

Cortical blindness after complicated general anesthesia in urological surgery

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

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Patient: Male, 4
Final Diagnosis: Cortical blindness after complicated general anesthesia
Symptoms: Blindness • fine motor activity derangements
Medication: —
Clinical Procedure: General anesthesia for unilateral inguinal hydrocelectomy
Specialty: Anesthesiology

Objective: Rare disease

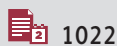
Background: We report a case of transient cortical blindness after urological surgery.

Case Report: We present the case of a 4-year-old boy with visual loss following complicated general anesthesia during urological surgery. The results of ophthalmological examinations were normal. The complication was diagnosed as cortical blindness after obtaining an extinguished flash visual-evoked potential (flash VEP). The visual acuity persisted to be hand motion after 4 months.

Conclusions: We report a very rare case of cortical blindness after urological surgery. Unrecognized causes of cortical blindness are common in the children. Because of the long survival and increasing surgical management in this age group, it is of great importance and perhaps it will be necessary to alert parents about it. Anesthesiologists have a unique opportunity to facilitate positive outcomes for these patients through risk identification and appropriate management.

Key words: cortical blindness • anesthesia • urology • ophthalmology • hydrocele

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Background

As surgical and anesthetic techniques are improved, there is an increasing prevalence of surgical management of children. Regardless of these achievements, due to their unique characteristics, new complications can be associated with surgery or anesthesia in this age group. One of these complications is visual loss, which sometimes can be very devastating. Visual loss is usually related to ischemic optic neuropathy, retinal vascular occlusion, or cortical blindness [1]. The prevalence of this complication is not well defined, and various studies have estimated it as between 0.0008% and 0.02% [2–4]. In this report we describe a child who developed visual loss attributed to cortical blindness after successful urological surgery.

Case Report

We present the case of a 4-year-old boy with left inguinal hernia and hydrocele, who had a history of superior respiratory tract infection with mild symptoms of dry cough, and hoarse voice. There was no fever or respiratory distress in his physical examination. His parents did not report any history of allergies or asthma. He had no specific problem in his past medical history. After pre-oxygenation and use of premedication agents (Hydrocortisone (1 mg·kg⁻¹), Salbutamol spray (2 puffs), Midazolam (1 mg), and Fentanyl (2 µ·kg⁻¹), the anesthesiology team began to induct anesthesia with thiopental (5 mg·kg⁻¹), Atracurium (0.5 mg·kg⁻¹) and Lidocaine (1 mg·kg⁻¹). The patient was intubated gently without any change in pulse rate or blood pressure. About 3 minutes after intubation, there were symptoms of bronchospasm, including chest rigidity and progressive drop in O₂ saturation. Although Isoflurane 2% and salbutamol spray were immediately started, symptoms remained and O₂ saturation dropped continuously, from 100% to 40% within 2 minutes. Ventilation became more difficult, bradycardia occurred associated with hypoxia, and pulse rate reached to 20–30 per minute. Fortunately, bradycardia was relieved after injection of 1 dose of adrenalin (0.01 mg·kg⁻¹) and pulse rate changed to 80/min within 2 minutes. The patient had acute hypoxia for about 5 minutes and the lowest O₂ saturation was 15%, which lasted 4 minutes. After all of these interventions, vital signs reached normal ranges, ventilation improved, chest rigidity relieved, and O₂ saturation remained in 90–97% during the operation. We encountered no other complications during the rest of the operation and vital signs were normal. The patient underwent a successful urologic surgery that lasted 30 minutes. The patient was reversed by Neostigmine and Atropine after surgery, and spontaneous respiration and normal gag reflex were seen, but level of consciousness remained at about 5–6 in Glasgow Coma Scale (GCS). The patient was transferred to the recovery room intubated. There was no significant change in the level of consciousness

while in the recovery room. The patient was in a coma in the intensive care unit 2 days following surgery, the level of consciousness gradually improved, and he could move the extremities spontaneously. However, bilateral visual loss was noted.

Ophthalmologic consultation with a neuro-ophthalmologist indicated that visual acuity was only light perception in both eyes, but other ophthalmologic fundoscopic examination and pupillary reflexes were normal and the Marcus Gunn pupil was negative. We conducted a flash VEP study according to the clinical guidelines developed by the American Neurophysiology Society [5]. However, it was extinguished (Figure 1).

The neurologic consultation results were normal, with no evidence of motility or sensory loss except mild impairment of cognitive state. Therefore, damage of the visual cortex was suspected. The parents did not permit us to do further imaging.

Discussions

Visual loss in the perioperative period may be related to ischemic optic neuropathy, retinal vascular occlusion, or cortical blindness. William et al. [5] suggested that ischemic optic neuropathy was the most common cause of postoperative visual loss, but other studies do not support his claim [4]. Cortical blindness is defined as visual impairment with normal ophthalmologic examination of the eye structure and normal pupillary responses [6]. With specific (watershed) blood supply, the visual cortex is more likely to be susceptible to hypoperfusion and ischemic injuries. Cortical blindness is often associated with neurological manifestations such as nausea, motility, and sensory defects, but the prognosis for recovery is better in very young children [7,8]. There is a higher incidence of cortical blindness with higher perioperative co-morbidity and orthopedic, spinal, or cardiac surgery [2,4].

