



Transcatheter aortic valve implantation in a very young patient with failed bioprosthesis as a bridge to transplantation procedure



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Introduction

In patients with congenital aortic valve disease repeat aortic valve surgery is necessary in about one third of the cases (1). Transcatheter aortic valve replacement has been reported as a viable alternative of redo surgery in patients with degenerated bioprosthetic valves (valve in valve procedure) (2).

Case presentation

We report the case of a 24-year-old female, with history of surgical closure of a ventricular septal defect in her preadolescence, followed by replacement of a stenotic bicuspid aortic valve at the age of 19. With respect to her desire of having children, the patient chose to receive a bioprosthesis. 4 years later, follow up echocardiography revealed signs of advanced prosthesis degeneration. However, due to the high risk of a second redo operation and because the patient was clinically asymptomatic, her treating physicians decided not to intervene. 22 months later the patient was admitted in our center for acute decompensated heart failure. At admission, echocardiography showed severely depressed ejection fraction with low flow high gradient severe stenosis of the degenerated bioprosthesis.

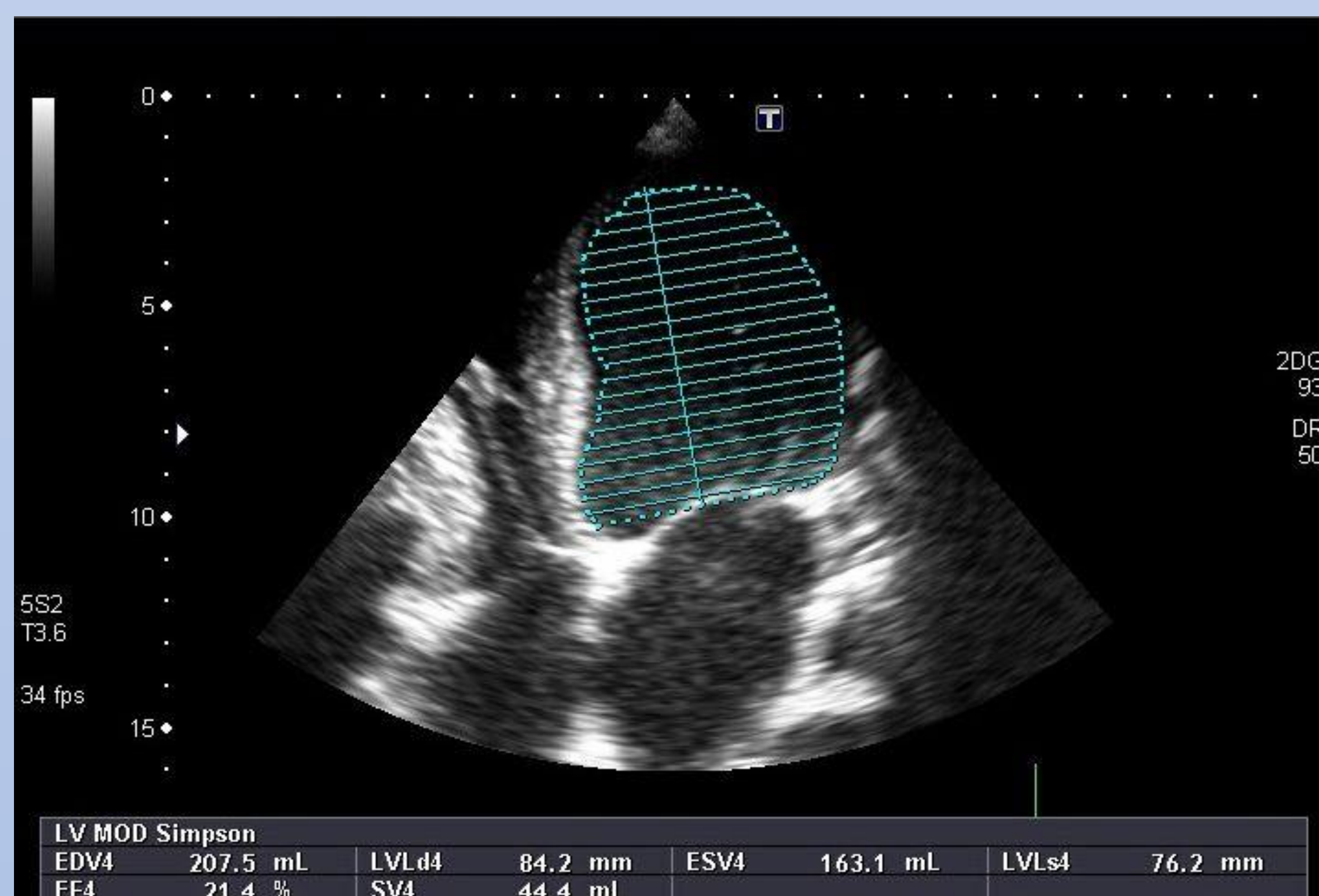
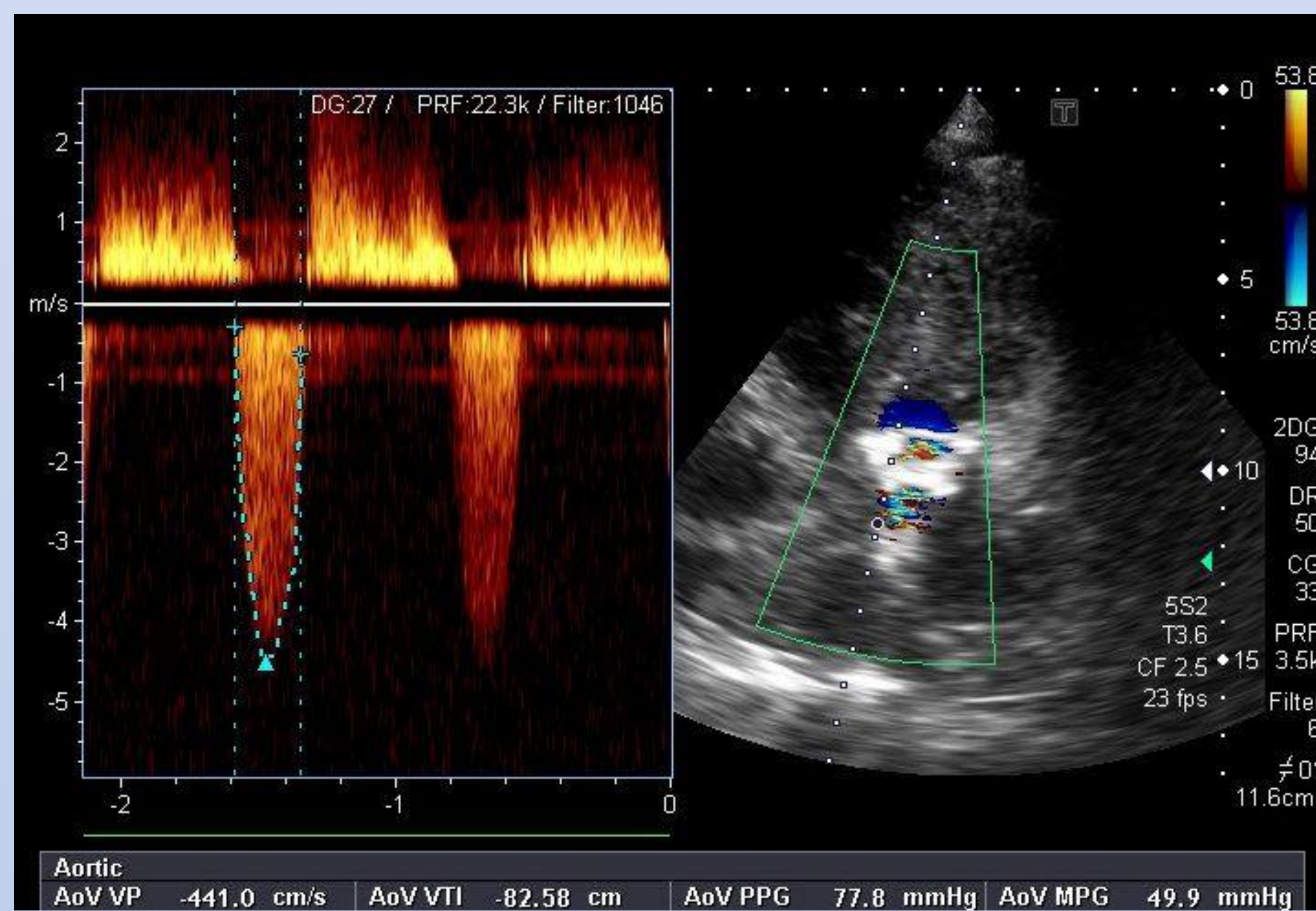


Fig. 1 and 2: The pre TAVI echocardiography of the patient

Multidisciplinary heart team considered the patient unsuitable for open-heart surgery, due to the history of multiple cardiac surgeries with sternotomy and cardiac arrest, therefore we decided to perform a valve in valve TAVI procedure, potentially as a bridge to transplantation solution.

