Subconjunctival Anesthesia: An Alternative to Retrobulbar and Peribulbar Techniques

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ABSTRACT
We present a method of anesthesia for intraocular surgery of the anterior segment of the eye that avoids the risks of the potential complications associated with retrobulbar and peribulbar anesthesia. The method consists of topical anesthesia plus 0.5 cc of lidocaine (with hyaluronidase and epinephrine) injected beneath the superior conjunctiva. We have demonstrated the safety and effectiveness of this technique in 431 consecutive cases.

Retrobulbar anesthesia, the standard for ocular surgery for almost 100 years, continues to be the most popular method used today. In one survey,1 75% of the responding ophthalmologists reported using retrobulbar blocks, and 30% said they used peribulbar (46% said they also used a Van Lindt). Respondents reported using a Nadbath block in 16% of cases and an O'Brien in 11%. The survey also noted that in busy ambulatory care centers most of the retrobulbar blocks are performed by anesthesiologists.1

Although relatively uncommon, retrobulbar injections have been associated with a variety of complications. Systemic problems, especially of the nervous or cardiopulmonary systems, have been reported.2-16 One study found the rate of central nervous system complications to be 1 in 375 and the incidence of lifethreatening episodes 1 in 700.2 Nonsystemic problems reported include central retinal artery occlusion,17-20 direct needle trauma to the optic nerve,21-30 perforation of the globe (even through and through),31-34 and restriction of extraocular muscle action.35

Peribulbar injection has been suggested as an alternative to retrobulbar injection,35-38 and many reports have discussed the optimum length of needle and position of the eye for these injections.36-40 The efficacy of varying agents and additives have also been reported.41-43 Still, it does not seem that peribulbar anesthesia has solved the problems or eliminated the complications that can result from injections around the globe. To be as effective as retrobulbar injection, the anesthetic must enter the muscle cone. There is no proof that it must be injected into the optic nerve sheath to produce central nervous system complications. An orbital hemorrhage occurred in one of the less than 10 peribulbar injections administered by one of the authors (W.C.P.). Although the bleeding was mainly in the lid, because of the swelling and pressure produced anterior to the orbital septum, the case could not be continued. Peribulbar anesthesia has resulted in at least one case of globe penetration,31 and in at least one death (personal communication: A Milauskas, 1989).

In the January 1988 issue of the British Journal of Ophthalmology, Redmond Smith44 suggested that anterior segment surgery, specifically cataract extraction and intraocular lens implantation, could be performed with a topical, plus a small aliquot of subconjunctival,
anesthetic injected at the 12 o'clock position. (Also, simple topical anesthesia has been recommended for strabismus surgery.) A technique of limbal subconjunctival local anesthesia similar to our own method has been described. In that technique, no superior rectus stay suture was used. One rupture of the lens capsule occurred due to unexpected upward motion of the eye. The report was limited to cataract surgery with or without lens implantation.

The method of combined topical and subconjunctival anesthesia we use offers a means of avoiding the potential complications of retrobulbar and peribulbar injections as well as the occasional retrobulbar hemorrhage that can occur.

METHOD

We have used exclusively a technique similar to that outlined by Smith in 431 consecutive patients (Table) over 2 years, usually in conjunction with an intravenous sedative, most commonly 1 mg of midazolam. For general medical reasons, 22 patients did not have intravenous therapy. Blood pressure, heart function, and oxygen were monitored in all cases.

In our method, tetracaine (0.5%), approximately 4 to 6 drops, is instilled in the eye. The patient is asked to look down while the upper lid is retracted with the anesthetist's thumb or forefinger. Then, using a 27-gauge needle, 0.5 cc of lidocaine containing hyaluronidase and epinephrine is placed beneath the conjunctiva at the 12 o'clock position, approximately 5 mm from the limbus. The bevel of the needle faces the eye to reduce the risk of penetrating the globe. The injections are aided by placing the needle about 7 mm from the limbus, bringing it forward to create a fold of conjunctiva. The subconjunctival space is easily entered. The lidocaine is massaged posteriorly to the area of the superior rectus muscle tendon.

RESULTS

No patients complained of pain during the peripheral iridectomy accompanying all cataract extractions and glaucoma procedures. Excess motion of the eye or intraocular pressure were not problems. No instances of pain or excess motion occurred that required added injection of anesthesia or discontinuation of the procedure.

Placing the stay suture beneath the tendon of the superior rectus muscle after placing a lid retractor between the lids caused mild discomfort in about 5% of patients. Also, there were a few instances of discomfort from stretching or pressure upon the ciliary body caused, for example, by manipulation with a spatula. Except for one case, the complications encountered were minimal (25 cases), consisting of subconjunctival hemorrhage or excess edema of the conjunctiva. In the one case, the anterior of the globe was penetrated, but there was no permanent damage.

In the recovery area, some patients experienced more discomfort than after retrobulbar or peribulbar anesthesia, but this was managed easily with acetaminophen. Only rarely was codeine (32 mg) added to the analgesic. The great majority required no postoperative analgesic.

REFERENCES


