

---

---

# DIFFICULT AIRWAY SOCIETY

---

---

Issue 7

Circulation 516

June 2001

## Chairman

Dr Adrian Pearce

Department of Anaesthesia

Guy's Hospital

London SE1 9RT

[chairman@das.uk.com](mailto:chairman@das.uk.com)

## Honorary Secretary

Dr Mansukh Popat

Department of Anaesthesia

John Radcliffe Infirmary, Headley Way, Headington

Oxford OX3 9DU

[secretary@das.uk.com](mailto:secretary@das.uk.com)

## Treasurer

Dr Peter Latto

Department of Anaesthesia

University Hospital of Wales

Cardiff CF4 4XW

[treasurer@das.uk.com](mailto:treasurer@das.uk.com)

## Newsletter

This newsletter was written by members of the Difficult Airway Society. The opinions expressed are those of the individual members and do not represent necessarily the view of the Society.

Any feed-back on this Newsletter, submissions for future editions or correspondence should be sent to;

Dr Chris Frerk

Department of Anaesthesia

Northampton General Hospital

Northampton NN1 5BD

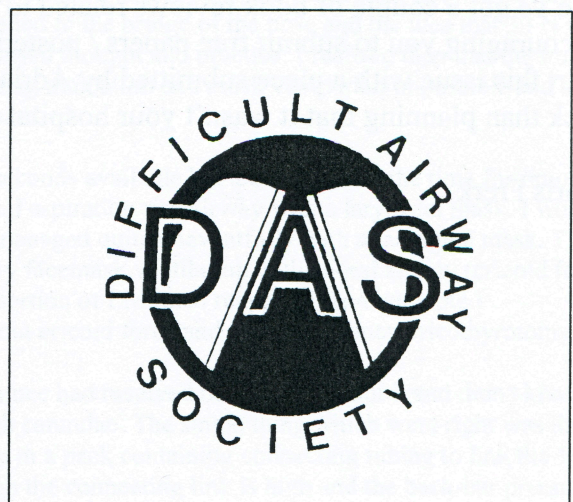
Telephone 01604 545671 Fax: 01604 545670

[newsletter@das.uk.com](mailto:newsletter@das.uk.com)

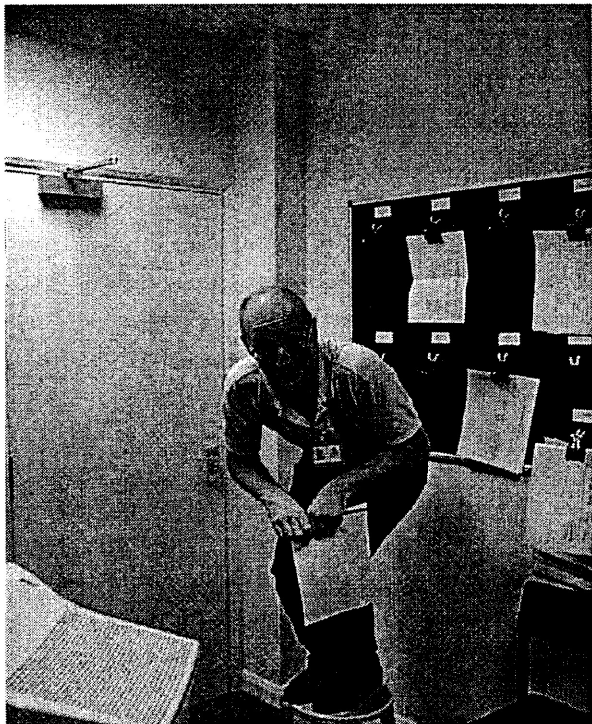
[www.das.uk.com](http://www.das.uk.com)

## INSIDE THIS ISSUE

- 2 Ed's hello
- 3, 4 Leader- An Airway disaster & what it taught me.
- 4, 5 Papers you may have missed
- 6 Forthcoming meetings
- 7 Book reviews
- 8 Sports page and membership application







**From The Editor:** Welcome to a bumper issue of the Newsletter, possibly the last one before the DAS shindig at Oxford (depending on press deadlines). The photo opposite seems to demonstrate that ed may be succumbing to the pressure of work – the pose seemed like a good idea at the time! Many thanks as always to contributors this month. We are trying some newish ideas to make the newsletter interesting and also hopefully valuable as we expand the airway dilemma idea from the sports page to a more serious discussion. Remember, when you've read as much as you want of this leave it in your juniors room, they may fancy joining DAS, the application form is on the back, you could even encourage consultant colleagues to join!

