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**Article type:** Clinical vignette

**Received:** January 5, 2023

**Accepted:** March 19, 2023

**Early publication date:** March 29, 2023

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## **Rescue balloon aortic valvuloplasty in a patient with cardiogenic shock followed by transcatheter aortic valve implantation**

**Short title:** Rescue aortic valvuloplasty in decompensated patient with severe aortic stenosis

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Balloon aortic valvuloplasty (BAV) is a technique for the treatment of severe aortic valve stenosis (AS) which is used less frequently in contemporary practice, however, according to current ESC guidelines, it still may be considered as a bridge to further therapy in decompensated patients [1, 2]. Recently published data suggest over half of the procedures may be performed as a bailout strategy [3].

A 71-year-old male with a history of arterial hypertension, chronic obstructive pulmonary disease and paroxysmal atrial fibrillation was admitted for evaluation of his AS. Moreover, he was diagnosed with advanced coxarthrosis and required walking assistance. The patient was symptomatic in class II/III according to the New York Heart Association (NYHA) classification, however, no signs of decompensation were present on admission. Transthoracic echocardiography (Figure 1A) confirmed severe AS with a mean gradient of 58 mmHg and aortic valve area (AVA) of 0.3 cm<sup>2</sup> with mildly reduced left ventricle ejection fraction (40%). Immediately after non-invasive testing on the same admission day, patient developed severe dyspnoea, hypotonia and finally, cardiogenic shock within several minutes. Due to pulmonary oedema with low blood pressure patient was intubated and mechanically ventilated. An urgent remote Heart Team assessment was performed and the patient was qualified for coronary angiography with concomitant rescue BAV. The coronary angiogram revealed no significant coronary lesions (Figure 1B1 and 1B2). Due to severe leaflets' calcifications, 22 mm Osypka VACS II (Osypka, Rheinfelden, Germany) balloon was unable to cross the aortic valve so an additional predilatation with 8.0 × 50 mm and 9.0 × 50 mm (Figure 1C1) peripheral balloon catheters were performed. Eventually, 22 × 50 mm balloon catheter was successfully introduced and BAV was performed (Figure 1C2). Periprocedural echocardiography confirmed a decrease in mean gradient to 38 mm Hg with AVA 1.0 cm<sup>2</sup>. The TAVI was abandoned at the time due to unknown neurological status of the patient. The patient was hospitalized at an intensive care unit for 2 days. After the patients' recovery, additional imaging with computed tomography according to pre-transcatheter aortic valve implantation (TAVI) workup was performed to assess the valve and vascular access (Figure 1D). Within a week, a TAVI procedure was performed (Figure 1E) using a self-expanding Navitor 25 valve (Abbott, Chicago, IL, US). Post-procedural echo showed 9/5 mmHg gradient and mild perivalvular leak. The patient was successfully discharged home after 16 days of in-hospital treatment. On 30-day follow up patient came alone, with almost no physical and mental decline.

Symptomatic severe AS is still a life-threatening condition. Balloon aortic valvuloplasty remains a feasible method to be used as a bridge-to-therapy, as well as a bailout strategy to be used in critical cases and followed by definite treatment [4].

