



POLISH HEART JOURNAL

Kardiologia Polska

The Official Peer-reviewed Journal
of the Polish Cardiac Society
since 1957

Online first

This is a provisional PDF only. Copyedited and fully
formatted version will be made available soon

ISSN 0022-9032

e-ISSN 1897-4279

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

Authors: Sebastian Stefaniak, Robert Bujak, Mateusz Puślecki, Aleksander Araszkiwicz, Sławomir Katarzyński, Jan Błażejowski, Małgorzata Dobosiewicz, Grzegorz Grzešek, Wojciech Barancewicz, Marek Jemielity

Article type: Clinical vignette

Received: August 13, 2024

Accepted: September 16, 2024

Early publication date: October 1, 2024

This article is available in open access under Creative Common Attribution-Non-Commercial-No Derivatives 4.0 International (CC BY-NC-ND 4.0) license, allowing to download articles and share them with others as long as they credit the authors and the publisher, but without permission to change them in any way or use them commercially.

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

Short title: PVIE removed percutaneously

Sebastian Stefaniak^{1*}, Robert Bujak^{2*}, Mateusz Puślecki³, Aleksander Araszkiwicz⁴, Sławomir Katarzyński¹, Jan Błazejewski², Małgorzata Dobosiewicz², Grzegorz Grześk², Wojciech Barancewicz⁵, Marek Jemielity¹

¹Department of Cardiac Surgery and Transplantology, Poznan University of Medical Sciences, Poznań, Poland

²Department of Cardiology, Pharmacology and Internal Medicine, Collegium Medicum in Bydgoszcz Nicolaus Copernicus University of Toruń

³Department of Medical Rescue, Poznan University of Medical Sciences, Poznań, Poland

⁴Department of Cardiology, Poznan University of Medical Sciences, Poznań, Poland

⁵Internal Medicine Ward, NZOZ „Nowy Szpital w Nakle i Szubinie sp. z o.o.”

*Both authors equally contributed to the study.

Correspondence to:

Sebastian Stefaniak MD, PhD,
Department of Cardiac Surgery and Transplantology,
Poznan University of Medical Sciences
Długa 1/2 Poznań, Poland
phone: +48 61 854 92 33,
e-mail: seb.kos@icloud.com

Pulmonary valve infective endocarditis is very rare disease were the ambulatory diagnosis can be challenging. We are presenting a case of 45-years old male patient admitted to the Department of Cardiology from 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 acute renal failure (creatinine 4.4 mg/dl, estimated glomerular filtration rate = 16 ml/min/1.73 m²). Before the admission to suburban hospital patient was treated ambulatory with the amoxicillin for three weeks because of recurring fevers. In transthoracic echocardiography the additional mass 6 × 10 mm in right

ventricular outflow track with the connection to pulmonary valve was diagnosed with moderate insufficiency. The patient received septic shock treatment with triple antibiotics [1] (gentamicin, cloxacycline and ampicillin). After clinical stabilization in transoesophageal echocardiography (TEE) (Figure 1A) the additional mass has increased to 8 × 12 mm. After 48 hours culture *Haemophilus parainfluenzae* was diagnosed in blood samples. The target antibiotic ceftiaxon 4 g/day *i.v.* was introduced. Patient reveal from fever, kidney failure, CRP and procalcitonin levels decreased. In 16-day of hospitalization, 14-day of target treatment the fever came back, the CRP and procalcitonin level increased with clinical deterioration. The TEE revealed enlargement of pulmonary valve vegetation to 14 × 22 mm. The antibiotic therapy was changed to meropenem. Patient was consulted for open procedure and he refused consent in writing. He was consulted in our cardiac surgery center for a percutaneous approach.

After a written consent the Angiovac procedure in hybrid-room (ultrasonography, TEE and X-ray) was performed January 4, 2024 with the fully percutaneous femoral-femoral approach. In right common femoral vein the 26 Fr sheath was introduced and after the crossing of tricuspid valve and secondly pulmonary valve first the 0–20 Angiovac (Angiodynamics, US) was placed under the pulmonary valve (Figure 1B). The angle of RVOT and aorta hugging were involved in positioning so the suction tips was not able to reach the vegetation (Figure 1C). The change to 0–180 Angiovac system was a key point to safety of vegetation suction under the pulmonary valve (Figure 1D). The procedure was performed on the centrifugal pump (Rotaflow, Germany) up to 2500 RPM (3.5 l/min) and the blood was reinfused using left common femoral vein cannulated percutaneously with 19fr return cannula. Blood lost was <200 ml and mass was observed in filter chamber, TEE confirmed 100% mass removal (Figure 1E). The mass (Figure 1F) was confirmed *H. parainfluenzae* colony. Patient returned to cardiology department fifth day postoperative. After the procedure there were no fever, pulmonary insufficiency was moderate with vena contracta of 6 mm. For next 4 weeks patient received ceftriaxon *i.v.* He was discharged home in good condition (CRP 2.2). After 6 months control transthoracic echocardiography did not show any vegetation on pulmonary valve with mild insufficiency vena contracta = 3 mm. Patient to 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 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.

