

***Aerococcus* spp infective endocarditis following a prostate biopsy: a case report**

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ABSTRACT

We report a rare case of an infective endocarditis by *Aerococcus* spp in a bioprosthetic aortic valve following a prostate biopsy, in an asymptomatic adult with no additional risk factor for prostate cancer, excepting for age. The diagnosis was based on the presence of vegetations on the bioprosthesis seen on the echocardiogram, positive blood cultures and fever, and a favorable clinical outcome following the treatment with ceftriaxone and gentamicin.

KEYWORDS: Prostate biopsy. Infective endocarditis. Bioprosthesis. Aortic valve.

BACKGROUND

Aerococci are Gram-positive, catalase-negative cocci bacteria comprised of seven species with similar growth characteristics to those of streptococci and enterococci^{1,2}. Generally, they are considered as a contaminant in clinical cultures, however *A. viridans*, *A. urinae* and *A. sanguinicola* have been reported as etiologic agents in rare cases of bacteremia, urinary tract infections, spondylodiscitis and infectious endocarditis (IE)²⁻⁶. Risk factors for systemic infections have not yet been fully elucidated and a standardized treatment regimen for these pathogens are not well established^{7,8}.

To date, less than 20 cases of *A. viridans* IE have been described in the literature. In Brazil, one case was published in 2014¹. Moreover, along with the rise in the use of invasive diagnostic procedures, one case of an infectious complication after an inguinal excisional biopsy was described⁹. Aerococci species determination is problematic and proper identification should be based on genetic methods or matrix-assisted laser desorption ionization time-of-flight mass spectrometry^{2,10}.

We report a case of *Aerococcus* spp IE following a prostate biopsy in an asymptomatic adult who was screened for prostate cancer.

CASE REPORT

A 65-year-old man attended the emergency room because of isolated fever for five days. Though dysuria was not present, a urinary culture was positive for *Escherichia coli*, and the patient was discharged with a prescription of nitrofurantoin.

After three weeks, he returned to the same emergency room due to the persistence of fever despite the use of antibiotics. He reported a weight loss of 7 kg, anorexia and adynamia since the onset of symptoms. He had a history of alcoholism, had diabetes mellitus diagnosed 5 years before, and degenerative calcified aortic

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stenosis with valvular replacement by a bioprosthesis three years before. One month before the onset of symptoms, a prostate cancer screening revealed a total prostatic specific antigen (PSA) of 6.27 ng/mL (normal: ≤ 4 ng/mL), a free PSA of 0.52 ng/mL (normal: ≤ 0.93 ng/mL), and a prostatic biopsy performed without any antibiotic prophylaxis within the week in which the patient presented with fever. The histopathology result was compatible with usual acinar adenocarcinoma, Gleason 3+3.

Dipyron was administered, and the patient was admitted to the hospital for further investigation. The initial laboratory evaluation was unremarkable, excepting for a normochromic normocytic anemia (Table 1). Ceftriaxone 2 g every 24 h was initiated.

After admission, the patient developed severe chills and the high fever persisted. On examination, the temperature was 38.0 °C, blood pressure was 120/70 mmHg and the heart rate was 64 beats per minute. Skin pallor was present. A systolic murmur grade 1/4 was best heard in the aortic area. The abdomen was soft, and a 2 cm non-tender liver was palpable but there was no evidence of an enlarged spleen. The remainder of the physical examination was normal.

Abdominal ultrasonography, chest X-ray and examination of the urine sediment were unremarkable. Blood cultures were collected, and a transesophageal echocardiogram (TEE) was performed.

TEE revealed an aortic-valve bioprosthesis with severe stenosis (maximum and mean gradient were 86 and 50 mmHg, respectively; a flow area of 0.54 cm²) and a filamentary image highly suggestive of a vegetation, measuring 10 mm. Also, vegetations were seen in the

ascending aorta proximal to the valve annulus. Blood cultures isolated an *Aerococcus viridans* in 3 of 3 flasks by using the Vitek 2 Compact System (bioMérieux, Marcy l'Etoile, France). All blood culture bottles were collected at the same time. The isolate was susceptible to penicillin G, ceftriaxone, tigecycline, linezolid, teicoplanin, vancomycin, clindamycin and gentamicin. The ceftriaxone regimen was maintained, and gentamicin 60 mg every 12 h was initiated for a total of 6 weeks.

The patient presented with great improvement, fever and chills resolved. The use of gentamicin led to an acute kidney injury after two weeks of treatment (creatinine highest level 1.5 mg/dL). Due to the renal impairment, the cardiothoracic surgery staff suggested an elective valve replacement after two weeks, and the patient was discharged.

The acute kidney injury resolved, and the infected biological valve was successfully replaced after two weeks, as planned (Figure 1). Unfortunately, the excised valve was not sent to histopathology analysis or to bacterial culturing at that time. Regarding the prostate adenocarcinoma, radiotherapy was prescribed by the oncologist and the patient responded well.

DISCUSSION

A. viridans is an infrequent human pathogen commonly found in dust, raw vegetables, animals, and animal products, as well as human skin and urinary tract^{7,8,11}. Other aerococci have been described as causative agents of IE¹¹. This rare infection has been reported in 12 cases worldwide (Table 2), one of which is the case of a Brazilian patient¹.

