



## Case report

# Aero to the heart: A case of aortic valve endocarditis caused by *Aerococcus Urinae* in an elderly woman

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## ABSTRACT

*Aerococcus urinae* (*A. urinae*) is an infrequent cause of infective endocarditis (IE) and few cases have been reported especially in older women. As of this publication, there are 31 reported cases of IE caused by *aerococcus urinae*, and of these, 4 are of women, 3 of which are aged > 75 years. Here, we describe a case of *A. urinae* endocarditis in an 80-year-old woman presenting with worsening fatigue. A diagnosis of native aortic valve endocarditis was established based on characteristic findings of aortic valvular vegetation on transesophageal echocardiogram along with isolation of *A. urinae* on blood cultures.

## Introduction

*Aerococcus urinae*, which is a catalase negative Gram-positive cocci belonging to the genus *Aerococcus*, is considered part of the normal flora of the urinary tract [1]. It primarily causes approximately 0.2–0.8 % of all cases of urinary tract infections especially in elderly men with existing urologic abnormalities, including urethral stricture, renal calculi, and prior urinary tract manipulation [2,3]. In the past, *A. urinae* has been commonly misidentified as staphylococci, enterococci, or alpha hemolytic streptococci due to similar microscopic appearances, hemolysis patterns, and antibiotic resistance patterns that have all contributed to its underestimated incidence. However, it has become increasingly identified in urine cultures through growing awareness and improved diagnostic testing as a significant human pathogen [2]. It has been associated with balanitis, soft tissue infections, and septicemia, as well as, endocarditis, which is the most common presentation for disseminated aerococcal bacteremia [2,4]. IE vegetation often involves the aortic valve, followed by the mitral valve in order of prevalence, and may increase in mortality due to complications for embolic events, cardiogenic shock, stroke, renal failure, disseminated intravascular coagulation, or aortic wall ulceration [5,6].

## Case presentation

An 80-year-old female with a past medical history of atrial fibrillation status post implantable loop recorder placement, type 2 diabetes

mellitus, chronic kidney disease stage 3, bilateral hydro-ureteronephrosis, rheumatoid arthritis, obesity, and prior allergic reaction to penicillin presented for one week of worsening fatigue with fever, diarrhea, pelvic irritation, and malodorous urine. On admission, the patient was hypotensive to 72/45 mm Hg and afebrile to 37.1 °C. Physical exam showed dry oral mucosa, chronic venous stasis of lower extremities, and an obese body habitus. Urinalysis revealed bacteria, leukocyte esterase, > 100 WBCs per high powered field, and qualitatively large blood. Testing for SARS-CoV-2 PCR, Legionella urine antigen, and *Streptococcus Pneumoniae* urine antigen were negative. CT abdomen and pelvis was significant for non-obstructing bilateral hydronephrosis with renal calculi measuring up to 1 cm. The patient was initiated on intravenous cefepime and vancomycin, and bilateral ureteral stents were placed to manage obstructive uropathy. Subsequent testing of blood cultures (2 of 2 sets) isolated *A. urinae*. Additional evaluation with transthoracic echocardiography (TTE) demonstrated no valvular abnormalities. Further testing with a transesophageal echocardiogram (TEE) was performed, which showed a 6.7 millimeter vegetation on the ventricular side of the aortic valve (Fig. 1). Antibiotic therapy was transitioned to intravenous ceftriaxone based on susceptibility. Her hospital course was complicated by hypotension requiring vasopressor support and hypercapnic respiratory failure with aspiration pneumonia, requiring broadening of antibiotic therapy to intravenous Meropenem. The patient was then transitioned back to intravenous Ceftriaxone once medically stable and completed a total of four weeks of intravenous antibiotics prior to being discharged to a

Abbreviations: *A. urinae*, *Aerococcus urinae*; IE, infective endocarditis; TEE, transesophageal echocardiogram; TTE, transthoracic echocardiography.

