Pulmonary valve infective endocarditis (PVIE) fully removed by the percutaneous approach with Angiovac: First report on 6-month follow-up

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DOI: 10.33963/v.phj.102631

Received:
August 13, 2024

Accepted:
September 16, 2024

Early publication date:
October 1, 2024

Pulmonary valve infective endocarditis is a very rare disease where the ambulatory diagnosis can be challenging. We are presenting a case of a 45-year-old male patient admitted to the Department of Cardiology from a small suburban hospital with suspicion of endocarditis.

The patient was admitted in septic shock (C-reactive protein [CRP] 298 mg/l, procalcitonin 37 ng/ml), blood pressure 60/40 mm Hg, and with acute renal failure (creatinine 4.4 mg/dl, estimated glomerular filtration rate = 16 ml/min/1.73 m^2). Before admission to the suburban hospital, the patient was treated ambulatorily with amoxicillin for three weeks because of recurring fevers. On transthoracic echocardiography, the additional mass of 6 × 10 mm in the right ventricular outflow track with a connection to the pulmonary valve was diagnosed, as well as moderate insufficiency. The patient received septic shock treatment with triple antibiotics [1] (gentamicin, cloxacillin, and ampicillin). After clinical stabilization in transesophageal echocardiography (TEE) (Figure 1A), the additional mass has increased to 8 × 12 mm. After 48 hours, a culture of *Haemophilus parainfluenzae* was diagnosed in the blood samples. The target antibiotic, ceftriaxone, 4 g/day *i.v.,* was introduced. The patient suffered from fever, kidney failure, CRP, and decreased procalcitonin levels. In 16 days of hospitalization and 14 days of target treatment, the fever came back, and the CRP and procalcitonin levels increased with clinical deterioration. TEE showed enlargement of pulmonary valve vegetation to 14 × 22 mm. The antibiotic therapy was changed to meropenem. The patient received a consultation for an open procedure, and he refused to give his consent in writing. Then he received a consultation in our cardiac surgery center regarding a percutaneous approach.

After obtaining his written consent, the Angiovac procedure in the hybrid room (ultrasonography, TEE, and X-ray) was performed on January 4, 2024, with the fully percutaneous femoral-femoral approach. In the right common femoral vein, the 26 Fr sheath was introduced, and after the crossing of the tricuspid valve and the secondly pulmonary valve first, the 0–20 Angiovac (Angiodynamics, US) was placed under the pulmonary valve (Figure 1B). The angle of right ventricular outflow tract and aorta hugging were involved in positioning, so the suction tips were not able to reach the vegetation (Figure 1C). The change to the 0–180 Angiovac system was key to safety of vegetation suction under the pulmonary valve (Figure 1D). The procedure was performed with the centrifugal pomp (Rotaflow, Germany) up to 2500 revolutions per minute (3.5 l/min), and the blood was reinfused using the left common femoral vein cannulated percutaneously with 19 Fr return cannula. The blood loss was <200 ml, and the mass was observed in the filter chamber; TEE

