

## INTRODUCTION

ACEI are prescribed to about 40 million people worldwide, due to their antihypertensive, cardioprotective and renal benefits. This class of medications is one of the most common causes of medication-induced angioedema and involves 0.1-0.7% of patients to whom they are prescribed.<sup>1</sup> Most commonly, angioedema will result in airway compromise; however, there have been reports of angioedema of the bowel as a potential manifestation. Signs and symptoms of angioedema of the bowel can be nonspecific, including nausea, abdominal pain, vomiting, and diarrhea. Symptoms resolve after withdrawal of the offending agent. We report a rare case of angioedema of the small bowel as a side effect of ACEI use.

## IMAGES

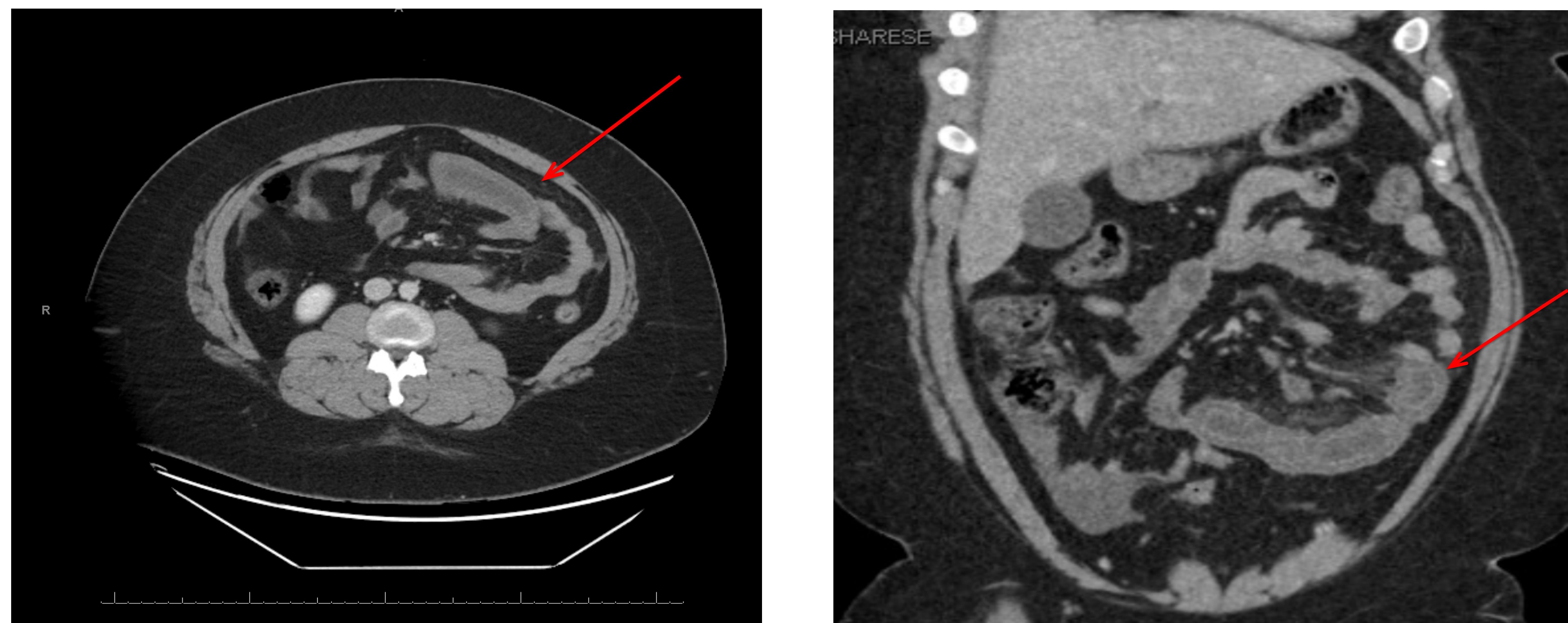


Figure 1. CT abdomen/pelvis positive for bowel wall thickening (indicated by red arrows).

