A Rare Case of AICD Endocarditis caused by Staphylococcus Saprophyticus Treated Successfully with Antibiotics

V Laskova, K Cervellione, R Mendelson, H Vo, V Shamalov, F Bahgeri

Citation

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Abstract

To date, there have been two cases of endocarditis caused by S. saprophyticus reported in the literature; both involved native valves and had serious to deadly courses. We report the first case of endocarditis of a prosthesis due to S. saprophyticus; it appeared to affect the right atrium and possibly the mitral valve as well. The infection did not occur as a result of urinary tract infection; it is assumed that the causative agent may have entered the body through a tunneled catheter for hemodyalisis, though the catheter insertion site exhibited no signs of infection. In addition, this case represents the first report of endocarditis caused by S. saprophyticus that was successfully treated with antibiotic therapy. This case illustrates the potential for infection of a prosthesis in addition to native valves caused by S. saprophyticus and also the potential for successful treatment with antibiotics.

INTRODUCTION

Staphylococcus saprophyticus is a coagulase-negative staphylococcus (CoNS) species that is most commonly associated in humans with uncomplicated urinary tract infections in young, sexually active females ([1]). Rarely, infections due to S. saprophyticus have progressed to become more serious, causing acute pyelonephritis ([2]), septicemia ([3]) and nephrolithiasis ([4]). To date, S. saprophyticus has been reported as the cause of endocarditis twice in the literature ([5], [6]). In both cases, a native valve was affected. One case required valve replacement ([5]) and the other resulted in death of the patient ([6]). Here we present the first reported case of endocarditis of a prosthesis due to S. saprophyticus, as well as the first case of endocarditis caused by S. saprophyticus which was successfully treated with antibiotic therapy.

CASE REPORT

A 58-year-old female presented to the emergency room with fatigue, fever, chills, shortness of breath upon exertion, intermittent chest pain and dry cough for the previous four days. She denied any nausea, vomiting, abdominal pain, urinary symptoms or diarrhea. She was receiving hemodialysis for end stage renal failure via a right internal jugular tunneled catheter. A blood culture taken by the primary care physician two days prior to admission was positive for CoNS. The patient's medical history was positive for hypertension, diabetes mellitus, coronary artery disease with PCI and hypercholesterolemia. She had stent placement in the left anterior descending artery after myocardial infarction five years prior to the current admission and implantable cardiac defibrillator (AICD) placement 3-4 weeks prior to the current admission. The catheter site showed no signs of infection.

The patient reported drug allergies to penicillin, tetracycline, vancomycin and tobramycin; therefore, she was started on quinupristin/dalfopristin and ciprofloxacin to treat possible tunneled catheter infection. Removal of the catheter was considered, but it was decided to wait to determine whether there was improvement in symptoms after beginning treatment. TEE revealed a 5x3 mm, highly echogenic density on the tip of the anterior leaflet of the mitral valve with a small amount of independent motion, suggestive of a vegetation versus a calcification of the leaflet (Figure 1). The right atrium (RA) showed a pedunculated, medium-sized, echogenic density with a tiny, more mobile surface excrescence at the junction of the inferior vena cava and the RA cavity consistent with a vegetation. There was also a 12x10 mm, fixed density with a mobile excrescence at the

junction of the RA and the superior vena cava involving the catheter representing a vegetation or thrombus (Figure 2). There was moderate regurgitation of the mitral and tricuspid valves. Four blood cultures (from arm) taken on the first three days of admission grew Staphylococcus saprophyticus/CoNS that was resistant to ampicillin, cefazolin, cefepime, cefotaxime, ciprofloxacin, amoxicillin, gentamicin, imipenem and oxacillin. Treatment was switched to quinupristin/dalfopristin and daptomycin on day 2, which was prescribed for 6 weeks. The presenting symptoms of fever and chills resolved and hospitalization course was uneventful. Blood cultures from days 9 and 10 of admission were negative.

Figure 1

Figure 1: Transesophogeal Echocardiogram reveals a 5x3mm heavily echogenic density at the tip of the anterior leaflet of the mitral valve with a small amount of independent motion. This likely represents a vegetation or calcification.

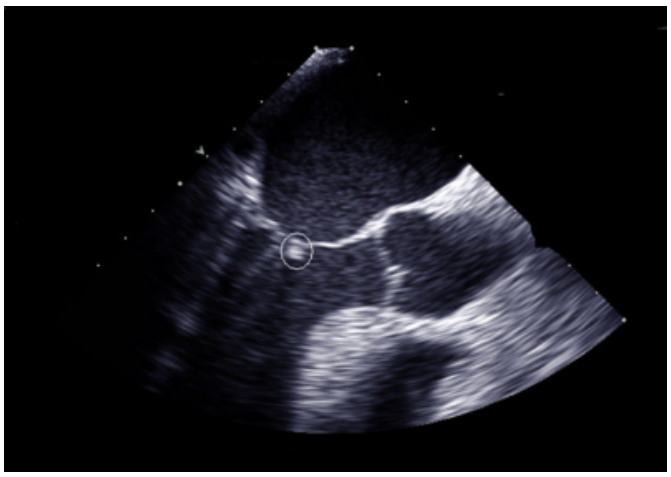
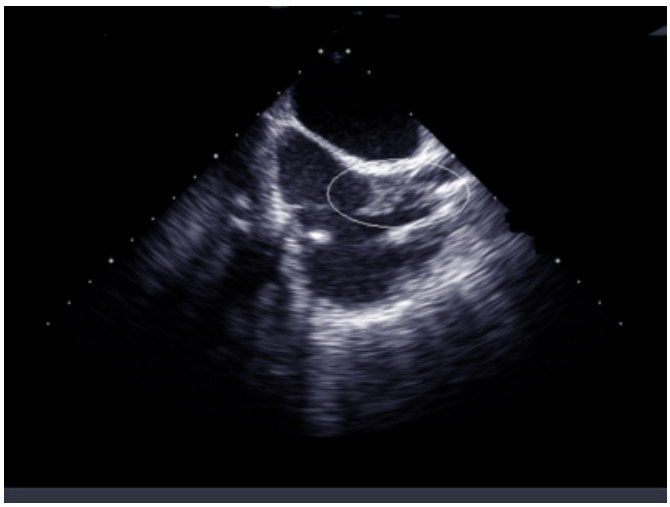


