Case Report

Pediatric Gastritis on Point-of-care Ultrasound

Eric Scheier*

Department of Emergency Medicine, Kaplan Medical Center, Rehovot, Israel

Abstract

Point of care ultrasound (POCUS) is used routinely in pediatric emergency medicine. I present a case in which repeat POCUS after admission directed the evaluation and followed the recovery of a child admitted with epigastric pain. POCUS of the epigastrium may decrease the number of imaging examinations and endoscopies in the evaluation of pediatric epigastric pain.

Keywords: Gastritis, pediatric, peptic ulcer, point-of-care ultrasound, ultrasound

INTRODUCTION

Point-of-care ultrasound (POCUS) is used routinely in pediatric emergency medicine. The accuracy of POCUS is dependent on operator experience. I present a case, in which repeat POCUS after admission directed the evaluation and followed the recovery of a child admitted with epigastric pain. This case accentuates the importance of an epigastric view on POCUS when evaluating epigastric pain in the emergency setting.

CASE REPORT

A 13-year-old previously healthy male presented to the pediatric emergency department (PED) with a day of nausea and epigastric pain. There was no past medical history of epigastric pain, he had no history of medications, and no family history of gastritis or *Helicobacter pylori*. He had six episodes of nonbilious emesis and was afebrile. Examination was remarkable for epigastric tenderness. Abdominal X-ray was unremarkable [Figure 1]. Laboratory evaluation including complete blood count, complete blood chemistries, liver function tests, serum amylase, venous blood gas, and C-reactive protein was normal. PED POCUS of the abdomen did not evaluate the epigastrium and was interpreted as normal. He was admitted for pain control and hydration, received IV acetaminophen, and antiemetic. The patient resumed oral intake the morning after admission but complained of

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epigastric pain and vomited. He was then started on a clear liquid diet, which he tolerated well for almost 24 h, before progressing to solids.

On day 1 of hospitalization, due to continued pain and emesis, POCUS was performed by the attending physician in the inpatient department and showed a globally thickened 1 cm gastric wall [Figure 2], without other intestinal thickening or abdominal free fluid. Given the abnormal finding on POCUS, he was sent for radiology-performed abdominal ultrasound which was normal. His vomiting resolved. He was started on omeprazole and continued intravenous acetaminophen for pain. On days 2 and 3 of hospitalization, he had improvement of his pain. POCUS on days 2 and 3 of hospitalization showed improvement in gastric wall thickness [Figure 2] with a small amount of free fluid in the right pelvis, and he was discharged on day 3. Given his rapid improvement, he did not undergo endoscopy, and in discussion with parents 6 months after discharge, he remains well without abdominal pain or vomiting, and he no further testing to clarify the etiology of the gastritis was performed.

DISCUSSION

The differential diagnosis of epigastric pain is broad and includes pancreatitis, appendicitis, celiac disease, lactose

Address for correspondence: Dr. Eric Scheier, Department of Emergency Medicine, Kaplan Medical Center, Rehovot, Israel. E-mail: eric.scheier@gmail.com

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Figure 1: The patient's supine abdominal X-ray

intolerance, inflammatory bowel disease (IBD), and parasitic infections. Pediatric gastritis is not uncommon, with the incidence of pediatric peptic ulcer disease ranging from 2% to 8%. Untreated gastritis can progress to peptic ulcer disease and to more severe complications such as perforation, bleeding, bowel strictures, and obstruction. Pediatric gastritis can result from medications such as ibuprofen or corticosteroids, viruses such as cytomegalovirus and Epstein–Barr virus, fungi, and parasites and can be stress related. Less commonly, ingestion of corrosive substances, hypersecretory states (Zollinger-Ellison syndrome), IBD, systemic mastocytosis, chronic renal failure, and hyperparathyroidism can present with gastritis in children.^[1]

A recent algorithm for the PED POCUS evaluation of pediatric abdominal pain recommends the evaluation of the gallbladder with the probe to the right of the midline in the assessment of epigastric pain but does not discuss the assessment of the stomach wall.^[2] A finding of isolated thickening of the gastric wall in the context of an abdominal ultrasound examination can help to narrow the differential diagnosis in cases of epigastric or generalized periumbilical pain.

In our country, *H. pylori* continues to be carried by about a third of all children,^[3,4] with a high burden of peptic ulcer disease.^[5] Physicians caring for children are strongly advised against treating before endoscopic confirmation of *H. pylori* infection.^[6]

Stomach ultrasound is more commonly discussed in the context of a preprocedural evaluation of stomach content.^[7] In adults, the mucosal wall thickness in the gastric antrum greater than 4 mm, or gastric wall thickness >5 mm may indicate acute gastritis.^[8] with one author using 8 mm as the cutoff for gastritis.^[9] Gastritis due to *H. pylori* infection in adults generally demonstrates both increased wall thickness and increased mucosal layer-to-antral wall thickness on sonography when compared with gastritis from other causes.^[8] In children, however, the increased gastric wall thickness in *H. pylori* gastritis as compared with gastritis from other causes has not been found,^[10] and the sensitivity of



Figure 2: From top to bottom: Transverse view of the epigastrium using a linear high frequency probe, showing the thick-walled inflamed gastric wall as the gastritis resolved over hospital days 1–3

sonography in identifying peptic ulcer disease in children is only 66.7%, increasing to 88% in children above 30 kg.^[9] To my knowledge, this is the first case report of pediatric gastritis identified on POCUS.

POCUS evaluation of epigastric pain should include views of the epigastrium to evaluate for a thickened gastric wall. POCUS practitioners should be aware of their institution's abdominal ultrasound protocol, as it may not include views of the epigastrium. The thickened gastric wall on POCUS early Scheier: Pediatric gastritis on pocus

in the evaluation can make other etiologies of epigastric pain such as pancreatitis, cholecystitis, and pneumonia far less likely, and quickly tailor further evaluation and care. Further research should investigate the test parameters of epigastric ultrasound in the evaluation for pediatric gastritis, particularly *H. pylori* gastritis, for which the current guidelines recommend endoscopic diagnosis. POCUS of the epigastrium may decrease the number of imaging examinations and endoscopies in the evaluation of pediatric epigastric pain.

Declaration of patient consent

The author certifies that he have obtained all appropriate patient's guardian consent form. In the form, the guardian has given the consent for the child's images and other clinical information to be reported in the journal. The guardian understands that the child's name and initial will not be published and due efforts will be made to conceal the identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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