

Initiation of Gastric Lavage in a Patient with Acute Overdose after Visualization of Pills in Stomach using Bedside Ultrasound

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Received date: November 17, 2016; Accepted date: December 09, 2016; Published date: December 12, 2016

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Abstract

Medication overdose is a common presenting complaint to the Emergency Department (ED) and is a significant cause of morbidity and mortality. Though the use of gastric lavage (GL) in patients with acute overdose has fallen out of favour over the last two decades, there are some instances in which GL may be still being considered as an important adjunctive therapy. This article describes a patient who presented after a massive acute overdose in which Point of Care Ultrasound (POCUS) was used to enhance decision making to proceed with initiation of GL in the ED. Our case report demonstrates the potential value of POCUS in detecting a large quantity of pills in the stomach of a patient after acute ingestion of pills in the ED. As Emergency physicians become more adept at the use of POCUS for novel applications and as the modalities themselves have significantly improved in image resolution, we are now more than ever more likely to affect our decision making through POCUS.

Keywords: Point of care ultrasound; Gastric lavage; Ingestion

Case Report

A 31 year old female with past medical history significant for Depression, Anxiety, and Lupus presented to the ED approximately 30 minutes after a toxic ingestion of medications in a suicide attempt. The patient stated she called her friend immediately after ingesting the pills and was brought to the ED by the friend.

Upon initial presentation to the ED, the patient admitted to taking approximately 170 tabs of diphenhydramine, 60 tabs of celecoxib, 30 tabs of lorazepam, 60 tabs of paroxetine, 60 tabs of extended release bupropion, and an unknown quantity of ibuprofen. Initial vital signs included a blood pressure of 128/95 mmHg, heart rate of 105 beats/min, respirations of 20 breaths/min, temperature of 98.2 degrees Fahrenheit, and an oxygen saturation of 98% on room air. On initial exam the patient was alert and oriented but somewhat lethargic. The neurologic exam was otherwise within normal limits. Cardiovascular exam revealed sinus tachycardia. Pupils were 3 mm and reactive to light. Pulmonary exam was within normal limits and the abdomen was soft and non-tender. The musculoskeletal exam was within normal limits and did not reveal any myoclonus.

Within 15 minutes of initial presentation to the ED, the patient began to exhibit a decline in clinical status with worsening delirium, lethargy, and tachycardia. Bedside portable X-ray was performed and revealed no findings. A bedside ultrasound was performed by an ED Point of Care Physician, which demonstrated large number hyper echoic foci consistent with ingested pills within the stomach (Figure 1). The toxicology service was consulted who recommended initiation of GL given the findings on the ultrasound as well as the potentially life-threatening nature of the ingestion, the relatively brief time from initial ingestion, and worsening of patient's clinical status. The GL was initiated within twenty-five minutes of the bedside ultrasound. The

decision was made to intubate the patient due to both worsening mental status and need for airway protection to facilitate GL.

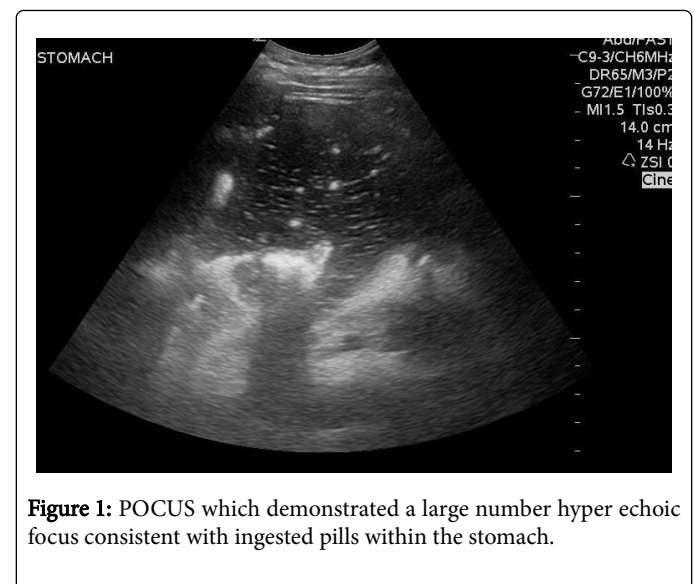


Figure 1: POCUS which demonstrated a large number hyper echoic focus consistent with ingested pills within the stomach.

In concert with other on-going supportive measures, GL was initiated and guided by Emergency Toxicology specialists at the bedside. A 36-French orogastric tube was placed and its position confirmed by X-ray. Activated charcoal was instilled into the tube. In the left lateral decubitus position, small aliquots of normal saline were instilled then withdrawn via suction. A large volume of pill fragments as well as whole intact pills were retrieved (Figure 2). Approximately 6 L of normal saline was instilled before the effluent became relatively clear. A second dose of activated charcoal was then instilled into the tube.



Figure 2: A large volume of pill fragments as well as whole intact pills were retrieved.

The patient was admitted to the Medical Intensive Care Unit where her clinical condition improved. She was extubated the following day, and discharged from the hospital to an inpatient psychiatric ward three days after initial presentation.

