- 2 Borland LM, Reilly JS. Jet ventilation for laryngeal surgery in children. Modification of the Saunders jet ventilation technique. *J Pediatr Surg* 1979; 14: 735-40.
- 3 Greene DA. Tracheostomy or not? *JAMA* 1975; 234: 1150-1.
- 4 Healy GB, McGill T, Simpson GT, Strong MS. The use of the carbon dioxide laser in the pediatric airway. *J Pediatr Surg* 1979; 14: 735-40.
- 5 Benumof JL, Scheller MS. The importance of trans-tracheal jet ventilation in the management of the difficult airway. *Anesthesiology* 1989; 71: 769-78.
- 6 Steward DJ. Percutaneous transtracheal ventilation for laser procedures in infants and small children (Letter). *Can J Anaesth* 1987; 34: 429.

CABS and CSEGA ...

To the Editor:

I would like to congratulate Dr. Kowalewski *et al.*¹ for their report of 18 cases in whom they used spinal combined with general anaesthesia for coronary artery bypass surgery (CABS).

I have recently² suggested even a triple combination for such operations: combined spinal-epidural-general anaesthesia (CSEGA). This combined triple approach can produce the relaxation and analgesia and anaesthesia from the subarachnoid injection; the augmentation and prolongation of the neuroaxial anaesthesia by injection of local anaesthetic via the epidural catheter plus the unconsciousness and controlled ventilation from general anaesthesia that makes the surgical field convenient for the surgeon in every part of the body, including the head. This CSEGA approach in CABS can avoid the need for muscle relaxation or intravenous opiates during the operation, because the neuroaxial anaesthesia produced by the subarachnoid anaesthetic injection is maintained throughout the operation by the epidural anaesthetic injections via the epidural catheter. The extubation can be done immediately after the operation with excellent post-operative analgesia by the epidural morphine.

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REFERENCES

- 1 Kowalewski RJ, MacAdams CL, Eagle CJ, Archer DP, Bharadwaj B. Anaesthesia for coronary artery bypass

surgery supplemented with subarachnoid bupivacaine and morphine; a report of 18 cases. *Can J Anaesth* 1994; 41: 1189-95.

- 2 Eldor J. Combined spinal-epidural-general anesthesia. *Reg Anesth* 1994; 19: 365-6.

Pneumothorax during fundoplication

To the Editor:

Manger *et al.*¹ report a case of pneumothorax during fundoplication and make monitoring recommendations for early diagnosis and treatment. Despite following their own recommendations for its monitoring and developing problems within 20 min of starting surgery they did not identify and treat the problem until the end of the operation.

We have had two cases of capnothorax during laparoscopic fundoplication surgery. Both developed problems about 15-20 min after insufflation of the abdomen. The first indication of a problem was desaturation necessitating an increase in FiO₂. The airway pressures were high but in only one case was it noted to have increased above the elevated level associated with the capnoperitoneum. Clinical examination revealed asymmetrical breath sounds and surgical emphysema in both cases, with wheeze in one and a deviated trachea in the other (Manger *et al.* made no comment about the presence or absence of surgical emphysema or the position of the trachea). Both cases were treated intra-operatively, one on clinical grounds and one after chest roentgenogram confirmation. In one case an intercostal drain was sited in the mid-axillary line, in the other anterior placement of a draining catheter connected to a Heimlich flutter valve was used as an interim measure. We feel continuous drainage is important. In one of our cases there was a continuous leak of CO₂ through the drain.

The differential diagnosis of desaturation and wheeze can include a misplaced endotracheal tube which should be corrected. However, the clinical features described, occurring during laparoscopic surgery, strongly suggest the presence of a capnothorax, which should be confirmed by chest roentgenogram even at the expense of surgical convenience. A chest roentgenogram may take a little time to perform and for this reason permissive hypoxia may result in having to treat a tension capnothorax as an emergency on clinical features alone.

We would recommend the use of a 14 g catheter inserted by Seldinger technique and connected to a Heimlich valve, rather than formal intercostal drainage since the capnothorax is likely to resolve upon release of the