

## Correspondence

### *Epidural combined with propofol anesthesia does not suppress the hyperglycemic response to abdominal surgery*

To the Editor:

In light of the results of most recent studies showing better survival of surgical patients with tight glycemic control the preservation of intraoperative normoglycemia gains clinical relevance.<sup>1</sup> Epidural anesthesia in the absence of general anesthesia has long been recognized to suppress the hyperglycemic and endocrine responses to pelvic surgery.<sup>2</sup> The failure of epidural anesthesia combined with inhalation anesthesia to maintain glucose homeostasis during major abdominal surgery was traditionally ascribed to incomplete inhibition of the counterregulatory endocrine response.<sup>3</sup> Studies demonstrating that inhaled agents per se, in contrast to *iv* anesthetics such as propofol,<sup>4</sup> provoke hyperglycemia, however, indicate that the use of inhaled anesthesia may be, at least in part, responsible.<sup>5</sup> We thus speculated that combining epidural anesthesia with *iv* propofol anesthesia would prevent the hyperglycemic response to colorectal surgery.

After obtaining patient consent we studied six consecutive ASA II patients (three male, three female, mean age  $69 \pm 12$  yr) who underwent resection of colorectal cancer (three hemicolectomies, three sigmoid resections) by the same surgeon (S.M.). An epidural catheter was inserted immediately before the operation between T10 and T12. Afferent neural blockade was established with bupivacaine 0.5% to achieve a bilateral sensory block from T4 to L2, and epidural anesthesia was maintained during the operation by boluses of bupivacaine 0.25%. General anesthesia was induced with propofol administered at a dose to abolish the eye reflex. Tracheal intubation was facilitated by rocuronium  $0.6 \text{ mg}\cdot\text{kg}^{-1}$  *iv* and the lungs were ventilated to normocapnia with oxygen-enriched air. General anesthesia was maintained by continuous infusion of propofol at 6 to  $10 \text{ mg}\cdot\text{kg}^{-1}\cdot\text{hr}^{-1}$ . Normal saline 0.9% was infused at a rate of  $6 \text{ mL}\cdot\text{kg}^{-1}\cdot\text{hr}^{-1}$ . Blood losses were replaced by normal saline in a ratio of 3:1. Phenylephrine boluses ( $100 \mu\text{g}$  *iv*) were given to maintain a mean arterial pressure above 60 mmHg. Arterial blood glucose concentrations were measured before anesthesia, 80 min and 120 min after surgical skin incision using the Accu-Chek™ glucose monitor (Roche Diagnostics, Basel, Switzerland).

Differences in blood glucose concentrations were determined using analysis of variance for repeated measures.

The blood glucose concentration increased from  $5.5 \pm 0.6 \text{ mmol}\cdot\text{L}^{-1}$  prior to surgery to  $6.7 \pm 1.2 \text{ mmol}\cdot\text{L}^{-1}$  at 80 min ( $P < 0.05$ ) and  $7.1 \pm 1.3 \text{ mmol}\cdot\text{L}^{-1}$  at 120 min of surgery ( $P < 0.05$ ). The intraoperative values were numerically greater than values previously obtained in patients undergoing colorectal surgery under combined epidural and inhalation anesthesia.<sup>3</sup>

Our data suggest that a clinically modest hyperglycemic response to colorectal surgery occurs in patients receiving epidural anesthesia during propofol anesthesia.

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### References

- 1 Van den Berghe G, Wouters P, Weekers F, et al. Intensive insulin therapy in critically ill patients. *N Engl J Med* 2001; 345: 1359–67.
- 2 Kehlet H, Brandt MR, Prange Hansen A, Alberti KG. Effect of epidural analgesia on metabolic profiles during and after surgery. *Br J Surg* 1979; 66: 543–6.
- 3 Schrickler T, Galeone M, Wykes L, Carli F. Effect of desflurane/remifentanyl anaesthesia on glucose metabolism during surgery: a comparison with desflurane/epidural anaesthesia. *Acta Anaesthesiol Scand* 2004; 48: 169–73.
- 4 Schrickler T, Klubien K, Carli F. The independent effect of propofol anesthesia on whole body protein metabolism in humans. *Anesthesiology* 1999; 90: 1636–42.
- 5 Horber FF, Krayer S, Miles J, Cryer P, Rehder K, Haymond MW. Isoflurane and whole body leucine, glucose, and fatty acid metabolism in dogs. *Anesthesiology* 1990; 73: 82–92.