Figure 2

Figure 2: Transesophogeal Echocardiogram reveals a definite 12x10 mm, fixed density with a mobile excrescence at the junction of the RA and the superior vena cava involving the catheter likely representing vegetation.



The patient was transferred to another facility on day 10 of admission to be evaluated for possible revision of the AICD. The patient continued treatment at the receiving hospital. During her 17 day stay at the second facility she had no recurrence of the presenting symptoms except for a low-grade fever on days 15 and 16. Daily repeat blood cultures were consistently negative. Repeat TEE showed improvement of the infective endocarditis since the initial TEE approximately three weeks prior. All labs were within normal limits. It was decided not to remove the AICD due to improvement of the infection and the lack of further symptom development. The patient was eventually discharged to a nursing home facility to complete 6 weeks of antibiotic treatment.

The patient has been followed for 10 months since admission. She has had two subsequent hospitalizations, one for atrial fibrillation and one for coagulopathy due to drug interaction. There have been no signs or symptoms of endocarditis reoccurrence.

DISCUSSION

Although S. saprophyticus is an inhabitant of the genitourinary skin, there was no apparent cutaneous source of infection in our patient, nor any genitourinary tract procedure. This is similar to previously reported cases ([3], [4]) and is in accord with a recent report y of all blood cultures positive for S. saprophyticus in a tertiary care hospital ([7]). In the report, 7 patients with positive cultures had clinically

significant bacteremia, none of which originated from the urinary tract. It was assumed that the portal of entry was most often tunneled central venous catheter (n = 4 patients). S. saprophyticus has been found to be a contaminant of several types of raw meat, which can eventually colonize the human gastrointestinal tract ([8]). No signs of gastrointestinal symptoms were present in our patient. The patient may have had contact with raw meat that could have caused the infection, though this was not confirmed.

Due to S. saprophyticus' apparent resistance to numerous antibiotics, as demonstrated here and previous reports ([5]), early identification of the causative organism is of great importance for successful treatment. There have been similar reports about the resistance of other CoNS to numerous antibiotics ([10]). One previous study reported that two-thirds of CoNS infections identified by blood culture were resistant to methicillin. Those that were resistant to methicillin were also resistant to gentamycin (90% of cases), erythromycin (80%), clindamycin (72%), trimethoprim-sulfamethoxazole (68%), ciprofloxacin (67%), tetracycline (60%), chloramphenicol (56%) and fusidic acid (25%) ([11]). Of all cultures (both methicillin-susceptible and methicillin-resistent), no CoNS were resistant to vancomycin or teicoplanin; this indicates that these two antibiotics may be the best initial treatment options for unspecified CoNS endocarditis ([11]). In our case, the patient had numerous drug allergies that limited the first line of treatment, but susceptibility tests demonstrated that combined quinupristin/dalfopristin and daptomycin was an appropriate treatment, which proved to be successful.

While CoNS are a common cause of prosthetic valve endocarditis ([9]), there has never been a report of endocarditis of a prosthesis due to S. saprophyticus. In our case, in addition to the involvement of the AICD, it appears that the right atrium and the mitral valve may have also been infected. Outcomes of patients who have prosthetic valve endocarditis are generally poor compared to those with native valve infections ([10]). In the two previously reported cases of endocarditis caused by S. saprophyticus, which were both native valve infections, more severe outcomes were reported. Death in the first reported case of IE caused by S. saprophyticus could have been due to the patient's weakened immune system from advanced HIV infection ([4]). The second previously reported case may have had a more severe outcome due to the longevity of the symptoms, which were present for 8 weeks prior to the diagnosis of endocarditis ([3]). In the case we present here, manifesting symptoms, including fever, were only present for four days prior to admission.

This report demonstrates the possibility of endocarditis of a prosthesis due to S. saprophyticus and also illustrates that the infection can be treated successfully with medical therapy, even given the agents' resistance to many antibiotics. Though the two previous reports of endocarditis caused by S. saprophyticus had complicated courses, the case described here shows that if the infection is diagnosed early and is treated with proper medications, it can be successfully remedied without surgical intervention, even if it involves a prosthesis.

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Author Information

Violetta Laskova, MD
Jamaica Hospital Medical Centre

Kelly L. Cervellione, MA
Jamaica Hospital Medical Centre

Robert Mendelson, MD
Jamaica Hospital Medical Centre

Hieu Vo, MD
Jamaica Hospital Medical Centre

Vyacheslav Shamalov, MD
Jamaica Hospital Medical Centre

Farshad Bahgeri, MD
Jamaica Hospital Medical Centre