Choice in local anaesthesia

A recent Medline database search selected more than 100 articles in the last 3 years relevant to local anaesthesia in ophthalmic surgery. Techniques described included retrobulbar, peribulbar, subconjunctival, one quadrant, and four quadrant sub-Tenon’s injections, and their variants. Phacoemulsification using topical anaesthesia only has also been reported, and the anaesthetic solution has been ‘doctored’ to reduce stinging. What should the ophthalmic surgeon in training derive from this wealth (or minefield) of data?

The complications of local anaesthesia have been well documented. Studies using computed tomography and magnetic resonance imaging have improved our understanding of anatomical relations in the orbit, though they have yet to prove their value in terms of lowered complication rates. Other obvious topics for investigation have been the efficacy of anaesthesia and akinesia, safety, and long term morbidity. However, many papers can be criticised for inadequate scientific methodology, particularly with regard to assessment of akinesia and pain.

In this issue of the journal, Ali-Melkkilä et al report on the comparison of three techniques of local anaesthesia which raises several important issues. The blocks were administered by anaesthetists rather than the surgeon. Is this ideal? There may be a clear conflict between improving ‘turnover time’ in theatre and the desirability of close quarter observation of the initial reaction to pain stimuli and periocular manipulation. Personal administration of the block promotes the best chance of observing orbital haemorrhage or other complications before draping the patient and incising the eye.

The use of a scoring system for akinesia is desirable in a research setting, but preset criteria seem to have resulted in reblock rates (11% to 19%) that are high in our experience. The norm in usual practice is close to 0%. We look forward to studies using peroperative video monitoring and subsequent assessment by an independent observer. It is likely that surgeons quickly develop a personal tolerance to eye movement that is preferable to running the gauntlet of peribulbar injection again. The recti muscles are not the only muscles to be considered in local anaesthesia. Lid squeezing against the speculum can be disastrous when the eye is open. Unless very confident of tissue diffusion and sufficient time, the very low risk and low volume of Lint injection should be considered for every case.

Discomfort and pain should be scored soon after the operation, preferably on a visual analogue scale. These should include the discomfort and stinging arising from the administration of the block, peroperative pain with particular reference to placement of the superior rectus suture where one is used, expression of the lens nucleus, and suturing of the wound, as well as postoperative pain.

The volume of anaesthetic agent used is greater with ‘peribulbar’ methods and the maximum safe volume is partly dependent on body weight — for example, 7-5 ml of 2% lignocaine for a 50 kg patient. Signs of toxic reaction include circumoral numbness and tingling, followed by dizziness, tinnitus, slurred speech, and aggressive behaviour before the onset of convulsions and collapse. Lonsdale et al raise strong objections to the use of bupivacaine, which is said to have a specific cardiac toxicity, with a lengthening of the QT interval and a lowering of ventricular tachycardia threshold. This has to be weighed against the advantage of its long duration of action. Strangely, the least toxic, prilocaine, is largely ignored in the ophthalmic literature. It does, however, reduce haemoglobin to methaemoglobin and this may bias pulse oximeter saturation readings.

The trainee surgeon’s attention should be drawn to the report of the Joint Working Party on Anaesthesia in Ophthalmic Surgery and the recommendations for intravenous access and monitoring (pulse oximetry, electrocardiography, and blood pressure measurement). An editorial review of pulse oximetry, its pitfalls, and basic respiratory physiology has been given by Hutton. The essential message is that pulse oximetry is a poor measure of hypoventilation when the concentration of inspired oxygen is high. The surgeon should consider whether oxygen supplementation under the drapes is strictly necessary, and whether transparent drapes will assist in observation of chest wall movement.

The administration of local anaesthesia has always been more than just deciding on the right place to inject. Decisions range from costs, time efficiency, safety, efficacy, and monitoring to postoperative analgesia. It is unlikely that any single approach will be ideal. However, where a peribulbar technique is chosen, it would make sense to use the medial compartment of the orbit as the site of the second injection as it works well, does not run the risk of damage to the trochlea, and reduces the risk of globe perforation.

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