In the papers you may have missed there's two about positioning for laryngoscopy – three axis theory in *Acta Scand* and an MRI paper on the sniffing position in

*Anesthesiology* – I'll be fishing them out to have a look at. There are a couple on evidence based practise relating to anaesthesia (not the airway in particular but important none the less). This issues "wackiest paper" comes from *Anesthesia & Analgesia* – Survival after failed resuscitation Hmmn. As usual our contributors have asterixed papers they consider particularly interesting– thank you to them all.

If you have any suggestions for style or content of this publication let us know – the address is on the front page. Letters are more than welcome – if you are sending them via email it would help if you could send stuff as attachments in word. If you know of meetings / courses that need publicising or you've got a clinical conundrum or a story for the sports page let us know.

We've got a couple of book reviews related to the airway towards the end of this issue and we are encouraging you to submit free papers / posters for the DAS meeting at Oxford. On a most serious note we start this issue with a piece submitted by Adrian Pearce – could have happened anywhere (probably more luck than planning that it wasn't your hospital or mine) – what do you think?

Chris Frerk

# An Airway Disaster ... and what it taught me.

Dr Adrian Pearce

It is unfortunate that there is no forum for discussion of airway disasters and it is hoped that the Newsletter might provide one. Of course, what actually happened is never known for certain but is coloured by the reporter. I wasn't there but this is what happened:

A Registrar on-call for the labour ward was asked to anaesthetise a patient for an emergency C-section. The rapid preoperative evaluation didn't reveal anything obviously amiss with the airway although he noted that the patient had undergone some operation on her jaw when she was a baby. He started in the normal fashion of ODA assistant, IV access, monitoring, preoxygenation, Thio/Sux, cricoid force. It went downhill from there.

A summary of the trainee's thoughts are captured in the ether. Direct laryngoscopy seems to be difficult, isn't the larynx just there, perhaps some more sux will help, oh dear the patient's saturations are really falling now, can't even bag her, the patient's had a cardiac arrest and they are doing cardiac massage and getting the baby out, Christ get some help, must do a cricothyrotomy, done that but can't see the chest rise when I press the oxygen flush, can't be in, will have to do a surgical cricothyrotomy, just doing that when senior help arrives and manages to intubate the patient. Oxygenation recovers but will the patient?

I heard about it an hour later and my immediate thoughts were what a dreadful thing to happen to the patient and trainee, and oh dear we will be in the next maternal mortality report. It was quite correct for the obstetricians to get the baby out as soon as maternal cardiac arrest occurred - it improves the efficacy of resuscitation attempts and should deliver a live child. The intensivists were now looking after the patient and the trainee needed uncritical support. It was easy to give that. The time for wondering whether the anaesthetic management was 'right' came in private over the next few weeks. There were obvious deficiencies. Why had a second dose of sux been given?, why had a laryngeal mask (LM) not been tried?, why was cricoid force maintained until an emergency cricothyrotomy was the only way to save the patient? should registrars be on their own in an isolated unit in the daytime?

It was clear that the trainee had never been taken through such a scenario and had never acted it out with a mannequin. There were guidelines in the obstetric department about the management of such scenarios but several sides of A4 text are no substitute for one-to-one discussion. The trainee was hopelessly unprepared and, to my profound shame, others will still be so. But it was over a year later that I had fully worked out, to my own satisfaction, what had happened and what lessons could be learned. It was not just a chance event. I had the same ODA shortly after the event performing cricoid force and I couldn't make out any of the normal landmarks. Reports in the journals show that high levels of cricoid force (not much over 30 N) make mask ventilation and direct laryngoscopy difficult, and can cause the trachea to become completely occluded in young women. It also makes laryngeal mask insertion difficult and makes intubation through the LM more difficult. An audit in the hospital on cricoid force application revealed that only 25% of our assistants applied it at around 30 N and some clocked in a 100 N. The ODA body had only ever been taught to apply cricoid force with sufficient force to cause pain if applied to the bridge of the nose and the idea that 30 N was the force required to register (only) 3 kg on a weighing machine revolutionised thought and practice. I realised then that the trainee had been caught out by both over-zealous application of cricoid force making intubation and mask ventilation impossible and a culture of compulsory maintenance of cricoid force even to the point of death.

