A New Technique of Local Anesthesia for Panretinal Photocoagulation

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ABSTRACT
We report a technique of local anesthetic administration used in 26 consecutive patients undergoing panretinal photocoagulation. A blunt-tipped irrigating cannula delivered 3 cc of anesthetic into the posterior sub-Tenon's space through a small opening in conjunctiva and Tenon's capsule. Immediate anesthesia, with no serious complications, was obtained in 38 of 40 eyes, facilitating administration of rapid, high-intensity laser burns. Although our experience with it is limited, we believe that this technique allows avoidance of many of the potential complications associated with the passage of a needle into the retrobulbar space.

Local anesthesia may be required in select patients undergoing panretinal photocoagulation (PRP) in order to minimize discomfort and/or ocular motility. Traditionally, retrobulbar administration has been used for this purpose. Although the incidence is low, reported complications of retrobulbar injections include cardiopulmonary and respiratory arrest, grand mal seizures, ocular perforation, retinal vascular occlusion, retrobulbar hemorrhage, optic nerve injury, and contralateral visual loss. Given the potential side effects of retrobulbar injections and the fact that PRP is an office procedure for which anesthesia monitoring is rarely available, an alternative technique of local anesthesia is desirable.

We describe an effective, simple anesthetic technique that minimizes and perhaps eliminates many of the complications associated with conventional retrobulbar anesthesia.

MATERIALS AND METHODS
Forty eyes of 26 consecutive patients desiring local anesthesia for PRP were treated as follows: After informed consent was obtained, the patient was placed in the supine position. Proparacaine hydrochloride was administered to the eye and a lid speculum was placed. Prophylactic povidone-iodine 10% solution was applied to the conjunctiva. After 5 to 10 minutes, the patient was instructed to look inferotemporally. The conjunctiva was tented up with a pair of toothed forceps, and a 30-gauge needle on a 3-cc syringe was used to inject 0.1 cc of 1% or 2% lidocaine HCL without epinephrine subconjunctivally in the superonasal quadrant, approximately 4 mm posterior to the limbus. In anxious patients with active Bell's phenomena, the subconjunctival injection was administered inferonasally. In order to avoid accidental perforation of the globe, the beveled side of the needle was kept down, the needle was directed tangential to the globe, and the tip of the needle was always kept in view.

Using toothed forceps and long, curved tenotomy scissors, the surgeon next incised the anesthetized conjunctiva and underlying Tenon's capsule down to bare sclera. The scissors were then passed through the small conjunctival and Tenon's opening, tangential to the globe, and were advanced posteriorly by spreading until the retrobulbar space was reached. The surgeon could feel when Tenon's capsule had been separated from the globe posteriorly. Care was taken not to enlarge the opening in the conjunctiva.

Without releasing conjunctiva and Tenon's capsule
from the toothed forceps, the surgeon next passed a blunt-tipped 19-gauge irrigating cannula, connected to a 3-cc syringe containing lidocaine HCl 1% to 2%, into the sub-Tenon’s space posterior to the globe. Care was taken to identify the path created by the tenotomy scissors. Three milliliters of anesthetic was administered.

To evaluate the rapidity of onset of the anesthesia, the toothed forceps were used to grasp the lateral rectus muscle, and the patient was questioned about pain. The lid speculum was then removed and high-intensity PRP was performed to achieve heavy burns.

After completion of PRP, the patient was questioned about any pain associated with the procedure. Patients who had had previous PRP were asked if they would prefer the present anesthetic technique for any future laser procedures.

Erythromycin ointment and a light patch were then placed over the treated eye. The patient was instructed to remove the patch the following morning and to use gentamicin drops four times a day for 4 days. Reexamination was performed within 3 weeks.