A 23 mm Evolute R (Medtronic, Minneapolis, MN) was deployed in general anesthesia from a. iliaca access (femoral access was not possible due to the patients unusually gracile vasculature).

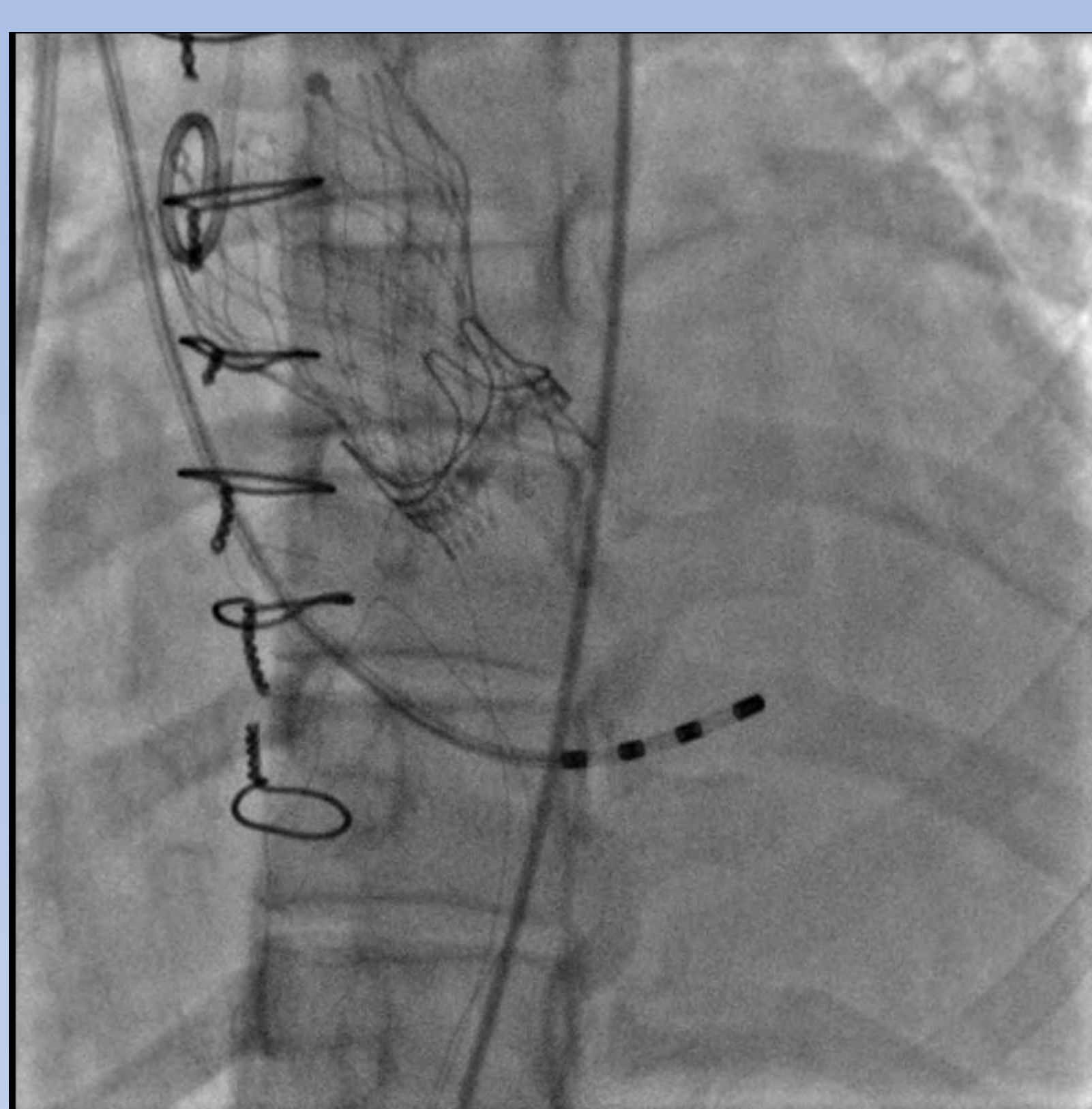


Fig. 3 and 4: The Medtronic Evolute R valve

Echo values	Pre TAVI	3 months post TAVI	12 months post TAVI	24 months post TAVI
EF	33 %	54 %	51 %	60%
Peak/Mean gradient	78/50 Hgmm	42/24 Hgmm	43/29 Hgmm	32/16 Hgmm
Vmax	4.7 m/s	2.3 m/s	3.3 m/s	2.8 m/s

Immediately after implantation, the patient showed marked improvement in her functional status. At three months follow-up, she was in NYHA I. Nearly full recovery of left ventricular systolic function was documented along with normalization of right sided pressures.

