

Anaesthesia for sleep nasendoscopy and snoring / obstructive sleep apnoea surgery

BY EDWARD BICK

Surgery for sleep disordered breathing inevitably requires surgeon and anaesthetist to share the airway. Here, **Edward Bick** gives us the anaesthetic viewpoint, reiterating that communication is the key. A specific note is made of the anaesthetic technique for sleep nasendoscopy, a very useful procedure when done well; the anaesthetist is key in ensuring this can be the case.

Introduction

I have worked as a locum consultant anaesthetist at the Royal National Throat, Nose and Ear Hospital, London (RNTNE) for just under three years. Throughout this time I have been the regular anaesthetist for Mr Bhik Kotecha who has the largest snoring surgery practice in the UK. The patients treated range from isolated 'simple' snorers through to those with severe obstructive sleep apnoea, whilst the surgery involves any part of the supraglottic airway. The anaesthetic techniques I use continue to evolve as my experience increases. The limited evidence base means that many 'old wives' tales' and 'recommended recipes' exist. Often they are correct, sometimes they are wrong, but frequently it's what works for you. There are many ways to skin this cat!

The patients

The typical patient for snoring surgery is a man between the ages of 30 and 50. He is often overweight and may smoke, but rarely has any serious co-morbidity – aside from obstructive sleep apnoea (OSA). Our patients have been screened for OSA with a sleep study and, if positive, have had a trial of continuous positive airways pressure (CPAP). The need for surgery often arises as this is poorly tolerated. The presence of OSA, even severe, alters the anaesthetic itself little but does influence the pre and postoperative care. Unfortunately, the evidence base for the care of OSA in the perioperative period is poor and is largely expert opinion [1]. Preoperatively patients with OSA should have a trial of CPAP as this can restore their cardiovascular physiology to nearer normal and may reduce their

perioperative complication rate [2, 3]. Moderate (apnoea-hypopnoea index (AHI) 15-30) and severe (AHI >30) OSA requires postoperative overnight HDU care with continuous oxygen saturation measurement. CPAP, if used at home, should be continued whilst in hospital but is often contraindicated by surgery to the airway.

The surgery

Simply put, the aim of surgery is to find out what part(s) of the upper airway obstructs, or vibrates, then to remove or stiffen the cause. This can include the septum, turbinates, soft palate, tongue, tonsils and epiglottis. Frequently the problem lies at more than one site to varying degrees. Surgery maybe with cold steel, laser, coblation, diathermy or radiofrequency.

Sleep nasendoscopy

After a sleep study the next step in planning snoring and OSA surgery is a sleep nasendoscopy (SNE). The aim is to: a) reproduce the airway physiology occurring during natural sleep; and b) allow the patient to tolerate nasendoscopy during this time. The technique was developed at the RNTNE and first described by Croft and Pringle in 1991 [4]. Anaesthesia for SNEs is more art than science. The literature includes bolus and continuous infusion techniques as well as monitoring the patient's depth of anaesthesia with bispectral index monitoring (BIS) [5, 6]. It would be fair to say that every anaesthetist has their own preferred technique for the procedure. I don't know whose is best so I can only tell you mine!

After IV cannulation and monitoring, the patient is laid supine with his head

on a pillow similar to at home. For men I give a combined bolus of 3mg midazolam and 120-160mg propofol. Women receive 2mg midazolam and 100-120mg propofol. The 'art' part of the anaesthetic is in the propofol dosing. Heavier, younger and smoking patients get a larger dose. The anaesthetic will initially render the patient apnoeic but within 30 seconds respiratory effort (usually obstructed) will start. If they are desaturating I will open the airway – often lifting the chin is sufficient. However, if the saturations are maintained I will allow the patient's respiratory effort to increase until they 'breakthrough' i.e. moving air and snoring.

My experience is that a greater initial dose of anaesthetic helps to avoid the common problems of SNEs, that is, sneezing and waking up to the point of trying to remove the nasendoscope with their hands. Patients often make small uncoordinated movements with their arms which can be controlled with very gentle restraint.