Why hadn't a laryngeal mask been considered? Perhaps it had in the milliseconds available but a disaster isn't the time for rational thought. It wasn't the culture at the time - far too risky to manage a potential aspiration risk airway with a laryngeal mask. I would place more weight on the series of over 100 (elective) caesarean sections managed quite uneventfully with a laryngeal mask. The correct sequence of ascending attempts at oxygenation must surely be to try facemask ventilation with an oral airway (cricoid force maintained), laryngeal mask insertion (cricoid force temporarily off for insertion of LM, then reapplied) and attempted laryngeal mask inflation with cricoid force followed by LM inflation without cricoid force and then emergency cricothyrotomy.

Why had the emergency needle cricothyrotomy failed? It hadn't but the trainee had received no training about it and didn't know what to expect. Vanner has been so useful in publicising flow-rates through cannulae. The single thing which went right was the immediate availability of a specific rigid trans-tracheal oxygenation needle in a pack containing connecting tubing to link the 14 G needle directly to the common gas outlet. But the resistance to flow through the connecting link is high and the back-bar pressure relief valve is activated when the oxygen flush button is pushed. A driving pressure of 32 kPa through a 14 G cannula produces a flow-rate of no more than 200 ml/s - too low to see chest movement but enough to provide subsistence oxygenation which (in my view) saved the patient's life. The triad of successful placement of an emergency cricothyrotomy needle is appropriate chest movement, improving oxygen saturations and gas 'exhalation' through the upper airway - but with cardiac arrest and an absence of visible chest movement would you be certain that the needle was correctly placed? The surgical cricothyrotomy was a disaster,

half-severing the trachea from the cricoid ring. Would you have done better in an emergency situation in a full-term patient in left lateral tilt undergoing vigorous cardiac massage? Thank God the senior registrar arrived and managed orotracheal intubation. His first attempt went into the oesophagus and he put the next one anteriorly. He was more experienced but, crucially, didn't have the disadvantage of life-threatening cricoid force.

This disaster supported my belief that improvements in airway management will come through dissemination and implementation (at department level) of a fairly limited amount of extra knowledge, skills and attitudes. Of particular importance is the 'play-acting' in front of a mannikin or patient of common scenarios guided by a trainer. Without this, people in trouble regress to endless and futile attempts at direct laryngoscopy and facemask ventilation. In a tutorial the trainee might have been able, given time, to work out the correct sequence; it was impossible at the time. In front of a mannikin he could have performed the correct sequence until it was ingrained. Written text, guidelines, 900-page airway books and two-day airway meetings are no substitute for relentless, unglamorous training at department level delivered by enthusiastic trainers.

The patient and baby made a full recovery. When seen two years later she had a 2 fb gape, Class B jaw-slide, Mallampati 2, full neck movement and normal thyromental distance. She might be a difficult direct laryngoscopy but I imagine that both facemask and laryngeal mask inflation would be easy. Has the application of cricoid force killed more patients than it has saved?

A.Pearce

*Thanks Adrian, I've got my own fairly odd ideas about RSI failed intubations but I'll save them for the time being (next issue maybe) – what do the rest of us DAS anaesthetists think – let us know - address is on the front page. Ed!*

## AIRWAY PAPERS YOU MAY HAVE MISSED

### Today's Anaesthetist

Laryngoscopy: Is it time to move on from the Macintosh? Vol 16 :1; 7-9 (correct tables published in next issue!) OK so this is one of mine but it did generate a bit of interest.

### European Journal of Anesthesiology Jan – Apr 2001

Management of Difficult Intubation (Review) 18:1;3-12

Use of a metal tracheostomy tube for laser surgery to a subglottic stenosis. 18:2;126

A comparison of 3 ETT tubes for ease of passage over the fiberscope. 18: supp21; A80

A comparison of McCoy straight and Miller laryngoscope blades in infants 18: supp21; A370

### Anesthesiology Jan – Apr 2001 issue 94

A method to improve a gas leak on mask ventilation in the patient with a nasogastric tube. 545.

