

Real-world case study

Maneuverability with the PASCAL Precision System: Navigate challenging anatomies with ease



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Dr Jérémy Boyer is an interventional cardiologist at AP-HM Hôpital de la Timone where he has been working for 4 years.

The PASCAL Precision system is designed for precise placement with accurate, intuitive control.* **Its guide sheath and steerable catheter are unkeyed and advance, retract, flex and rotate independently.**¹ Together with the implant catheter handle, this enables operators to maneuver the implant in **eight degrees of freedom**, helping them adjust the implant trajectory and gain or lose height from the mitral valve plane.¹ Here, Dr Jérémy Boyer describes a small, elderly patient who needed corrective maneuvers after a suboptimal transseptal puncture (TSP).

The patient

A 91-year-old woman was transferred to our hospital suffering from heart failure with acute pulmonary oedema. She was in New York Heart Association (NYHA) functional class III, and echocardiography revealed she had severe (grade 4) degenerative mitral regurgitation (DMR) with a P2 prolapse (Figure 1). The patient was frail and deemed inoperable because of her age, so the Heart Team agreed to perform mitral transcatheter edge-to-edge repair.

The challenge

The patient had an indentation between P2 and P3, with limited height above the mitral valve coaptation line to perform the TSP (3.8 cm). The optimal TSP site is at least 4.5 cm above the coaptation line,¹ so the TSP here was suboptimal.

The approach

We opted for a one-implant strategy, using the PASCAL Ace implant and the PASCAL Precision system. The posterior mitral leaflet was about 12 mm, so we were confident that the PASCAL Ace implant would clasp it well. As the patient was small, with a mitral valve area of 4.2 cm², we hoped one implant would be enough. Other benefits of the PASCAL Precision system include the ability to elongate the device if needed and the nitinol construction, which, in my opinion, limits the elevation of post-procedural gradients. We anticipated that the maneuverability of the PASCAL Precision system would be advantageous in this case, enabling us to correct the trajectory after a potentially low TSP.

Patient key facts



91 years old



Female



Severe DMR



NYHA class III

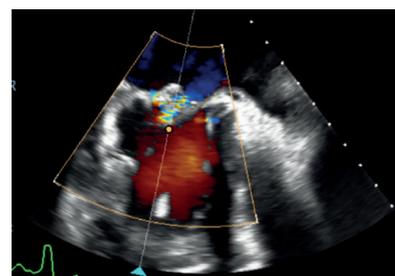


Figure 1. Pre-procedural transoesophageal echocardiography of the mitral valve showing severe DMR with a P2 prolapse.

DMR, degenerative mitral regurgitation.

*Performance data on file and marketing evaluation.



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The procedure

As anticipated, I achieved a low TSP height of 3.8 cm, and the implant followed an aorta hugger trajectory (Figure 2A). I gained height by flexing the guide sheath posterior, then rotating it clockwise and, finally, adjusting the steerable catheter medially. I corrected the aorta hugger by flexing the guide sheath posteriorly and then rotating the steerable catheter handle counterclockwise. I found these steps smooth and straightforward thanks to the responsive catheter design.

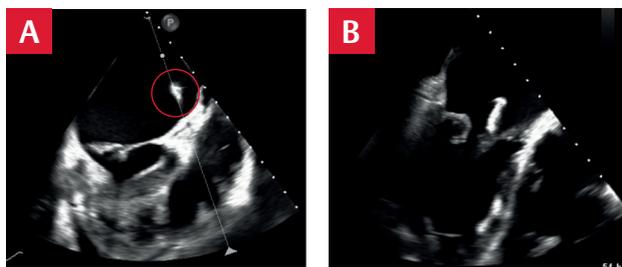


Figure 2. Transoesophageal echocardiography showing the aorta hugger trajectory (A) and the improved trajectory after anterior steerable compensation (B).

After trajectory correction (Figure 2B), I simultaneously clasped both leaflets, but I was unhappy with the clasping of the posterior one (Figure 3A), so I decided to optimise it. I found this easy using the independent clasping feature of the PASCAL Precision system, which allowed me

to optimise the posterior leaflet before reclasping and achieving a better outcome (Figure 3B).

Initial evaluation showed grade 3 MR but, after relieving the tension in the system, this dropped to grade 2, which was maintained after releasing the device and retrieving the catheter (Figure 3C). I might have achieved a lower MR grade if I had positioned a second implant, but I considered this procedure too risky for this frail, elderly patient because of her relatively small mitral valve area. Hence, I was satisfied with the result.

The patient was discharged home from hospital after 2 days. The result was sustained at 1-month follow-up (Figure 3D).

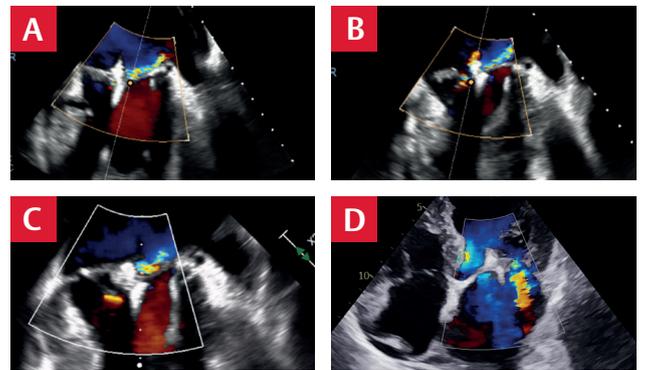


Figure 3. Transoesophageal echocardiography after initial clasping (A), optimisation (B) and release (C); transthoracic echocardiography at 1-month follow-up (D).

Key tip



“ If the patient’s anatomy prevents you from performing an optimal TSP, use the PASCAL Precision system to help correct a suboptimal trajectory. The system is comfortable to use, stable and responsive, making the corrective maneuvers smooth and uncomplicated. Plus, the learning curve with the PASCAL Precision system is short; I was confident after five procedures, and I performed this case alone, without a second operator. ”

Dr Jérémy Boyer

Reference

1. Garcia S, Elmariah S, Cubeddu RJ *et al.* Mitral transcatheter edge-to-edge repair with the PASCAL Precision System: Device knobology and review of advanced steering maneuvers. *Struct Heart*. 2024; **8**: 100234.

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