Surviving the Electrolyte Storm

Severe Electrolyte Abnormalities Associated with Excessive Gastric Fluid Drainage

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INTRODUCTION

- Excessive gastric fluid losses can result in severe electrolyte abnormalities leading to complications including acute renal failure and acid-base disturbances.
- Gastric fluids have high HCl content and large volume loss of HCl causes Cl ion shift from plasma into gastric secretions. Bicarbonate ions then shift from erythrocytes into plasma to replace the lost Cl ions.
- At the same time, more bicarbonates are reabsorbed through the proximal tubules as a result of intravascular volume contraction. The combined mechanisms lead to hypochloremic metabolic alkalosis.

HISTORY OF PRESENT ILLNESS

- 72 year old male with a past medical history significant for a recent duodenal perforation repaired with a graham patch. Treated conservatively and was discharged with gastrojejunostomy tube for tube feeds.
- After discharge, he utilized his J port for continuous tube feeding with G tube draining to gravity.
- Family reported significant output from G tube with thousands of milliliters per day which appeared similar to tube feedings
- He returned to the hospital 2 weeks after his hospitalization for progressive encephalopathy and weakness.

Labs on Arrival

Sodium 142	**Chloride** <50	**BUN** 143
Potassium 4.2	**Bicarbonate** 71	**Creatinine** 12.5

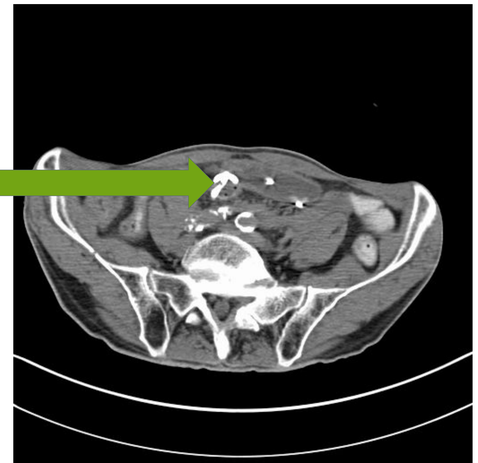
CLINICAL COURSE

- Aggressively fluid resuscitation with > 6 L normal saline within 24 hours of arrival to hospital
- IVF resuscitation drastically corrected electrolytes
- Interventional radiology fixed the incorrect positioning of the J tube, and the patient's G tube was clamped when not in use to prevent recurrent episodes
- Acute kidney injury resolved with IVF and patient ultimately did not need dialysis
- Encephalopathy improved following IVF and correction of electrolyte imbalance

IMAGING STUDIES

Perigastric abscess and evidence of the G tube inserting into the stomach

Malposition of the J tube within the stomach



DISCUSSION

- This case is possibly the one with the highest bicarbonate and lowest HCl numbers in recent literature.
- It illustrates the extreme pattern of electrolyte derangements and acid-base disturbance associated with large-volume gastric content loss.
- Early recognition of chloride-responsive metabolic alkalosis is critical to the institution of appropriate therapy.
- This case affirms that the right type of intravenous fluid in the severe dehydration from gastric loss is essential to prevent further complications such as permanent dialysis, neurological sequelae and death.
- It is important to point out the iatrogenic nature of this case and that the subsequent adverse events are avoidable

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