Discussion

In 1997, the American Association of Poison Centers (AAPC) and the European Association of Poison Centers and Clinical Toxicologists (EAPCCT) issued a joint statement that GL should not be employed routinely, if ever, in the management of poisoned patients [1,2]. However, there are rare cases in which the procedure can be considered after weighing the potential risks and benefits. In general, GL may be indicated if the ingested xenobiotic is known to produce serious toxicity, the patient has obvious signs of life-threatening toxicity, the ingested xenobiotic is not adsorbed by activated charcoal, or there is reason to believe that a significant amount of ingested xenobiotic is still in the stomach given the time of ingestion. GL is usually not indicated if the xenobiotic has limited toxicity, if it is well adsorbed by activated charcoal, if a corrosive substance or hydrocarbon with high aspiration potential has been ingested, if significant emesis has occurred, if there is a highly effective antidote (i.e. N-acetylcysteine), if the patient's airway is unprotected, or if the patient presents hours post-ingestion. GL also has many potential complications to consider including aspiration, laryngospasm, mechanical injury to the esophagus or stomach, and electrolyte imbalance [1].

The use of GL has fallen out of favour in the past two decades due to a body of research that calls its effectiveness into question [1-9]. Experimental studies have been done in healthy volunteers, though their results are limited due to substantially lower doses than would be encountered in real patients. In a study comparing GL to ipecac-induced emesis and activated charcoal in healthy volunteers, GL did show a non-statistically significant reduction in serum levels of ingested ampicillin, though both ipecac-induced emesis and activated charcoal performed better in reducing serum levels [3]. In another study done on acutely poisoned patients, post-GL endoscopy was used to evaluate the effectiveness of gastric decontamination. After lavage

was completed, 88% of patients had solid debris still visible in the stomach [4]. A randomized control trial showed that there were no clinically significant differences in outcome between groups that were treated with GL and activated charcoal versus activated charcoal alone [5]. These studies, amongst many others, show that GL rarely improves severity of illness or the ultimate medical outcome of treated patients.

Though the use of GL has declined over previous decades, its use continues to be reserved for some select cases. In a study done which compared activated charcoal alone to activated charcoal combined with GL, a higher proportion of obtunded patients presenting within one hour and receiving GL plus activated charcoal improved clinically [6]. Authors concluded that GL is generally not of benefit unless it is performed within one hour of ingestion and reserved for those patients with clinically severe presentations. Much of the evidence in support of GL comes from case reports. In one case report, the authors describe the use of GL after multiple pills were seen incidentally on CT scan in a patient who was found profoundly hypothermic and unresponsive. GL was used with success both to remove pill fragments and to assist in rewarming efforts [7]. In another case study, a patient experienced clinical improvement after undergoing GL almost 10 hours after ingestion when a CT scan revealed multiple pills in the stomach [8]. Though the data to support GL is lacking, the American Academy of Clinical Toxicology continues to recommend consideration of GL in potentially life-threatening ingestions when the procedure can be undertaken within 60 minutes of ingestion [1]. Insufficient data are available to guide decisions on this small, but important, subset of patients with life-threatening ingestions. Though as one author wrote, "the failure to find supporting evidence in a small subset of data should not be used as a reason to abandon therapies that are logical, safe, rapid, and inexpensive [9]".

Emergency Physicians often rely on incomplete information when making decisions regarding patients presenting with acute ingestion. In cases where there is uncertainty regarding an ingestion, diagnostic imaging has been used with some success to aid in critical decision-making. In a study done with ultrasound-trained Emergency Physicians and Residents, the ability to detect enteric-coated aspirin in water, polyethylene glycol, and activated charcoal was assessed. 100% of participants were able to identify the tablets in water and polyethylene glycol, and approximately half were able to identify tablets in activated charcoal [10]. Regardless of the solution tested, participants did routinely underestimate the total number of tablets seen on ultrasound (US). Authors thus concluded that point of care US is potentially useful for detecting the presence of tablets in an acute ingestion, but less useful for quantifying them [10]. In another study, healthy volunteers were randomized to ingest 50 enteric coated placebo tablets plus 1 Litre of water versus 1 litre of water alone. US were performed at 0, 60, and 90 minutes post ingestion. At 0 minutes post-ingestion, sensitivity and specificity for pill identification was 62.5% and 58.3% respectively, with sensitivities and specificities declining at 60 then 90 minutes. Authors concluded that US has poor utility in detecting the presence of pills after an acute ingestion [11]. In another small study, healthy volunteers ingested four tablets with slow disintegration (sustained release or enteric coated) and two with fast disintegration. All four pills with slow disintegration were visualized in the stomach by US, while detection of the fast disintegrating pills was inconsistent [12]. Though data regarding use of US in the setting of ingestion is lacking, it should not be excluded as a potential adjunctive therapy in the management of the patient with acute overdose.

Our case report demonstrates the potential value of bedside US in detecting a large quantity of pills in the stomach of a patient after acute ingestion of pills in the ED. As Emergency physicians become more adept at the use of US for novel applications and as the US modalities themselves have significantly improved in resolution of image, we are now more than ever likely to change our decision making through Point of Care Ultrasound. In addition, ultrasound is a bedside tool to aid in the rapid evaluation of toxic ingestions and does not require critical patients to leave the emergency department. In this particular case, the decision was made to initiate GL based on the patient's history of potentially life-threatening ingestion of a large amount of pills, the bedside ultrasound, deteriorating clinical status, and a relatively short time from ingestion to ED presentation. Bedside US detected a large amount of pills in the stomach, bolstering our decision to proceed with GL. Though data to support the use of US in this setting is limited, US may continue to be of use as a decision making aid in the rare patient who may benefit from GL.

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