Massive Calcified Tricuspid Valve Endocarditis in a Patient with Dual Lumen Tunneled Venous Catheter

Mina Farag, MD,1 Alexander Weymann, MD,1 Bastian Schmack, MD,1 Helmut Rauch, MD,2 Matthias Karck, MD, PhD,1 and Gábor Szabó, MD, PhD1

Infection is the most common cause of death in hemodialysis patients after cardiovascular complications. The long-term use of venous catheters for dialysis elevates the risk. Valvular calcification is of special concern in developing infective endocarditis and is often found in chronic dialysis patients. The right-sided endocarditis is rarely reported in the literature and may be overseen until the development of further complications. In our case tricuspid valve endocarditis, with severe insufficiency and stenosis due to a calcified laminar plate was found in a 57-year-old female patient undergoing dialysis due to end-stage renal disease. The calcification aroused from the tip of the dual lumen tunneled venous catheter used for routine dialysis. We replaced the tricuspid valve with mechanical valve prosthesis and reconstructed the right atrium.

Keywords: right-sided infective endocarditis, valvular calcification, tunneled venous catheter, hemodialysis

Case Report

A 57-year-old female patient (weight: 113 kg, height: 165 cm, NYHA IV, [NYHA: New York Heart Association]), with a history of nephrotic syndrome requiring hemodialysis since 2008, was transferred to our intensive care unit suffering cardiac decompensation. She showed severe tricuspid valve insufficiency (IV°) with right atrial and right ventricular dilatation, causing severe impairment of the right ventricular function developing ascites and anasarca. Lung embolus was ruled out using computed tomography (CT)-imaging. Her right and left
cardiac catheterization showed elevated pulmonary artery pressures and no signs of significant coronary artery stenosis with normal left ventricular function. The echocardiography showed a calcified circular plate in the right atrium with a fluctuating structure, causing functional stenosis (mean gradient: 7 mmHg, calculated opening area: 1.3 cm²) of the tricuspid valve (Fig. 1a–1d). The most probable cause for the calcification was a tunneled dual lumen venous catheter, which was implanted over a period of 3 years to establish dialysis access. She suffered earlier from atypical pneumonia, which was treated successfully with Piperacillin/Tazobactam. Repeated blood culture examinations were preformed without yielding a causative microbial agent. However, the patient was continuously under antibiotic treatment for the aforementioned purulent pneumonia. The intraoperative finding showed massive calcification extending to the free wall of the right atrium, with destructive bacterial vegetation of the tricuspid valve leaflets (Fig. 2a–2c).

After excision of the severely destroyed valve a mechanical prosthesis was implanted and the atrial wall was reconstructed (Fig. 2d).

Total cross clamp was 31 minutes and CPB time was 91 minutes. The patient recovered slowly and was transferred to our intensive care unit (ICU). Later on, the patient underwent pacemaker insertion because of a higher-grade atrioventricular block.

Discussion

Dialysis access still represents a challenge in some patients. The ease and convenience of venous catheters led them to rapidly gaining acceptance for both temporary and permanent hemodialysis access. However, bacteremia and bacterial colonization of those catheters attributes greatly to patient morbidity and mortality. The US Renal Data System Morbidity and Mortality Study wave 1, showed a relative risk for infection-related death.
of 2.3 for venous catheters compared with arteriovenous fistulas.\textsuperscript{10} Infective endocarditis was reported in up to 20\% of cases, increasing with hemodialysis vintage.\textsuperscript{4,11} Many reports on dialysis-related endocarditis did not include any patients with right-sided endocarditis. Hanslik observed that right-sided endocarditis might have been overseen. He also reported that valve calcification represents an additive risk factor for endocarditis – similar to our case.\textsuperscript{11,12} In this case the patient started deteriorating and retaining fluid because of manifested right-sided heart failure. Blood cultures were negative and signs of infection were attributed to her atypical pneumonia. Hence, the diagnosis of right-sided endocarditis requires a high index of suspicion, especially in patients with venous catheters implanted over long period of time as an access for hemodialysis. The modified Duke’s Criteria combined with echocardiography (especially transesophageal echocardiography [TEE]) may alleviate the diagnosis. It is noteworthy, that central venous catheters are mostly associated with left-sided endocarditis involving the mitral valve, the aortic valve, or both and that the tricuspid valve is rarely affected.\textsuperscript{8} Altogether raising the awareness for endocarditis in dialysis patients and routine use of (transesophageal) echocardiography in those patients to check for calcifications or valvular vegetation seems mandatory. Despite the acute right ventricular decompensation, our patient recovered well from the procedure.

\textbf{Disclosure Statement}

None.

\textbf{References}

4) Hoen B. Infective endocarditis: a frequent disease

\textbf{Fig. 2} (a) Intraoperative view with massive intra-atrial calcification extending to the tricuspid valve. (b) Extracted calcifications and vegetation. (c) Intraoperative image depicting destructed tricuspid valve leaflets. (d) Intraoperative situs after completed mechanical prosthesis implantation.