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Critical Care Medicine

(Abstracts and Case Report/ Series)

Contents

Gastric Ultrasound in Stable Patients with Decreased Level of Consciousness and Recreational Substance Use -- Are Presumed Full Stomachs Full?

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Introduction: Intoxicated patients with decreased Glasgow Coma Scale (GCS) are common presentations to emergency departments. These patients are often intubated due to presumed full stomachs and perceived aspiration risk. Gastric ultrasound (GUS) -- a simple, non-invasive and objective option -- could be applied to this problem. This pilot study uses GUS alongside usual care at a music festival; a bounded, intoxication-dense environment where airways are often managed using non-invasive airway strategies. We aim to (1) clarify the gastric contents of any intubated patients, and (2) assess if patients managed without intubation go on to have a lack of aspiration sequelae because of empty stomachs or in spite of full stomachs.

Methods: Ethics approval was obtained from the local REB. A prospective cohort study was conducted at a multi-day music festival. Patients presenting to on-site medical services with GCS ≤ 13 and known or suspected substance use were included. Patients with trauma, instability, metabolic derangements or additional aspiration risk factors (eg morbid obesity, pregnancy) were excluded. Standard GUS was performed by a trained provider and results were categorized according to convention as FS (full stomach, ie solids or liquids >1.5mL/kg) or ES (empty stomach, ie empty or liquids <1.5mL/kg). Additional patient data were extracted from linked medical records post event.

Results: 33 patients met inclusion criteria and 27 remained after exclusions were applied and consent obtained. 25 patients reported substance use and 19 polysubstance use. The FS group had 15 patients (7 solid & 8 liquid>1.5), and the ES group had 12 patients (5 empty & 12 liquid<1.5). The median low GCS documented for FS and ES was 7 and 11 respectively, and 10 patients total had a GCS of 8 or less (6 FS & 4 ES). No patients were intubated and all were managed conservatively according to usual care. 3 patients (2 FS, 1 ES) were transferred to hospital. No patients re-registered at medical for clinically significant aspiration.

Conclusion: This pilot study demonstrates the potential utility of GUS in stratifying aspiration risk in intoxicated patients with decreased GCS. “Empty” stomachs might avoid intubation, while the implications and true risks of “full” stomachs for aspiration sequelae in the absence of intubation remain unclear. Due to the small numbers in this pilot study and the quoted GUS sensitivity (only 95%), further research is needed to evaluate the safe application of this modality to clinical decision-making in intoxicated patients.

Veno-Venous ECMO for Severe Intraoperative Bronchospasm in a Pediatric Patient

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Introduction: Intraoperative bronchospasm is a well-documented complication under general anesthesia, with an overall incidence of approximately 0.2% [1]. In pediatric patients the reported incidence is between 0.3% - 3.2% [2,3]. Although rare, morbidity and mortality have been associated with severe intraoperative bronchospasm. We report a case of severe intraoperative bronchospasm in a pediatric patient, successfully salvaged by intraoperative veno-venous extra corporeal membrane oxygenation (V-V ECMO).

Case Presentation: A previously healthy 6 year old male presented to the OR for urgent reduction and fixation of a supracondylar fracture. His medical history consisted of eczema and food allergies. There was no history of reactive airway disease or hospital admissions. He had an upper respiratory tract infection approximately 2 weeks prior. He was afebrile, however had a residual non-productive cough.

Anesthetic induction with propofol and remifentanil was conducted and endotracheal intubation was performed. Subsequent to endotracheal intubation, the patient developed profound isolated bronchospasm. Treatment for bronchospasm was initiated, however the patient was refractory to comprehensive medical therapy. Over several hours a severe respiratory acidosis followed, with an arterial pH of 6.88 and pCO2 >110, exceeding the upper measurable limit. There were no systemic findings consistent with anaphylaxis.

A pediatric intensive care unit (PICU) team was mobilized from the closest tertiary pediatric hospital including pediatric ECMO equipment. With worsening hemodynamics and refractory hypercapnic respiratory failure, the decision was made to place the patient on V-V ECMO. He was transported by ambulance to the PICU at the pediatric hospital on V-V ECMO. Flows were maintained at 1 L/minute and the patient's pH and pCO2 normalized. He was decannulated from ECMO less than 24 hours later and extubated the following day. 5 days after admission, the patient was discharged home from hospital without any long term sequelae. Follow up asthma and allergy testing were normal, however his nasopharyngeal culture was positive for rhinovirus.

Conclusion: A literature review was conducted on the use of V-V ECMO for rescue therapy for intraoperative bronchospasm. Two previous case reports have described successful salvage of intraoperative bronchospasm with V-V ECMO [4,5]. Both of these cases were described as bronchospasm secondary to anaphylaxis reactions. To our knowledge, this is the first case report of intraoperative salvage V-V ECMO for isolated bronchospasm in a pediatric patient.

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