An analysis of an enlarging mycotic abdominal aortic aneurysm in the setting of salmonella enteritis

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Introduction

This is a case study of an ill 82-year-old female who arrived in the emergency department with weakness, abdominal pain, diarrhea, hypotension, and tachycardia.

Background

History of Present Illness:

- 82-year-old female with PMH significant for AAA, Afib, HTN, PAD, diverticulosis, HLD, and GERD presenting for weakness, abdominal pain, and diarrhea x 3 days.
- Patient describes having 5-6 episodes of watery, non-bloody diarrhea daily since Saturday (it was Tuesday). Per family at bedside, patient ate some pork chops Friday night, and Saturday morning the diarrhea started.
- The abdominal pain was located epigastrically, non-radiating, sharp, with some associated fevers, nausea, and fatigue. Patient also recalls feeling very weak, fatigued, and having an episode of falling, in which she hit her head after using the toilet.

Family History:

- Sister and brother had DM, HTH, HLD. Her son had colon cancer.

Social History:

- Denied history of smoking, alcohol, or drug use
- Lived with daughter, retired

Medications:

- Eliquis, metoprolol, nifedipine, lisinopril, rosuvastatin, cilostazol, memantine, pantoprazole

Physical Exam:

- Vital signs: T 98.7F BP 82/54, HR 108, RR 18, SPO2 95% on RA
- Exam: mucous membranes dry, irregular rhythm and rate, epigastric and lower abdominal tenderness bilaterally, no guarding or rebound

Laboratory data:

- CBC: WBC 3.55, Hg 14.2(13-14), Hct40.3, platelet 237, neutrophils 40 L, lymphocytes 9 L, bands 35 H
- CMP: Na+ 132 L, K+ 2.8 L, Cl 94 L, CO2 15 L, AGAP 23 H, glucose 176, BUN 58 (17), Cr 4.35 (0.9-1), GFR 9 (50-60)
- UA +1 leuk est, Negative Nitrites, +1 blood, 5 RBCS, 3 wbcs, +2 bacteria
- Urine culture ++ E. coli and Blood cultures: 2 out of 2 negative
- C Diff negative, Stool PCR positive for salmonella

Imaging:

- CXR and CT head w/o contrast: WNL
- EKG: Atrial fibrillation with rapid ventricular rate of 78-115, No ST segment changes
- CT chest: Enlarging 4.2 cm infrarenal abdominal aortic aneurysm with particular asymmetric lateral posterior wall aneurysm. CTA is recommended for adequate evaluation. 3.3 cm infrarenal AAA in 4/2018. Fluid-filled bowel loops present ileus versus enteritis
- CTA Abdomen: the infrarenal abdominal aorta, which has significantly increased in size since 2018. Maximal diameter of the abdominal aorta at the penetrating ulcer is 4.7 cm. Previously measured 3.4 cm. No evidence of aortic dissection. Thrombosed penetrating ulcer measures 1.9 cm.
- Repeat CTA abdomen 48 hours later showed CT scan shows rectal sheath hematoma versus a mesenteric hematoma. AAA is intact and unchanged from last evaluation 48 hours ago there is no evidence of extravasation for the aneurysm; there is no evidence of rupture. Reports more than likely that the aneurysm is infected likely mycotic aneurysm.

Hospital Course

- Admitted for further workup given severe sepsis, likely from enteritis and concern for enlarging AAA
- Initially admitted to PCU floor, treated for severe sepsis with IVF, antibiotics Rocephin and Flagyl, Afib and HTN medications held in the setting of hypotension
- During hospital course of Day 1 to Day 5, her stool PCR came back positive for Salmonella. Rocephin 1gm daily was continued, and Flagyl was discontinued. Her Acute kidney injury had significantly improved to safely get the CTA Abdomen
- CTA abdomen showed: the infrarenal abdominal aorta, which has significantly increased in size since 2018. Maximal diameter of the abdominal aorta at the penetrating ulcer is 4.7 cm. Previously measured 3.4 cm. No evidence of aortic dissection. Thrombosed penetrating ulcer measures 1.9 cm. We consulted consult vascular surgery and infectious disease.
- At this point, we were considering unlikely but possible salmonella Aortitis; vascular surgery recommended endograft placement due to due to high risk of imminent rupture. Infectious disease increased Rocephin dose from 1 gm daily to 2 gm daily.
- Day 7 to Day 8, patient around 2:00 am became hypotensive 84/51 with HR 125, SpO2 of 89% on RA and less responsive. Stat H&H showed a drop in hemoglobin from 11.8 to 9.3, then 2 hours later 7.1. Negative troponins. WBC 17.83 from 8.97. She was intubated and transferred to the surgical ICU. At the time of the onset of this bleeding, she was on a heparin drip. She then received a total of 4 units PRBC's. Heparin drip stopped and reversed with protamine. She received a stat CTA which showed a blush within an abdominal wall hematoma extending into the abdominal cavity, likely the source of her bleeding. Speaking with family present at bedside, yesterday she had to be grabbed around the abdomen when she almost fell going to the bathroom.
- There was a concern for AAA rupture vs. mycotic aneurysm; other options include bowel perforation from the Salmonella enteritis
- Repeat CTA abdomen 48 hours later showed rectal sheath hematoma versus a mesenteric hematoma. AAA was intact and unchanged, no evidence of extravasation for the aneurysm. There is no evidence of rupture. Reports more than likely that the aneurysm is infected likely mycotic aneurysm.
- IR was consulted, and the patient underwent pelvic angiogram & left inferior epigastric artery angiogram for possible embolization but found no active bleed. Developed rectus sheath hematoma due to heparin gtt for her atrial fibrillation, resolved without intervention.
- Day 9-Day 10, patient's vitals and hemoglobin stabilized, and she underwent successful endovascular repair of abdominal aortic aneurysm (EVAR)
- Diagnosis was that the extension of aneurysm of the aorta was secondary to Salmonella Aortitis; patient would need to be on suppressant antibiotics for at least 1 year, perhaps life long per ID recommendations