### *Another method to assist nasogastric tube insertion*

To the Editor:

Insertion of a gastric tube can be a difficult and frustrating experience, especially in patients who are anes-

thetized, paralyzed and sedated.<sup>1,2</sup> Ozer and Benumof have found that the most common sites of impaction of orogastric and nasogastric tubes are pyriform sinuses and arytenoids cartilages, rendering its coiling in the oropharynx.<sup>3</sup> In our experience, in addition to the impaction of tube against these structures, the basic design of the tube contributes to tube coiling in the oropharynx. The distal 6 cm of the gastric tube has multiple holes that are weak points. Once the tube is impacted against the pyriform sinuses or arytenoid cartilage, bending of the tube occurs at these weak points, thereby promoting coiling and retarding its entry into the esophagus.

We explain a technique of digital assistance to facilitate the insertion of gastric tube (orogastric or nasogastric) in anesthetized and sedated patient. The gloved index finger of the left hand is introduced into the left side of the oral cavity of the patient. Once the gastric tube is negotiated into the oropharynx, it is pulled towards the lateral pharyngeal wall with the index finger, virtually grasping it between the index finger and the lateral pharyngeal wall. As the tube is pushed to the proximal end by the right hand, the left index finger simultaneously guides the tube along the lateral pharyngeal wall into the esophagus. The fingertip provides the buttress against the holes in the distal part of the gastric tube providing it the requisite sturdiness, preventing its bending and impaction with simultaneous steering into the esophagus.

Our method is akin to that reported by Bong and colleagues, which tends to keep the gastric tube adjacent to the lateral pharyngeal wall.<sup>1</sup> Our technique avoids some of the time consuming and technically demanding measures of failed gastric tube insertion. No lateral bending of the head, lateral neck pressure or anterior lifting of the thyroid cartilage is required.<sup>1,3,4</sup> These maneuvers may not be possible in patients with cervical spine trauma, cervical traction or in neck surgery, where our method can be used easily. Further, digital palpation of the feeding tube in the oral cavity almost obviates the need to check the entry of the gastric tube into the esophagus or its retention in the oropharynx, if any, by direct laryngoscopic examination. This technique has been used by us approximately 90 times over the past six months and was found to be successful approximately 83% of times it was used.

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## References

- 1 Bong CL, Macachor JD, Hwang NC. Insertion of the nasogastric tube made easy (Letter). *Anesthesiology* 2004; 101: 266.
- 2 Flegar N, Ball A. Easier nasogastric tube insertion (Letter). *Anaesthesia* 2004; 59: 197.
- 3 Ozer S, Benumof JL. Oro- and nasogastric tube passage in intubated patients. Fiberoptic description of where they go at the laryngeal level and how to make them enter the esophagus. *Anesthesiology* 1999; 91: 137-43.
- 4 Parris WC. Reverse Sellick maneuver (Letter). *Anesth Analg* 1989; 68: 423.

## *Re-expansion pulmonary edema following laparotomy for volvulus*

To the Editor:

Re-expansion pulmonary edema (REPO) is an uncommon life-threatening condition that results mostly from rapid drainage of long-standing pleural effusion or pneumothorax. We report yet another unusual cause of REPO in a surgical patient with acute abdomen.

A 24-yr-old autistic girl presented to the general surgeons with a two-day history of abdominal pain and distension. She deteriorated prior to surgery and was admitted as an emergency on the intensive care unit in extremis with severe hypoxemia and a tense grossly distended abdomen. Despite pre-oxygenation the SpO<sub>2</sub> did not rise above 85%. Tracheal intubation was successfully performed but lung compliance was extremely poor. Despite use of high inflation pressures with positive end-expiratory pressure, the SpO<sub>2</sub> deteriorated down to 60% on FiO<sub>2</sub> of 1.0. With the situation becoming desperate, a decompressive laparotomy was performed in the intensive care unit. Immediately the lung compliance improved pari passu with the SpO<sub>2</sub>, which rose to 96%. However she developed pulmonary edema a few minutes later. She was immediately transferred to the theatre for a formal extended right hemicolectomy for a massive dilatation of transverse colon secondary to a volvulus.

She was electively ventilated postoperatively in the intensive care unit. Postoperative chest *x-ray* showed bilateral pulmonary shadowing. Gas exchange improved over the next 24 hr to allow ventilatory weaning and extubation.

Reported REPO from unusual causes include delayed repair of traumatic diaphragmatic hernia<sup>1</sup> and excision of extra-pleural lesions such as mediastinal tumours and giant hepatic cysts.<sup>2,3</sup> Clinical presenta-