There are consistent data indicating that patients younger than 18 years have significantly higher prevalence of cortical blindness than those who older than 18 years. In contrary, patients older than 50 years are more likely than younger patients to develop ischemic optic neuropathy and retinal vascular occlusion [2,9]. The reason of the increased risk of cortical blindness in this age group is not entirely understood, but cortical blindness may be related to embolic phenomena or stroke [10]. Huo et al. [6] demonstrated that the 4 most common causes of cortical blindness are cerebral vascular accident, meningitis, perinatal hypoxia, and acquired hypoxia. There are reports of perioperative visual loss associated with prone positioning in spinal surgery [11,12] and hypotension after cesarean section in pre-eclamptic patients [13]. The other etiologies may be related to massive intraoperative blood loss or hypotension, such as coronary artery bypass graft, coronary

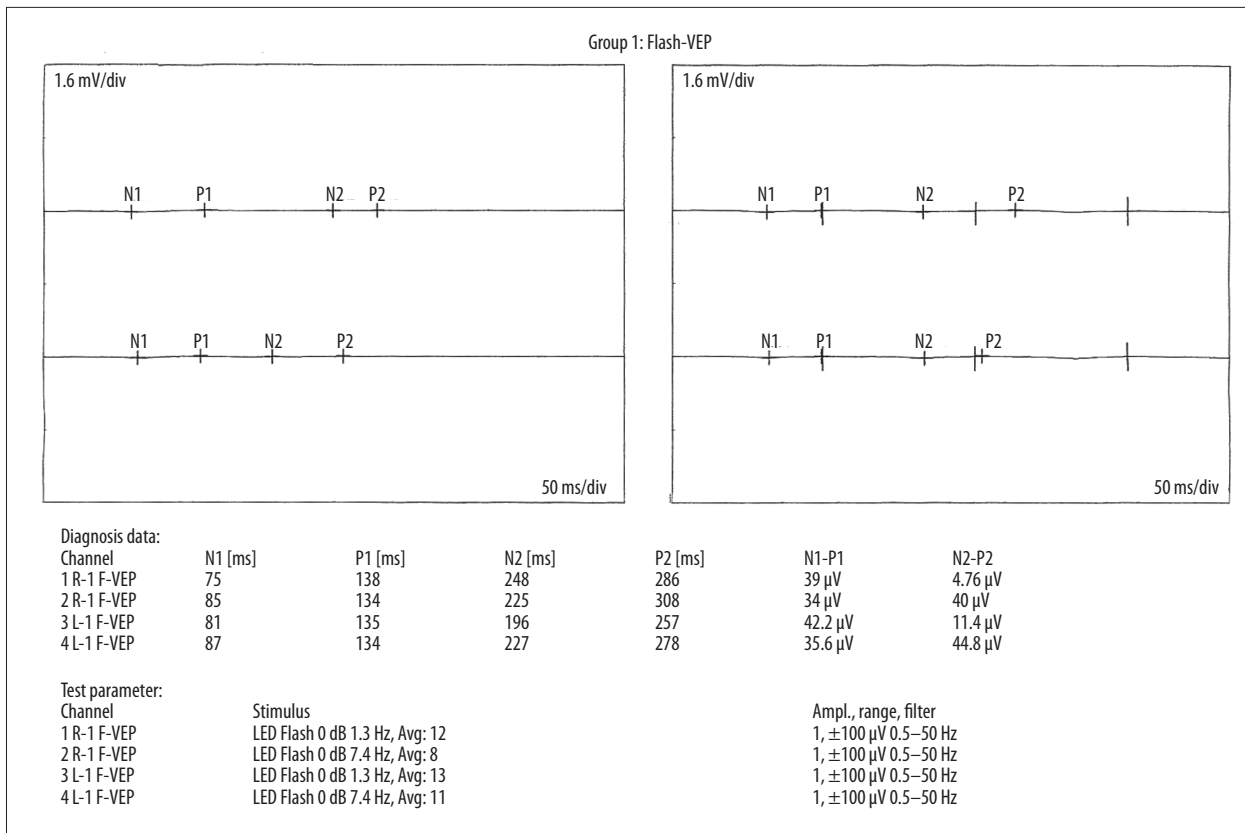


Figure 1. Extinguished flash VEP of the patient.

angiography, or radical neck dissection, or may be associated with anemia and prolonged prone position [14–17]. No previous report of cortical blindness after urological surgeries was found in our search of Med Line. In the literature, there are rare reports of pediatric visual loss in the peri-operative period [8]. Cortical blindness may be transient as our case or as described by Ye et al. [18].

Conclusions

Cortical blindness is an ophthalmologic complication of surgical procedures and is more common in children. Because of the long survival and increasing surgical managements in this age group, it is of great importance and perhaps it will be necessary to alert parents about it. We reported a very rare case of cortical blindness after urological surgery. Anesthesiologists

have a unique opportunity to facilitate positive outcomes for patients through risk identification, assessment, patient and family education, and emotional support.

Conflict of interests

None declared.

Funding

None.

Consent

We obtained written consent from the patients' parents and we can provide this consent upon editor request.

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