A warm air blanket causes intraoperative airway obstruction. 169-70.

Airway anesthesia alone does not explain attenuation of histamine-induced bronchospasm by local anesthetics: A comparison of lidocaine, ropivacaine, and dyclonine. 423-8.

Distinguishing endotracheal and esophageal intubation. 539.

\*Effect of cricoid pressure on the success of endotracheal intubation with a lightwand. 259-62.

Mask tolerance and preoxygenation: A problem for anesthesiologists but not for patients. 546.

Negative-pressure pulmonary edema in a child with hiccups during induction. 378-9.

\*Potential damage to the larynx associated with light-guided intubation: A case and series of fiberoptic examinations. 165-7.

Study of the "Sniffing Position" by Magnetic Resonance Imaging. 83-6. *Previous publication of this group criticized by Benumof*

The Combitube in elective surgery: A report of 200 cases. 79-82. *97% success from Benumof's group*

Tracheostomy tube replacement: Role of the airway exchange catheter. 718-9.

Transient lingual and glossopharyngeal nerve injury: A complication of cuffed oropharyngeal airway. 719-20.



## **Anesthesia and Analgesia Jan – Apr 2001 issue 92**

- \*A videographic analysis of laryngeal exposure comparing articulating laryngoscope and external laryngeal manipulation. 267-70.
- \* Cost identification analysis for succinylcholine. 693-9. *Believable?*
- Deflationary phenomenon of the nitrous oxide-filled endotracheal tube cuff after cessation of nitrous oxide administration. 145-8.
- Difficult airway in a patient with Coffin-Siris syndrome. 554-5.
- Difficult tracheal intubation as a result of unsuspected abnormality of the temporomandibular joint. 783-4.
- Endotracheal intubation with thiopental/succinylcholine or sevoflurane-N<sub>2</sub>O anesthesia in adults: a comparative study. 523-8.
- \*Evidence-based medicine in anesthesiology. 787-94. *Not airway, but important*
- \*Examining the evidence in anesthesia literature: a critical appraisal of systematic reviews. 700-9.
- Immediate or early extubation: Where do we start? 1073. *Not airway, but important*
- Negative pressure post-tracheal extubation alveolar hemorrhage. 273-5.
- New intravenous catheter not suitable for trans-tracheal jet ventilation. 1074. *Was previous catheter OK?*
- Postoperative left vocal cord dysfunction caused by Ortner's cardiovocal syndrome. 1071-2.
- Profile soft-seal cuff, a new endotracheal tube, effectively inhibits an increase in the cuff pressure through high compliance rather than low diffusion of nitrous oxide. 140-4.
- Severe laryngospasm at tracheal extubation in a patient with superior laryngeal nerve injury. 271-2.
- Survival after failed intraoperative resuscitation: a case of "Lazarus syndrome". 690-2. *There is hope*
- \*The efficacy of esophageal detector devices in verifying tracheal tube placement: a randomized cross-over study of out-of-hospital cardiac arrest patients. 375-8.
- The minimum alveolar concentration of enflurane for laryngeal mask airway extubation in deeply anesthetized children. 72-5.
- The three-dimensional computed tomography imaging and prediction of unanticipated difficult tracheal intubation. 281.
- Use of intracuff lidocaine during general anesthesia. 1075.
- \*Validation of a simple algorithm for tracheal intubation: Daily practice is the key to success in emergencies — an analysis of 13,248 intubations. 517-22. *Rapid resort to fiberoptic intubation, after training programme*
- Video imaging to assess neuromuscular blockade at the larynx. 149-53.

## **CANADIAN JOURNAL OF ANESTHESIA – Jan – Apr 2001**

### **ANESTHESIA AND INTENSIVE CARE. – Jan – Apr 2001**

#### **International Anesthesiology Clinics.**

Nothing this time round

#### **Acta Anaesthesiologica Scandinavica.**

- \*\* Rethinking the three axes alignment theory for direct laryngoscopy. 2001; **45**: 261-2
- A survey of tracheal intubation difficulty in the operating room: a prospective observational study. 2001; **45**: 327-32
- Life-threatening upper airway obstruction in a child caused by retropharyngeal emphysema. 2001; **45**: 393-5
- One way to ventilate patients during fiberoptic intubation. 2001; **45**: 507-9
- Ease of laryngeal passage during fiberoptic intubation: a comparison of three endotracheal tubes. 2001; **45**: 624-6.
- Laryngeal papillomatosis with airway obstruction in an infant. 2001; **45**: 645-8.

