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Infected perivalvular and circumaortic hematoma in a patient with severe endocarditis of bicuspid aortic valve: A disastrous beginning and a happy end

Short title: Infected perivalvular and circumaortic hematoma

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A 46-year-old man with a history of a bicuspid aortic valve stenosis was admitted due to *Enterococcus faecalis* sepsis. On admission, transthoracic echocardiography showed severe stenosis and moderate aortic regurgitation, dilated ascending aorta and a moderate amount of pericardial fluid (Figure 1A). Transesophageal echocardiography (TOE) revealed severe aortic infective endocarditis (IE) and a fissure at the annulus, suggesting its partial dehiscence (Supplementary material, *Video S1*). After two days of targeted antibiotic therapy (ampicillin, ceftriaxone), the patient underwent urgent Bentall de Bono surgery, and SJM conduit with the Valsalva sinus was implanted. Intraoperatively, massive vegetations, a pericardial abscess entering the muscle, and aortic detachment of 2/3 of the circumference were found (Figure 1B).

After 3 weeks of a relative clinical improvement, high fever returned and inflammatory markers increased. Follow-up TOE showed a thick tissue (up to 20 mm) with abscess cavities around the prosthesis, and a thickened cuff along the graft, suggestive of an inflammatory infiltration. It bulged into the right atrium, and a large bifurcated vegetation (24 mm) was attached at its lower edge (Figure 1C–D; Supplementary material, *Video S2*). Antibiotic therapy was expanded to include vancomycin and gentamycin.

Computed tomography (CT) revealed an active periprosthetic leak with a channel approximately 5mm wide with several areas of blood extravasations and an extensive cuff (up to 25 mm) indicating the periaortic hematoma within the mediastinum (Figure 1E). A decision about reoperation was difficult and heart transplantation was considered.

Due to the worsening of patient's clinical status after numerous consultations, 69 days after the first surgery, an aortic homograft (23 mm) extended with a vascular prosthesis was implanted (Figure 1F; Supplementary material, *Video S3*). Additionally, the first epicardial pacing, and finally a DDDR-type pacemaker was implanted because of permanent third degree A-V block.

The patient was discharged in good condition after 147 days and it remains so to this day.

In cases of native valves IE, an incidence of perivalvular process ranges from 10% to 30%, and is higher in prosthetic valves IE [1]. Perivalvular extension occurs more frequently in aortic valve than mitral valve IE, and it is relatively often observed in patients with bicuspid aortic valve [1]. In complicated and life-threatening cases, more than one surgery may be required, and homografts are usually not available urgently.

Differential diagnosis of periaortic mass is challenging: it may include aortic abscess and pseudoaneurysm, as reported by Łoboz-Rudnicka et al. [2], and also a conglomeration of unresorbed haemostatic fabrics described by Kezeviciute et al. [3].

TOE is obviously the primary diagnostic tool in perivalvular complications, however, it should be supplemented with another imaging modality, such as CT, cardiac magnetic resonance and nuclear techniques [1]. An important role of cardiac magnetic resonance in the evaluation of para-aortic conduit abscess after Bentall procedure was decribed by Rudiene et al. [4]. Gupta et al. [5] emphasized the utility of contrast-enhanced CT and ^{18}F-fluorodeoxyglucose positron emission tomography/CT in the assesment of periaortic hematoma in a patient with staphylococcal IE of a bioprosthesis and an aortic graft.

Both, our case and all the above reports indicate that multimodal diagnostics and the enormous "endocarditis team" effort allowed to save patients' lives.

Supplementary material

Supplementary material is available at https://journals.viamedica.pl/polish_heart_journal.

Article information

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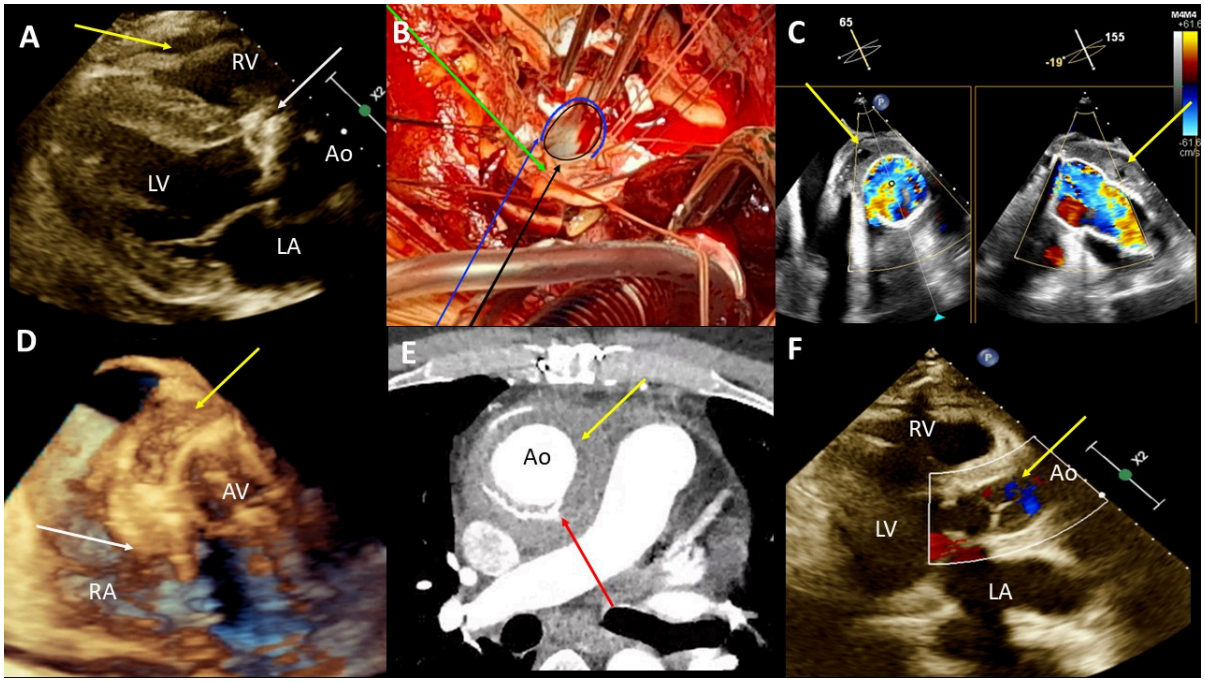

Figure 1. A. An abnormal image of the aortic valve and enlarged aortic bulb (white arrow); pericardial fluid (yellow arrow); 2D transthoracic echocardiography; a long axis view. **B.** An intraoperative view: left ventricle outflow tract (LVOT) — black line and arrow, 2/3 of the detached circumference of the aorta — blue line and arrow, ostium of the left coronary artery — green arrow. **C.** Perivalvular and periaortic infiltration with abscess cavities (yellow arrows); 2-dimensional transoesophageal echocardiography, X-plane view, color Doppler. **D.** Perivalvular infiltration with abscess cavities (yellow arrow) and a large bifurcated vegetation attached at its lower edge (white arrow); 3-dimensional transoesophageal echocardiography. **E.** An active periprosthetic leak (red arrow) and an extensive cuff indicating a periaortic hematoma (yellow arrow); contrast-enhanced computed tomography. **F.** A follow-up echocardiogram after aortic homograft implantation (arrow); 2D transthoracic echocardiography, color Doppler, a long axis view

Abbreviations: Ao, aorta; AV, aortic valve; LA, left atrium; LV, left ventricle; RA, right atrium; RV, right ventricle