RESULTS

Of the 26 patients, 6 men and 20 women, 20 were black and 6 were white. The average patient age was 53 years. Immediate anesthesia was obtained in 38 of 40 eyes. Failure to obtain adequate anesthesia in two eyes was attributed to the surgeon’s inability to create an opening into the retrobulbar space, which meant that the anesthetic was injected into the anterior, as opposed to the retrobulbar, sub-Tenon’s space. Rejection was not performed and these patients, due to the fairly light anesthesia, experienced mild discomfort from the laser procedure. It should be noted that short rather than the recommended long, curved tenotomy scissors had been used in these two cases.

The rapidity and degree of akinesia was hard to evaluate because PRP was initiated immediately after injection. Akinesia, however, did not develop as rapidly as anesthesia.

Although no oral or intravenous sedation was provided, patients did not experience pain during the administration of the anesthetic; many, however, were frightened. Complaints of pain associated with the laser procedure were reported for only 2 of the 40 eyes. Of the 19 patients who had had previous PRP, all but one said they would prefer this type of anesthesia administration for any future laser therapy. The one patient who said he would not want this type of anesthesia again was one of the two in whom the block had been unsuccessful.

Because the patients remained comfortable during the procedure, we could easily and rapidly administer laser burns of high intensity. However, conjunctival bleeding made the initial placement of the contact lens more cumbersome in a few instances. This problem could be eliminated by briefly flushing the eye with a sterile irrigating solution.

One patient was lost to follow-up. All of the others had a red eye for a few days to a week following treatment. The conjunctiva spontaneously closed in all patients within 3 weeks. With the exception of the two patients who had received inferior blocks, the subconjunctival hemorrhage either had resolved by the time the patient returned for follow-up or was small enough to be hidden by the upper lid. No serious complications occurred.

DISCUSSION

Performing PRP sometimes requires local anesthesia. Despite the efficacy of retrobulbar anesthesia, serious complications can result when a needle is blindly placed around the eye. To circumvent these complications, we directly place the anesthetic in the retrobulbar space, eliminating the blind passage of a needle. It is a simple, painless, and very effective maneuver, requiring only 3 cc of a short-acting anesthetic.

Using only 3 cc of anesthetic provides the benefit of anesthesia without akinesia. At least for the first several minutes of laser photocoagulation, ocular motility seems to be maintained. This may be due to the immediate effect of the anesthetic on the ciliary nerves as they enter the posterior globe. Akinesia probably requires diffusion of the anesthetic through Tenon’s capsule into the muscle cone. Therefore, with the described technique, patients will lose ocular sensation before motility, and in some cases may maintain some motility.

There are three drawbacks to this anesthesia procedure. First, many patients are frightened by the ocular manipulations required to administer the anesthesia. Second, subconjunctival incisions made superiorly can bleed and interfere with laser photocoagulation. We found this to be a minor and easily remedied inconvenience occurring in only a few patients. Finally, subconjunctival hemorrhage is common postoperatively, and patients must be warned that their eye may be red for days to weeks following treatment. Despite these drawbacks, 18 of the 19 patients who had had previous PRP said they would prefer the present anesthetic technique for any future laser therapy.

Although we have used this anesthetic technique in only 40 eyes in preparation for PRP, we have used it without complication in 70 eyes undergoing pars plana vitrectomy and/or scleral buckling surgery. A variation was used in 112 cataract extractions without complication.19

The only complication resulting from the direct placement of a blunt cannula into the retrobulbar space for anesthetic purposes was reported by Mein and
Woodcock. The authors injected 6 cc of local anesthetic solution into the retrobulbar space, producing a tight orbit and increased intraocular pressure. This can be avoided by using only 3 cc of anesthetic solution.

Although the complication rate from retrobulbar anesthesia is low and many more cases using the above described technique must be performed before the true incidence of side effects can be determined, we are encouraged by these preliminary results. Infection is a potential complication, but there is no reason why it should occur more frequently with this anesthetic technique than with conventional retrobulbar injection, provided a sterile technique is employed. With the exception of patients whose conjunctiva should not be violated (eg, patients who have had or will most likely require glaucoma filtering surgery), we will continue to administer local anesthesia as described above as an alternative to conventional retrobulbar anesthesia.

REFERENCES