usually aerogenous through droplets or surfaces contaminated by these droplets. Airway management presents a high risk for the staff and patients. The increased risk of infection during airway manipulations requires the use of techniques, which are reliable and maximize success for the first attempts. Regular and planned simulations are recommended, to facilitate the recognition and identification of unidentified problems, before these processes are used in emergency situations. Airway management in emergencies requires prior strategic institutional, material and team preparation. It's requiring fast and accurate manager, punctuality and efficient team communication. Rapid sequence induction in apnea, with the use of muscle relaxants is preferred, after prior preoxygenation of the patient. Equipment known to the team should be used that allows the patient to stay away from the airways to avoid contamination of staff. Hemodynamic stability is a necessity and requires immediate availability of vasopressors. Intubation should be done with a tube of the adequate size, ventilation in a closed system should begin after adequate blowing of the tube balloon and confirmed through capnography. Intubation of patients with Covid requires the preparation of staff and material precisely through checklists. The space in which the intubation takes place should have air conditioning with negative aspiration and only three operators are needed. A patient with covid who does not require urgent surgery should be rescheduled after 7 weeks for intervention.

Supraglottic Airway Devices

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Supraglottic airway devices (SAD) are mostly used to describe the group of non-invasive airway devices capable of delivering oxygen or anaesthetic gases above the level of the glottis and sealing the pharynx. Although “non-invasive airway devices” is also referred to as “extra glottic airway devices” in literature, the latter is a broader term which includes airways that do not violate the larynx (1). The classic laryngeal mask airway was invented by Dr Archie Brain in the UK in 1982. The main advantages of the SADs over endotracheal tubes are easy insertion, easy use by inexperienced personnel, a short learning curve, decreased airway trauma, less hemodynamic changes at insertion and high effectiveness as a rescue device (2). In the process of time, the use of SADs has progressively and significantly increased. They are used in both out of -hospital and in-hospital settings, elective and emergency operations, for spontaneously breathing and ventilated patients as a bridge to extubation as well as for difficult airway management (3). The ideal SAD should have some desired features including, without limitation the efficient sealing of the upper airway during spontaneous and positive pressure ventilation, having low resistance to respiratory gas flow, protecting the subglottic airway from upper airway secretions and gastric content, having a low incidence of airway morbidity and adverse events and having shape, material, cuff volume and cuff position which is easily accepted by the oropharynx (4). Complications of

SAD include; aspiration, trauma of the airway: from the lips to larynx, compression of the surrounding nerves, such as recurrent laryngeal nerve, lingual nerve, hypoglossal nerve, mental nerve, mucosal bruising from prolonged insertion or too high cuff pressures and failed insertion or displaced device (1). SAD's are usually inserted blindly, often resulting in malposition of the device. Clinically airway control is verified by bilateral chest auscultation, capnography, pulse oximetry, airway pressure and oropharyngeal sealing pressure. But the most reliable method of verifying correct placement of a SAD is fiberoptic visualization with glottis opening (2). There are different classifications for SAD's. One of these classifications relates to sealing mechanism and classified as cuffed perilaryngeal sealers (eg, the LAM), cuffed pharyngeal sealers (eg, the Combitube) and cuffless anatomically preshaped sealers (eg, the i-gel and SLIPA) (5). Cuffed pharyngeal sealers also can be seperated into two groups, based on the presence (eg, Combitube, EasyTube and Laryngeal Tube) and absence of the esophageal cuff (eg, the Cobra Perilaryngeal Airway, Tulip Airway). The other classification is made according to level of technology used in the SAD's as first, second and third generation. First generation SAD's are simple airway tubes attached to a mask that rests over the glottic opening (eg, LMA Classic, LMA Unique, LMA Flexible, Air- Q, intubating LMA, Cobra Perilaryngeal Airway etc.). One of the problems relating to first generation SAD's is seen as regurgitation and vomiting due to the absence of drainage channel. Other problem relates to the rotation or folding of the device due to the wide cuff and there can still be leak despite the high cuff pressure. Second generation SAD's are designed to reduce the risk for pulmonary aspiration (eg, LMA Proseal, LMA Supreme, Laryngeal Tube Selection, i-gel, SLIPA). They have improved airway seal which can support higher airway pressures than first-generation. Also gastric access channel added to these SAD's to reduce the risk of gastric insufflation, to place a gastric tube and to allow PPV (6). The third generation SAD's are self-energizing devices (eg, Baska Mask) (2). These SAD's have no cuff but seal which increases proportionately with increasing airway pressure during positive pressure ventilation. Additionally, they have gastric drainage chanel and it closes during ventilation. They have also bite block and smaller

glottic opening which can be counted as the advantages of them (7). SADs have become an essential tool in airway management.

