Corynebacterium jeikeium Native Valve Endocarditis Following Femoral Access for Coronary Angiography

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We present a unique case of rapidly fatal native aortic-valve endocarditis due to Corynebacterium jeikeium, with inoculation as a complication of repeated femoral vascular access for coronary angiography.

There are few reported cases of native aortic-valve infective endocarditis due to corynebacterium (diphtheroid) species, despite their presence as normal skin flora [1]. We report a unique case of native valve endocarditis due to Corynebacterium jeikeium (group JK), resulting from repeated femoral manipulations for coronary angiography.

Case Report. A 63-year-old obese woman with a history of coronary artery bypass–graft surgery underwent percutaneous saphenous vein–graft (SVG) angioplasty and stenting via right femoral artery cannulation 6 weeks prior to presentation. At original presentation, transthoracic echocardiography demonstrated a normal aortic valve without aortic insufficiency. She returned 1 week later with unstable angina, necessitating repeat angioplasty of her SVG stent, again performed via right femoral artery cannulation. This second procedure was complicated by a large right groin hematoma, managed by manual compression.

During the succeeding month, she experienced intermittent fevers to 38.9°C, progressive malaise, fatigue, and generalized weakness. She presented to an outside hospital with recurrent angina. At that time, she was afebrile, without findings suggestive of localized infection on physical examination. Blood samples for 4 sets of cultures were obtained. Examination of cardiac enzymes showed no evidence of myocardial injury, and she was transferred to our facility for repeat cardiac catheterization.

On arrival, she was found to have an oral temperature of 37.8°C and a blood pressure of 112/50 mm Hg. Cardiac examination revealed distant heart sounds and no murmurs. Physical examination revealed no evidence of local or systemic infection and no peripheral embolic or immunologic stigmata of infectious endocarditis. Her medical history was notable for polymyalgia rheumatica, for which the patient took prednisone (2.5 mg/d). Laboratory testing revealed a WBC count of 8400 cells/mm3, with 36% neutrophils and 46% band forms. Two additional sets of blood cultures were obtained.

At cardiac catheterization, but prior to crossing the valve, the patient developed acute respiratory distress requiring emergent intubation. Catheterization of the right side of the heart revealed significantly elevated filling pressures. Aortography demonstrated severe (4+) aortic insufficiency. Emergent transesophageal echocardiography showed mobile vegetations involving the left and right aortic-valve leaflets (figure 1), with severe aortic insufficiency.

Intravenous vancomycin and gentamicin were administered, and the patient underwent emergent aortic valve replacement with a bioprosthesis. Pathologic examination of the native valve revealed focal acute endocarditis with abscess formation. Anaerobic bottles from all blood cultures grew diphtheroid species, susceptible to vancomycin and ciprofloxacin but resistant to gentamicin.

Postoperatively, the patient remained hypotensive despite...
pressor support. On the fourth postoperative day, in the setting of worsening multiorgan-system dysfunction, the family requested withdrawal of support, and the patient expired.

Postmortem examination revealed an intact bioprosthetic valve, evidence of an ischemic splenic infarction, and diffuse ulcerations throughout the gastrointestinal tract consistent with ischemia. State reference laboratory speciation of blood cultures revealed Corynebacterium jeikeium.

Discussion. As physicians offer invasive diagnostic and therapeutic options to more patients with cardiac disease, the number of infectious complications of percutaneous transluminal coronary angioplasty (PTCA) and stenting are expected to rise. Nevertheless, bacteremia and endocarditis complicating such procedures remain surprisingly rare. One study noted a 0.64% rate of PTCA-related bacteremia, with the offending organisms being Staphylococcus aureus, coagulase-negative staphylococci, and group B streptococci [2]. Our patient demonstrated 2 of the independent risk factors for PTCA-related bacteremia identified in that study—namely, repeated catheterization at the same site and difficult vascular access as a result of her body habitus.

C. jeikeium is a gram-positive rod that exists as part of the normal skin flora, particularly in the axillary, rectal, and inguinal regions of hospitalized patients [3]. Disruption of the integument may lead to bacteremia and subsequent septic complications, particularly in immunocompromised hosts or in patients with prosthetic devices [4].

Although C. jeikeium infection is not an uncommon cause of prosthetic valve endocarditis, we are aware of only 10 previously reported cases of native valve endocarditis due to C. jeikeium. The majority of patients had either structurally abnormal valves and/or chronic indwelling hemodialysis catheters [5–7]. One patient had a peritoneovenous shunt, and one patient had no risk factors [8].

A major difficulty with C. jeikeium infection is the organism’s resistance to multiple antibiotics. Whereas most non-diphtheroid corynebacteria are susceptible to penicillin and gentamicin, C. jeikeium, as in our case, is typically resistant. Our isolate was susceptible only to vancomycin, ciprofloxacin, and erythromycin. Serious infection with corynebacteria is therefore treated with vancomycin with or without an aminoglycoside until susceptibility testing is performed. Although quinolones demonstrate in vitro activity against many C. jeikeium isolates, their added role to vancomycin is unknown. A reported case of resistance developing within 8 days of monotherapy with ciprofloxacin [9] should make one approach this option with extreme caution.

Our patient demonstrated a normal aortic-valve morphology 6 weeks prior to her final admission. The temporal relationship between the final presentation and contemporaneous PTCA suggests that the femoral access was the likely mechanism of inoculation of C. jeikeium. The patient’s ultimate demise was the result of a prolonged period of hypoperfusion and end-organ damage, despite what appeared to be a successful valve replacement by clinical and autopsy evaluation. Reasons for the acute compromise prior to the catheter crossing the valve as well as the lack of clinical findings prior to this event are unclear.

Although infectious complications of PTCA are uncommon, measures to decrease risk should be undertaken routinely. Repeat catheterization at the same site and prolonged placement of arterial sheaths should be avoided when possible. Although the risk of PTCA-related infection may be too low to justify routine administration of periprocedure antibiotics, such prophylaxis may be warranted in high-risk cases. Finally, the isolation of diphtheroids from patients who have undergone intravascular instrumentation deserves close attention.

This case demonstrates that even organisms with relatively low virulence, such as C. jeikeium, can cause lethal native valve endocarditis in immunocompetent patients without structural heart disease. The increased invasiveness of modern medicine may well transform C. jeikeium into an emerging pathogen.

References