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Emergency Department Diagnosis and Initial Management of an Unruptured Celiac Artery Aneurysm: A Case Report

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Case Report

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Abstract

Background

Celiac artery aneurysm (CAA) is an uncommon visceral artery aneurysm that may present with nonspecific abdominal symptoms but can cause life-threatening hemorrhage after rupture. This report describes a practical emergency diagnostic pathway and guideline-informed individualized management of an intact aneurysm near the boundary between intervention and observation.

Case presentation:

An 86-year-old man with hypertension, stage 3 chronic kidney disease, and prior ischemic stroke presented with sudden epigastric pain radiating to the back. Initial clinical, laboratory, electrocardiographic, and point-of-care ultrasonographic evaluation did not reveal another clear explanation for the pain, although a focal vascular abnormality was suspected in the celiac artery region. Because the finding could not be adequately characterized owing to the deep location and limited acoustic window, computed tomography angiography was performed and identified an intact approximately 2.0-cm celiac trunk aneurysm without active extravasation, peri-aneurysmal hematoma, or dissection. Intravenous labetalol was titrated during emergency stabilization toward a systolic blood pressure of approximately 100–120 mmHg. After intensive monitoring and multidisciplinary assessment, conservative management was selected because the patient remained stable and had advanced age, a debilitated baseline, chronic kidney disease, prior stroke, and substantial anticipated procedural risk. His pain resolved, and he was discharged in stable condition on hospital day 10.

Conclusions

This case demonstrates how rapid bedside assessment, timely escalation to definitive vascular imaging, exclusion of immediately life-threatening complications, and hemodynamic stabilization can support safe transition from emergency care. For an intact CAA near a guideline-based treatment threshold, management should integrate aneurysm size and symptoms with physiological stability, comorbidity, life expectancy, and procedural risk rather than apply a size criterion in isolation.

Background

Celiac artery aneurysm (CAA) is an uncommon visceral artery aneurysm. Many lesions are detected incidentally, whereas symptomatic patients may present with vague upper abdominal or back pain that overlaps with gastrointestinal, hepatobiliary, pancreatic, renal, mesenteric, and aortic disorders. Rupture is uncommon but potentially catastrophic, making timely recognition and anatomical assessment important in emergency care [1–4].

Point-of-care ultrasonography (POCUS) is a rapid and radiation-free bedside imaging tool that can support the initial evaluation of undifferentiated abdominal pain [5]. Visualization of the celiac artery may be limited by its deep anatomical location, bowel gas, available acoustic windows, and insonation angle. Computed tomography angiography (CTA) provides broader anatomical coverage and permits assessment of aneurysm origin, size, rupture, hemorrhage, dissection, and associated aortic or mesenteric pathology [2, 3, 6].

Management of an intact CAA depends on more than diameter alone. The Society for Vascular Surgery (SVS) guideline recommends treatment of nonruptured true CAAs larger than 2 cm, those with demonstrable interval growth, or lesions associated with symptoms in patients of acceptable operative risk; observation is suggested for small, stable asymptomatic CAAs and for patients with significant medical comorbidities or limited life expectancy [1]. Other contemporary guidance similarly emphasizes anatomy, symptoms, rupture risk, physiological status, and procedural risk [2, 3]. We report an older high-risk patient with an intact approximately 2.0-cm CAA identified during evaluation of acute abdominal pain, illustrating how guideline-based treatment criteria were integrated with patient-level procedural risk during emergency stabilization and multidisciplinary decision-making.

Case presentation

An 86-year-old man with long-standing hypertension, stage 3 chronic kidney disease, and prior ischemic stroke presented to the emergency department with sudden dull upper abdominal pain radiating to the back. The pain awakened him from sleep at approximately 3:00 AM and was associated with mild nausea. He denied vomiting, diarrhea, constipation, chest pain, diaphoresis, dyspnea, fever, or recent unexplained weight loss.

On arrival, his temperature was 36.8°C, heart rate 69 beats/min, respiratory rate 20 breaths/min, oxygen saturation 97% on room air, and blood pressure 172/69 mmHg. His pain score was 6/10. Physical examination showed localized epigastric tenderness without guarding, rebound tenderness, or a palpable pulsatile mass. Laboratory testing showed a white blood cell count of $7.4 \times 10^3/\mu L$, C-reactive protein < 0.02 mg/dL, troponin I < 0.010 ng/mL, lipase 40 U/L, creatinine 1.73 mg/dL, and estimated glomerular filtration rate 37.9 mL/min/1.73 m^2. Electrocardiography showed normal sinus rhythm without ischemic changes. The initial evaluation did not reveal a clear cardiac, pancreatic, hepatobiliary, or inflammatory explanation for the pain.

Because the pain persisted despite analgesic treatment and radiated to the back in an older patient with substantial vascular risk, an abdominal vascular disorder was considered. Bedside abdominal POCUS did not identify another clear sonographic cause but showed a focal abnormality suspicious for vascular dilatation in the celiac artery region (Fig. 1A). The suspected lesion could not be adequately characterized because of its deep location and limitations of the available acoustic window and insonation angle. CTA was therefore performed and identified an approximately 2.0-cm celiac trunk

aneurysm without active contrast extravasation, peri-aneurysmal hematoma, celiac artery dissection, or aortic dissection (Fig. 1B, C).

