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CASE REPORT / OLGU SUNUMU

Primary Salmonella-associated Aortoenteric Fistula Presenting with Massive Hematemesis: A Case Report

Masif Hematemez ile Prezente Olan Primer Salmonella İlişkili Aortoenterik Fistül: Bir Olgu Sunumu

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ABSTRACT

Aim: Primary aortoenteric fistula (AEF) is a rare but life-threatening cause of massive gastrointestinal bleeding, characterized by an abnormal communication between the abdominal aorta and the gastrointestinal tract. Salmonella-associated AEF represents a small subset (1–2%) of cases, typically arising from infectious arteritis leading to aortic wall necrosis and aneurysm formation.

Case Presentation: We report the case of a 57-year-old man with a history of Salmonella arteritis and a known abdominal aortic aneurysm who presented with sudden massive hematemesis. Initial bedside ultrasonography suggested aneurysm rupture, and subsequent thoracoabdominal computed tomography (CT) angiography confirmed a 6 cm aneurysm with fistulization to the jejunum. Despite aggressive resuscitation, including intubation, massive transfusion, and cardiopulmonary resuscitation, achieving temporary return of spontaneous circulation, the patient's hemodynamic instability precluded surgical repair. The patient ultimately succumbed to recurrent cardiac arreste.

Conclusion: This case highlights the diagnostic challenges and high mortality associated with Salmonella-related primary AEF. Early consideration of AEF in patients with vascular infections presenting with gastrointestinal bleeding is critical. Contrast-enhanced CT angiography remains the gold standard for diagnosis, enabling the timely identification of fistulization and guiding management. Multidisciplinary approaches that incorporate infection control, hemodynamic stabilization, and surgical intervention are essential for improving outcomes in this rare but fatal condition.

Keywords: Aortoenteric fistula, massive hematemesis, abdominal aortic aneurysm, Salmonella arteritis, CT angiography

ÖZ

Amaç: Primer aortoenterik fistül (AEF), abdominal aort ile gastrointestinal sistem arasında anormal bir bağlantı ile karakterize, nadir ancak hayati tehlike oluşturan bir masif gastrointestinal kanama nedenidir. Salmonella ilişkili AEF, genellikle enfektif arterit sonucu aort duvarında nekroz ve anevrizma oluşumuyla ortaya çıkan vakaların küçük bir alt grubunu (%1–2) oluşturur.

Olgu Sunumu: Salmonella arteriti öyküsü ve bilinen abdominal aort anevrizması olan 57 yaşındaki bir erkek hastanın ani masif hematemezisle başvurduğu bir olguyu sunuyoruz. İlk yatak başı ultrasonografide anevrizma rüptürü şüphesi saptanmış, sonraki torakoabdominal bilgisayarlı tomografi (BT) anjiyografisi 6 cm'lik bir anevrizma ile jejunuma fistülizasyonu doğrulamıştır. Entübasyon, masif transfüzyon ve kardiyopulmoner resüsitasyonla geçici spontan dolaşım dönüşü sağlanmasına rağmen, hastanın hemodinamik instabilitesi cerrahi onarımı engellemiştir. Hasta, tekrarlayan kardiyak arrest nedeniyle hayatını kaybetmiştir.

Sonuç: Bu olgu, Salmonella ilişkili primer AEF'nin tanısal zorluklarını ve yüksek mortalitesini vurgulamaktadır. Vasküler enfeksiyon öyküsü olan hastalarda gastrointestinal kanama ile başvuru durumunda AEF'nin erken düşünülmesi kritik öneme sahiptir. Kontrastlı BT anjiyografi, fistülizasyonun zamanında tanımlanmasını ve tedavinin yönlendirilmesini sağlayan altın standart tanı yöntemidir. Enfeksiyon kontrolü, hemodinamik stabilizasyon ve cerrahi girişimi içeren multidisipliner yaklaşımlar, bu nadir ancak ölümcül durumun sonuçlarını iyileştirmek için gereklidir.

Anahtar Kelimeler: Aortoenterik fistül, masif hematemez, abdominal aort anevrizması, Salmonella arteriti, BT anjiyografi

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Introduction

Aortoenteric fistula (AEF) is a rare but life-threatening cause of upper gastrointestinal bleeding, characterized by an abnormal communication between the abdominal aorta and the gastrointestinal tract (1). Primary AEFs are typically associated with aortic aneurysms (80%), infectious arteritis (5–10%), or penetrating ulcers, whereas secondary AEFs arise from complications of aortic surgery, such as graft erosion (2). Clinical presentations vary and may include massive hematemesis, melena, hematochezia, or an initial minor bleeding episode known as “herald bleed”; mortality rates associated with AEF range from 30% to 80%, reflecting the severity of this condition (3).

