

## A case report of fatal mycotic abdominal aortic aneurysm, an unusual complication of methicillin resistant *Staphylococcus aureus* bacteremia.

Leow Mei Yee<sup>1</sup>, Khoo Jun Kit<sup>2</sup>, Yap Jen Fai<sup>3</sup>.

<sup>1</sup> Department of Medicine, Hospital Tengku Ampuan Rahimah; <sup>2</sup> Department of Medicine, Faculty of Medicine, University Malaya Medical Centre, <sup>3</sup> Department of Medicine, Hospital Kuala Lumpur

### Introduction

Mycotic aneurysm is a rare complication of methicillin resistant *Staphylococcus aureus* (MRSA) bacteremia. However, it is associated with a high morbidity and mortality rate.

### Case Report

- A 67-year-old female with underlying type 2 diabetes mellitus, hypertension, dyslipidemia, chronic kidney disease stage 5 and heart failure with preserved ejection fraction presented with a three-day history of right flank pain and fluid overload symptoms.
- Abdominal examination was notable for focal tenderness at the right flank and right renal angle. Examination of the other systems was normal.
- Blood investigation was notable for raised infective markers: white cell count  $35.88 \times 10^9/L$  (4-10) and CRP 271 mg/dL (< 5). Urine analysis was positive for nitrite.
- She was initially diagnosed with right pyelonephritis and treated with intravenous (IV) ceftriaxone 2g once daily.
- Her first blood culture yielded MRSA and ceftriaxone was changed to IV vancomycin. Meanwhile, ultrasound abdomen did not reveal any renal calculi nor were there features suggestive of pyelonephritis.
- Despite adequate vancomycin levels based on therapeutic drug monitoring, repeated blood culture continued to grow MRSA. A transthoracic echocardiogram was negative for any vegetation, ruling out infective endocarditis.
- Despite targeted antibiotic therapy, her right flank pain did not improve. An urgent CT abdomen after 13 days of antibiotics showed severe atherosclerotic changes of the distal abdominal aorta with multiple penetrating atherosclerotic ulcers. The largest wall outpouching or ulcer was at the posterior aspect of the aorta at the level of L5 vertebra, measuring 2.4x 3.3 cm.
- After 14 days of IV vancomycin, repeated blood culture persistently grew MRSA. Serial infective markers did not reduce significantly. Hence, IV vancomycin was changed to IV linezolid.
- Despite multiple red cell transfusion, her haemoglobin level and hemodynamics continued to deteriorate. An oesophagoduodenoscopy was negative for active bleeding.
- Repeat CT abdomen after 7 days of IV linezolid revealed a ruptured mycotic aneurysm. She was referred to Surgery for co-management. However, she was deemed unsuitable for surgical intervention.. She eventually succumbed to her illness on Day 23 of hospitalisation.

**Day 1:** Initial presentation with right flank pain and failure symptoms, diagnosed as right pyelonephritis, started on IV ceftriaxone

**Day 14:** Blood culture continued to grow MRSA, IV Vancomycin changed to IV Linezolid

**Day 20:** Haemoglobin level and hemodynamics deteriorated

**Day 23:** Succumbed to illness

**Day 5:** Blood culture grew MRSA, IV ceftriaxone changed to IV vancomycin



CT Abdomen revealed multiple penetrating atherosclerotic ulcers at distal abdominal aorta.

**Day 22:** Repeat CT Abdomen showed ruptured mycotic aneurysm

### Discussion

- Mycotic aneurysm is defined as an infection of a preexisting aneurysm or the aneurysmal degeneration of arterial wall secondary to bacteremia or septic emboli. Our patient was at risk of mycotic aneurysm as she had chronic kidney disease stage 5 and atherosclerotic abdominal aorta.
- The aorta is the most common site to be affected as it is the most common site for atherosclerosis to occur. Therefore, in our patient, the first CT abdomen which showed severe atherosclerotic abdominal aorta could have raised suspicion of mycotic aneurysm as a complication of MRSA bacteremia.
- *Staphylococcus spp* and *Salmonella spp* are the most common causative pathogens of mycotic aneurysm.
- Mycotic abdominal aortic aneurysm can present atypically but it often presents with retroperitoneal hematoma after it ruptures. Our patient presented with right flank pain which is a symptom seen in other conditions such as pyelonephritis and renal calculi. Her worsening right flank pain was most likely due to the ruptured mycotic aneurysm, which could explain her anemia and worsening hemodynamics.
- It is difficult for antibiotics to penetrate an aneurysm. Hence, our patient developed persistent MRSA bacteremia despite adequate vancomycin and linezolid.
- The definitive treatment for mycotic aneurysm is surgical removal of infected aneurysm and necrotic tissue in addition to antibiotics.

### Conclusion

Mycotic aortic aneurysm may present atypically, mimicking pyelonephritis or renal calculi, obfuscating the diagnosis. Clinicians should keep in mind the diagnosis of mycotic aortic aneurysm as a complication of persistent MRSA bacteraemia, as timely appropriate intervention will lead to optimal patient outcomes.

### References

1. Celeste Sharon Chang, Peterus Thajeb, Han-Hsiang Chen, Chin-Jen Wu. Mycotic Aneurysms and Death in a Hemodialysis Patient. *Seminars in Dialysis* —Vol 18, No 4 (July–August) 2005.
2. Chung-Ching Lee, Yee-Yung Ng, Yi-Hong Chou, Chui-Mei Tiu, Zing Wang, Hui-Ming Yang, Tzen-WenChen, Wu-Chang Yang. Mycotic Aneurysm of the Abdominal Aorta in a Patient Undergoing Hemodialysis: An Unusual Complication of *Staphylococcus aureus* Bacteremia. *Clinical Infectious Diseases* 2000;30:823–4.
3. Morag E. Hogg, Struan W.A. Wilkie, Lawrence L.M. Li, Kevin B. Cassar. Right iliac fossa pain: A case report of abdominal aorta mycotic aneurysm in a patient with methicillin-resistant *Staphylococcus aureus*. *European Journal of Radiology Extra* 65 (2008) 105–107.
4. Anucha Apisanthanarak, Linda M. Mundy. Fatal Bacteremic Mycotic Aneurysm Complicated by Acute Renal Failure Caused by Daptomycin-Nonsusceptible, Vancomycin-Intermediate, and Methicillin-Resistant *Staphylococcus aureus*. *Clinical Infectious Diseases* 2008; 47:858–9. DOI: 10.1086/591279