FIGURE 2 A combined cleft lip and cleft palate in a patient with an oral endotracheal tube (ETT), *in situ*, fixed firmly in the midline with the help of the ETT fixation device.

Sishir Agarwal MD
 Devendra Gupta MD
 Anil Agarwal MD
 Sanjay Gandhi Postgraduate Institute of Medical
 Sciences, Lucknow, India
 Source of financial support: None.
 E-mail: aagarwal@sgpgi.ac.in
Accepted for publication March 12, 2008.

Reference

- 1 Hatch DJ. Magill's endotracheal catheter device for use during repair of cleft lip and palate. *Paediatr Anaesth* 1995; 5: 199–201.

Hemoglobin M variant and congenital methemoglobinemia: methylene blue will not be effective in the presence of hemoglobin M

To the Editor:

We thank Drs Melarkode and Prinzhausen for their description of the anesthetic management of an asymptomatic patient with congenital methemoglobinemia due to hemoglobin M (HbM).¹ The practical difficulty in management is that such a patient will remain cyanosed with an erroneously low reading

on the pulse oximeter.² Serial blood gases are reassuring, but continuous monitoring of oxygenation is lost. We also were faced with a 44-yr-old patient with congenital HbM (subtype 1 WATE) for major maxillofacial reconstructive surgery with vascular free flap, who would require postoperative intensive care. He was similarly asymptomatic, because only 9% of his hemoglobin was HbM. He was cyanosed with a reading of 40% on the pulse oximeter and a PO_2 of 109.5 mmHg on room air.

Searching for alternative means of monitoring perioperatively, we considered using continuous transcutaneous oxygen tension monitoring (pTcO₂). Continuous transcutaneous oxygen tension monitoring is established in neonatal intensive care³ to monitor premature babies, in whom pulse oximetry has its limitations.⁴ This is a Clark type electrode applied to the skin and heated. Vasodilation induced by the heat allows correlation between arterial PO_2 and skin PO_2 .⁵ A preoperative check on the function of the monitor on the patient was encouraging and we found that increasing and decreasing the F_{iO_2} had the anticipated effect on the reading of pTcO₂.

We decided to use the pTcO₂ monitor intraoperatively, along with regular arterial blood gas samples during the 12-hr case. The pTcO₂ monitor helped us to continuously monitor the patient's oxygenation. Encouraged by performance of the monitor, it was subsequently used throughout the postoperative period, in intensive care, and on the ward.

Disadvantages of pTcO₂ include the fact that the sensor is heated to 44°C, and therefore its site must be changed every four hours to prevent heat damage to the skin. Also, for the first ten to 20 min after each site change, the reading is inaccurate while the sensor equilibrates with the skin. Also there is a one-minute lag time between changes in arterial PO_2 and pTcO₂ which would be disadvantageous in a crisis. We prevented possible interference in the function of the sensor with nitrous oxide,⁶ by using oxygen in air.

We found the transcutaneous oxygen tension monitor invaluable for our patient. We recommend its use in other patients in whom the pulse oximeter cannot be used reliably, such as the case described by Drs Melarkode and Prinzhausen.

Frances Spears FRCA
 Arnab Banerjee FRCA
 Luton and Dunstable Hospital NHS Trust, Luton,
 United Kingdom
 E-mail: Francesspears@aol.com
Accepted for publication March 25, 2008.

References

- 1 Melarkode K, Prinzhausen H. Hemoglobin M variant and congenital methemoglobinemia: methylene blue will not be effective in the presence of hemoglobin M. *Can J Anesth* 2008; 55: 129–30.
- 2 Schweitzer SA. Spurious pulse oximeter desaturation due to methaemoglobinaemia. *Anaesth Intensive Care* 1991; 19: 269–71.
- 3 Cassidy G. Transcutaneous monitoring in the newborn infant. *J of Paediatrics* 1983; 103: 837–48.
- 4 Southall DP, Bignall S, Stebbins VA, Alexander JR, Rivers RP, Lissauer T. Pulse oximeter and transcutaneous arterial oxygen measurements in neonatal and paediatric intensive care. *Arch Dis Child* 1987; 62: 882–8.
- 5 Huch A, Huch R, Arner B, Booth G. Continuous transcutaneous oxygen tension measured with a heated electrode. *Scand J Clin Lab Invest* 1973; 31: 269–75.
- 6 Eberhard P, Mindt W. Interference of anaesthetic gases at oxygen sensors. *Birth Defects Orig Artic Ser* 1979; 15: 65–74.

