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Case Report

Perivalvular Abscess of Tricuspid Valve: A Rare Complication of Infective Endocarditis

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Abstract

Infective endocarditis is a serious complication of intravenous (IV) drug abuse, with a reported mortality of 5 to 10%. A 21-year-old man, who was an intravenous drug abuser, presented with fever and dyspnea. Transthoracic echocardiography showed a highly mobile, large vegetation on the anterior leaflet of the tricuspid valve. Despite antibiotic therapy for ten days, the patient remained febrile. Transesophageal echocardiography revealed severe aortic regurgitation and an echo-lucent space between the tricuspid and aortic valves. Color Doppler demonstrated a flow within the echo-lucent space and a connection between that and the left ventricle, suggesting a perivalvular abscess of the tricuspid valve opening in the left ventricle. The patient was transferred to the operating room, where he unfortunately expired.

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Introduction

The incidence of infective endocarditis (IE) remained relatively stable from 1950 through 2000 at about 3.6 to 7.0 cases per 100,000 patient-years.[1] In selected areas, the incidence may rise because of the concentration of populations at uniquely high risk of infection, specifically intravenous (IV) drug abusers. The risk of IE among IV drug abusers, 2 to 5% per patient-years, is several-fold greater than that for patients with rheumatic heart disease or prosthetic valves. IE is located on the tricuspid valve in 46 to 58% of patients with IV drug abuse. IV drug abuse is a risk factor for recurrent native valve endocarditis. Staphylococcus aureus causes more than 50% of IE occurring in IV drug abusers overall and 60 to 70% of infection involving the tricuspid valve.

The clinical manifestation of IE in IV drug abusers depends on the valve involved and, to a lesser degree, on the infecting organism. The sensitivity of transthoracic echocardiography (TTE) for the detection of vegetations in patients with native valve endocarditis (NVE) is approximately 65%, whereas that of transesophageal echocardiography (TEE) in these patients is 85 to 95%.[2] TEE is the preferred approach in patients in whom TTE is technically suboptimal and is the procedure of choice for imaging the pulmonic valve.[3] When initial TEE is negative and the clinical suspicion of IE remains, repeating TEE within 7 to 10 days is advocated.[4]

Perivalvular abscess or intracardiac fistula formation occurs in 10 to 14% of patients with NVE.[6] Persistent, otherwise unexplained, fever despite appropriate antimicrobial therapy in patients with IE suggests infection extending beyond the valve leaflet. Perivalvular abscess of the tricuspid valve is very rare. TEE is superior to TTE for detecting invasive infection in patients with NVE and prosthetic valve endocarditis (PVE). Cardiac surgery should be considered to debride abscesses, allowing the eradication of uncontrolled infection, and to reconstruct cardiac structures, restoring homodynamic and alleviating congestive heart failure.

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Case report

A 21-year-old man, who was an IV drug abuser, presented with fever and dyspnea. TTE showed highly mobile, large vegetation on the anterior leaflet of the tricuspid valve and no vegetation on the aortic valve, mitral valve, and pulmonic valve. The patient was admitted to the cardiology ward for antibiotic therapy and received vancomycin and gentamycin. The blood culture of the patient became positive for staphylococcus areus 3 times in 24-hour intervals. Despite the antibiotic therapy for 10 days, the patient remained febrile and developed severe dyspnea. TEE revealed severe aortic insufficiency, moderate tricuspid regurgitation, and an echo-lucent space between the tricuspid and aortic valves (Figures 1).