Open access: This article is available in open access under Creative Common Attribution-Non-Commercial-No Derivatives 4.0 International (CC BY-NC-ND 4.0) license, which allows downloading and sharing articles with others as long as they credit the authors and the publisher, but without permission to change them in any way or use them commercially. For commercial use, please contact the journal office at polishheartjournal@ptkardio.pl

REFERENCES

1. Habib G, Lancellotti P, Antunes MJ, et al. 2015 ESC Guidelines for the management of infective endocarditis: The task force for the management of infective endocarditis of the European Society of Cardiology (ESC). Endorsed by: European Association for Cardio-Thoracic Surgery (EACTS), the European Association of Nuclear Medicine (EANM). *Eur Heart J.* 2015; 36(44): 3075–3128, doi: 10.1093/eurheartj/ehv319, indexed in Pubmed: 26320109.
2. Habib G, Erba PA, Iung B, et al. EURO-ENDO Investigators. Clinical presentation, aetiology and outcome of infective endocarditis. Results of the ESC-EORP EURO-ENDO (European infective endocarditis) registry: a prospective cohort study. *Eur Heart J.* 2019; 40(39): 3222–3232, doi: 10.1093/eurheartj/ehz620, indexed in Pubmed: 31504413.
3. Moriarty JM, Rueda V, Liao M, et al. Endovascular removal of thrombus and right heart masses using the angiovac system: results of 234 patients from the prospective, multicenter registry of angiovac procedures in detail (RAPID). *J Vasc Interv Radiol.* 2021; 32(4): 549–557.e3, doi: 10.1016/j.jvir.2020.09.012, indexed in Pubmed: 33526346.
4. Riasat M, Hanumanthu BK, Khan A, et al. Percutaneous treatment of right heart endocarditis. *Kardiol Pol.* 2023; 81(10): 1028–1029, doi: 10.33963/KP.a2023.0176, indexed in Pubmed: 37537923.

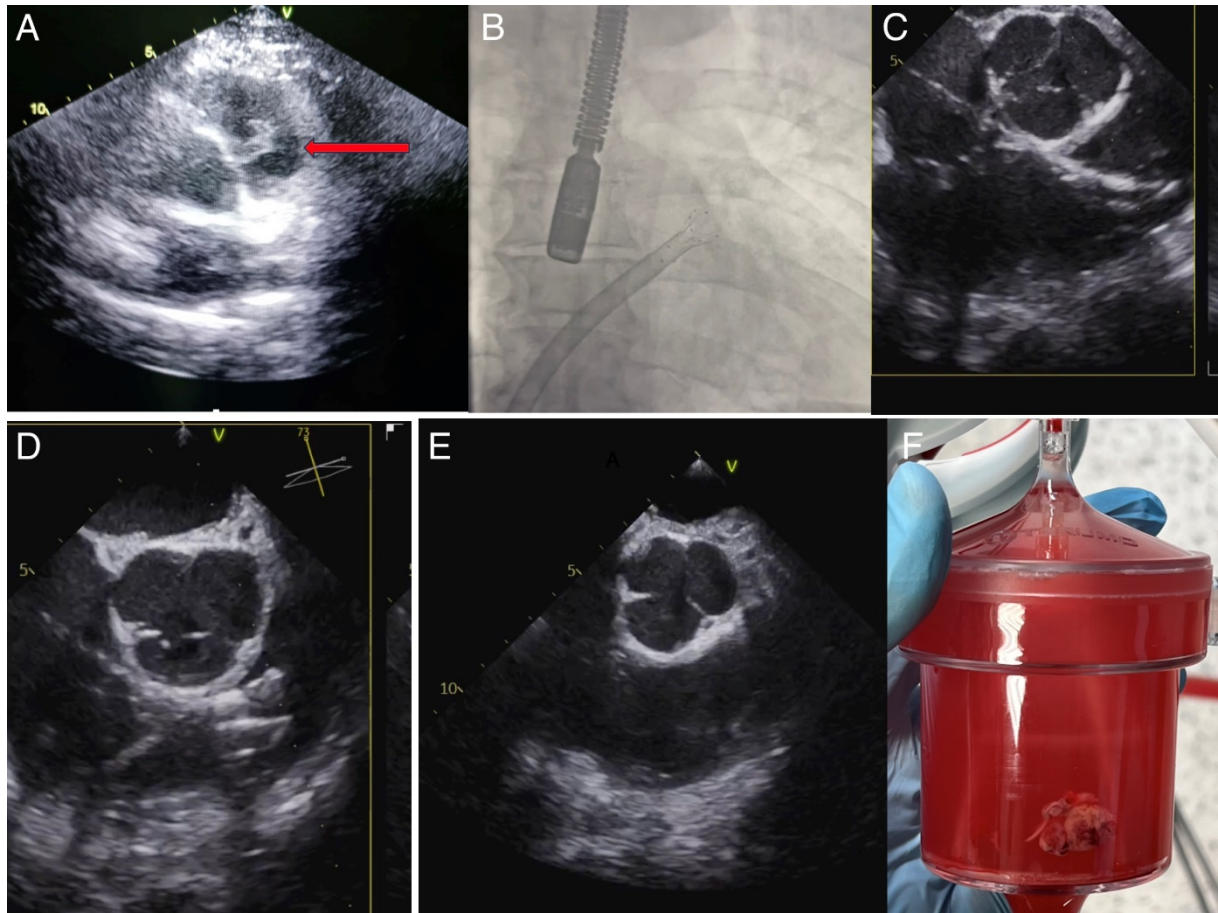


Figure 1. **A.** The pulmonary valve vegetation (arrow) visualized in transthoracic echocardiogram. **B.** Fluoroscopy image anterior-posterior view, AngioVac system introduced into the right ventricle under pulmonary valve. **C.** Angiovac 0–20 degree system not able to reach vegetation because of aorta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