Two faces, one valve: rheumatic and non-rheumatic mitral stenosis in contemporary practice

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Introduction: Mitral stenosis (MS) is shifting from rheumatic to prosthetic and calcific causes in developed regions. The 2025 ESC guidelines stress individualized, Heart Team–based care. Echocardiography, particularly transesophageal echocardiography (TEE) with 3D imaging, is pivotal for defining valve anatomy, hemodynamics, and guiding intervention.[1,2]

Case presentations: Through presented cases we discuss two different etiologies of mitral stenosis. First, a 35-year-old severely symptomatic woman with prior bioprosthetic mitral valve replacement for prolapse developed combined prosthetic stenosis and regurgitation 15 years later. Comprehensive TEE evaluation demonstrated a valve area of 1.0 cm² (3D), mean transmitral gradient of 12 mmHg, effective regurgitant orifice area 0.4 cm², regurgitant volume 66 ml, and moderately reduced LVEF at 45%. Two leaflets were immobile, consistent with structural valve degeneration (**Figure 1**). Second patient (**Figure 2**) is a 47-year-old man with longstanding rheumatic MS and prior surgical commissurotomy (2007) who presented with dyspnea. TTE and TEE revealed classical commissural fusion, severe annular calcification, valve area 0.7 cm² (3D), mean gradient 11 mmHg, mild MR, moderate functional TR,

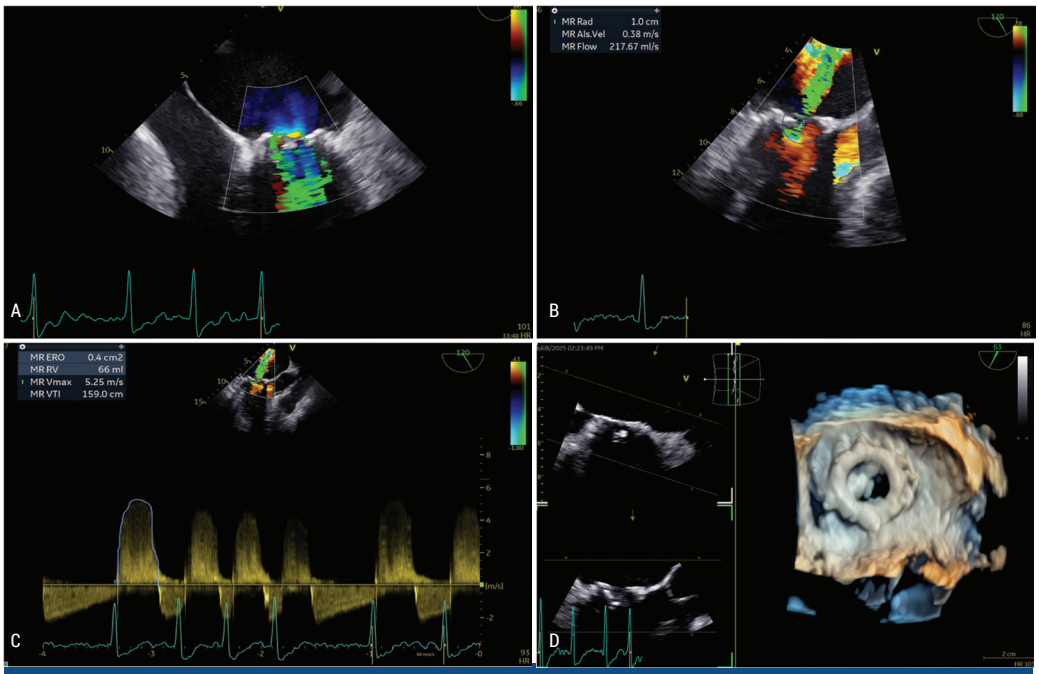

FIGURE 1. A) Transesophageal echocardiography (TEE) apical 4-chamber view showing severe turbulence during mitral valve opening. B) TEE long axis view showing the PISA radius for mitral regurgitation. C) TEE long axis view showing the PISA VTI for mitral regurgitation. D) TEE 3D reconstruction of the prosthetic mitral valve and depiction of immobile leaflets of the prosthesis.

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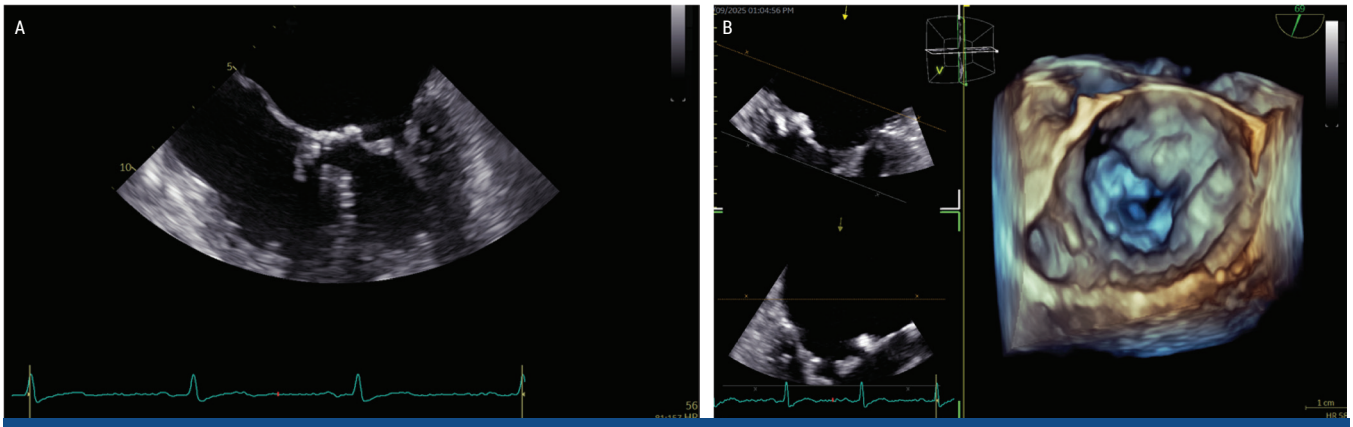

FIGURE 2. A) Transesophageal echocardiography (TEE) apical 4-chamber view showing severe mitral valve calcifications and thickening of the leaflet tips. B) TEE 3D reconstruction of severe mitral stenosis; the valve is heavily calcified, with commissural fusion and restricted mobility of both mitral valve leaflets.

and preserved LVEF at 50%. Both patients were discussed at the multidisciplinary Heart Team for definitive management planning.

Discussion: The ESC 2025 guidelines recommend percutaneous mitral commissurotomy (PMC) as first-line therapy in suitable rheumatic MS. However, in prosthetic degeneration and heavily calcific, non-rheumatic stenosis, PMC is ineffective and either surgical redo or transcatheter mitral valve replacement is favored. These cases underscore the pivotal role of TEE and 3D echocardiography in diagnosis and workup. This comprehensive imaging framework informs not only severity grading but also intervention feasibility, procedural strategy, and perioperative risk assessment.

Conclusion: MS in contemporary practice represents two distinct entities—rheumatic and non-rheumatic/prosthetic. Advanced echocardiographic workup, particularly TEE with 3D modalities, is indispensable for accurate diagnosis, mechanism delineation, and intervention planning. Alongside structured Heart Team review, imaging serves as the cornerstone of individualized patient management.

LITERATURE

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