There were 23 participants with a range of experience: six had performed less than 20, eleven between 20 and 50, and six participants had performed more than 50 conventional (asleep) VATIs. Holding the VS with the left hand and directing the TT with the right hand was associated with a faster time to successful tracheal intubation (Table 5).

This small study shows that anaesthetists who are familiar with traditional videolaryngoscopy find it easier to hold the VS in their left hand and direct the TT with their right hand in face-to-face intubation attempts. Both groups perceived their second attempt at this procedure to be easier, which may be explained by a learning effect from the first attempt on the second attempt. This study shows that face-to-face VATI is a technique in which the logistics and ergonomics need to be practised in a non-emergent situation.

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Pressure in the airway under apnoeic oxygenation with different nasal flow rates: a randomised controlled study

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High-flow nasal cannula therapy (HFNCT) is recognised to avoid desaturation during airway managment.[1] Studies in spontaneously breathing patients showed a linear relationship between flow rate and positive airway pressure in the nasopharynx.[2] Increasing airway pressure is discussed as a beneficial mechanism of HFNCT. In apnoeic adults under anaesthesia, there is no data on subglottic pressures generated with HFNCT.

With Ethics Committee Bern approval and written informed consent, this study investigated airway pressures generated by HFNCT in apnoeic patients with opened and closed mouth, using different flow rates in a randomised order (1, 20, 40, 60, and 80 L min^{-1}). Standard anaesthesia induction agents and neuromuscular blocking agents were administered. Jaw thrust was applied to ensure upper airway patency. Airway pressure was measured in the right main bronchus 2 cm from carina, in the middle of the trachea, and in the pharynx above the vocal cords with a 11 Fr airway-exchange catheter (COOK Medical, Bloomington, IN, USA), placed under fibrescopic control, connected to a pressure transducer. Each measurement at each position with each flow was performed randomised with open and closed mouth.

Twenty patients undergoing elective surgery were included (38 [18] yr old, BMI 25 (3) kg m^{-2}, nine females, ASA physical status classification: 1 [35%], 2 [55%], and 3 [10%]). A non-linear increase of pressure with closed mouth and higher flow rates was observed (Fig. 5). With open mouth, there was only a minimal increase in pressure (Fig. 5). No difference in pressures was observed between bronchus, trachea, and pharynx.

These preliminary results show the generation of a flow-dependent positive airway pressure in the airway of apnoeic patients with closed mouth under HFNCT. Surprisingly no relevant pressure increase was observed while the patient's mouth was open. This challenges the mandate to keep the mouth open during HFNCT and the alleged mechanism of positive airway pressure generation as an important physiological mechanism of oxygenation during apnoea. Furthermore, airway pressures remained below 10 cm H_2O despite flow rates of up to 80 L min^{-1}, suggesting that HFNCT may represent a safe option even if the mouth is closed. During this study, we never observed pressure levels possibly causing lung injuries.

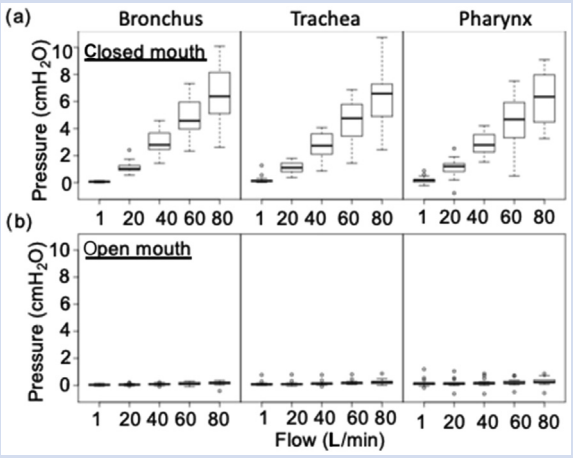

Fig 5 Boxplot of raw data.

Funding

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Preoxygenation with high-flow nasal cannula *versus* face mask in morbidly obese patients

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Morbidly obese patients have reduced functional residual capacity, putting them at increased risk of critical desaturation during induction of anaesthesia.[1] We aimed to compare the heated humidified high flow nasal cannula (HFNC) to standard management for preoxygenation, and oxygenation during apnoea and tracheal intubation in this patient population.

We report preliminary data from a randomised, single-centre, open-labelled, controlled trial. After approval by the local ethics committee and written informed consent, patients scheduled for bariatric surgery were randomly assigned to

receive 5 min of preoxygenation with 100% oxygen by a face mask with a PEEP of 7 cm H_2O or HFNC set at 70 L min^{-1}. Anaesthesia induction was followed by bag-mask ventilation continued until laryngoscopy or HFNC maintained during apnoea and intubation. The primary endpoint was fraction of end tidal oxygen (ETO_2). The secondary endpoints were arterial oxygen partial pressure (Pa_{O_2}) and peripheral capillary oxygen saturation (SpO_2). Measurements were performed at baseline, after 2.5 and 5 min of preoxygenation, and repeated immediately after intubation. Apnoea time was defined as time from last spontaneous breath *vs* time from discontinuation of bag-mask ventilation to confirmation of correct tracheal tube placement in the HFNC and face mask group, respectively.