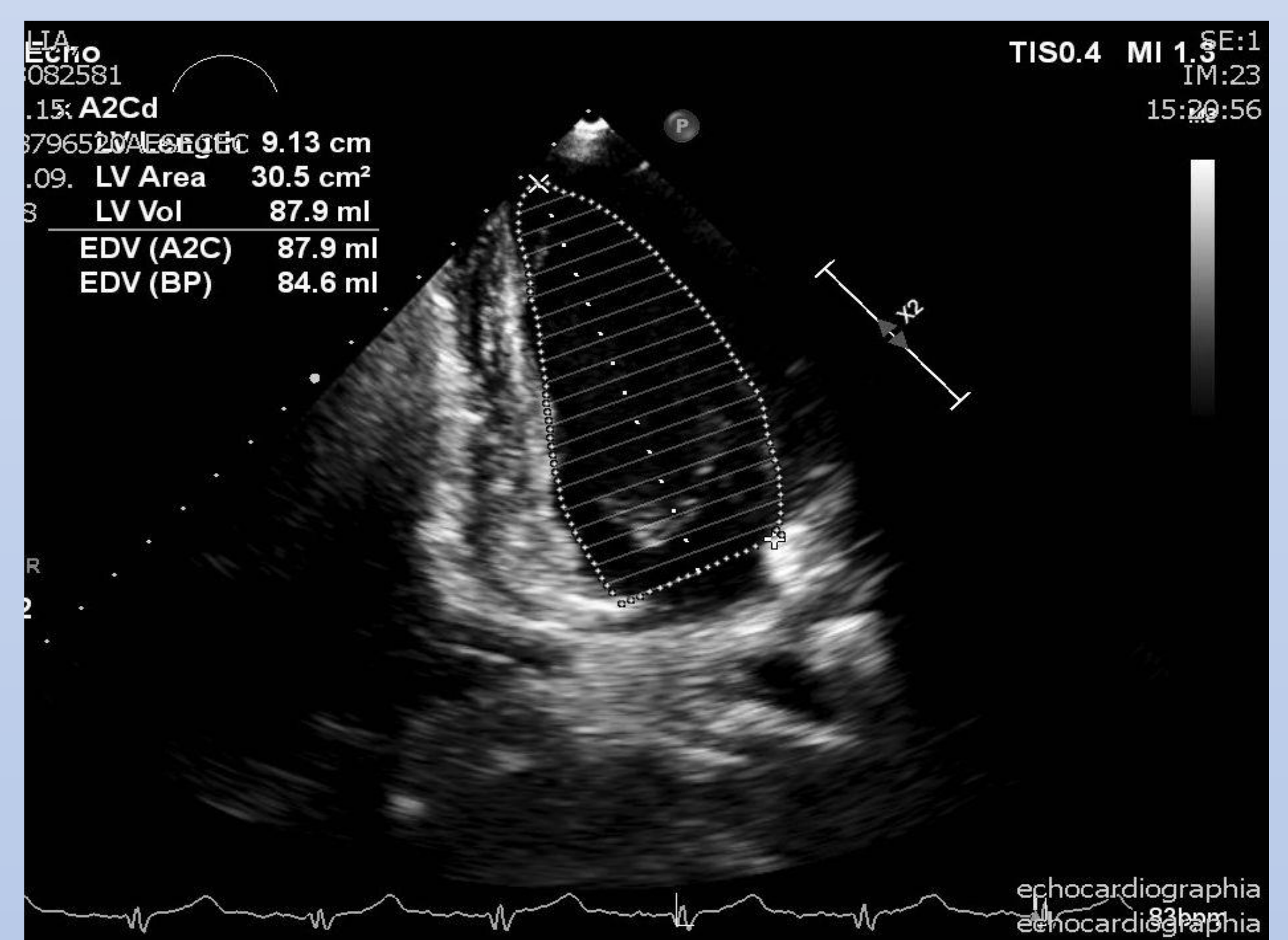
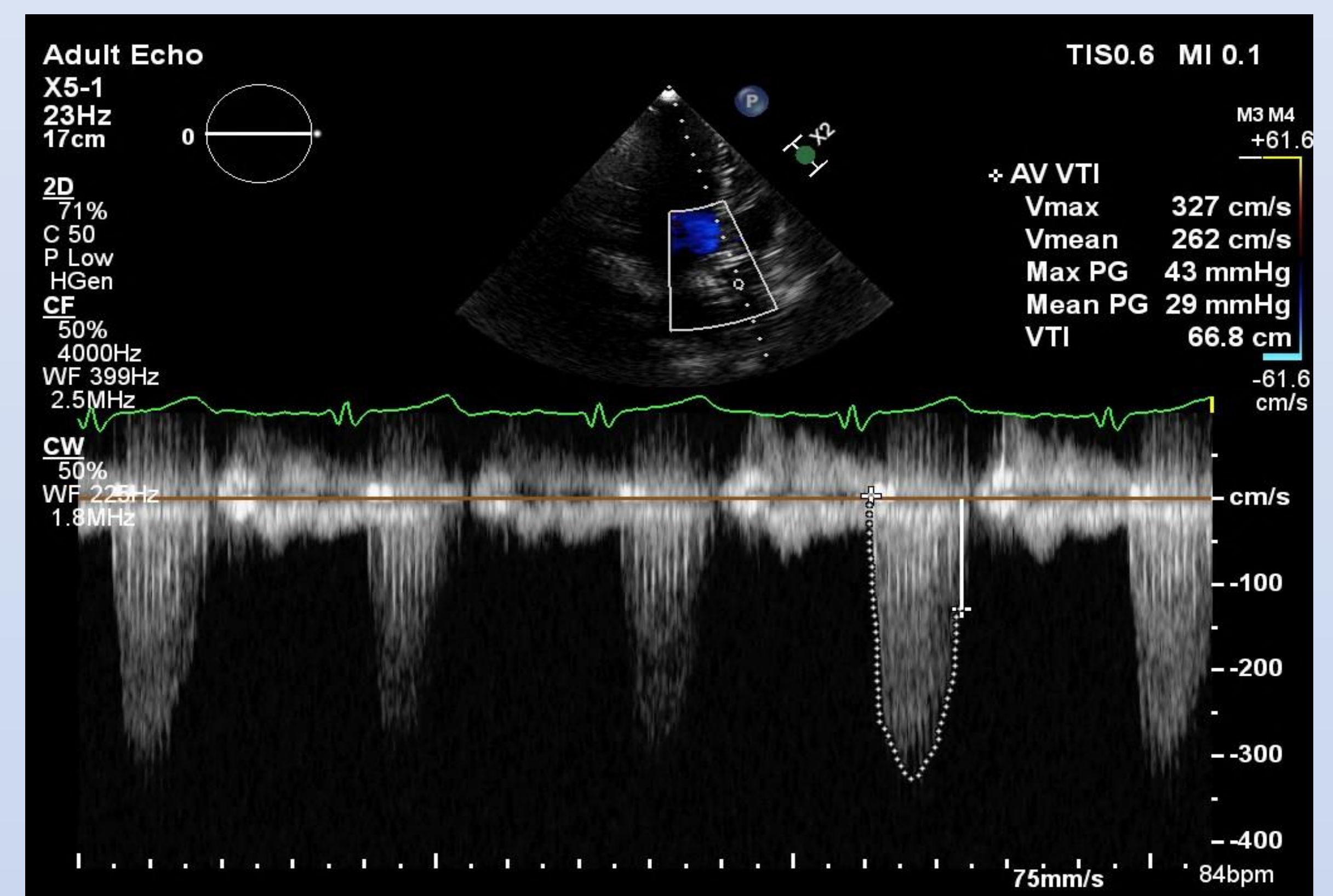


Fig. 5 and 6: The 12 months post TAVI echocardiography of the patient

Discussion

Surgical aortic valve replacement remains the gold standard for the treatment of aortic stenosis. At present, the indication of TAVI is limited to patients with high- or prohibitive risk for operation usually with advanced age; nonetheless, there is a trend towards its application in intermediate risk patients and younger generations.

In the presented case TAVI was successfully applied in a very young patient with congenital heart disease in order to minimize cumulative morbidity resulting from repeated open-heart surgery and to facilitate later cardiac transplantation. A repositionable self-expanding valve was chosen because accurate device positioning is often challenging in patients with homograft, and particularly in this case, the preceding septal operation resulted in specific anatomy. The major concern around the use of TAVI in younger patients is its durability, however, the medium-term results of TAVI are excellent (3, 4), suggesting that in selected young patients, in whom the individual advantages of TAVI outweigh the expected excellent long-term results of conventional surgical AVR, this treatment approach might provide a much safer and clinically efficient solution (5-8).

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