

Imaging of a Detached Mitral Annuloplasty Ring by Intra-Operative 3D Transoesophageal Echocardiography: A Case Report

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Abstract

A 53 year old gentleman with previous tissue AVR and mitral valve repair in 2011 was admitted for redo AVR and MVR. On perioperative TOE we noted an echogenic structure projecting into the left atrium just above the anterior mitral valve leaflet. It was difficult to characterise on 2D TOE but 3D TOE views immediately revealed it was the mitral annuloplasty ring which had detached from the posterior annulus.

Keywords: Cardiac surgery; Mitral annuloplasty ring; 3D transoesophageal echocardiography

Abbreviations: AVR: Aortic Valve Replacement; MVR: Mitral Valve Repair; TOE: Transoesophageal Echocardiography

Introduction

Mitral regurgitation (MR) is increasingly prevalent in Europe [1]. The development of mitral valve surgical repair techniques imposes new responsibilities of the assessment of MR by imaging. 3D echocardiography represents the major innovation in echocardiography and is highly valuable for defining the extent and location of pathology, determining the severity and mechanism of malfunctioning valve [2]. We are describing the case of detached mitral annuloplasty ring detected by three dimensional (3D) transoesophageal echocardiography (TOE). Written consent was obtained from the patient to publish his condition.

Description of the Case

A 53 year old gentleman had tissue AVR and mitral valve repair in 2011. Since October 2014 he had become progressively more short of breath (NYHA III-IV). Transthoracic echo showed severe prosthetic aortic valve stenosis along with severe mitral regurgitation and mild stenosis with apically attenuated leaflets causing poor leaflet coaptation. Furthermore he had moderate tricuspid regurgitation with elevated pulmonary artery systolic pressures. His left ventricular (LV) systolic function was severely impaired, his right ventricular systolic function was moderately to severely impaired. His coronary angiogram was normal. He was treated for heart failure, hypertension, gout and was an ex-smoker of 4 years. He was admitted to hospital for redo aortic valve replacement and mitral valve replacement. Calculated EUROscore II for 2 procedures was 12.9%, for 3 procedures was 18.4%.

Pre-cardiopulmonary bypass TOE confirmed the above mentioned findings. In addition we noted an echobright structure projecting into the left atrium just above the anterior mitral valve leaflet (Figure 1). The nature of structure was difficult to determine on 2D TOE but 3D TOE views immediately revealed it was a detached mitral annuloplasty ring mainly around the posterior annulus (Figure 2).

Discussion

Although one early study examining the role of intraoperative 3D TOE for assessing mitral valve anatomy in patients undergoing mitral valve repair did not suggest any major advantage when compared to

conventional 2D TOE [3], in our case report we can see clear benefit of 3D TOE imaging which is in accordance with other case reports [4-8]. Furthermore 3D TOE is an easy tool for assessing mitral valve pathology for experts but also for inexperienced echocardiographers [9].

Conclusion

This case demonstrates the superiority of 3D over 2D TOE imaging for the characterisation of complex cardiac anatomy and therefore we recommend its use when it is possible and appropriate.

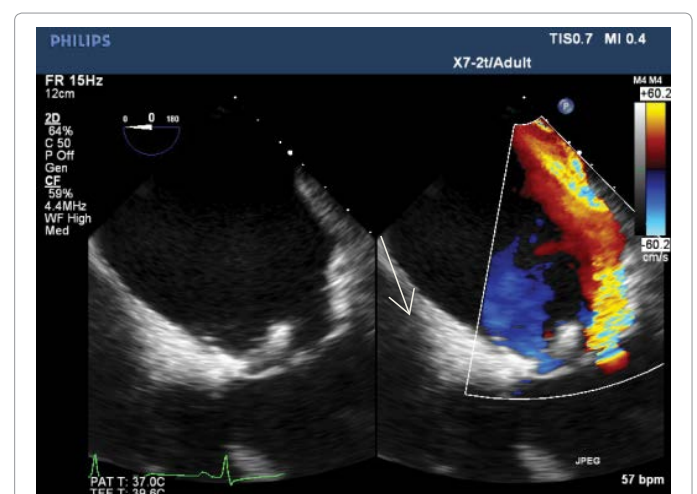


Figure 1: 2D TOE showing echobright structure sitting above the mitral valve (arrow).

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Figure 2: Detached mitral annuloplasty ring, 3D TOE.

It is imperative that the cardiac surgeon has as much anatomical data as possible available preoperatively to ensure that a safe and effective operative strategy is developed. This is especially true for complex patients with increased perioperative risk e.g., severely impaired left ventricular function, redo surgery and high EuroScore II. 3D TOE imaging provides detailed 3D mitral valve anatomical information within a short period of time and generates images which mimic conventional surgical views. 3D TOE can therefore provide a “surgeons’ eye view” of the mitral valve and our case report highlights the usefulness of this approach particularly in more complex patients.

References

1. Zamorano JL, Manuel Monteagudo J, Mesa D, Gonzalez-Alujas T, Sitges M,

et al. (2016) Frequency, Mechanism and Severity of Mitral Regurgitation: Are There any Differences Between Primary and Secondary Mitral Regurgitation? *J Heart Valve Dis* 25: 724-729.

2. Lang RM, Badano LP, Tsang W, Adams DH, Agricola E, et al. (2012) American Society of Echocardiography; European Association of Echocardiography. EAE/ASE recommendations for image acquisition and display using three-dimensional echocardiography. *Eur Heart J Cardiovasc Imaging* 13: 1-46.
3. Mukherjee C, Tschernich H, Kaisers UX, Eibel S, Seeburger J, et al. (2011) Real-time three-dimensional echocardiographic assessment of mitral valve: Is it really superior to 2D transesophageal echocardiography? *Ann Card Anaesth* 14: 91-96.
4. Lida R, Shanks M (2012) Three-Dimensional Transesophageal Echocardiography Shows Dehiscence of Mitral Valve Repair. *Tex Heart Inst J* 39: 772-773.
5. Kronzon I, Sugeng L, Perk G, Hirsh D, Weinert L, et al. (2009) Real-time 3-dimensional transesophageal echocardiography in the evaluation of post-operative mitral annuloplasty ring and prosthetic valve dehiscence. *J Am Coll Cardiol* 53: 1543-1547.
6. Swaans MJ, Braam RL, Plokker HW, Jaarsma W (2008) Three-dimensional transesophageal echocardiography in a patient with early failure of mitral valve repair: why are we still looking at a three-dimensional structure in 2 dimensions? *Circ Cardiovasc Imaging* 1: 282-283.
7. Scandura S, Caggegi A, Cammalleri V, Tamburino C, Ronsivalle G, et al. (2013) Mitral flexible annuloplasty band displacement: the role of three-dimensional echocardiography. *Echocardiography* 30: 56-58.
8. Zacà V, Ballo P, Mondillo S (2007) Late mitral annuloplasty failure: the loss of the ring. *Int J Cardiol* 114: 127-128.
9. Hien MD, Großgasteiger M, Rauch H, Weymann A, Bekeredjian R, et al. (2013) Experts and beginners benefit from three-dimensional echocardiography: a multicenter study on the assessment of mitral valve prolapse. *J Am Soc Echocardiogr* 26: 828-834.