If the SNE is brief no further doses of propofol are required but, if needed, repeated boluses of 10-20mg can be used. I always reverse the midazolam with flumazenil and let patients go home the same day, regardless of OSA status.

The general principle of anaesthesia for surgery

Nearly all surgery is done with variations on a standard general anaesthetic. As a standard, all patients have an IV induction. Nearly all procedures, except base of tongue surgery, can be done with a flexible laryngeal mask airway (LMA). This allows for a quick anaesthetic without muscle relaxants, and the patient waking in recovery smoothly, rather than coughing

on a tube. It is awake extubation that contributes to laryngospasm and coughing which, in turn, raises blood pressure causing bleeding. This is particularly a problem in smokers. When endotracheal tubes are used- it is usually a nasal tube for tongue base procedures. This is exchanged post procedure for an LMA whilst asleep. This exchange of airways can itself lead to problems if not done with a deep anaesthetic and adequate opiate analgesia.

All patients, unless contraindicated, receive ondansetron, dexamethasone, paracetamol and NSAIDs. Surgery on the airway (tonsillectomy being typical) is very unpleasant and whilst all efforts are made to minimise opiate analgesia, my experience is that avoiding opiates completely is unrealistic. The majority of patients having palatal and tongue base surgery do require intraoperative, but not postoperative, morphine. The airway can't be rested like a broken arm and it needs to be used to prevent further problems e.g. infection, dehydration and chest infections. Again, as with tonsillectomy, pain can get worse before settling over a period of around two weeks. Patients have commonly had previous airway surgery and their postoperative pain experience can be a very useful guide to future analgesic needs. Balancing adequate analgesia with OSA has to be done on a case by case basis. We should not be reluctant to keep patients monitored in hospital for longer if we have concerns.

Special cases

Tongue base surgery – usually radiofrequency. Mr Kotecha's practice is to favour nasal tracheal tubes for better access. After nasal preparation, I attempt to pass these with a blind technique which works in the majority of cases. It is quicker and requires less anaesthetic. The nasal tube (6mm Portex preformed north facing) is passed into the oropharynx then, with a good jaw thrust to lift the epiglottis, into the trachea. Failure can often be overcome by manipulation of the head with gentle repeated attempts at intubation. At the end of surgery the tube

is exchanged for an LMA.

Multiple interventions, as mentioned above, are commonly required. The differing requirements for surgical access mean different anaesthetic airways may be required. As a rule, procedures requiring an endotracheal tube are done first, followed by those able to be done with an LMA. The patient then has an LMA for emergence from anaesthetic. Multiple interventions increase pain and the risk of inflammation, swelling and worsening OSA. These patients have a lower threshold for overnight monitoring and postoperative dexamethasone.

Patients with co-morbidities require careful consideration especially when the surgery is for snoring without OSA. As with all operations the risk / benefit ratio must be balanced. Most importantly, the patient and relatives need to be aware of the risks of general anaesthesia and airway surgery. Often, non-surgical treatments are available e.g. persevering with CPAP, weight loss and mandibular advancement splints. It is sometimes all too easy for patients to assume operations are always successful and without complication. We all know this is not the truth.

Laser surgery still results in fires. Although rare, these can be of rapid onset and devastating. Whenever possible the anaesthetic airway should be laser resistant, noting that these are not necessarily laser proof [7]. Lowering the oxygen concentration delivered to the patient, saline soaked swabs and a low threshold for communication between team members further reduces the risk. Water must be immediately available in case of fire.

Conclusion

For the most part, anaesthesia for snoring / OSA surgery is uneventful. However, problems and risks are always lurking due to the patient population and postsurgical airway compromise. These are best dealt with by avoiding complacency but most importantly working with a close and expert theatre team.

SUMMARY

- Patients must have sleep studies and a trial of CPAP if indicated
- Communication between anaesthetist and surgeon is essential to determine airway type and order
- Waking patients with an LMA provides a better recovery from anaesthesia
- Long acting opiates should be minimised in hospital and not used on discharge
- Patients with moderate or severe OSA should have overnight continuous oximetry

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Declaration of competing interests None declared

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