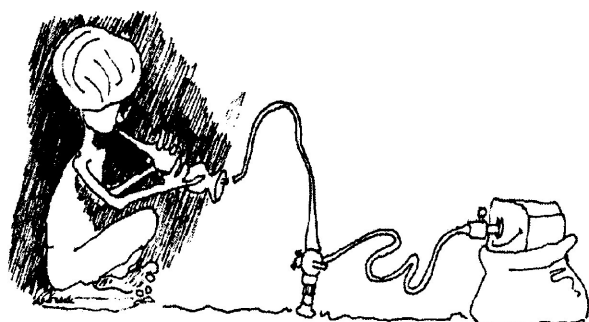
## Forthcoming Meetings

22<sup>nd</sup> & 23rd November 2001

### Difficult Airway Society meeting Oxford

Telephone 01865 221590 Fax 01865 220027

Email [marguerite.scott@orh.anglox.nhs.uk](mailto:marguerite.scott@orh.anglox.nhs.uk)



Thanks to Guy Rousseau for another splendid drawing. I always knew anaesthetists were charming people (*groan*). The above is the only meeting I have details for. If you are running a course or meeting and want free publicity to 400 people interested in the airway send details (address on front page). Meanwhile what to do with ½ a page of blank space:-

### DAS Annual meeting at Oxford

*Deadline for free papers is approaching(sept 2001)*

Get your submission in soon

Get your trainees to get their submissions in soon

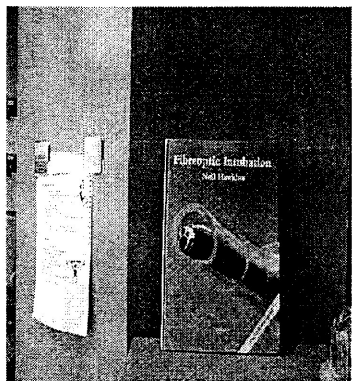
Fame fortune and prizes await you, not to mention a free pass into the meeting (I think) – details from and submissions to Pat Millard, Dept of Anaesthesia, John Radcliffe Hospital, Headley Way, Headington , Oxford, OX3 9DU. Or [pat.millard@nda.ox.ac.uk](mailto:pat.millard@nda.ox.ac.uk)



# Book Reviews

## Fibreoptic Intubation. N.Hawkins

Published by Greenwich Medical Media Limited



Reviewed by N Bhandal

The stated aim of this book is to be 'intended as an introduction to the fibreoptic laryngoscope and its use for intubation. 'It is aimed primarily at trainees and related professionals in anaesthesia.

In nine chapters, relevant aspects of fibreoptic intubation are covered. The text is easy to read and well illustrated with multiple figures and tables. The book starts by discussing the physical principles behind the fibrescope and gives a clear concise overview of the physics involved. It makes for easy reading, and the diagrams are useful in understanding the basic concepts that need to be grasped. It then goes on to cover the indications and conduct of fibreoptic intubation, in both the awake and asleep patient. The book concludes with the relevant and often forgotten issues regarding cleaning and caring for the scope.

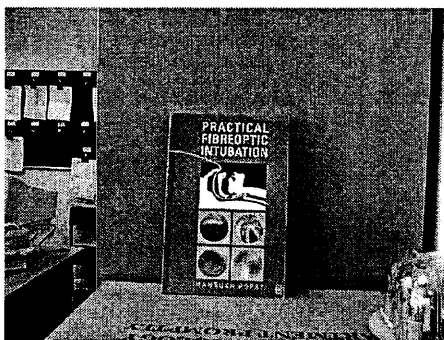
Particularly relevant to trainees is the chapter on tricks, tips and techniques on intubating the airway, although this seems to be based on the authors experience rather than any evidence. None of the chapters are referenced but a bibliography is supplied. Appendix three provides a useful reference guide and information on the sizes and compatibilities of intubating laryngeal masks and sizing of endotracheal tubes. Perhaps less useful is the extensive list of conditions associated with difficult intubation. It may have been more useful to devote more time and space to the predictive tests of difficult intubation and ventilation.

