
Pediatric eye block and local anesthetic systemic toxicity

Sir,

Use of single-shot extraconal block has become an important strategy in managing pediatric postoperative pain after eye surgery. Herein, we present a case of local anesthetic systemic toxicity (LAST) in a 2-month-old boy (12 kg) with congenital glaucoma, undergoing right eye enucleation under general endotracheal anesthesia (GETA).

Before incision, the ophthalmologist performed a single-shot extraconal block [Figure 1], with 1.5 mL of 0.75% bupivacaine and 1.5 mL of 4% lidocaine and hyaluronidase 7.5 IU/mL (total of 3 mL). The surgery was uneventful and 3 h later a repeat block was done, for a total dose of 22.5 mg bupivacaine and 120 mg lidocaine. The child's trachea was extubated and transferred to the recovery room. However, 20 min later the patient became agitated, developed generalized tonic-clonic seizures associated with oxygen desaturation, and tachycardia. The electrocardiogram (ECG) displayed increased T-wave amplitude and ST-segment elevation. Fortunately, 100% oxygen and IV midazolam stopped the seizure activity and improved oxygen saturation with normal ECG waveform. A 6 mL bolus of 20% intravenous lipid emulsion (ILE) was administered given high-suspicion for LAST. The child's trachea was intubated for a short period for airway protection. The patient was later transferred to a pediatric intensive care unit for continued monitoring, post which he was discharged home the following day.

Pediatric LAST is a rare but life-threatening complication with an incidence of 0.76 per 10,000 cases.^[1] In children, the early signs and symptoms of LAST may go undetected under GETA. Therefore, the clinical signs of toxicity in children are likely

to be seizures, tachyarrhythmias, or cardiovascular collapse. Following an eye block, LAST may occur due to injection into the ophthalmic artery or within the optic nerve sheath. In our case, the LAST and seizures were most likely secondary to excessive dosage. In children, the T-wave criterion after IV test dose containing lidocaine and bupivacaine is more reliable than either heart rate or systolic blood pressure for detecting intravascular injection.^[2] Children also have an increased risk due to lower plasma levels of alpha-1-acid glycoprotein (A1AG), increasing the amount of unbound plasma amino-amide LA. Consequently, weight-based submaximal dosing is a preferred, safe method and doses should be reduced by 15% in infants less than 4 months of age. Thus, the anesthesiologist and surgeons should be cognizant of the LA volume and concentration injected. Clebone *et al.*^[3] developed a time-out checklist to mitigate factors that could lead to LAST. The American Society of Regional Anesthesia 2017 checklist update for managing LAST^[4] recommends ILE 20% at the first sign of a serious LAST event. Our clinical priority should be to eliminate dosing errors, prevent LAST, and promote patient safety with a structured time-out procedure directed at LA dose. In conclusion, LAST continues to be a concern for all practitioners, and reducing the modifiable factors is thereby possible by educating the whole operating or procedural room personnel who uses or handles LA but is less aware of the potential risks and complications. Cross-checking of calculations and verbalization of dosages/kg prior to injection should be applied as a safeguard to prevent life-threatening and serious drug dosage errors.

Declaration of patient consent

The authors certify that they have obtained all appropriate

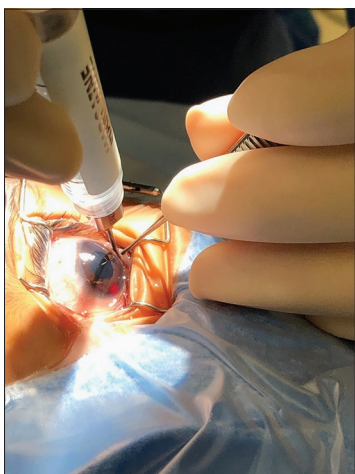


Figure 1: Technique for extraconal block injection in an infant. Photo credit: Luis I. Rodriguez, M.D. Bascom Palmer Eye Institute

patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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