## CASE REPORT

A 29-year-old African American female with a history of obesity, severe persistent asthma, GERD, and HTN treated with lisinopril, presented to the hospital with complaints of left upper quadrant abdominal pain, nausea with occasional vomiting. The pain was intermittent, mild to moderate in intensity, and non-radiating with no aggravating or relieving factors. She explained the sensation as a “hard ball or knot” in her abdomen. Her allergies included clindamycin causing dermatitis, naproxen causing hives and shortness of breath, and adverse drug reactions to amoxicillin-clavulanate and morphine. Physical exam revealed generalized abdominal tenderness on palpation. CT abdomen showed moderate to severe small bowel thickening (Figure 1). Infectious work up was benign. Ultrasound of the abdomen showed hepatic steatosis without evidence of large gallstones. Symptomatic treatment with omeprazole and promethazine for dyspepsia was implemented.

One month later, she presented again to the emergency department with similar symptoms, as well as a new complaint of alternating episodes of diarrhea and constipation. Pain this time was located in the left upper quadrant, similar in character and severity to the last episode, and radiating to the right upper quadrant. Repeat CT abdomen was similar to the previous study with slight improvement of small bowel edema. The patient also underwent upper endoscopy and colonoscopy which were negative for any acute pathology. Due to persistent symptoms, further investigation with magnetic resonance imaging (MRI) of the abdomen and hepatobiliary iminodiacetic acid (HIDA) scan were pursued, which were also unremarkable.

Given her benign imaging findings, suspicion for angioedema secondary to ACEI use was considered. Lisinopril was discontinued, and the patient reported resolution of all symptoms within three months.

## DISCUSSION

The prevalence of angioedema as an adverse effect of ACEI is 0.1-3%, which is the second most common adverse effect of ACEI behind cough.<sup>3</sup> Studies show ACEI-induced angioedema accounts for 20-40% of every 10,000 emergency department visits in the United States.<sup>3</sup>

Historically, angioedema was seen within the first week of ACEI use, but recent studies have shown only 10% will develop symptoms in the first month.<sup>2</sup> Angioedema from ACEI can occur up to five years after starting the medication,<sup>3</sup> such as in our patient, where it appeared more than one year after medication use. This adverse effect, when manifesting in the bowel, can appear with vague symptoms such as nausea, abdominal pain, vomiting and diarrhea. Our patient presented similarly.

African American race, female gender, obesity, and diabetes are important risk factors in the development and severity of angioedema from ACEI. Interestingly, studies have also found that people developing angioedema from ACEI were more likely to have an NSAID allergy,<sup>2</sup> which our patient also had previously documented in her chart.

## TAKE HOME POINTS

- Comprehensive medication review should be conducted as part of the diagnostic workup for dyspepsia
- Recognizing gastrointestinal symptoms as a potential adverse effect of ACEI early on could save patients from costly and invasive studies and reduce readmission rates
- Female gender, African American race, and obesity are risk factors for developing ACEI-induced angioedema
- ACEI adverse effects can occur at any time during medication use
- Angioedema of the bowel should be considered in patients taking ACEI with nonspecific gastrointestinal symptoms, regardless of the duration of use

## REFERENCES

1. Montinaro V, Cicardi M. ACE inhibitor-mediated angioedema. *Int Immunopharmacol.* 2020;78:106081. doi:10.1016/j.intimp.2019.106081
2. Banerji A, Blumenthal KG, Lai KH, Zhou L. Epidemiology of ACE Inhibitor Angioedema Utilizing a Large Electronic Health Record. *J Allergy Clin Immunol Pract.* 2017;5(3):744-749. doi:10.1016/j.jaip.2017.02.018
3. Diaz-Mendez M, Carrillo-Martin I, Werlang ME, Palmer WC, Gonzalez-Estrada A. Isolated Abdominal Angioedema from an Angiotensin-Converting Enzyme-Inhibitor. *J Allergy Clin Immunol Pract.* 2020;8(4):1394-1395. doi:10.1016/j.jaip.2019.10.035