

Liu M, Haydar B

Cs Mott Children's Hospital, University of Michigan , Ann Arbor , MI, USA

Introduction

Emergence agitation (EA) in children is a postoperative complication with reported incidence of 2-80%.¹ EA presents shortly after emergence but may be up to 45 min and rarely 2 days later.² In the case discussion, we present an unusual case of delayed and prolonged EA presenting in a 16 month old female with neuroblastoma after exploratory laparotomy and resection with epidural for postoperative pain control.

Case

A term 16 month old, Caucasian female was brought to the OR for exploratory laparotomy and resection. After induction of anesthesia, an epidural was placed at T9-10. Surgery was uneventful and pain was managed first with IV morphine and then with epidural bupivacaine. Anesthesia was maintained with isoflurane. Her emergence and PACU stay were uneventful; she was moderately sedated and calm with FLACC 0-2. Upon transfer to PICU, she became profoundly agitated with FLACC 10. Her agitation was not improved despite epidural boluses, transitioning to epidural plus hydromorphone IV PCA, diazepam and diphenhydramine. After 4 hours, they called for the anesthesiologist for assistance. On exam, she was only minimally consolable with waxing and waning episodes of agitation. She exhibited thrashing, kicking, arching of her back, purposeless movements, eyes closed or averted, unresponsiveness and lack of awareness of her surroundings. Boluses of fentanyl 1 mcg/kg, totaling ~5 mcg/kg, were given with minimal improvement. She immediately calmed with ketamine 0.5 mg/kg and remained calm with FLACC 0 for the following 4 hours. Upon awakening, she received an additional dose of ketamine with similar effect.

Discussion

This is an unusual case of EA presenting after discharge from the PACU, with a well-functioning epidural that excludes pain as a cause for agitation. This and similar cases may be unknown to anesthesia providers who cared for the patient, as postoperative agitation in the PICU is managed by the PICU service without notifying the anesthesia team. This case is unique in that the patient was refractory to benzodiazepines, despite it being one of the first-line treatments for EA. Diagnosis of EA relies on clinical signs and ruling out other causes of agitation, including pain, hypotension, hypoxemia, hypoglycemia or other metabolic disturbances. CNS injury and paradoxical reaction may also present as EA. The patient received both benzodiazepines and diphenhydramine without paradoxical reaction. CNS injury was considered, although symptoms were waxing and waning and did not include focal neurologic findings, signs of intracranial pressure or seizure. To help clinicians diagnose EA, the Pediatric Anesthesia Emergence Delirium (PAED) Scale was developed (table 1).¹ This case highlights the delayed presentation of EA and the management of agitation including identification of possible etiologies and treatment.

References

1. Dahmani S et al. Anesthesiology. 2012;117:399-406.
2. Voepel-Lewis et al. Anesth Analg. 2003;96:1625-30.

Table 1 Pediatric Anesthesia Emergence Delirium (PAED) Scale

Items

1. The child makes eye contact with caregiver
 2. The child action is purposeful
 3. The child is aware of his surroundings
 4. The child is restless
 5. The child is inconsolable
-

Items 1, 2, and 3 are scored: 4 = not at all, 3 = just a little, 2 = quite a bit, 1 = very much, 0 = extremely. Items 4 and 5 are scored: 0 = not at all, 1 = just a little, 2 = quite a bit, 3 = very much, 4 = extremely.

Adapted from [Dahmani et al, Anesthesiology 2012.](#)