Intravenous labetalol was titrated during emergency stabilization toward a systolic blood pressure of approximately 100–120 mmHg, with concurrent pain control and close monitoring. After stabilization, the patient was admitted to the cardiovascular surgical intensive care unit for continuous hemodynamic observation. Cardiology advised medical optimization, and general surgery reviewed the clinical and imaging findings. The multidisciplinary team considered the aneurysm diameter, intact appearance on CTA, absence of bleeding or dissection, clinical stability, advanced age, debilitated baseline, stage 3 chronic kidney disease, prior stroke, and anticipated procedural risk. Conservative nonoperative management with blood pressure control and observation was selected.

The patient remained hemodynamically stable, and his abdominal pain completely resolved. He was subsequently transferred to the general medical ward, continued oral antihypertensive treatment, and was discharged in stable condition on hospital day 10 with cardiovascular surgery and cardiology follow-up arranged.

Discussion and Conclusions

This case demonstrates a practical emergency diagnostic sequence. POCUS raised suspicion of focal vascular dilatation in the celiac artery region, but the deep location of the suspected lesion and technical limitations prevented definitive characterization. CTA subsequently confirmed an intact approximately 2.0-cm CAA and excluded active extravasation, peri-aneurysmal hematoma, celiac artery dissection, and aortic dissection, becoming the key diagnostic and management turning point.

These CTA findings reclassified the immediate clinical concern from a potentially catastrophic abdominal vascular event to an intact aneurysm that could be assessed in the context of the patient's overall condition. The absence of hemorrhage or dissection allowed the emergency team to prioritize blood pressure control, pain relief, intensive monitoring, and multidisciplinary consultation rather than immediate open or endovascular intervention. Although the patient had stage 3 chronic kidney disease, the need to exclude a potentially life-threatening vascular event outweighed the contrast-related concern [2, 3, 6].

Published emergency reports have often highlighted missed diagnosis followed by rupture, acute abdominal pain leading to urgent intervention, or successful repair of ruptured CAA [7–9]. Contemporary treatment literature similarly concentrates on endovascular or operative outcomes [10]. By contrast, a recent natural-history cohort of 76 true CAAs, most of which were small, reported no new symptoms or ruptures during a mean clinical follow-up of 31.2 months, while acknowledging that existing literature is weighted toward larger or symptomatic lesions selected for intervention [4]. The present case lies at a clinically relevant boundary: acute pain prompted vascular evaluation, the aneurysm measured approximately 2.0 cm, CTA showed an intact lesion without dissection or hemorrhage, and the patient had substantial comorbidity and procedural risk.

The clinical relevance of this case is the application of existing SVS recommendations at a treatment boundary where aneurysm-related concern and patient-level procedural risk pointed in different directions. The SVS guideline recommends treatment of nonruptured true CAAs larger than 2 cm, those demonstrating interval growth, or lesions associated with symptoms in patients of acceptable operative risk; observation is suggested when significant medical comorbidities or limited life expectancy shift the balance away from intervention [1]. In our patient, the acute presentation and an approximately 2.0-cm aneurysm warranted serious consideration of intervention. However, CTA showed an intact lesion without hemorrhage or dissection, the patient remained hemodynamically stable, and advanced age, a debilitated baseline, stage 3 chronic kidney disease, prior stroke, and anticipated procedural risk shifted the individualized risk-benefit balance toward nonoperative management after multidisciplinary review. The decision therefore represented guideline-informed patient selection rather than reliance on aneurysm diameter alone. For CAAs managed nonoperatively, the SVS guideline also suggests annual CTA surveillance to assess interval growth [1]. Blood pressure reduction with intravenous labetalol was part of acute stabilization in this patient rather than a standardized CAA treatment protocol.

The favorable short-term course was consistent with this individualized management strategy. The patient remained stable under intensive monitoring, his pain resolved, and he was safely transferred to continued inpatient care without emergency open or endovascular intervention. This case therefore provides a real-world example of translating vascular guideline criteria into emergency decision-making when aneurysm-related treatment considerations coexist with substantial patient-level procedural risk. As a single case, it does not establish a management algorithm, but it illustrates how these competing factors can be integrated in practice.

In conclusion, this case demonstrates a coordinated emergency pathway: recognition of a possible vascular cause of persistent upper abdominal pain, rapid bedside assessment, timely CTA for anatomical clarification and exclusion of life-threatening complications, hemodynamic stabilization, and multidisciplinary decision-making. Its clinical value lies in showing how guideline-based treatment criteria can be applied when aneurysm-related concern and patient-level procedural risk point in different directions. For an intact CAA near the size threshold, management should integrate symptoms and anatomy with hemodynamic status, comorbidity, life expectancy, and procedural risk rather than rely on diameter alone.

