Figure 1.
The i-gel airway; sizes 3, 4, and 5.

of i-gel airway, which was exchanged in place of tracheal tube at the end of surgery.

Lubricated gastric tubes, sizes 10–14, were easily inserted through the gastric channel at first-attempt, in all 80 cases where this was performed. Intraoperative regurgitation occurred in two fasted patients who had no gastric tube inserted initially and the gastric fluid drained freely from the i-gel gastric channel. This was managed by head-down positioning without disrupting surgery and insertion of gastric tube through the gastric channel with effective drainage. Direct pharyngoscopy and suction did not reveal gastric fluid soiling. Neither patient had clinical evidence of aspiration at 48 h. It is recommended that if regurgitation occurs during anaesthesia, the patient should be positioned head-down or lateral, gastric tube drainage performed, the i-gel removed, the pharynx suctioned and the patient intubated [1].

In conclusion, the i-gel is very suitable for perioperative airway management, positive pressure ventilation, and weaning from ventilation. It is also useful as an intubation aid and has a potential role in airway management during resuscitation. It is very easy to use, highly reliable and associated with minimal morbidity. The gastric channel separates the oesophagus from the larynx and provides protection from aspiration. Further studies are required to compare the i-gel with other supraglottic devices.

O. A. Bamgbade, W. R. Macnab, W. M. Khalaf
Department of Anaesthesia
Central Manchester University Hospital
Manchester, UK

References

1. Intersurgical. *I-gel User Guide*. Wokingham, UK: Intersurgical Ltd, 2006: Issue 2.
2. Levitan RM, Kinkle WC. Initial anatomic investigations of the i-gel airway: a novel supraglottic airway without inflatable cuff. *Anaesthesia* 2005; **60**: 1022–1025.
3. Gibbison B, Cook TM, Seller C. Case series: protection from aspiration and failure of protection from aspiration with the i-gel airway. *Br J Anaesth* 2008; **100**: 415–417.
4. Sharma S, Rogers R, Popat M. The i-gel airway for ventilation and rescue intubation. *Anaesthesia* 2007; **62**: 419–420.

The use of near-infrared spectroscopy (NIRS) in surgical clipping of giant cerebral aneurysm

doi:10.1017/S0265021508004651

EDITOR:
A 49-yr-old male patient was scheduled for clipping of a giant right middle cerebral artery (MCA) aneurysm. He presented with Grade IV subarachnoid haemorrhage (SAH) and large intracerebral haemorrhage. Upon admission, the patient's Glasgow Coma Scale score was 8 (E2V2M4) with left-sided hemiplegia. The patient was transferred to the operating room, sedated and intubated. Two 18-G peripheral intravenous lines and a left radial arterial line were placed. In addition to the routine standard monitors, electroencephalograph (EEG) electrodes were placed over the midline and left

Correspondence to: Nezar Khalifah, Department of Anesthesia and Perioperative Medicine, University of Western Ontario, London Health Sciences Centre, 339 Windermere Road, London, Canada N6A 5A5. E-mail: nkhalifah@kfshrc.edu.sa; Tel: +966 1 4647272, Ext 32700; Fax: +966 1 4423909

Accepted for publication 29 April 2008 EJA 5076
First published online 5 June 2008