Imaging and Procedures

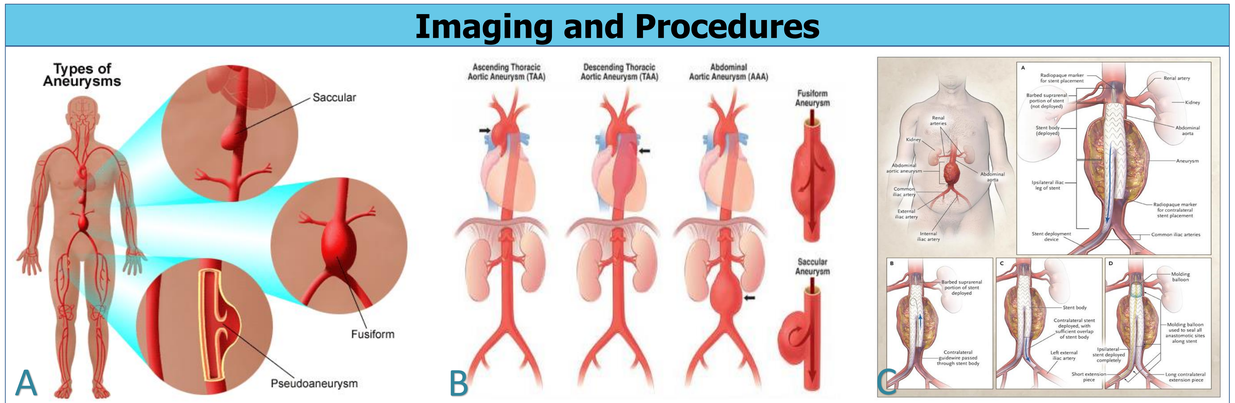

Figure A: Types of Aneurysms
Figure B: Locations of Abdominal Aneurysms
Figure C: EVAR procedure
Figure C: Abdominal Aortic mycotic aneurysm
Figure D: Left rectus sheath Hematoma

Discussion

This is a case presentation of an 82-year-old female admitted with salmonella gastroenteritis and found to have expanding AAA with penetrating ulcer thought to be due to salmonella aortitis.

- A rare complication of a rare condition

Mycotic abdominal aortic aneurysm

- Syphilis, tuberculosis, and untreated endocarditis are the most common causes of mycotic aneurysms
- Although bacteriologic patterns continue to evolve over time, the organisms with the greatest affinity for the arterial wall, *Staphylococcus* spp and *Salmonella* spp, remain the most common.
- Salmonella has a strong affinity for large blood vessels and can easily adhere to the damaged vascular wall, playing a decisive role in the pathogenesis of mycotic aneurysms. The current literature reports that the most important pathophysiological mechanism of mycotic aneurysm is necrosis and rupture of the atherosclerotic vascular wall, which causes the adhesion of bacteria
- Notably, preexisting aneurysms are at risk for secondary infection due to bacteremia or spread from a contiguous infection
- Among the reported cases, the most common complications included rupture of the aneurysm (10/57), psoas abscess (6/57), aneurysmal abscess (2/57), and discitis (1/57)
- The mortality rates were 21.43 and 7.14% after open surgery or endovascular aneurysm repair (EVAR) intervention, respectively. The recurrence rates of infection were 0 and 17.85% for both treatments, respectively

Conclusion

A mycotic abdominal aneurysm developed almost leading to a patient's death. The purpose of his study is to alert medical professionals to the possibility of mycotic aortitis as a rare but life-threatening result of salmonella enteritis in patients with AAA. In this case, a Salmonella-induced mycotic abdominal aneurysm was not anticipated. This situation, along with the inadequate dosing of antibiotics initially and not emergent surgical repair, almost lead to a poor development. The most serious complication of Salmonella aortitis is a mycotic aneurysm formation with subsequent rupture leading to unfortunate consequences. However, with prompt surgical evaluation and therapeutic dosing antibiotics, fatal outcomes can be minimized.

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