CASE REPORT

Case Report: A rare case of prosthetic valve infective endocarditis caused by *Aerococcus urinae* [version 1; referees: awaiting peer review]

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Abstract

Infective endocarditis (IE) is a serious and life threatening cardiac condition, most commonly caused by staphylococci, streptococci, enterococci and rarely by HACEK organisms (*Haemophilus*, *Aggregatibacter*, *Cardiobacterium*, *Eikenella corrodens* and *Kingella*). Here, we present a case of IE caused by *Aerococcus urinae* in a 75-year-old man with a bioprosthetic aortic valve. *Aerococcus urinae* is a gram-positive, catalase negative microorganism, and is usually an isolate of complicated urinary tract infections in the elderly male population. It is associated with high morbidity and mortality. Awareness of this organism as a cause of IE is important, since failure to recognize the condition may lead to adverse clinical outcomes and significant complications with even fatal outcome, as in this case.

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Introduction
The diagnosis of infective endocarditis (Habib et al.) is based on a number of factors, including patient history, physical examination, as well as diagnostic tools (blood cultures, chest X-ray and echocardiography) (Durack et al., 1994), (Lukes et al., 1993). Risk factors for IE include advanced age (> 60 years), male gender, history of intravenous drug use, poor dentition, structural or valvular heart disease and presence of prosthesis. It is most commonly caused by *Staphylococcus aureus*, *Streptococcus viridans*, and enterococci, and rarely by HACEK (Sharara et al., 2016) organisms. Here, we describe a rare case of IE secondary to *Aerococcus urinae*, a gram-positive, catalase negative coccus that grows in clusters. It is associated with high mortality and neurological complications (Ebnother et al., 2002).

Case report
A 75-year-old Caucasian man presented to his local hospital with malaise, fever and nausea for 5 days. He had a bio prosthetic aortic valve replacement for mixed aortic valve disease 12 years ago, further significant past medical history included placement of a permanent pacemaker for complete heart block, right total hip replacement, hypertension and benign prostatic hyperplasia (BPH). The patient had no history of smoking, alcohol consumption or illicit drug use. The patient had no recent surgeries or dental work and the review of systems was unremarkable. The physical exam revealed vital parameters of HR 97 bpm regular, BP 134/87, temperature of 101.5°F, respiratory rate of 18 per minute and oxygen saturation of 96% on room air. On precordial auscultation a systolic and a diastolic murmur were heard in aortic area, mild bi-basal crepitation, but no JVD or peripheral edema. The rest of the physical exam was unremarkable. His labs showed a normal white cell count (WCC) of 9.9 × 10^6/L, but his C-reactive protein (CRP) was elevated to 214.9 (normal <5mg/L) with a stable haemoglobin (11.2 g/dl), further labs were unremarkable. His mid-stream urine showed WCC < 20; red cell count (RCC) of 20-50 and it grew mixed organisms, all considered part of the normal flora. Chest X-ray, CT scan of the brain, thorax, abdomen and pelvis did not show any significant cause of sepsis. The patient was empirically commenced on IV piperacillin-tazobactam and vancomycin for sepsis treatment. His blood cultures grew *Aerococcus urinae* sensitive to penicillin within 24 hours of admission.

A trans-thoracic echocardiogram showed mild aortic regurgitation and mitral regurgitation with no clear vegetation, however, trans-esophageal echocardiogram (TOE) showed a moderate aortic regurgitation due to a large mobile vegetation on the bio-prosthetic aortic valve with normal left ventricular function, no peri-valvular abscess was noted (See Image 1a and 1b). Clinical presentation, echocardiographic findings and positive blood cultures fulfilled Duke’s criteria (Hoen et al., 1996) for IE. Patient was managed as prosthetic aortic valve endocarditis from *Aerococcus urinae* with IV amoxicillin 2 grams every 4 hours, and gentamicin 1 mg/kg twice daily as per local guidelines. Antibiotic therapy for 6 weeks in total with early surgery for prosthetic valve replacement was planned (Truninger et al., 1999).

Despite prompt initiation of appropriate antibiotic treatment and intensive clinical monitoring, the patient failed to improve this hospitalization and developed a large pulmonary edema and progressive aortic regurgitation, and died before definitive surgery. As per family’s wishes, an autopsy was not performed.

Discussion
*Aerococcus urinae* is a gram-positive, catalase negative coccus which grows in clusters. It is mostly associated with urinary tract infections in elderly men, especially in the setting of structural abnormalities e.g. BPH, urethral strictures and nephrolithiasis. It has been associated with culture negative infective endocarditis (Slany et al., 2007). It is reported to be sensitive to penicillins/
cephalosporins and resistant to sulfonamides and aminoglycosides (Skov et al., 2001). There are less than 20 reported cases of IE caused by Aerococcus urinae worldwide.

Despite being sensitive to common antibiotics, prosthetic valve endocarditis (PVE) secondary to Aerococcus urinae can be difficult to manage with antibiotic therapy alone, and often requires surgical intervention (Wang et al., 2007). The indications for surgical intervention for PVE include severe prosthetic dysfunction, severe heart failure, large persistent vegetation and abscess or peri-valvular involvement (Habib et al., 2005). The presence of vegetation on the valve created a consistent source of bacteria that could embolize and can serve as a source of sepsis.

This case highlights the importance of source control by expediting prosthesis removal in presence of overt symptoms of worsening cardiac failure and worsening prosthetic dysfunction (regurgitation in this case), as medical therapy alone may not be sufficient to effectively treat Aerococcus urinae IE despite appropriate sensitivities. Early identification is crucial and can be life-saving. The main problem is current diagnostic testing for microorganisms – whereas 16s sequencing would be the most time-efficient method, it’s rarely done, as the expertise is limited and costs are high. Recently, there is good evidence for the use of MALDI-TOF (Senneby et al., 2013), (Senneby et al., 2016) due to increased detection rates, even in direct comparison to 16s sequencing.

In conclusion, Aerococcus urinae used to be a rare cause of IE but rates have been increasing significantly within the last 10 years. Therefore establishing a concise and broadly acknowledged protocol from diagnosis up to patient management is critical.

Consent
Written informed consent for publication of their clinical details was obtained from the patient. Permission was also granted from a next of kin for publication of the manuscript.

Competing interests
No competing interests were disclosed.

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References


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