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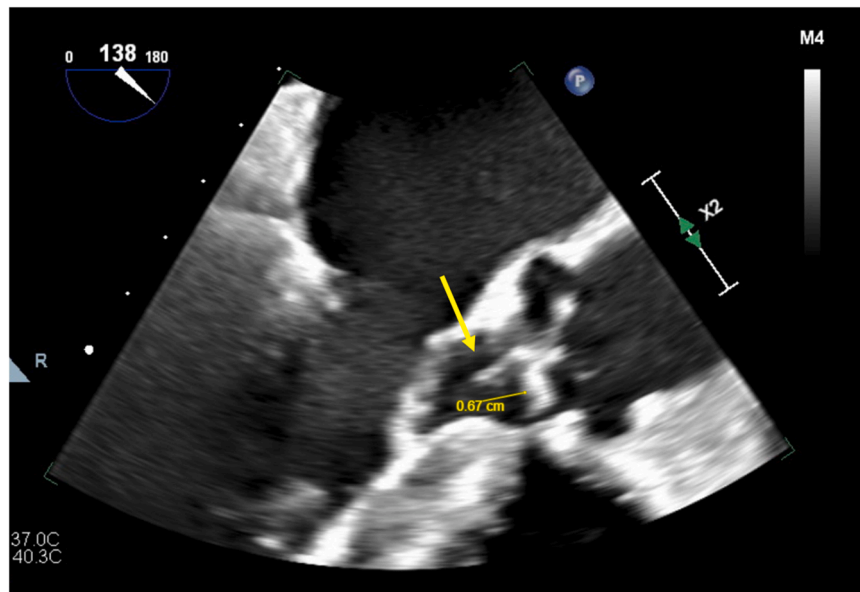


Fig. 1. TEE showing a 6.7 mm aortic valve vegetation.

skilled nursing facility for outpatient follow-up.

### Discussion and conclusions

*Aerococcus urinae* is rarely documented as a cause of IE and rarer still is it seen in women. Per our review of the literature, there are only 31 reported cases of IE caused by *A. urinae*, 4 of which are women and 3 of them are aged > 75 years. In our patient, a screening TTE was performed showing no valvular abnormalities, however, since blood cultures were positive for *aerococcus urinae* (primarily pan-sensitive with intermediate MIC only for Chloramphenicol), we were prompted to perform further investigation with a TEE to evaluate for subacute endocarditis. Based on Duke criteria, the patient was diagnosed with *A. urinae* IE. *A. urinae* has historically been isolated from urinary tract infections [6], and given our patient's initial presenting signs and symptoms, we attributed her bacteremia to translocation from a urinary source. Treatment for *A. urinae* is typically with penicillin, vancomycin, or cephalosporins, with one study showing susceptibility to Meropenem, Bactrim, and tetracyclines, but resistance to sulfonamides and possibly fluoroquinolones [7]. Duration, however, is not yet well-defined since there is limited published information on *A. urinae* as a cause of endocarditis, but a four-week course of penicillin or Ceftriaxone has been noted to yield good results [7,8]. Given our patient's allergy to penicillin, we chose treatment with intravenous Ceftriaxone.

In conclusion, IE is an infrequently seen complication caused by *A. urinae* bacteremia but should not be overlooked as endocarditis can be challenging to treat and can result in further complications in the presence of large vegetations. Although infection from *A. urinae* has been rare in the past, it has become increasingly more recognized as a common human pathogen and implicated as a cause of acute to subacute infections at a similarly increasing rate. *A. urinae* generally causes urinary tract infections in elderly men and especially those with underlying comorbidities, however, as our case report shows, elderly women should not be overlooked as a target population for the bacterium. If *A. urinae* is isolated from blood cultures, evaluation should be performed for IE and early detection by TEE is important. For management, penicillin is seen as the mainstay choice, however, cephalosporin therapy may be considered as an alternative in cases of penicillin allergy, as demonstrated by the current case.

### Ethics approval and consent to participate

The study was approved by the Bioethics Committee at NewYork-Presbyterian Brooklyn Methodist Hospital. The study was conducted according to the principles of the World Medical Association Declaration of Helsinki, Good Clinical Practice Guidelines, and local laws and regulations.

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### CRediT authorship contribution statement

**Aaron Yee:** conceptualization, investigation, writing-original draft preparation, writing-review and editing, visualization. **Ting Ting Wong:** validation, writing-review and editing, supervision. All authors revised the manuscript critically for important intellectual content of the manuscript. All authors read and approved the final manuscript.

### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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### Author contributions

Please specify the contribution of each author to the paper, e.g., study design, data collections, data analysis, writing, others, who have contributed in other ways should be listed as contributors. **Aaron Yee:** conceptualization, investigation, writing-original draft preparation, writing-review and editing, visualization. **Ting Ting Wong:** validation, writing-review and editing, supervision. All authors revised the manuscript critically for important intellectual content of the manuscript. All

authors read and approved the final manuscript.

#### *Consent*

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

#### *Declaration of generative AI in scientific writing*

The authors declare that no AI or AI-assisted technologies were utilized in the writing process.

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