



## Primary mitral regurgitation - echo evaluation

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### Abstract

A 57 year old woman referred to our clinic for the evaluation of the mitral regurgitation. She was a candidate for potential valvular intervention. Transthoracic echo showed a flail leaflet in the region of the prolapsing P2 scallop of the posterior leaflet and the mitral regurgitant jet was directed toward the interatrial septum. The left ventricle systolic function was preserved. The patient underwent three-dimensional transoesophageal echocardiography to investigate the precise anatomy of the mitral valve complex. The anatomical analysis was done by post-processing prior the reconstruction. During surgery, a rigid ring was implanted and Gerbode plastic of the large P3 segment was performed-which turned out to be the prolapsing scallop with “flail”. Echocardiography is important in assessing mitral valve disease.

### Kew words

mitral valve regurgitation, mitral valve repair, echocardiography

**O**ur patient is a 57 year old woman referred to our clinic for the evaluation of the mitral regurgitation (MR). Since her childhood she was told that she has a murmur, but she was never send to an echo exam. Several months ago she noted dyspnea on exertion. On the physical exam holosystolic murmur was noted at the apex. She was in sinus rhythm. Laboratory values were within normal values.

Transthoracic echocardiogram (TTE) showed normal left ventricle (LV) systolic function. The ejection fraction of the LV was 65%, with no regional wall motion abnormalities, and enlarged left atrium. With 2D TTE a flail leaflet in the region of the prolapsing posterior mitral cusp in the region of the P2 scallop and severe MR was registered. The MR color Doppler jet was excentric toward the interatrial septum. The grading of the MR and mitral valve (MV) disease involved qualitative, semi-quantitative and quantitative parameters - as recommended by the Guidelines<sup>1</sup> indicating sever MR.

TTE and the 3D reconstruction of the LV and right (RV) were done with postprocessing on EchoPAC version 201 GE. TEE is recommended in most cases before cardiac surgery, which enables a precise anatomical analysis of the lesion prior the reconstruction which was also performed. The MV parameter analysis was obtained with postprocessing for 4D Mitral valve assessment, so mitral annular, leaflet parameters and the feasibility of the repair were obtained.

Coronary angiography showed no significant coronary artery disease. All the TTE and TEE parameters were analyzed and referred to the Heart team, who indicated surgery after using operative risk stratification.

### Discussion

Our patient has an evidence of flail mitral leaflet and severe consequent MR. According the Carpentier classification the MR was type II. This patient represents one of the most common form of primary MR. “Mitral regurgitation is the second-most frequent indication for valve surgery in Europe.”<sup>2</sup>

“MV surgery is recommended for symptomatic patients with chronic severe primary MR and LVEF greater than 30 %”, what remains current from the previous recommendation.<sup>3</sup>

Reconstruction surgery was an option in this case. Intraoperative 3D TEE usually impacts the outcome of the reparaire, and provides additional information for the repair strategy. According to the surgeon who performed the reconstruction of the flail leaflet, large P3 was identified- which occupied the majority of the posterior mitral annulus circumferention, and not the P2 scallop as it was previously reported according to the comprehensive echo finding. The flail leaflet corresponded on TTE and TEE with the position of P2, but instead of it, the enlarged P3 scallop was the diseased part of the MV. Annuloplasty of the MV with rigid ring was implanted and Gerbode plastic of the P3 segment was performed. In patients with flail leaflet, an LVESD of 40–44 mm has been reported to predict a worse outcome compared with LVESD <40 mm.<sup>4</sup>

Before dissmision, TTE revealed no residual MR. “Patients with a predictably complex repair should undergo surgery in experienced repair centers with high repair rates, low operative mortality and a record of durable results”.<sup>1</sup>

Today, there are transcatheter MV interventions widely accepted to correct primary MR. The indications for MV surgery are to be discussed by the heart team before the intervention.

Lessons from the guidelines: "Echocardiography is essential to assess the etiology of MR, as well as valve anatomy and function. An integrative approach is needed to assess the severity of mitral regurgitation. Indication for intervention in primary MR is guided by symptoms and risk stratification that includes the assessment of ventricular function and size, atrial fibrillation, systolic pulmonary pressure and left atrial size. Mitral valve repair is the preferred method, but mitral valve replacement should be considered in patients with unfavorable morphological characteristics."<sup>1,5</sup>

## References

1. Baumgartner, Falk, Bax et al. 2017 ESC/EACTS Guidelines for the management of valvular heart disease European Heart Journal, Volume 38, Issue 36, 21 September 2017, Pages 2739–2791, <https://doi.org/10.1093/eurheartj/ehx391>
2. Iung B, Baron G, Butchart EG, et al. A prospective survey of patients with valvular heart disease in Europe: the Euro Heart Survey on Valvular Heart Disease. Eur Heart J 2003;24:1231–1243
3. Nishimura RA, Otto CM, Bonow RO, et al. 2014 AHA/ACC guideline for the management of patients with valvular heart disease: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. Circulation. 2014;129:e521–643.
4. Tribouilloy C, Grigioni F, Avierinos JF, et al. Survival implication of left ventricular end-systolic diameter in mitral regurgitation due to flail leaflets a long-term follow-up multicenter study. J Am Coll Cardiol. 2009;54(21):1961-8.
5. Nishimura, et al. 2017 AHA/ACC Focused Update on VHD 2017 AHA/ACC Focused Update of the 2014 AHA/ACC Guideline for the Management of Patients With Valvular Heart Disease A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines, Circulation. 2017;000:e000–e000. DOI: 10.1161/CIR.0000000000000503.

## Sažetak

### **Savremeno lečenje akutnog infarkta miokarda sa ST elevacijom komplikovanog srčanim zastojem na terenu**

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Bolesnica stara 57 godina, upućena je radi evaluacije mitralne regurgitacije na našu kliniku. Razmatrana je mogućnost intervencije na mitralnoj valvuli. Transtorakalna ehokardiografija je ukazivala na "flail" u predelu prolabirajućeg P2 skalopa zadnjeg mitralnog kuspisa, a mlaz mitralne regurgitacije je bio usmeren ka interatrijalnom septumu. Globalna sistolna funkcija leve komore je bila očuvana. Urađena je I trodimenzionalna transezofagealna ehokardiografija radi precizne evaluacije mitralno-valvularnog kompleksa. Pre operacije, postprocesuiranjem je rekonstruisana mitralna valvula. Tokom operacije je implantiran rigidni ring uz Gerbode plastiku velikog P3 skalopa sa "flailom", koji se ispostavilo se bio prolabirajući. Ehokardiografija je bitna u proceni mitralno-valvularnih bolesti.

**Ključne reči:** regurgitacija mitralnog zaliska, hirurgija mitralnog zaliska, ehokardiografija