My main criticism of this book is the CD Rom, which proved to be difficult to load by myself and other colleagues. It contains video clips of the techniques described, but it would have been of more use to view the whole procedure from start to finish, rather than short clips. The use of sound would also help to maintain an interest.

Overall I enjoyed the book and would recommend it as a good starting place for anyone interested in fibreoptic intubation.

## Practical Fibreoptic Intubation. Mansukh Popat.

Published by Butterworth Heinemann



The stated goal of this book is to "prepare the reader in performing the skill of fibreoptic techniques to its fullest extent with the highest degree of success". Not a book for the starter nor for the most experienced fibreoptic practitioner, but yes for those inbetween. The writing style makes it much easier to dip in and out of this book rather than read it start to finish and I would suggest that this is the best way to use it. Necessarily when discussing practical clinical skills it is often the authors opinion that is presented and that is the case for some parts of this book but refreshingly much of the text contains up to date references. Particularly good are the sections on cleaning (for all people who work with these instruments), nerve blocks (for exam candidates), and ancillary equipment (for those of us who can never remember who sells which gadget!). There are good descriptions of the practicalities of the technique

that could be used as a recipe but the book is not (nor does it claim to be) a substitute for proper training. This book could perhaps be most usefully found in the departmental library as a reference source and problem solving guide. It is the sort of book a learner or moderately experienced endoscopist should turn to before and after a case to refine their technique, because as well as basic information the book also contains some top practical tips that till now have only come with experience.

# SPORTS PAGE

Weekday afternoon a consultant anaesthetist was asked to urgently review a 120kg, 5' 10", 45 year old man in the recovery area. He had had a thyroidectomy 2 hours previously and his airway was now almost completely obstructed. (It had been completely obstructed and this had been slightly relieved when a passing urologist had removed the wound staples to release 500 mls blood). The urologist was relieved to be able to return to a TURP, the patient was struggling for breath, the consultant anaesthetist grabbed a passing colleague for moral support and they managed the case together. The anaesthetic chart from the original op recorded a grade 2 laryngoscopy with no further information. It turned out jolly **sporting**. How would you manage that one?



If you said awake FOI I'd like to see you try ! If you said intravenous induction, paralysed and intubate I would suggest you make sure your MDU subs are up to date cos surely you'll get caught out one day. These 2 experienced consultants opted for oxygen sevoflurane induction in theatre with team standing by for emergency access to trachea (you would not believe how difficult it was to persuade the team to scrub up during the induction!). The airway deteriorated during induction with stridor and snoring. The mouth would not open at all to admit a Guedel. The airway soon became completely obstructed. A nasal airway didn't help and a quick look with the fibroscope saw blood and secretions. Saturations were still 97% but the airway was completely obstructed, so the sats wouldn't be 97% for long. It was explained to the surgical team that it really was time they scrubbed up (These were not the exact words used!). Never give relaxants in airway obstruction they say – both consultants agreed the man would die soon and that if they gave sux it would make no difference to the tracheostomy option but may allow them to intubate. 200mg sux given (LMAs on standby for attempt at IPPV if intubation failed). Difficult grade 2 intubation over a bougie compounded by the fact that all the bruising inside alters the pattern of reflection of light – (everything looks black), not to mention the shaking hands of the anaesthetist. Patient however was fine – lowest SpO2 = 89%, survived to discharge at 1 week. Surgeon explained to patient that he had never been in any danger.

## *Application Form For Membership of Difficult Airway Society*

If you would like to join the DAS, a non threatening, non expensive society then just photocopy this form fill it in and return it to the membership secretary: Dr Mansukh Popat, Dept Anaesthesia, John Radcliffe Infirmary, Headley Way, Headington, Oxford OX3 9DU. Or email him [secretary@das.uk.com](mailto:secretary@das.uk.com)

Name .....

Address .....

email .....

Grade      Cons   SpR   SHO   Staff Grade   Other.....

In which specialty do you meet difficult airways .....