Salmonella-associated AEF is rare, comprising 1–2% of cases. This form results from vascular infection that induces chronic inflammation and necrosis of the aortic wall, promoting aneurysm formation and fistulization (4,5). Contrast-enhanced computed tomography (CT) angiography is the gold standard for diagnosis, offering 94% sensitivity and 85% specificity by detecting fistulization, contrast extravasation, or gas locules within the aneurysmal sac (6). However, in unstable patients, preoperative stabilization remains challenging and significantly impacts outcomes (1). The classic triad of AEF (abdominal pain, gastrointestinal bleeding, and a pulsatile mass) is infrequently complete, necessitating a high index of suspicion (7,8).

Herein, we present a case of primary Salmonella-associated AEF, highlighting the diagnostic utility of CT angiography and the clinical challenges encountered in managing this rare but fatal condition.

Case Presentation

A 57-year-old man with a history of Salmonella spp.-positive blood cultures and arteritis involving the aortic bifurcation, diagnosed two months prior, had previously been admitted to the intensive care unit for 10 days due to syncope. He had a documented 5 cm abdominal aortic aneurysm. On June 11, 2025, at 00:30, he presented to the emergency department with sudden massive hematemesis (Table 1).

Time	Event
00:30	Emergency department admission, massive hematemesis
00:45	Bedside USG, 6 cm aortic aneurysm with suspected rupture
01:00	RSI intubation, CVS and GS consultation
01:37	Cardiac arrest, CPR initiated
02:00	ROSC achieved, massive transfusion protocol
02:30	Thoracoabdominal CT, AEF diagnosis
03:00	Repeat CVS and GS consultation, unstable course
03:30	Recurrent arrest, CPR, 1 mg adrenaline every 3 minutes
04:15	ROSC not achieved, patient deceased

Table 1. Timeline of Events.

Upon arrival, his vital signs were as follows: blood pressure, 126/65 mmHg; heart rate, 133 beats/min; temperature, 36.5°C; oxygen saturation, 97%; respiratory rate, 22 breaths/min; and Glasgow Coma Scale score, 15. Physical examination revealed ischemic changes, coldness, and pallor in both upper and lower extremities, with prolonged capillary refill time. Bilateral lower extremity pulses were filiform. The abdominal examination revealed a pulsatile midline mass. Nasogastric tube aspiration yielded hemorrhagic content. Laboratory investigations revealed a hemoglobin level of 8.6 g/dL, hematocrit of 27%, lactate of 8.6 mmol/L, pH of 7.193, bicarbonate of 16.5 mmol/L, and glucose of 217 mg/dL. Blood cultures were obtained, but the results were pending.

At 00:45, bedside ultrasonography identified a 6 cm distal abdominal aortic aneurysm with suspected rupture. At 01:00, the patient, unable to maintain airway protection, was intubated via rapid sequence induction. Consultations with cardiovascular and general surgery teams were initiated. At 01:37, the patient experienced cardiac arrest; cardiopulmonary resuscitation (CPR) was started, and return of spontaneous circulation (ROSC) was achieved by 02:00. A massive transfusion protocol was activated, with administration of four units of red blood cells, four units of platelets, and four units of fresh frozen plasma. Noradrenaline infusion (0.1 µg/kg/min) was initiated for hypotension; intravenous ceftriaxone 2 g was started empirically, given the history of Salmonella infection.

At 02:30, thoracoabdominal CT angiography revealed a 6 cm distal abdominal aortic aneurysm with fistulization to the jejunum and contrast extravasation (Figure 1). Proximal thrombus in the iliac arteries and absent distal contrast flow supported the AEF diagnosis. No gas locules were noted in the aneurysmal sac. Comparison with prior imaging confirmed that the aneurysm had increased in size from 5 cm to 6 cm (Figure 2). Due to the absence of active rupture and the patient’s unstable condition (BP: 90/50 mmHg, pulse: 85 beats/min), cardiovascular surgery was deferred, and emergent surgery was performed.

Figure 1. Thoracoabdominal CT angiography revealed a 6 cm distal abdominal aortic aneurysm with fistulization to the jejunum and associated contrast extravasation.

At 03:30, the patient became pulseless, prompting renewed CPR with 1 mg adrenaline every 3 minutes. By 04:15, ROSC was not achieved, and the patient was declared deceased. The cause of death was recorded as hypovolemic shock and multiorgan failure.

Figure 2. Prior imaging studies showed an abdominal aortic aneurysm measuring 5 cm, indicating progression to 6 cm in the current imaging.

Discussion

Aortoenteric fistula (AEF) is a rare but high-mortality condition encountered in the emergency department. This case highlights the clinical course and diagnostic challenges of a primary AEF associated with Salmonella arteritis. A prior report described a secondary AEF presenting with melena and anemia, diagnosed via contrast-enhanced CT; however, this case is distinguished by its primary nature and Salmonella etiology (7).