Successful laryngeal mask airway Fastrach intubation in the presence of an endotracheal tube inserted via the cricothyroid route

To the Editor:

A 57-yr-old African American male, with a history of carcinoma of the lung, presented to the emergency department of our institution with a history of increasing respiratory distress. A previous pathological fracture of the cervical spine required surgical fusion; a halo fixation device had been applied for postoperative immobilization. Respiratory arrest rapidly supervened. Manual ventilation with 100% oxygen was provided at frequent intervals throughout the ensuing episode of airway management. Several attempts at both conventional laryngoscopy and fibreoptic endotracheal intubation under general anesthesia failed. Fibreoptic endotracheal intubation via the laryngeal mask airway Fastrach (Ft-LMA; LMA North America, San Diego, CA, USA) was successful. Unfortunately, the patient's trachea was inadvertently extubated, and thereafter manual ventilation became increasingly difficult. At this point, the emergency room physician proceeded to cricothyromyotomy, and a size 6.0 cuffed endotracheal tube (ETT) was inserted via the cricothyroid membrane and sutured in position. Bilateral chest movement and the presence of carbon dioxide in the expired gas were confirmed. The patient was stabilized and transferred to the medical intensive care unit for ventilator therapy.

On hospital day six, the patient was scheduled for closure of the cricothyromyotomy incision and formal tracheostomy. The halo fixation device remained *in situ*. The otorhinolaryngology surgeon expressed concern about the possibility of losing the airway during the surgical procedure, and requested that the airway be secured by the oral or nasal route. This presented a unique challenge, as previous attempts at conventional laryngoscopy and conventional fibreoptic endotracheal intubation had failed. Previous flexible fibreoptic endotracheal intubation via the Ft-LMA had been successful. However, there was concern that the presence of a size 6.0 ETT through the cricothyroid route might obstruct the passage of the ETT placed via the Ft-LMA. An attempt at endotracheal intubation using the Ft-LMA was considered a reasonable approach.

Balanced general endotracheal anesthesia was induced and the patient's lungs were ventilated via the cricothyromyotomy tube. A size 5 Ft-LMA was inserted, and the cuff of the size 6.0 cricothyroid ETT was immediately deflated, while ventilation via the Ft-LMA continued. Bilateral chest movement and the presence of carbon dioxide in the expired gas were confirmed. A size 7.0-mm cuffed ETT, supplied with the Ft-LMA, was inserted into the patient's trachea to a distance of approximately 22 cm, measured at the patient's upper incisors; the cuff was gently inflated. Once again, bilateral chest movement, and the presence of carbon dioxide in the expired gas were confirmed. The size 6.0-mm ETT through the cricothyroid route was removed. A formal tracheostomy was performed approximately 2 cm above the sternal notch through the second to fourth tracheal rings, without complication. At the end of the procedure, the patient was transferred to the medical intensive care unit, in stable and satisfactory condition.

Difficulties with intubation of the trachea are common in anesthesia practice. Difficult endotracheal intubation may be accomplished by flexible fibreoptic endotracheal intubation¹ or by the use of a blind technique, with devices such as the Ft-LMA.² Endotracheal intubation may be difficult because of the presence of a halo fixation device.³ The management of these challenges have been well documented previously.^{4,5} However, successful endotracheal intubation using the Ft-LMA in the presence of an ETT inserted through the cricothyroid membrane has not previously been reported, and it is important to appreciate that the normal-sized adult trachea may accommodate two ETTs if necessary. It should be emphasized that deflation of the cuff of the *in situ* ETT is essential before attempting to ventilate through the Ft-LMA.