Table 1 - Laboratory data

	Reference range	On hospital admission	6 th day after admission	On discharge
Hb (g/dL)	12-16	8.5	8.6	8.8
Ht (%)	36-46	25.7	27.2	29.4
Leucocytes (cells/mm ³)	4,500-11,000	9,200	10,070	10,030
Blasts (%)	0-4	0	0	-
Segmented (%)	45.5-73.5	78	76	73
Lymphocytes (%)	0-4.4	18	22	21
Platelets (10 ³ /mm ³)	140-500	231	254	250
Urea (mg/dL)	19.3-49.2	34	64	74
Creatinine (mg/dL)	0.50-1.10	0.8	1.3	1.4
Sodium (mEq/L)	135-145	135	136	137
Potassium (mEq/L)	3.5-5.5	4.5	5.0	5.5
Total bilirubin (mg/dL)	0-1.2	0.44	-	-
Albumin (g/dL)	3.5-4.7	3.7	-	-
CRP (mg/dL)	< 0.3	-	13.02	3.6

Hb = hemoglobin; Ht = hematocrit; CRP = C-Reactive protein.

However, among those, only in one of the reports specific methodologies were performed to confirm that *A. viridans* was the causative agent⁷.



Figure 1 - Aortic valve prosthesis infected with biological explant.

In all the reported cases, symptoms and laboratory findings were non-specific. Blood cultures and echocardiography were essential to provide the final diagnosis. In our case, the patient was diagnosed as having infective endocarditis due to *Aerococcus* spp. based on the modified Duke’s criteria, including one major criterium

[vegetation on transesophageal echocardiography (TEE)] and three minor criteria (predisposing heart condition, fever and positive blood culture)¹⁵. Although *A. viridans* was isolated in blood culture, at the time no further confirmatory tests were performed. A previous report by Cattoir *et al.*¹⁶ demonstrated that all eight cases of *A. sanguinicola* were erroneously identified as *A. viridans* using the Vitek 2 system. Several isolates identified as *A. viridans* were probably *A. sanguinicola*, which is more prevalent.

The association of penicillin or a cephalosporin and an aminoglycoside was prescribed in eight of the 12 cases (66.6%) reported. Surgical approach was chosen in five^{1,8,11}. In our case, the ceftriaxone and gentamicin regimen was adopted and the patient responded well.

The prevalence of infectious complications after prostate biopsy is about 0.1 to 7%, and antibiotic prophylaxis is recommended¹⁷. Although cases of IE as an infective complication have been described, to our knowledge this is the first report of *Aerococcus* spp IE following a prostate biopsy.

Recent randomized clinical trials and meta-analysis studies have found that PSA screening leads to early cancer detection in asymptomatic men, however, this strategy revealed a small or no disease-specific and an overall mortality reduction^{18,19}. Our patient developed a complication of the prostate biopsy following the PSA screening, even though he was asymptomatic and had no known risk factors (i.e. black ethnicity, family history or Lynch syndrome) for prostate cancer, excepting for age, which probably resulted in the overdiagnosis.

Table 2 - Summary of *A. viridans* infective endocarditis reports in literature

Articles	Age	Sex	Time to diagnosis	Treatment	Additional confirmation	Valve replacement	Outcome
Popescu <i>et al.</i> ⁶	49	M	7 months	Ampicillin + Amikacin	No	No	Cure / No relapse
Popescu <i>et al.</i> ⁶	62	M	1 month	Ceftriaxone + Amikacin	No	Yes	Cure / No relapse
Popescu <i>et al.</i> ⁶	40	M	3 weeks	Penicilin G + Gentamicin	No	No	Cure / No relapse
Popescu <i>et al.</i> ⁶	45	F	3 days	Penicilin G + Gentamicin	No	Yes	Cure
Janosek <i>et al.</i> ¹²	10	M	1 month	Norfloxacin + Amikacin	No	Yes	Cure
Untereker <i>et al.</i> ¹³	28	M	6 months	Penicilin G + Gentamicin	No	Yes	Cure / No relapse
Calik <i>et al.</i> ¹⁴	44	M	Days	Penicilin + Streptomycin	16S rRNA sequencing	No	Death
Li <i>et al.</i> ¹⁵	54	M	4 months	Penicilin	No	No	Cure / No relapse
Chen <i>et al.</i> ⁷	58	M	4 days	Cefotaxime + Vancomycin	No	No	Cure
Cattoir <i>et al.</i> ¹⁶	44	F	2 weeks	Ampicillin + Gentamicin	No	No	NI
Zhou <i>et al.</i> ⁸	69	M	5 weeks	Penicilin	No	Yes	Cure
Orati <i>et al.</i> ¹	56	F	8 days	Ampicillin + Vancomycin	No	No	Cure

M = male; F = female; 16S rRNA = ribosomal RNA subunit 16; NI = not informed

CONCLUSIONS

This report illustrates a rare case of bioprosthetic aortic valve infective endocarditis following a prostate biopsy. We could not confirm whether the isolated bacterium was an *A. viridans* or an *A. sanguinicola*, so that we chose to refer to it as an *Aerococcus* spp. The diagnosis was clinically defined by the Duke modified criteria and the patient responded well to treatment with ceftriaxone and gentamicin. Clinicians should consider prostate cancer screening for selected patients and be aware of potential risks and complications.

CONFLICT OF INTERESTS

The authors declare no conflict of interests.

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