I want my carotid asleep

Leo G. Kevin MD

Few questions in cardiovascular anesthesia seem to generate as much heated debate as the ‘Awake vs Asleep for Carotid Endarterectomy (CEA)’ controversy. Advocates of each approach regularly face-off with reasoned but impassioned argument worthy of a Charles Dickens courtroom scene. Surgeons are often party to the case, with strong views of their own. Both sides have well rehearsed arguments. Regional anesthesia permits neurologic assessment in the awake patient – the only robust real-time measure of cerebral perfusion throughout the surgery, but most pertinently during the period of carotid cross-clamp. Regional anesthesia also avoids the many possible adverse hemodynamic, respiratory and other effects of general anesthesia in this high-risk vasculopathic and usually elderly population. General anesthesia, by contrast, guarantees optimal operating conditions for this often testing surgery, a secure airway, generally desirable for any operation in the head and neck region, and possibly provides some cellular neuroprotective effect.

There is little sign of a verdict anytime soon in this vexed case. Nonetheless, The General Anesthesia Versus Local Anaesthesia for Carotid Surgery (GALA) trial (1), and a number of recently published retrospective series (2) (3), all point to roughly equivalent rates of the key outcome measures, stroke or death. In the absence of more compelling evidence, we are left, therefore, with our own biases. Perhaps more importantly, however, we are left with an increased obligation to give weight to the patient’s preference. In my experience, given the choice, most patients prefer to be asleep for carotid surgery.

The fundamental intervention upon which the awake vs asleep question hinges is the placement of a Javid, Inahara, or similar shunt. A shunt allows blood flow to bypass a clamp on the carotid artery during endarterectomy. There is, however, the possibility that it may injure the vessel wall causing distal embolization and stroke – precisely the complication (although by a different
mechanism) that its placement was intended to avoid. The benefit of shunting (increased blood flow) is therefore undone, at least in some patients, by embolic stroke. The focus of intra-operative decision-making has been to distinguish patients who will most likely benefit from shunting – those with poor ipsilateral hemispheric blood flow after carotid clamping, from those for whom shunting may do more harm than good – those with adequate ipsilateral hemispheric blood flow after carotid clamping.

A variety of monitors can be used in an attempt to guide shunt placement in the patient under general anesthesia. These include Carotid Stump Pressure, Transcranial Doppler, Cerebral Oximetry and various forms of processed and non-processed EEG. Different anesthesiologists, vascular surgeons and clinical departments favor different monitors - a clear indication that none of these monitors has established superiority over the others. More disturbing is the fact that none of them has established superiority over the complete omission of any cerebral monitoring. The argument for monitoring is to permit strategic placement of shunts. But there is also significant doubt regarding the merits of shunt placement in any patient (4)! Indeed, vascular surgeons are divided into those who routinely shunt, those who shunt selectively (based on evidence of hypoperfusion) and those who never shunt. It should be apparent, therefore, that providing a regional anesthetic primarily to permit optimal neurologic monitoring during carotid endarterectomy is problematic.

The one key recent publication in this field is undoubtedly the GALA trial (1). This was a substantial multinational study in which over 3,500 patients were randomized to either local or general anesthesia. The essential finding was that any anticipated decreased reduction in stroke (at 30 days) with local anesthesia failed to materialize. Mortality at 30 days was also the same between the two groups, putting paid to the age-old contention that general anesthesia was ideally avoided in this high risk vasculopathic group - irrespective of stroke risk - and that a trial of sufficient magnitude would reveal its hazard. Indeed, pointing to the contrary, there was a non-significant trend towards an increased rate of myocardial infarction in the local anesthetic group (0.5% vs 0.2%; effect
difference 0.3% [95% CI -0.2% to 0.8%]. Although entirely unproven, one might not unreasonably surmise that epinephrine-containing local anesthetic solutions and the likely psychological stress of a major vascular procedure in an awake patient, in a less than comfortable position, were possibly contributing to adverse cardiac outcomes.

Although undoubtedly a huge disappointment to the ‘awake’ proponents, with some justification they can (and do) point to a number of important quibbles with the conduct of the trial and the study population. Although a credit to its organizers, the scale of the undertaking - there were 95 centers in 24 countries - must have made standardization extremely difficult. Several centers contributed precious few cases. The planned sample size of 5,000 patients was not reached and the event rate was less than expected, leading to an under-powered study.

These limitations notwithstanding, the GALA trial investigators have given us the best quality prospective data to date. They concluded that ‘The anaesthetist and surgeon, in consultation with the patient, should decide which anaesthetic to use on an individual basis’. A sensible statement after a negative trial involving several thousand patients. I will continue to offer general anesthesia as the optimal approach for the majority of these patients, if only because I suspect that most of my patients, and yours, given the choice, will continue to prefer to be asleep!

References

