

tracheal jet ventilation is again being advocated as "a useful technique in infants and small children."¹ Several unnecessary deaths have occurred from the unwise application of this extremely hazardous procedure, and I am concerned that more deaths will surely follow if this method continues to be used. I am amazed that the authors of this recent paper can under any circumstances endorse a technique which in their hands has a 10% serious complication rate (two out of three being potentially life-threatening). I am most surprised that your reviewers would accept the paper's conclusions as valid; surely jet ventilation distal to an obstructing lesion (i.e., "... in those with upper airway stenosis ...") is absolutely contraindicated, and to put it bluntly is simply asking for trouble. As far as the other aspects of the anaesthesia techniques described in the paper are concerned (thiopentone induction in severe airway obstructive lesions?), I would hope that they would send a shiver through the ranks of the Royal College Board of Examiners.

In 1987 some of the present authors described two cases in which trans-tracheal jet ventilation was used. In response, I wrote to protest the use of a highly dangerous technique in children when much safer alternatives were available.² My views remain the same; the previous letter still reads well. The trans-tracheal technique has proved lethal in the past, even when, as recommended by the present authors, it was "performed by experienced practitioners in specialised centres."³ It will if used, sooner or later, be equally lethal in the future.

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REPLY

As in 1987, we thank Dr. Steward for having so strongly pointed out that the use of percutaneous transtracheal jet ventilation (TTJV) for paediatric endoscopic laser treatment is dangerous, particularly in infants and small children. Indeed the narrowness of the airway in these young patients renders their disease much more serious than in adults and thus, we acknowledge that the technique is potentially hazardous.¹ How-

ever, all the other described techniques carry their own drawbacks and dangers.

- *Spontaneous ventilation, which is the technique of choice for endoscopic diagnosis, may be accompanied, during laser surgery, by respiratory depression and/or laryngospasm.*
 - *The use of an endotracheal (ET) tube secures the airway but limits surgical access, impedes the view of the endolarynx, decreases the space for surgical manipulation and may cause direct laryngeal trauma. Furthermore, an ET tube may be of potentially ignitable material in close proximity to the laser beam.²*
 - *Elective tracheostomy, particularly in infants and small children, is associated with severe morbidity and even mortality.³*
 - *Jet ventilation through a translaryngeal catheter has drawbacks similar to those encountered with an ET tube.*
- Thus, in endoscopic procedures of this type, few techniques ensure both a free surgical field and a secure airway with adequate ventilation and oxygenation while eliminating the risk of tube ignition.*
- Alternatively, percutaneous TTJV for microlaryngoscopic laser surgery offers several advantages.*
- *Muscular relaxation and an immobile surgical field.*
 - *Absence of an ET tube, allowing access to the lesion, with a diminished risk of an endotracheal fire.*
 - *Absence of trauma to the diseased tissues.*
 - *Continuous expiratory flux.*
 - *Continuous ventilation even during percutaneous insertion of the transtracheal catheter.*
 - *Manual or automatic rate between 0 to 200 c · min⁻¹ (from simple oxygenation to ventilation).*
 - *Avoidance of a tracheostomy.*
 - *Reduction of procedure time – one major issue in this type of specialized surgery is that the quality of surgery, and the prognosis of the lesion, are directly related to the quality of exposure of the surgical field.⁴ Procedures are shorter with TTJV.*
 - *Potentially life-saving route in cases of acute upper airway obstruction – in accordance with recent review articles.⁵*

As Dr. Steward has pointed out, it is important to stress the hazards linked to TTJV. We would have preferred more constructive criticism, appropriately referenced, rather than vague phrases such as "several unnecessary deaths have occurred from the unwise application of this extremely hazardous procedure."

When Dr. Steward says "much safer alternatives are available," he only quotes a letter which he wrote in 1987 as a reference.⁶

To conclude, TTJV is more invasive than orotracheal intubation. It should not be used as a routine technique in paediatric endoscopic surgery when a more conventional anaesthetic technique is possible, but should be considered for use in specific cases as a valid alternative in experienced hands.

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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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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

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