Contrast Echocardiography without Contrast Agent for Display of Intraventricular Mass

Tan Suwatanaviroj[1] MD, Harald Becher[1] MD, Brian Chiu[2] MD, John Dimitry[1] MD, John Mullen[3] MD Jonathan Choy[1] MD and Jonathan Windram[1] MD

[1] Mazankowski Alberta Heart Institute, University of Alberta Hospital, Edmonton, Alberta, Canada
[2] Department of Laboratory Medicine and Pathology, [3] Department of Surgery, Faculty of Medicine and Dentistry, University of Alberta, Edmonton, Alberta, Canada

Background

- Microbubble contrast agents are useful to confirm diagnosis and characterize tumors, which is crucial for management.
- This is the first report that just using the low mechanical index contrast-specific imaging technique without injection of a contrast agent may be helpful in assessing a cardiac mass.

Case presentation

- A 62-year-old female was referred for transthoracic echocardiography having presented with fatigue and weakness for several weeks prior.
- **2D Echocardiography** revealed a 15x20 mm, highly mobile, homogenous, echogenic mass attached to the mid septal wall of the LV (Figure 1).
- **TEE** confirmed the tumor size and its attachment.
- **Cardiac MRI** was arranged but the findings were non-diagnostic due to motion artifact from the rapidly moving mass.
- **Contrast echocardiography** was therefore planned to further assess the nature of the mass.

Contrast Specific Imaging - very low power (MI 0.07) before injection of the contrast agent

- Cancelled signals from myocardial tissue
- Displayed an unusual bright signal from the mass was displayed on a dark image background (Figure 2).

Contrast Specific Imaging - very low power after intravenous injection of 1 mL diluted Definity®

- The mass demonstrated similar echogenicity as the myocardium (Figure 3).

The findings were therefore suggestive of a vascularized tumor with fibrotic tissue within. The tumor was subsequently surgically resected, with a final diagnosis of a papillary fibroelastoma (PFE).

Imaging Studies

Figure 1 Transthoracic echocardiogram showing a mass attached to the mid septum of the LV.

Imaging studies

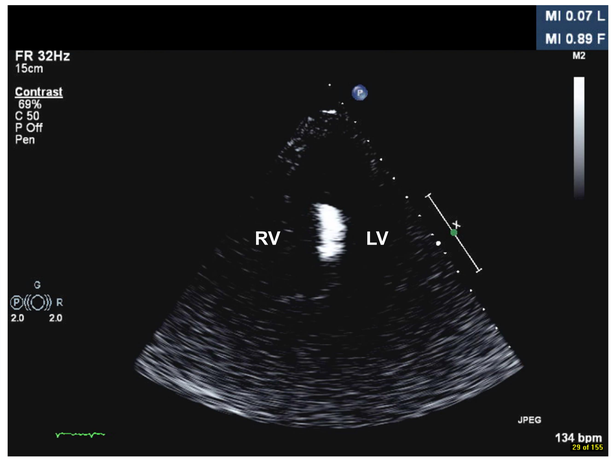

Figure 2 Very low mechanical index (MI 0.07) contrast-specific imaging technique without contrast administration showing bright signal from the mass.

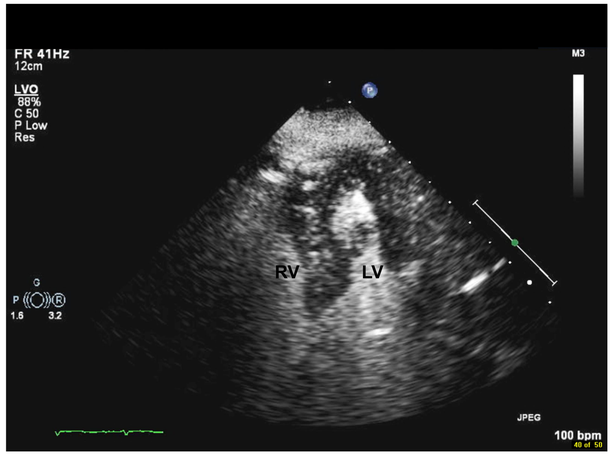

Figure 3 Contrast echocardiogram demonstrating contrast enhancement in the mass similar to the adjacent myocardium, which would be in agreement with the diagnosis of a tumor.

Pathology

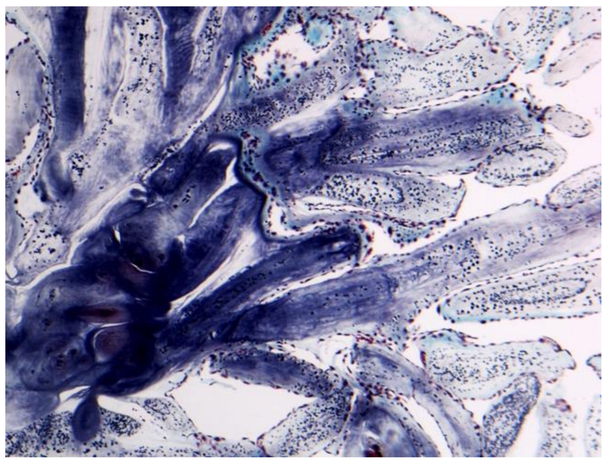

Figure 4 Papillary fibroelastoma (PFE), showing tumor papillae near the tumor base with dense fibroelastic tissues in those papillae.

Conclusion

- The fibroelastic tissue in a PFE provides bright signal in a contrast-specific imaging technique without contrast administration.
- The contrast-specific imaging technique can detect fibrotic tissue in a PFE, in a fashion similar to the concept of contrast echocardiography assessing scar tissue without requiring the administration of contrast agents[1].

Reference

1. Gaibazzi N, Bianconcini M, Marziliano N, Parrini I, Conte MR, Siniscalchi, C, et al. Scar detection by pulse-cancellation echocardiography: validation by CMR in patients with recent STEMI. J Am Coll Cardiol Img. 2016;9(11):1239-51.