Over the past three decades, these devices have been increasingly adopted as an alternative to face mask ventilation and/or endotracheal intubation. Although considered a low skill technique, adequate practice, familiarity with the specifics of the chosen device, and careful patient selection are important to ensure safety and proficiency.

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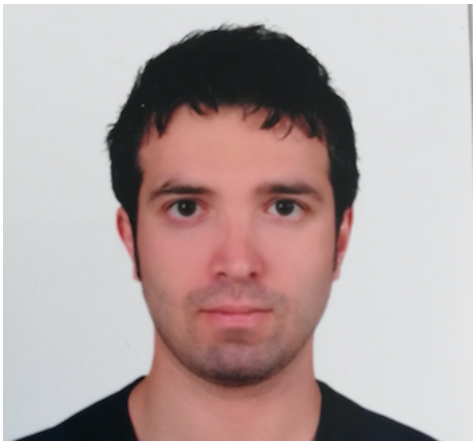

Lighted Stylets in Difficult Airway Management

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Although the first use of illuminated introducer dates to 1957 when Sir Robert Macintosh used it to guide intubation via laryngoscopy, the first use of conventional lighted stylet (LS) designed for blind intubation was by Yamamura et al. in 1959 (1,2). He described a bulb-tipped wire inserted into the tracheal tube that was used for blind nasal intubation. Many commercially available devices have been developed since then, including Tube-Stat™ (Xomed, Jacksonville, FL), Imagica™ (Fiberoptic Medical Products, Allentown, PA), and Trachlight™ (Laerdal, Armonk, NY). With slight differences in design, they rely on the same principle of transtracheal illumination. The technique is very easily learned, and many studies have demonstrated good results regarding intubation success, duration of intubation, sympathetic nervous system stimulation, and complications, when compared with the conventional laryngoscopy (3-5). Basic technique involves blind insertion of the endotracheal tube-loaded LS through oral or nasal route into the trachea and then pulling the introducer back after observing the transillumination light on the patient's anterior neck. Hybrid technique have been used, including use with direct laryngoscopy, laryngeal mask airway, fiberoptic scope, and airway introducer as well. LS technique can be used in difficult intubation

situations in operating rooms, intensive care units, emergency settings, austere environments as well. Weis et al. (4) have demonstrated successful intubation via LS in 20 patients who were impossible to intubate by direct laryngoscopy. Hung et al. (6) have intubated 263 of 265 patients with anticipated or unexpected difficult airway via LS. Contraindications for use are upper airway foreign body, tumor, or polyp; retropharyngeal abscess; friable tissue; laryngeal trauma; planned fiberoptic examination due to concern of bleeding. Complications include upper airway trauma, including bleeding, sore throat, hoarseness, dysphagia, dental trauma, laceration, arytenoid dislocation; but these are encountered less when compared with direct laryngoscopy (5,7). Recommendations for LS use in managing difficult airways have been incorporated into many national and international practice guidelines, including American Society of Anesthesiologists Task Force on Management of the Difficult Airway, Canadian Airway Focus Group. Some national survey results have demonstrated the availability of LS between 10-54% in their clinics. More importantly, some survey results have demonstrated that only half of the clinic directors had experience with the device. Considering that the device is cost-effective, easily learned and have great success rates in difficult intubation conditions, I think that its training should be incorporated into the standard training curriculum of Anesthesiology, Intensive Care, and Emergency Medicine practices.

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Pediatric Difficult Airway

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The pediatric patient has a number of predictable difficult intubation criteria compared to adults. These include some anatomical difficulties such as large occiput and are impediment for giving the patient appropriate position, narrow and easily collapsed nostrils, small mouth, floppy epiglottis, large tongue and high larynx cause laryngoscopy particularly difficult. On the other side functional residual capacity decreases and their oxygen consumption is high. Therefore, hypoxia can easily develop in a short time period. There are some predictors in the preoperative evaluation. Obesity, low age, high American Society of Anesthesiologists (ASA) score and congenital syndromes are important predictors. The APRICOT study was a multicenter observational study of 261 hospitals and investigated the incidence of severe critical events that may develop during pediatric

anesthesia (1). According to the results of 31.127 cases, the incidence of complications in children under 1 year of age was found to be 10.6%, and half of them had severe complications. As a result, it has been reported that children under 3-3.5 years should be managed by pediatric anesthesiologists, or tertiary care providers.

Cardiac and oromaxillofacial surgery were also found to be associated with difficult airway (2). The Pediatric Difficult Intubation registry in 2016 was a prospective cohort analysis (3). According to this analysis, unexpected difficult airway patients experience serious complications more frequently.

Oxygenation and ventilation problems can be examined in two parts as anatomical and functional airway obstruction. Causes of anatomical airway obstruction include inappropriate head position, appropriate facial mask technique or large adenoids / tonsils and obesity. On the other hand, unsuitable depth of anesthesia, laryngospasm, muscle rigidity and bronchospasm cause functional obstruction. The neck flexion can occur in infants when they lie on flat surface. It has been shown that the alignment is effectively achieved and the success of tracheal intubation is increased (4).

