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Aerococcus urinae Aortitis: A Case Report

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Background. *Aerococcus urinae* is a Gram-positive coccus that is increasingly recognized as a urinary pathogen since the introduction of mass spectrometry for identification of bacteria. We report a case of abdominal aortitis (with aneurysm) caused by *A urinae* in a male with recurrent urinary tract infections and recently treated *A urinae* bacteremia. A 63-year-old gentleman with a history of *A urinae* urosepsis 7 weeks prior, presented to the Emergency Department with thoracolumbar back pain radiating bilaterally into the groin. Radiological and surgical findings were consistent with infective infrarenal aortitis with aneurysm.

Methods. The patient successfully underwent open surgical debridement and reconstruction of the infrarenal aorta with autologous vein graft.

Results. *Aerococcus urinae* was isolated from excised tissue. The patient completed a 4-week course of intravenous antimicrobial therapy.

Conclusions. *Aurinae* is a urinary pathogen with the ability to cause severe invasive disease including endovascular infections.

Keywords. abdominal aortitis; *Aerococcus urinae*; endovascular infection; infective infrarenal aortic aneurysm.

Aerococcus urinae is an emerging pathogen [1–3]. *Aerococcus urinae* accounts for between 0.2% and 0.8% of positive urinary cultures, but up to 45% of positive cultures come from asymptomatic patients [3–7]. Bacteremia is the most common invasive disease caused by *A urinae*; however, isolates from a variety of other clinical sites has been reported [1].

Infective endocarditis caused by *A urinae* primarily effects older males with underlying urinary tract abnormalities [8, 9]. We report a rare case of *A urinae* aortitis.

CASE PRESENTATION

A 63-year-old man presented with 5 days of thoracolumbar back pain radiating bilaterally into the groin. Medical history included ischemic heart disease with previous coronary artery bypass, chronic kidney disease, hypertension, dyslipidemia, and peripheral vascular disease. He had an existing urethral stricture and experienced recurrent urinary tract infections (UTIs).

Examination was unremarkable except for hypertension (blood pressure, 220/110 mmHg). Peripheral leukocyte count was 12.1 × 10^9/L (normal range, 4.0–11.0 × 10^9/L) with 6.1 × 10^9/L neutrophils (normal range, 1.9–7.5 × 10^9/L) and an elevated C-reactive protein of 109 mg/L. Two sets of blood cultures and a midstream urine yielded no pathogens.

A computed tomography scan confirmed infrarenal abdominal aortic abnormality with extravasation of intravenous contrast approximately 6.5 cm distal to the right renal artery with periaortic fat stranding in this area (see Image 1 below). Inflammatory change involved the distal 45 mm of the infrarenal aorta with an aortic diameter of 29 mm.

Infrarenal aortic excision and reconstruction with bifurcating femoral vein autograft was performed. Surgical specimens were sent for culture.

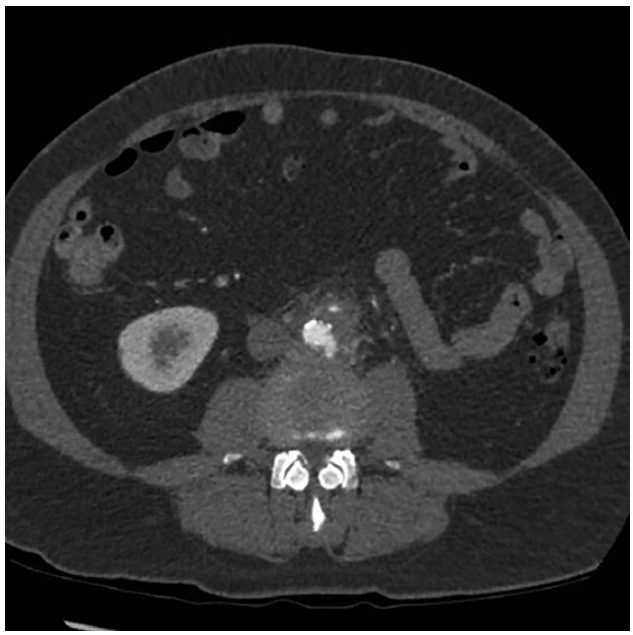

Image 1. Computed tomography scan on admission. Infrarenal aortic contrast extravasation with surrounding periaortic inflammatory fat stranding.

Received 19 August 2019; editorial decision 9 October 2019; accepted 21 October 2019.