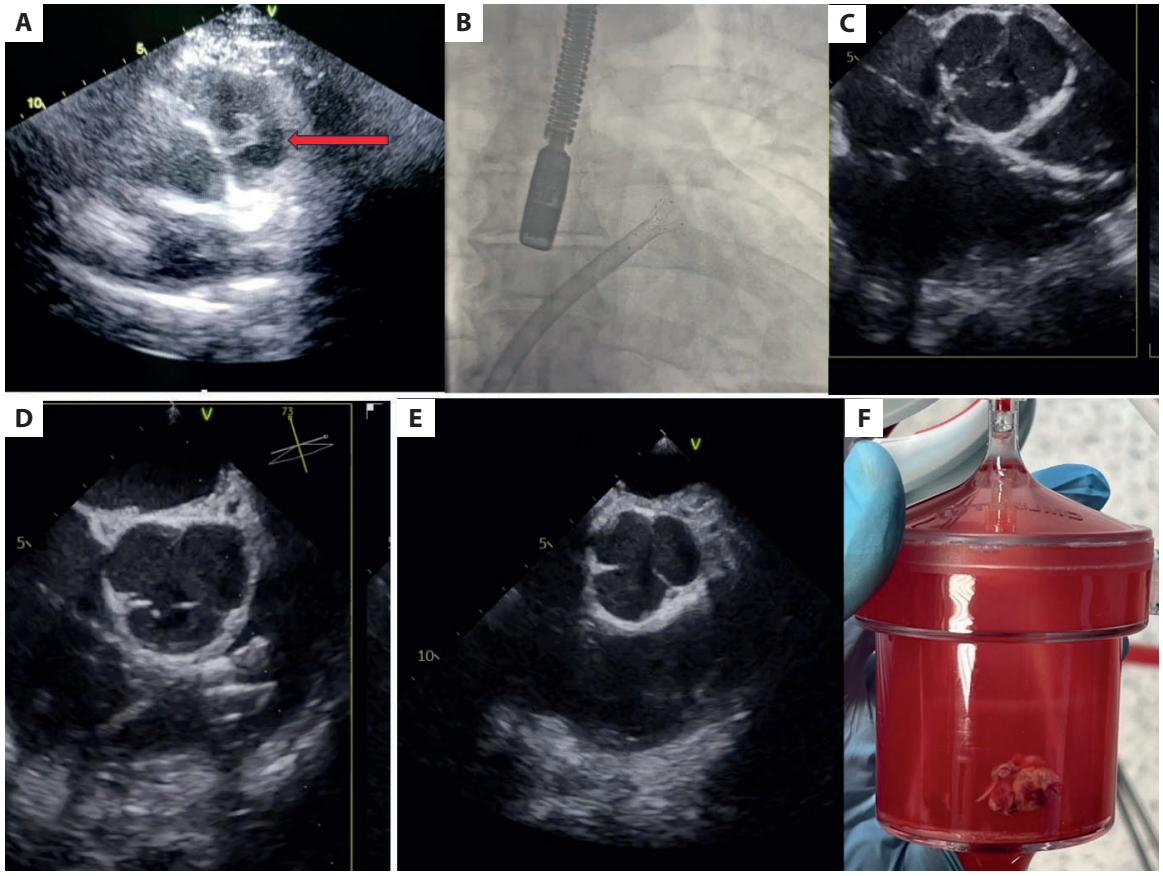

Figure 1. A. Pulmonary valve vegetation (arrow) visualized on transthoracic echocardiogram. **B.** Fluoroscopy image, an anterior-posterior view, AngioVac system introduced into the right ventricle under the pulmonary valve. **C.** Angiovac 0-20 degree system not able to reach the vegetation because of aorta hugging; transesophageal echocardiogram (TEE) image. **D.** Angiovac 0–180 degree system able to reach vegetation in safe distance to the pulmonary valve (TEE image). **E.** Post-procedure TEE of the right ventricular outflow tract. **F.** Vegetation in the filter chamber

confirmed the complete mass removal (Figure 1E). In the mass (Figure 1F), *H. parainfluenzae* colony was confirmed. The patient returned to the cardiology department on the fifth day after the procedure. He had no fever; pulmonary insufficiency was moderate, with vena contracta of 6 mm. For the next 4 weeks, the patient received ceftriaxon *i.v.* He was discharged home in good condition (CRP 2.2 mg/dl).

After 6 months of follow-up, transthoracic echocardiography did not show any vegetation on the pulmonary valve with mild insufficiency of vena contracta (3 mm). The patient, as of the day of publication (4 months after discharge), is under monthly control [2].

The Angiovac system has a confirmed place in tricuspid vegetation removal from the right atrium [3, 4]. This is the first percutaneous procedure of pulmonary valve infective endocarditis treatment, which will open a new era of treatment for right heart infective endocarditis.

Article information

Conflict of interest: None declared.

Funding: None.

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