

## The use of the laryngeal mask airway to facilitate the insertion of a percutaneous tracheostomy

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**Abstract.** We report the use of the laryngeal mask airway to facilitate the insertion of a percutaneous tracheostomy (Ciaglia kit) in two patients. This method has not been reported previously. We believe that in selected patients the technique described increases the ease of placement of a percutaneous tracheostomy.

**Key words:** Laryngeal mask airway – Percutaneous tracheostomy

Tracheostomies are routinely used in intensive care units (ICU) for patients requiring long-term ventilatory support. Although the indications for, and timing of, a tracheostomy vary from unit to unit it is our unit's policy to perform a tracheostomy 10 to 14 days after endotracheal intubation. We use the 'Ciaglia' percutaneous tracheostomy kit (Cook Critical Care) [1]. Prior to tracheal puncture, the endotracheal tube is withdrawn and repositioned under direct laryngoscopy, with the inflated cuff directly above the cords [2]. It is held in place throughout the procedure by one of the anaesthetic team. We describe two cases in which the endotracheal tube was replaced by laryngeal mask airway (LMA) prior to performing the percutaneous tracheostomy. We found this procedure markedly improved the ease of the technique.

### Case histories

#### Case 1

A 40-year-old male, weighing approximately 60 kg, was admitted after a road traffic accident. His initial score on the Glasgow Coma Scale was 5. He was intubated and ventilated. CT-scan showed cerebral and brain stem contusions. Other injuries included fractures of his left scapula and left ankle. He was transferred to ICU and mechanically ventilated via a Siemens 900C and sedated with a fentanyl infusion at 100 µg/h. He continued to require ventilatory support and after 11 days it was de-

cided to perform a tracheostomy. Informed consent was obtained from his father and the tracheostomy performed the following day.

The FIO<sub>2</sub> was increased to 1 prior to induction of general anaesthesia with propofol 2 mg/kg. The fentanyl infusion was continued, a bolus of 50 mg of atracurium was given and anaesthesia maintained with propofol 0.3 mg/kg/min. Monitors in use included pulse oximetry, intra-arterial pressure, ECG and airway pressure.

The pharynx was suctioned under direct vision. The nasogastric tube was aspirated and left in situ. The patient was then extubated. A size 4 LMA was inserted in the usual fashion and secured with ribbon gauze. Good control of the airway was achieved and the patient reconnected to the ventilator. A sandbag was placed under the shoulders and the neck extended without affecting the airway. The cricoid and first two tracheal rings were easily palpated and the overlying skin was infiltrated with 7 ml of 2% lignocaine with adrenaline 1:200000.

Two anaesthetists were present throughout the procedure, one (LL) was responsible for anaesthesia and the second (JT) performed the tracheostomy.

The skin was prepared and draped. The tracheostomy was performed using the Ciaglia percutaneous tracheostomy kit [1]. There were no difficulties and a size 8 cuffed tracheostomy tube was inserted and the ventilator connected to it. Anaesthesia was discontinued, the LMA removed and a chest X-ray obtained, which was satisfactory.

#### Case 2

A 76-year-old female who weighed 55 kg, was admitted to ICU after a left upper lobectomy for carcinoma of the lung. Her initial course was uncomplicated and she returned to the ward the following day. However two days later, she was readmitted to the ICU with respiratory failure secondary to left middle and lower lobe collapse and large pleural effusion. She required reintubation and mechanical ventilation. Thirteen days after her original operation informed consent was obtained and a percutaneous tracheostomy performed using the technique described above. The procedure was complicated by venous bleeding which stopped when the tracheostomy tube (size 7.0) was inserted. The chest X-ray was satisfactory and there were no subsequent problems.

### Discussion

There have been several reports published confirming the usefulness of percutaneous tracheostomy [1–5]. Both general and local anaesthesia have been used for the procedure. The general anaesthetic techniques usually involve repositioning the endotracheal tube under direct vision so that the inflated cuff lies above the vocal cords in

the pharynx [2]. We feel that this technique has several disadvantages. The tube must be held in situ by an anaesthetist, there may be excessive pressure exerted on the cords and larynx. The tip of the tube may become dislodged during the procedure or may be transfixed by the guidewire. The patient is not protected from aspiration.

Using the laryngeal mask airway to secure the patients airway during the insertion of the percutaneous tracheostomy overcomes many of these difficulties but does not protect against aspiration either [6]. The LMA has been used in theatre for patients requiring mechanical ventilation [7, 8]. The use of the LMA has not been previously reported for airway control during percutaneous tracheostomy insertion but there have been two reports of its use for surgical tracheostomy [9, 10]. In both of these reports, good control of the airway was achieved with the LMA.

In patients at risk from aspiration neither the LMA nor an endotracheal tube with the cuff above the cords will adequately protect the airway. In this situation it would be advisable to either delay performing the percutaneous tracheostomy to allow gastric emptying to occur to perform a surgical tracheostomy. This technique is unsuitable for patients who are obese, or who require high inflation pressures (greater than 20 cm/H<sub>2</sub>O) or are dependent on high levels of PEEP. In such patients a surgical tracheostomy should be considered.

In the two cases described there was no distortion of the anatomical landmarks by the cuff of the laryngeal mask airway. In addition the two patients were quite thin and the landmarks were easily identified.

The authors feel that this modified technique increases the ease of placement of the tracheostomy by the percutaneous route. Patients should be carefully selected (as described above) and staff performing the procedure

should be experienced in both the use of the LMA and the percutaneous tracheostomy kit. Further experience is needed to determine if the perceived advantages are clinically important.

We have described a new technique for airway control during insertion of a Ciaglia percutaneous tracheostomy which we feel improves the ease of insertion compared with previously reported methods.

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