Aortic Valve Endocarditis in a Transplanted Heart After Urethral Instrumentation

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Endocarditis represents a rare but life-threatening condition after heart transplantation. Recent American Heart Association guidelines recognize cardiac transplant patients with valvulopathy as high risk for endocarditis, but acknowledge that there were not sufficient data to make a recommendation for prophylaxis. Also, genitourinary procedures were no longer considered a risk factor for endocarditis in the most recent guidelines. We present a patient who acquired aortic valve endocarditis of the intact valve, after multiple urethral instrumentation 2 years after heart transplantation, who was successfully treated by aortic valve replacement and prolonged antibiotic therapy.

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Infective endocarditis (IE) in heart transplant (HTx) patients is a rare but life-threatening condition. Immunosuppression makes such patients prone to severe sepsis with 67% to 80% mortality reported in different series [1, 2]. Tricuspid and mitral valves are involved more frequently with atrial wall and myocardial involvement being reported as well [2]. Isolated aortic valve IE is very rare in HTx patients. Staphylococcus aureus and Staphylococcus epidermidis are most frequently isolated microorganisms in IE early after HTx and usually associated with sternal and mediastinal infection. Late after HTx, endocarditis is usually caused by Enterococcus and Aspergillus fumigatus [2]. Enterococcal IE was reported in only 4 patients in reported series, 1 of whom was 18.5 months post HTx, one 11 months, and for the remaining 2, the time after HTx was unknown [1, 2]. Enterococci are increasingly associated in nosocomial IE involving intravenous catheterization or instrumentation [3]. They are the predominant microorganism isolated in patients with IE after genitourinary (GU) procedures, suggesting the association of the procedure with IE [4]. However, GU procedures are no longer considered a risk factor for endocarditis in 2007 American Heart Association (AHA) guidelines [5].

A 50-year-old man diagnosed with end-stage heart failure due to ischemic cardiomyopathy, underwent orthotopic heart transplantation using a biatrial technique in January 2011. Postoperative course was uneventful, except for a 7-day course of amoxicillin and clavulanic acid for asymptomatic E.coli isolate in his urine. He was given a standard immunosuppression therapy with cyclosporine, mycophenolate mofetil, and prednisolone. Four months after surgery, he observed weak urine stream and was diagnosed with multiple urethral strictures. Five months after HTx he underwent internal urethrotyom in spinal anesthesia. Perioperative prophylaxis included a 7-day peroral course of sulfamethoxasole and trimethoprim 2 × 960 mg. Over the next 8 months, his urethra was dilated on 6 more occasions, each time with periprocedural prophylaxis with peroral norfloxacin 2 × 400 mg over 5 days, and sterile urine pre-procedurally. He was then diagnosed with Peyronie penile induration and started on intralesional verapamil injections. One month prior to admission, the patient developed shortness of breath, mild dyspnea on exertion, cough, and fever up to 37.5°C, which coincided with seasonal flu vaccination. He was started on peroral amoxicillin clavulanic acid 2 × 1 g for 7 days, followed by a 5-day course of nitrofurantoin 2 × 100 mg for Enterococcus faecalis isolated in his urine (>10⁵ colony forming units/mL). After institution of the antibiotic therapy the symptoms and fever resolved. After obtaining a sterile urine culture he underwent another urethral dilatation with 7-day prophylactic course of sulfamethoxasole-trimethoprim 2 × 960 mg for 5 days. He was admitted 2 days later, subfebrile (37.5°C) with mild dyspnea on exertion. Early diastolic murmur 2-3/6 was heard in the third left intercostal space. Echocardiography revealed severe aortic regurgitation (3+) (Fig 1A) with two 1 × 1 cm vegetations on the ventricular side of right and noncoronary leaflets (Fig 1B). No perianural abscess was depicted on transesophageal echocardiography. At admission, his white blood cell count was 5.7 × 10^9/L with C-reactive protein of 28 mg/L and C3 and C4 complement components of 1.18 g/L and 0.25 g/L, suggesting a subacute phase of the disease. Three pairs of GU cultures were drawn, one of which grew Enterococcus faecalis and the patient was started on vancomycin 2 × 1 g and gentamicin 3 × 80 mg intravenously.

Intraoperative course was standard with resternotomy after right femoral cannulation. Inspection of the aortic valve revealed right coronary cusp perforation and a vegetation on the noncoronary cusp (Fig 2). After excision of the native valve, aortic valve replacement with a 23-mm CE Magna Ease pericardial bioprosthesis (Edwards Lifesciences, Irvine, CA) was performed in a standard fashion. Enterococcus faecalis was isolated from aortic valve tissue as well. Postoperative course was notable for incipient renal dysfunction with a drop in creatinine clearance to 30 mL/min, after which vancomycin was replaced with ampicillin and gentamicin dose reduced to 3 × 40 mg intravenously. Renal function had recovered afterward with creatinine clearance 68 mL/min. Antibiotic therapy continued up to a total of 6 weeks.
Comment

This case report illustrates a rare occurrence of IE in a transplanted patient after multiple GU instrumentations, despite a conservative prophylaxis standpoint taken, not entirely justified by current guidelines.

There are no specific guidelines on IE prevention in HTx patients due to insufficient data. The 1997 “AHA Recommendations for prevention of IE” state that HTx patients are most frequently considered as a moderate-risk category because of immunosuppression and increased risk for valvular dysfunction in episodes of rejection [6]. Genitourinary and gastrointestinal procedures (GI) were removed from 2007 AHA prevention of IE guidelines as one of the major changes [5], despite the historic reports of up to 24% incidence of bacteremia after urethral dilatation [7] and more recent 9% incidence of IE after GU and GI procedures [4], suggesting GU instrumentation as a non-negligent potential source of IE. Bacteremia after GU procedures was significantly associated with pre-procedural urinary tract infection, suggesting the need for antimicrobial prophylaxis [7]. Furthermore, there was still no specific recommendation on prophylaxis for HTx patients other than prophylaxis for dental procedures in cardiac transplant patients “who develop cardiac valvulopathy” [5].

We considered our patient at risk despite the absence of any valvular pathology and had urine cultures analyzed before each urethral dilatation. He was administered antibiotics accordingly, as well as periprocedural prophylaxis. Despite that, he acquired IE in between 2 urethral dilatations during the period in which 1 Enterococcus faecalis positive urine culture was obtained, illustrating that even such a conservative stand might not be successful in completely eliminating IE risk. It is our opinion that more emphasis should be put on the choice of antibiotic and timing of prophylaxis as well as adequate duration of antibiotic treatment if positive cultures were obtained prior to any invasive procedure. Regular microbial screening for asymptomatic bacterial contamination might be in order to ease the choice of antibiotic. All things considered, we still feel that HTx patients, due to their increased potential of adverse outcome of IE, should accordingly be considered at least as moderate, and in some instances (repeated infections, instrumentations, etc) even as a high risk of IE acquisition and treated as such.

References