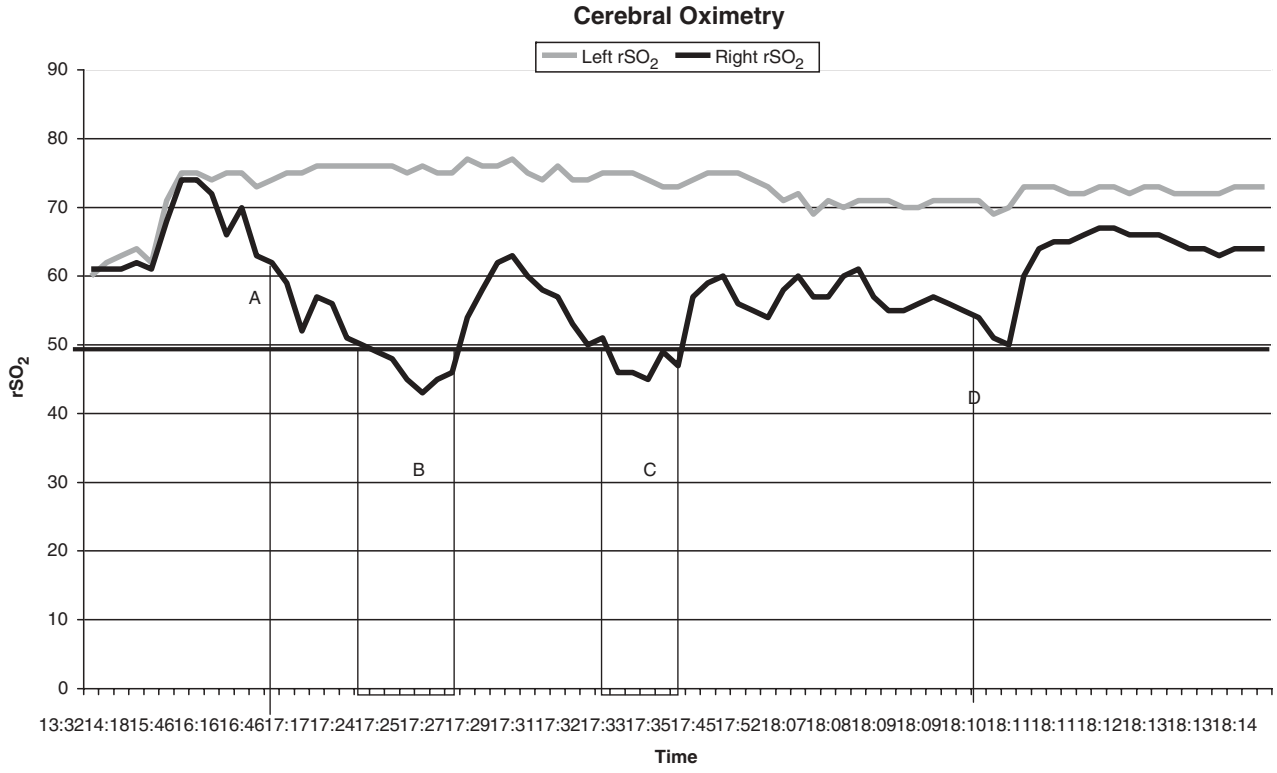

Figure 1.
Time course of changes in cerebral oxygen saturation. Point A: correspond to temporary clip application, areas B&C: represent periods of desaturation, Point D: correspond to temporary clip adjustment.

cerebral hemisphere. Two near-infrared spectroscopy (NIRS) sensors (model INVOS-4100; Somanetics Corporation, Troy, MI, USA) were applied, one on either side of the forehead. The sensors were covered with adhesive cover to shield them from ambient light. Baseline rSO_2 recordings from both sides were 71–73%. Baseline systemic temperature was 37.0°C.

General anaesthesia was maintained with sevoflurane (0.5% MAC (minimum alveolar concentration)), oxygen/air (40–60%) and remifentanil (0.15 $\mu g\,kg^{-1}\,min^{-1}$). Mechanical ventilation was adjusted to maintain a PCO_2 in the 30–35 mmHg range.

Following right fronto-temporal craniotomy, right femoral artery to right carotid artery (FA–CA) extracorporeal hypothermic bypass was instituted. After 40 min of cooling and right brain surface temperature of 23°C, a temporary clip was placed on the right MCA. Systemic temperature was 37.3°C. Shortly after temporary clip application, the right rSO_2 recordings were in the range of 55–60%. After 26 min of temporary clip application, right rSO_2 readings dropped below 50% on two separate occasions 5 min apart each episode lasted for 3 min. Left-sided rSO_2 recordings remained unchanged and EEG recording from midline and left hemisphere did not show any changes suggestive of ischaemia. In response to the episodes of cerebral desaturation, the neurosurgeon was informed and the temporary clip position was adjusted. Propofol infusion ($3–5\,mg\,kg^{-1}\,h^{-1}$) was started to reduce cerebral metabolic rate and titrated until EEG burst suppression was achieved. Right cerebral oxygen saturation readings returned to baseline values after 5 min of temporary clip adjustment (Fig. 1). Total temporary clipping time was 67 min and 54 s and the total duration of surgery was 12 h and 15 min.