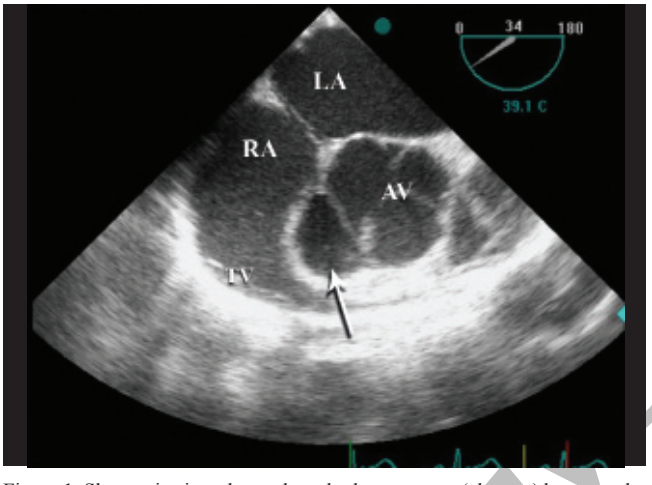

Figure 1. Short axis view shows the echo lucent space (abscess) between the tricuspid and aortic valve (arrow)
LA, Left atrium; RA, Right atrium; AV, Aortic valve; TV, Tricuspid valve

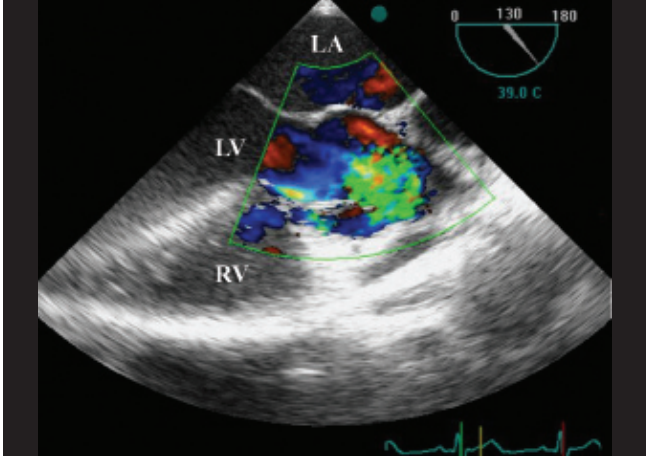

Figure 2. Color Doppler imaging demonstrating the flow within the echo lucent space and connection between that and left ventricle (LV)
LA, Left atrium; RV, Right ventricle

Color Doppler demonstrated a flow within the echo-lucent space and a connection between that and the left ventricle, suggesting a perivalvular abscess of the tricuspid valve opening in the left ventricle (Figure 2). After consultation with a cardiac surgeon, the patient was transferred to the operating room, where he unfortunately expired due to severe bleeding and disseminated intravascular coagulation.

Discussion

IE is a serious complication of IV drug abuse, with a reported mortality of 5 to 10%.[1] Endocarditis in IV drug abusers commonly involves the tricuspid valve, and Staphylococcus aureus is the most common causative organism. Fever and chills are the most common symptoms. Dyspnea, cough, and chest pain are the common complaints of IV drug users. This is likely related to the predominance of tricuspid valve endocarditis in this group and secondary embolic showering of the pulmonary vasculature. Within a week after the initiation of effective antimicrobial therapy, almost 70% of patients with NVE or PVE are afebrile and 90% have defervesced by the end of the second week of treatment.[5] Persistence or recurrence of fever more than 10 days after the initiation of antibiotic therapy identifies patients with increased mortality rates and with complications of infection or therapy.[5] Patients with a prolonged or recurrent fever should be evaluated for intracardiac complications.

Perivalvular infection beyond the valve leaflet results in abscesses in the annulus or adjacent structures, intracardiac fistulas, and purulent pericarditis. Periannular extension is common, occurring in 10 to 40% of all native valve IE and complicates aortic valve endocarditis more commonly than mitral or tricuspid valve endocarditis.[3] Intra-cardiac fistulas are rarely seen and they are estimated to account for < 1% of all cases of IE.[6] Fistulization of the paravalvular abscess has been found in 6 to 9% of all cases.[7] Perivalvular abscess and intracardiac fistula of the tricuspid valve is very rare. TEE is the method of choice for abscess detection. IE is a lethal disease if not treated aggressively with parental antibiotics, often in combination with surgery. Cardiac surgery should be considered in patients with perivalvular abscess and intracardiac fistula to debride abscesses and to reconstruct cardiac structures, restoring homodynamic and alleviating congestive heart failure.

Conclusion

Perivalvular abscess of the tricuspid valve is a rare complication of infective endocarditis. TEE is the method of choice for abscess detection.

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