Abbreviations

CAA
celiac artery aneurysm
CTA
computed tomography angiography
POCUS
point-of-care ultrasonography.

Declarations

Ethics approval and consent to participate:

Not applicable.

Consent for publication:

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Competing interests:

The authors declare that they have no competing interests.

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Author Contribution

TYL performed the emergency evaluation and management, curated the clinical information, and drafted the manuscript. JYW, CWW, and CYC contributed to case discussion, clinical guidance, and critical revision of the manuscript. CWL assisted with CTA assessment, image interpretation, and image processing. All authors read and approved the final manuscript.

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Data Availability

All data generated or analyzed during this case report are included in this article. Additional de-identified clinical information may be available from the corresponding author on reasonable request and subject

to institutional approval.

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Figures

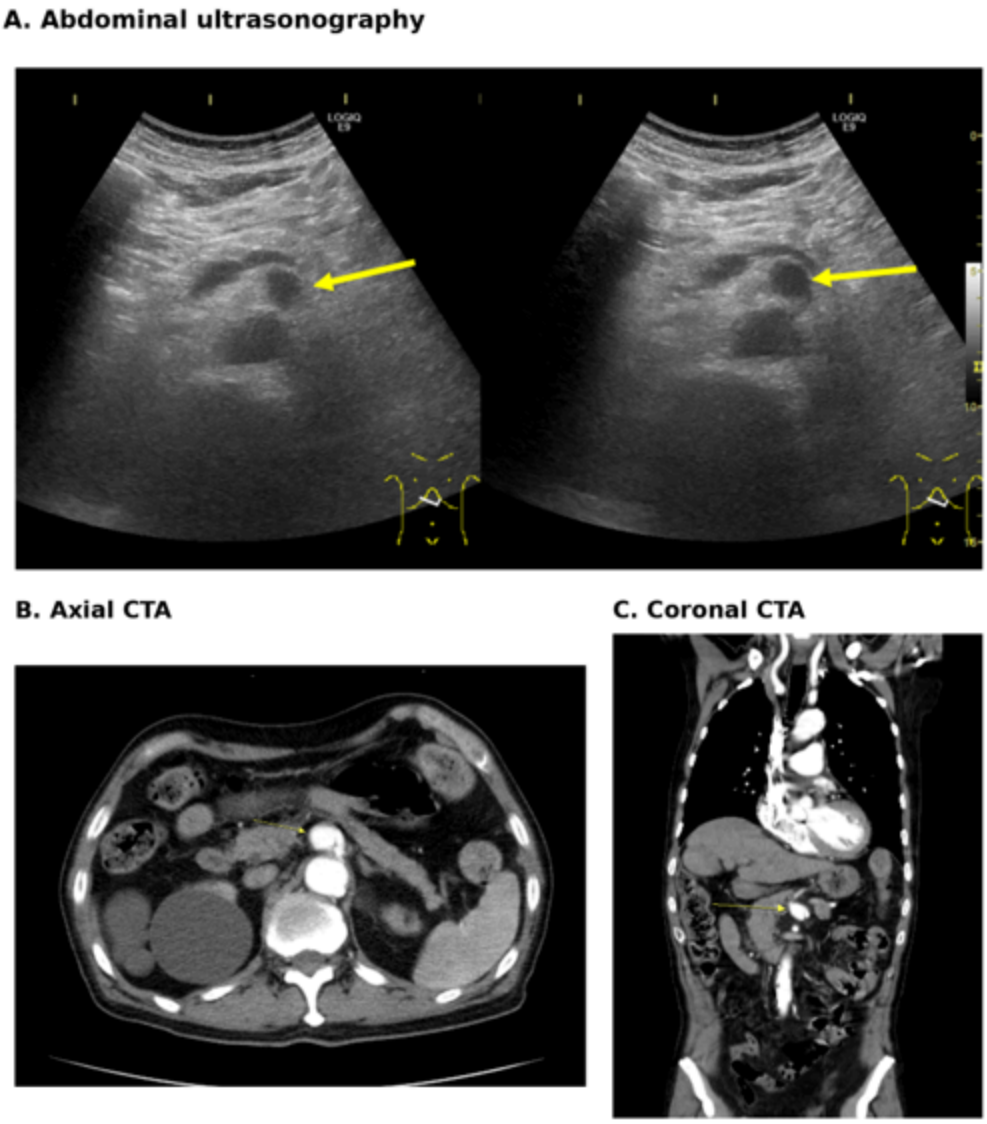


Figure 1

Imaging findings of the celiac artery aneurysm. (A) Bedside abdominal ultrasonography showing a rounded focal abnormality suspicious for vascular dilatation in the celiac artery region (arrows); its origin and extent could not be fully characterized because of the deep location and acoustic limitations. (B) Axial contrast-enhanced CTA image showing the approximately 2.0-cm celiac trunk aneurysm (arrow). (C) Coronal CTA reconstruction confirming the celiac arterial origin of the lesion (arrow). No active contrast extravasation, peri-aneurysmal hematoma, celiac artery dissection, or aortic dissection was present.