Primary AEFs are predominantly caused by aortic aneurysms (80%) or infectious arteritis (5–10%) (1). Although rare, Salmonella arteritis, can induce chronic inflammation and necrosis of the aortic wall, promoting aneurysm formation and fistulization (4). In the present case, the patient's history of Salmonella-positive blood cultures and arteritis at the aortic bifurcation provided a clear etiological link.

The microbial spectrum of aortic infections is diverse, with Staphylococcus species being the most common, particularly in graft-related infections. In contrast, Salmonella plays a significant role in primary microbial arteritis, especially in East Asian populations (5,9). Figure 3 illustrates the relative frequency of pathogens causing aortic graft infections, highlighting the prominence of Gram-negative organisms, such as Salmonella, in specific clinical contexts (9). Notably, the patient's prior treatment for Salmonella arteritis was inadequate, as medical records indicated incomplete antibiotic therapy due to non-compliance and early discharge against medical advice two months prior. This suboptimal management likely contributed to persistent vascular infection, accelerating aneurysm progression, and predisposing to AEF formation (5). Inadequate treatment of Salmonella vascular infections has been associated with increased risk of complications, including aneurysm rupture and fistulization, emphasizing the importance of prolonged and compliant antibiotic regimens (4,5).

The documented increase in aneurysm size from 5 cm to 6 cm over a short interval further suggests ongoing infectious activity. The clinical presentation of AEF is often atypical. While the classic triad—abdominal pain, gastrointestinal bleeding, and a pulsatile mass—is well described, it is infrequently observed in its entirety, especially in cases with infectious etiologies such as Salmonella (8). In this patient, a pulsatile mass and ischemic extremities were evident, but abdominal pain was notably absent, highlighting the need for a high index of suspicion in similar clinical contexts.

Contrast-enhanced CT angiography is the gold standard for AEF diagnosis, as it identifies fistulization, contrast extravasation, or gas locules within the aneurysmal sac (6). In this case, CT demonstrated a 6 cm aneurysm, jejunal fistulization, and contrast extravasation; the absence of gas locules reflects the variable radiologic features of Salmonella-associated AEF. Hemorrhagic nasogastric tube aspirate, ischemic extremities, and filiform pulses confirmed massive hemorrhage. Elevated lactate (8.6 mmol/L) and metabolic acidosis (pH: 7.193) underscored severe hypoperfusion. Endoscopy, with a sensitivity of only 25–50%, was not performed due to its limited diagnostic yield (1,8).

Management of AEF is complex and time-sensitive, aiming to control hemorrhage, repair the aortic defect, and address underlying infection. Open surgical repair is preferred in stable patients, while endovascular stent grafts (EVSG) serve as a bridge in unstable cases (3). However, in infectious AEF, EVSG is associated with a risk of graft infection, necessitating prolonged antibiotic therapy (4–6 weeks) (8). In this case, the patient's persistent instability and absence of active rupture precluded surgical intervention. Despite aggressive resuscitation—including massive transfusion and vasopressor support—progressive hypovolemic shock and recurrent cardiac arrests rendered further intervention futile. Empiric initiation of ceftriaxone was appropriate given the patient's history of Salmonella, but the rapid clinical decline limited its therapeutic impact. The observed mortality is consistent with reported rates of 30–80% for AEF (2).

The differential diagnosis in cases of massive upper gastrointestinal bleeding should include peptic ulcer disease, variceal hemorrhage, aortic dissection, and ruptured aneurysm. In this patient, the combination of hemorrhagic nasogastric aspirate and CT-confirmed fistulization established the diagnosis of AEF. Salmonella arteritis remains a rare cause of AEF, with few cases reported in the literature (5). This case adds to the existing body of evidence, emphasizing the critical role of CT angiography in diagnosis and the unique challenges posed by Salmonella-associated primary AEF (7)

Clinical Implications

- AEF should be considered in patients with a history of aneurysm or vascular infection presenting with massive hematemesis.
- Contrast-enhanced CT angiography is essential for rapid and accurate diagnosis.
- Massive transfusion and vasopressor support are vital for initial stabilization, but early multidisciplinary consultation is mandatory.
- Salmonella arteritis significantly increases the risk of AEF; empiric broad-spectrum antibiotics should be initiated promptly.

Conclusion

Primary aortoenteric fistula associated with Salmonella arteritis is a rare but lethal condition with high mortality. Clinicians should maintain a high index of suspicion in patients with vascular infections or known aneurysms presenting with gastrointestinal bleeding. Prompt contrast-enhanced CT angiography is crucial for diagnosis and surgical planning. Early multidisciplinary collaboration and aggressive infection management are crucial for improving outcomes in these patients.

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Informed Consent: The patient's next of kin provided written informed consent on June 18, 2025, for the use of this case in scientific publication and presentation. A copy of the informed consent is available for review in this journal.

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