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DOI: 10.1093/ofid/ofz453

Microbiology Results

Gram stain of aortic plaque tissue showed occasional neutrophils but no organisms. Light growth of alpha-hemolytic colonies was noted after 48 hours on 5% sheep blood agar incubated aerobically at 35°C. The isolate was identified as *A urinae* by matrix-assisted laser desorption ionization time-of-flight (MALDI-TOF) (bioMérieux, Marcy l'Etoile, France) with a probability score of 99.9% and confirmed using 16S ribosomal ribonucleic acid (rRNA) conventional polymerase chain reaction (PCR) amplification and Sanger sequencing as previously published [10].

Susceptibility testing by minimum inhibitory concentration (MIC) gradient method (Lilofilchem, Roseto degli Abruzzi, Italy) showed the isolate was susceptible to penicillin, vancomycin, meropenem, and ciprofloxacin by the European Committee on Antimicrobial Susceptibility Testing (EUCAST) criteria (penicillin MIC, 0.016 mg/L; vancomycin MIC, 0.5 mg/L; meropenem MIC, 0.03 mg/L; ciprofloxacin [uncomplicated UTI] MIC, 0.06 mg/L).

Additional history revealed that the patient had an admission to hospital 7 weeks earlier for urosepsis where *A urinae* was cultured from blood and urine. All invasive *A urinae* isolates had the same antibiogram. Treatment included 5 days of intravenous cefuroxime 750 mg q8hourly and 5 days of oral ciprofloxacin 500 mg twice daily.

Treatment

Empiric ceftriaxone and vancomycin was administered. The patient's history of anaphylaxis to penicillin was reviewed 1 week after surgery, and he tolerated oral penicillin challenge and successfully completed a further 3 weeks of intravenous benzylpenicillin 0.6 grams q4hourly (renal adjusted dose, creatinine 254 μmol/L).

Follow-Up

There were no surgical complications 3 months after surgery.

Ethics Statement

After discussion with institutional research office, formal ethical approval was deemed unnecessary if written informed consent was obtained. Verbal and written informed consent was obtained from the patient.

DISCUSSION

Older men with underlying urological abnormalities have a predisposition to *A urinae* UTI [3, 11], with a risk of subsequent infection at other sites including endovascular infection [8].

Morphological and biochemical similarities to staphylococci, streptococci, and enterococci have previously led to misidentification and underestimation of *A urinae* disease [2]. The colony morphology of this isolate appeared typical of alpha-hemolytic streptococci on 5% sheep blood; however, it was identified to the species level by MALDI-TOF and confirmed by 16S rRNA PCR sequencing.

Aortic infections are rare but life-threatening conditions most commonly presenting with aneurysm of underlying atherosclerotic lesions [12, 13]. Aortitis caused by *Salmonella* spp, *Staphylococcus aureus*, *Streptococcus* spp, *Klebsiella* spp, *Listeria* spp, and *Candida* spp are well described [12, 14, 15]. Aortitis caused by *Aerococcus viridans* has been reported [15], but this is the first reported case cause by *A urinae*.

The preferred antimicrobial regimen is not clear, but susceptibility results support the use of penicillin and vancomycin as previously reported [2]. In addition, endovascular infections often require both surgical and medical treatment as in this case.

Our patient, at 63 years, was younger than the median age in published series [8, 9], but he had significant risk factors; urinary tract structural abnormality and peripheral vascular disease. His prior episode of bacteremia was treated with 5 days of intravenous cefuroxime and 5 days of oral ciprofloxacin. This would have been indaqueate to effectively treat an endovascular infection.

CONCLUSIONS

In this study, we report the first case of *A urinae* infective aortitis. *Aerococcus urinae* particularly effects older males with abnormalities in the urinary system. Further elucidating its role as a uropathogen and determining the best treatment approach may be helpful to manage invasive complications that are increasingly being recognized with the help of new technologies.

Acknowledgments

We acknowledge significant contributions by Emma McLean, Anna Vesty, and Mary Bilkey. We also acknowledge the medical laboratory scientists at the Department of Microbiology LabPLUS. Finally, we acknowledge the medical and surgical staff who take great care of our patients every single day of the year.

Author contributions. S. M. and A. V. C. conceived the idea for publication. A. V. C., S. M., and S. A. R. drafted the initial manuscript. A. V. C., S. M., S. A. R., and A. A. H. revised the manuscript and provided input. A. A. H. and A. V. C. obtained informed consent. A. V. C., S. M., S. A. R., and A. A. H. read and approved the final manuscript.

Potential conflicts of interest. All authors: No reported conflicts of interest. All authors have submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest.

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