Postoperatively, the patient was transferred to the ICU on mechanical ventilation. The patient was extubated 3 days following surgery and discharged from ICU on day 4. He was awake, obeying commands. His preoperative left-sided hemiplegia did not change. There was no new neurological deficit and postoperative cerebral angiography did not reveal any evidence of new infarction or haemorrhage.

Discussion

Intraoperative cerebral ischaemic complications may be due to improper temporary or permanent clip application, prolonged temporary clipping time, retraction injury and cerebral vasospasm. With respect to intraoperative neuromonitoring, in addition to EEG, NIRS was used to monitor cerebral oxygen saturation during periods of potentially

https://doi.org/10.1017/S0265021508004651 Published online by Cambridge University Press

compromised cerebral blood flow (in this case, prolonged temporary parent artery occlusion of 67 min).

Several investigators have reported the use of NIRS during carotid endarterectomy and found rSO_2 recordings less than 50% is indicative of cerebral ischaemia [1,2]. However, the efficacy and clinical outcome associated with the use of NIRS during cerebral aneurysm surgery has not yet been established. In this case report, the patient developed two episodes of right rSO_2 desaturation ($<50\%$) which were not detected clinically or by EEG. This could have resulted in significant cerebral ischaemia.

NIRS can provide a useful feedback to the anaesthesiologist and neurosurgeon that could allow early detection of cerebral ischaemia and thus early intervention. In this case report, in response to the episodes of cerebral desaturation and after discussion with the surgeon, the potential cerebral protection of propofol was considered [3,4].

The findings of this report are consistent with earlier studies showing the clinical utility of multimodal neuromonitoring in the prevention of uncommon but possibly catastrophic cerebral ischaemia [5]. This modality is relatively new in neurosurgery and appears to be a promising technology that could support clinical decisions regarding detection of cerebral ischaemia. Since limited data are available, more research is needed to establish its clinical efficacy and justify its routine use in neurosurgery.

N. Khalifah, D. Bainbridge, S. Lownie
M. Quantz, R. Craen
Department of Anesthesia and Perioperative Medicine
Department of Clinical Neurological Sciences (Division of Neurosurgery) and Surgery (Division of Cardiac Surgery)
University of Western Ontario
London Health Sciences Centre
London, Canada

References

1. Samra SK, Dy EA, Welch K, Dorje P, Zelenock GB, Stanley JC. Evaluation of a cerebral oximeter as a monitor of cerebral ischemia during carotid endarterectomy. *Anesthesiology* 2000; **93**(4): 964–970.
2. Hirofumi O, Otone E, Hiroshi I *et al*. The effectiveness of regional cerebral oxygen saturation monitoring using near-infrared spectroscopy in carotid endarterectomy. *J Clin Neurosci* 2003; **10**(1): 79–83.
3. Ergun R, Akdemir G, Sen S, Tasci A, Ergungor F. Neuroprotective effects of propofol following global cerebral ischemia in rats. *Neurosurg Rev* 2002; **25**(1–2): 95–98.
4. Engelhard K, Werner C, Eberspacher E *et al*. Influence of propofol on neuronal damage and apoptotic factors after incomplete cerebral ischemia and reperfusion in rats: a long-term observation. *Anesthesiology* 2004; **101**(4): 912–917.
5. De Georgia MA, Deogaonkar A. Multimodal monitoring in the neurological intensive care unit. *Neurologist* 2005; **11**(1): 45–54.

https://doi.org/10.1017/S0265021508004651 Published online by Cambridge University Press