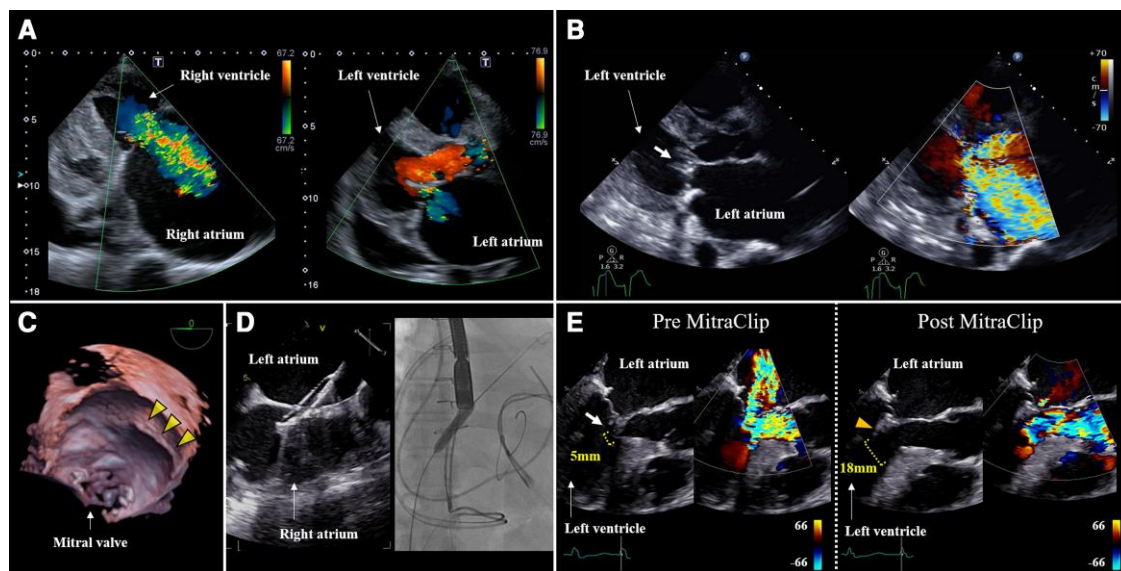


# MitraClip therapy for acutely developed systolic anterior motion-related severe mitral regurgitation after mitral annuloplasty

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**Figure 1** (A) Transthoracic echocardiography showing severe tricuspid regurgitation (left) and concomitant mitral regurgitation (right). (B) Transthoracic echocardiography post-mitral annuloplasty revealed newly developed systolic anterior motion of the mitral valve (arrow), leading to severe mitral regurgitation. (C) Transoesophageal echocardiography showing a sutured interatrial septum (arrowheads). (D) Balloon angioplasty for the interatrial septum. (E) Comparison of mitral valve motion before and after MitraClip therapy on transoesophageal echocardiography. Arrow and arrowhead indicate a finding of systolic anterior motion and a NTV clip, respectively.

A 58-year-old man with low cardiac output syndrome due to right-sided heart failure underwent tricuspid valve repair for severe tricuspid regurgitation and mitral annuloplasty (MAP) for mitral regurgitation (MR) with mitral annular dilatation due to chronic atrial fibrillation (Society of Thoracic Surgeons [STS] score: 13.5%; [Figure 1A](#)). Transthoracic

echocardiography revealed acute severe MR (vena contracta width, 7 mm; effective regurgitant orifice area, 0.42 cm<sup>2</sup>; regurgitant volume, 71 mL/beat) due to newly developed systolic anterior motion (SAM) of the mitral valve (MV) with substantial left ventricular outflow tract (LVOT) obstruction (peak velocity, 5.0 m/s), although SAM-related

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MR was not observed immediately after operation (Figure 1B, Supplementary material online, Video S1). Medications, including intravenous beta-adrenergic blocker (landiolol), and infusion therapy were ineffective, and unstable haemodynamics (blood pressure, 74/34 mmHg; heart rate, 118 beats/min) due to right ventricular dysfunction with acute pulmonary congestion developed. Transoesophageal echocardiography showed that SAM was mainly caused by morphological changes in MV complex with residual anterior leaflet (9.8 mm) and shallowed aorta-mitral angle (120° from 130°, preoperatively) and slightly thickened septum (septal dimension, 12.3 mm; Supplementary material online, Figure S1). Furthermore, MV morphology was conditionally optimal for MitraClip therapy (posterior leaflet length, 16.7 mm; MV area, 4.7 cm<sup>2</sup>; transmitral pressure gradient, 3.9 mmHg, no calcification). Therefore, the heart team selected less-invasive MitraClip therapy (Abbott, IL, USA) for SAM-related MR due to prohibitively high surgical risks (STS score, 32.5%). While advancing a steerable guide catheter (SGC) into the left atrium, interatrial septostomy using an 8.0/40 mm semi-compliant balloon (Advance 35LP; Cook Medical, Bloomington, IN, USA) with 12 atmospheres (nominal pressure, twice) was required due to interatrial suture after standard left atriotomy (Figure 1C and D). MitraClip therapy with one NTW clip was successfully performed for the A2-P2 segment of the MV; MR drastically reduced, and postoperative LVOT peak velocity (1.3 m/s) and pulmonary vein flow pattern improved, despite mild iatrogenic mitral stenosis (MV area, 1.5 cm<sup>2</sup>; mean transmitral pressure gradient, 6.0 mmHg before and 6.1 mmHg after device detachment; Figure 1E, Supplementary material online, Videos S2 and S3, Figure S1). His blood pressure increased from 63/34 mmHg preoperatively to 103/52 mmHg postoperatively, and heart rate improved from 100 to 77 beats/min. After MitraClip therapy, we could perform continuous haemodialysis filtration without deterioration of SAM. Four weeks after the MitraClip therapy, SAM-related MR was well controlled.

Although re-operation is curative for acute refractory SAM-related MR after MV surgery, it is challenging in patients with increased risk of re-operation. Moreover, transcatheter alcohol septal ablation can be effective in LVOT obstruction with SAM-related MR; however, it is also challenging in patients with unstable haemodynamics because of potential complications of myocardial damage leading to conduction

block and large myocardial necrosis.<sup>1</sup> The efficacy of MitraClip therapy for acute-phase SAM-related MR remains unclear despite recent similar reports supporting MitraClip therapy for SAM-related MR.<sup>2,3</sup> An NTW clip was implanted for wide MR jet in this case; however, available clips (NT or XT) should be appropriately selected with an evaluation of the transmitral pressure gradient before device detachment considering the potential risk of iatrogenic mitral stenosis. To our knowledge, this is the first case to demonstrate the advantage of MitraClip therapy for a patient with unstable haemodynamics due to acutely developed refractory SAM-related MR after MAP. In such situations, MitraClip therapy should be performed with caution due to the relationship between iatrogenic mitral stenosis and residual MR and the difficulty in advancing an SGC via a sutured interatrial septum.

## Supplementary material

Supplementary material is available at *European Heart Journal – Case Reports* online.

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## Data availability

No new data were generated or analysed in support of this research.

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