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Difficult Airway in the Emergency Department and Intensive Care

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Airway management in the Intensive Care Unit (ICU) is important because of several factors. Failure of 'first pass success' occurs in up to 30% of ICU intubations. Severe hypoxaemia may occur during ICU intubation up to 25%. Around 6% of ICU patients have a predicted difficult airway. Recently the term ''physiologically difficult airway'' was defined. This describes critically ill patients with severely deranged physiology who are at high risk of cardiopulmonary collapse during or immediately after airway management (1). Decreased functional residual capacity, increased oxygen consumption, decreased PaO2/FiO2 ratio or acid base disturbances are among reasons (2). The problems in the ICU is consist of fluid resuscitation, capillary leak syndromes, prone ventilation, and prolonged intubation. They all contribute to airway oedema and distortion. Awake intubation is often inappropriate and awakening the patient following failed airway management is usually impractical. Up to 15% of patients extubated in ICU require reintubation within 48 h. The guideline for the management of tracheal intubation in critically ill adults was published in 2018 (3).

According to the guideline, there are some challenges for the management of airway in the ICU. First of all the ICU bed space is not designed for airway management. Airway equipment is often different in the ICU. Capnography is not always available.

The transfers have high risk periods. Airway assessment may be time limited. Patients are often not fasted. Pathologies and drugs cause gastric distention. There is an increased incidence of edema, trauma and immobilized neck. Besides urgency increases difficulty. The presence of pulmonary shunt interferes with effective preoxygenation. Because of hypoxia, anxiety and reduced concious level, awake tracheal intubation may not be performed. Furthermore, optimal positioning may not be feseable.

MACOCHA score is the only validated airway assessment tool in the critically ill. Factors related to the patient include Mallampati class 3 or 4, obstructive sleep apnea, reduced mobility of cervical spine and limited mouth opening less than 3 cm. Factors related to the pathology include coma, severe hypoxemia less than 80%. Finally the factor related to the operator is being non-anesthesiologist. If the score is between 8 and 12, this means that there is a high risk for difficult airway management in the ICU. After tracheal intubation there are several red flags to make us alert in the ICU. Absence, or change of capnograph waveform, or chest wall movement, are important factors. Reduced tidal volume and increased airway pressure, or inability to pass a suction catheter, are predictord of risky situations. Obvious air leak and a vocalization with a cuffed tube in place are among other factors.

There are also unique challenges for airway management in the Emergency Department (ED). Time pressure, hemodynamic instabilty, altered airway anatomy, associated injuries, lack of patient cooperation, risk of aspiration, need for cervical spine protection and positioning concerns are the issues. If the patient is not untresponsive and if we don’t predict difficult airway, rapid sequence induction (RSI) is recommended. Airway double setup in the

ED was defined in the latest guideline from Canadian Airway Focus Group (4). In patients who are agitated and difficult to preoxygenation, delayed sequence of induction was defined. Small doses of ketamine, benzodiazepine, or dexmedetomidine is administered by experienced anesthesiologists in order to keep airway reflexes or spontaneous respiration. Retrograde intubation has advantages in the ED, especially for the patients with bloody airway.

In conclusion, the incidence of complication and failure rate is high in the ICU. Critical illness and its management can make anatomically 'normal' airways 'physiologically difficult'.

RSI is recommended for emergency intubations when significant anatomic or physiologic difficulty is not anticipated. We should consider awake intubation when our patient cooperates and there is time. Double setup and surgical airway should be considered early.

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Non-technical skills during difficult airway management

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Difficult airway management presents the challenges not only for the anesthesiologist but also for all staff involved. The essential part of this management is the realization of non-technical skills. Non-technical skills are cognitive skills and interpersonal communication, therefore, are the conditions for effective teamwork, where the human factor plays the key role.

Cognition, on the other hand, is a process in which sensory information is transformed, reduced, elaborated, recorded, reappeared and used. During the realization of teams work we serve with cognitive aids, which in this case are: difficult airway trolley, check lists, trained team and debriefing.

Difficult airway team must consists from: lieder, who give instructions; 2 anesthesiologist purposed for intubation, 2 nurses, a runner and cricothyrotomy team.

The World Health Organisation recommends clinical debriefing after tasks, shifts or events. Clinical debriefing is a team conversation about what has happened during a case. Any aspects of patient care may be discussed and everybody's perspectives matter. The debriefing structure consists of four steps: Target, Analysis, Learning and Key actions (TALK), which guide individuals in having focused and constructive conversations with practical outcomes. It enables effective communication across diverse health care professional teams that work together on a regular or occasional basis in any healthcare environment.

Finally, our messages are: apply cognitive aids and train you and your colleagues to be more successful!

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