#### **Article information**

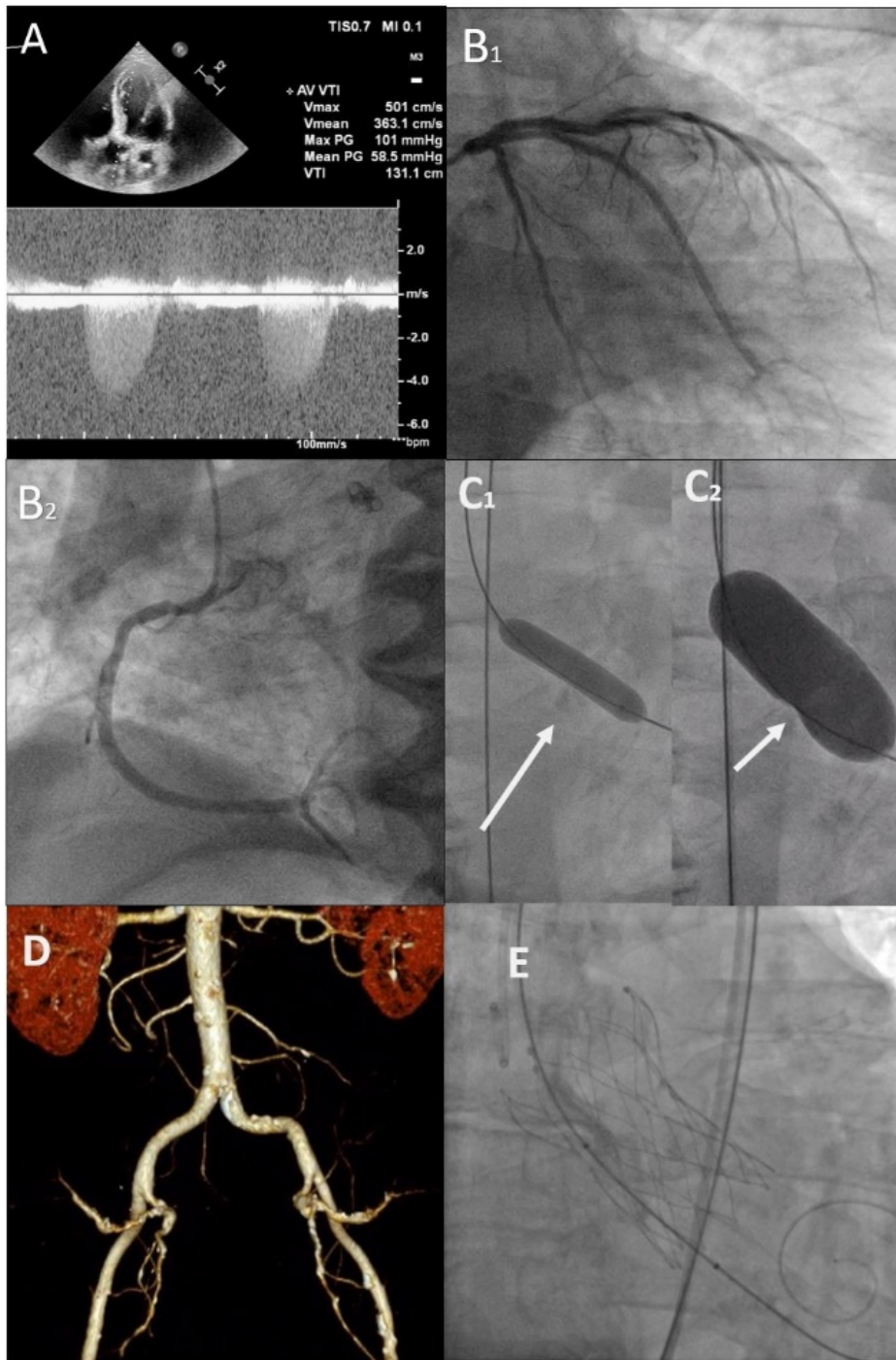
**Conflict of interest:** None declared.

**Funding:** None.

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**Figure 1.** **A.** Baseline transthoracic echocardiography showing severe aortic valve stenosis. **B1.** Coronary angiography of the left coronary system with no significant lesions. **B2.** Coronary angiography of the right coronary artery with moderate lesion in its proximal segment. **C1.** 9.0 × 50 mm peripheral angioplasty balloon that passed across stenosed valve. **C2.** Final 22 × 50 mm valvuloplasty balloon (white arrows — calcifications). **D.** Computed tomography angiography assessment showing optimal femoral access. **E.** Self-expanding aortic valve implantation