

isoflurane-N₂O-fentanyl anesthesia, 11 days before admission for the present surgery. Physical examination was unremarkable, including no detectable carotid bruits. Laboratory data were all within normal limits.

After 5 mg nalbuphine iv and block of the orbicularis oculi muscle, the surgeon administered a retrobulbar block behind the left eye. He first injected 1.5 ml of a lidocaine/marcaine mixture (2% lidocaine, 0.75% marcaine, 50:50). As the block had not seemed to work after a few minutes, he injected an additional 0.75 ml of the mixture. Adequate anesthesia was established, and the patient was draped. During the 12-min procedure, the patient's vital signs remained stable. When the drapes that had been covering the right (unoperated) eye were removed, the patient reported that he could not see anything. The pupil of the right eye was mid-position and fixed, funduscopy revealed no apparent abnormalities, corneal reflex was intact, and movement of the globe was intact. He had no other neurologic deficits by physical examination.

Eighty minutes after the block the patient reported that he could perceive light with his right eye. Fifty-five minutes later the patient was able to read small print, and by examination, vision had returned to preoperative values of 20/25 right eye, 20/200 in the left eye. Confrontation visual fields were intact, and vision remained intact, bilaterally, through hospital discharge the following day.

Although the initial differential diagnosis included occipital ischemia and ophthalmic transient ischemic attack, the pupillary examination, time course, and progression of improvement suggest anesthesia of the contralateral optic nerve by the retrobulbar block. Possibly the initial 1.5 ml was injected into the left optic nerve sheath and tracked back to the optic chiasm. This would explain the failure of the initial injection to anesthetize the ipsilateral globe and paralyze the extraocular muscles. As the patient's vision in the left eye was already distorted by preexisting ocular disease, he might not have perceived any changes with the initial injection.

The recommended amount of local anesthetic mixture for retrobulbar anesthesia is 2–3 ml⁶ and brain stem anesthesia has been reported with suspected subdural (via optic sheath) injection of this amount (although in the case reported by Chang *et al.*,¹ 8 ml was used). The slightly smaller amount in this case might have been sufficient to track back to and affect the chiasm and, therefore, the right optic nerve without affecting the brain stem.

The incidence of complications with retrobulbar block is very small, but the ophthalmology/anesthesia care team needs to remain aware that such complications can, as in this case, be very dramatic.

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Accidental Epidural Overdose of Hydromorphone

To the Editor:—Respiratory depression after epidural narcotic administration has been recently reviewed.¹ The margin of safety and optimal dose of narcotic have not been determined. A recent case report suggests that in some patients the margin of safety may be extremely

high.² Our experience in one case supports this conclusion.

A 17-year-old female patient with steroid dependent asthma since age two years was admitted for surgical correction of severe reflux esophagitis. Medications in-

cluded prednisone, long-acting theophylline and terbutaline, in addition to inhaled salbutamol and beclomethasone. She was Cushingoid in appearance and slightly obese: height 145 cm, weight 50.4 kg. Analysis of arterial blood gases revealed Pa_{O_2} to be 60 mmHg, Pa_{CO_2} 32 mmHg, and pH_a 7.46.

The patient had an uneventful general anesthetic for her Nissen fundoplication, consisting of enflurane, nitrous oxide, and oxygen. To minimize respiratory depression thoracic epidural blockade with local anesthetic was planned for postoperative analgesia. At the end of the procedure an epidural catheter was inserted into the T₇-T₈ interspace without difficulty. Induction of epidural blockade was successfully accomplished with 0.25% bupivacaine, with her T₅ to T₉ dermatomes anesthetized bilaterally except for a small area, which unfortunately included part of the incision. We decided to give her epidural hydromorphone and started with the small dose of 0.5 mg because of her presumed high risk of respiratory depression. She obtained excellent analgesia with this dose administered in 5 ml of normal saline. Four hours later, she complained of pain again and was mistakenly given 5 mg instead of the planned 0.5 mg. She experienced excellent pain relief, which lasted about 6.5 h. She was monitored throughout this period in the intensive care unit with arterial blood gas measurements every 30 min for the first 1.5 h, and then every hour. Respiratory rate did not change. Forty-five minutes after the dose, the Pa_{CO_2} increased to 44

mmHg. Pa_{CO_2} remained stable at that value until 4 h and 30 min after the dose, at which time it decreased to baseline value. The patient was discharged to the ward 25 h postoperatively and had an uneventful recovery until she required reoperation for dehiscence of her wound 5 days later.

Although we observed a slight increase in Pa_{CO_2} , frank respiratory depression did not occur. We are unaware of any case reports of late respiratory depression caused by epidural hydromorphone. This case supports the view that, at least under some circumstances, epidural hydromorphone may carry with it a low risk of respiratory depression.

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Erratum

The article "Anesthesiologists Come of Age: Their Stake in General Education, Research, Residency Education, and Selection of Medical Students and Faculty," which appeared in the June 1985 issue of *Anesthesiology* (pp. 774-780), was the 1984 Rovenstine Lecture.