Nineteen patients were available for statistical analysis. The mean BMI was 42 (2.5) kg m^{-2} in the face mask group (n=8) and 40 (4.3) kg m^{-2} in the HFNC group (n=11) (P=0.23). There was no significant difference in ETO_2 or Pa_{O_2} at any time during preoxygenation, and all patients reached an ETO_2 >0.90 within 5 min. The mean apnoea time was significantly longer (206 [28] *vs* 43 [12] s; P<0.0001) and Pa_{O_2} was lower (38 [12] *vs* 53 [12] kPa; P=0.013) after intubation in the HFNC group. No patient experienced a SpO_2 <100% during intubation. The maximal apnoea time was 264 s owing to a case of unexpected difficult intubation in the HFNC group.

Both HFNC and face mask with PEEP provided effective preoxygenation in the morbidly obese. Despite a significantly longer apnoea time and lower post-intubation Pa_{O_2} compared with bag-mask ventilation, HFNC maintained SpO_2 at 100% throughout the induction and intubation procedure.

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C-MAC VA Video Stylet in clinical practice: an observational study of intubation success

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Rigid scopes are an alternative to flexible fibreoptic scopes for predicted or unpredicted difficult airway management. The semi-rigid C-MAC VS (Video Stylet; Karl Storz, Tuttlingen, Germany) is a rigid video stylet with a flexible tip. Clinical data collected from this new tool are rare; hence, this study aims to gather data from 3000 to 4000 patients undergoing airway management under general anaesthesia in everyday clinical practice to establish oro-tracheal intubation success, the side-effects, and the safety issues of the C-MAC VS. This is a preliminary report of an ongoing observational study.

The Cantonal Ethics Committee, Bern, Switzerland, waived the need for informed consent if the general research consent defined by the Swiss Research Act is available. Patients requiring general anaesthesia, who have given general consent and have at least one predictor of difficult airway management (e.g. Mallampati ≥2, mouth opening <4 cm, thyromental distance <6 cm, head and neck movements <90°, short neck, reduced neck extension, or ENT/maxillofacial surgery) have been and will be included. After induction of general anaesthesia, orotracheal intubation is facilitated with the C-MAC VS. The primary outcome is the first-attempt orotracheal intubation success rate. The secondary outcomes are time of intubation (the moment when the tip of the device passes the patient's lips, until the device is out of the tube), overall success rate, difficulty of intubation, complications during intubation, and technical problems with the device.

So far, 47 patients have been included. The mean BMI was 26 kg m^{-2} (standard deviation, 5) and the age 54 (20) yr. ASA physical status classification distribution was: 1 (17%), 2 (40%), 3 (36%), and 4 (6%). Most (63%) underwent ENT/maxillofacial surgery.

The first attempt at orotracheal intubation was successful in 91%, and in 9% a second attempt was needed (100% overall success rate). The median time (IQR) from the start of intubation was 27 (18–44) s. Time until the first $EtCO_2$ reading was 53 (30–64) s. One patient suffered from bleeding and oedema during intubation, another from hypoxaemia <90% SpO_2. Both had no sequelae on the next day. Thirty-seven ENT patients could be followed up; meanwhile, 33% reported sore throat and 5% hoarseness.

Although the number of patients included in this early preliminary report about oral intubation success rate and complications of the C-MAC VS was small, the intubation success rate was surprisingly high. Time to successful intubation and complication rates seem comparable with the results of studies using intubation stylets such as the Levitian or the Bonfils.[1]

Funding

Karl Storz (C-MAC VS).

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Training on three-dimensional airway models improves confidence in managing a cannot intubate-cannot oxygenate situation

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Cannot intubate, cannot oxygenate (CICO) events are rare, extremely stressful, and potentially catastrophic. Anaesthetic airway emergency preparedness is crucial, and this includes skills in performing an emergency front-of-neck access in a CICO crisis. However, anaesthetists may not be familiar or confident in performing emergency cricothyrotomies owing to the rarity of these situations. In view of this, we initiated a refresher training course in a tertiary Asian hospital, on managing CICO crises using three-dimensional airway models.

Our objectives were to provide an update on the CICO algorithm recommended by the Royal Perth Hospital,[1] and to give a refresher on CICO techniques. At the end of the training, participants were expected to be able to use the CICO algorithm to aid decision-making, critique the use of various jet oxygenation devices, proficiently perform CICO rescue airway techniques and recognise the potential pitfalls of each technique. We modified and printed three-dimensional (3D) cricothyrotomy models, based on a free-of-charge download from the website www.airwaycollaboration.org. Four training