

BIVENTRICULAR PACING-INDUCED LEFT VENTRICULAR OUTFLOW TRACT OBSTRUCTION IN A WOMAN WITH ADVANCED HEART FAILURE AND LEFT BUNDLE BRANCH BLOCK: A RARE COMPLICATION

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INTRODUCTION: Biventricular pacing is an emerging alternative modality for reducing left ventricular outflow tract (LVOT) gradient and symptom improvement in a large proportion of hypertrophic obstructive cardiomyopathy patients who are not suitable for other treatment modalities (1-3). Dyssynchrony analysis using displacement curves has shown inversion of wall motion timing with earlier displacement of the lateral wall resulting in LVOT peak gradient reduction from 80 [51/100] to 30 [5/66] mmHg (p = 0.005) (2). Given this, it is very unlikely to encounter LVOT obstruction as a complication of biventricular pacing; indeed, this is a paradoxical outcome from the desired effect of treatment. Here, we present a rare case of biventricular implantable cardioverter-defibrillator (CRT-D) induced LVOT obstruction in a 73-year-old patient with advanced heart failure with left bundle branch block (LBBB).

CASE PRESENTATION: This is a 73-year-old-female with past medical history of cardiomyopathy, congestive heart failure, LBBB, coronary artery disease and hypothyroidism. She was initially diagnosed with cardiomyopathy with left ventricular ejection fraction (LVEF) 20% in February 2016. Cardiac catheterization in February 2016 revealed 80% stenosis of left anterior descending artery which was stented in April 2016. However, despite being on appropriate heart failure medications, her LVEF (35%) did not improve significantly. Given her persistent dyspnea on exertion, moderate to severe LV dysfunction and LV dyssynchrony secondary to LBBB, she underwent CRT-D placement in September 2016.

On a morning of November 2018, she became symptomatic again with profuse sweating and lethargy. She was managed medically at that time. Echocardiogram in December 2018 revealed LVEF of 55% with systolic anterior motion of mitral valve peak gradient 40 mmHg and LVOT obstruction (Fig. A, B). In response, CRT-D parameters were changed (Fig. C) to counteract LVOT obstruction. Thereafter, her symptoms were well-controlled and repeat echocardiogram in September 2019 showed LVEF 60% without any evidences of LVOT obstruction (Fig. D). She has not had any features of LVOT obstruction thereafter.

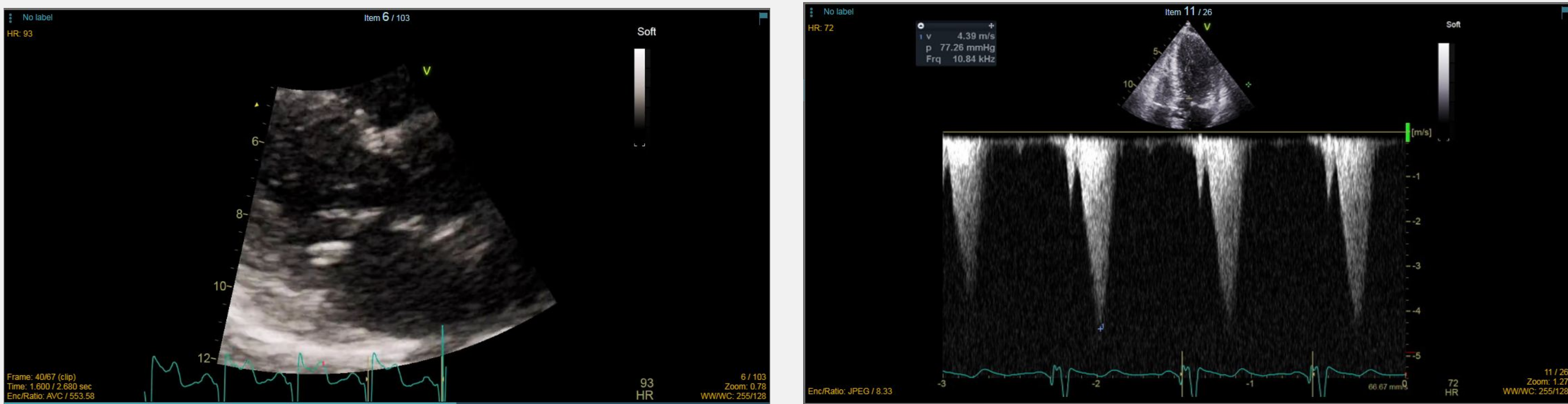


Fig A , B: End systole and LVOT velocity showing LVOT obstruction

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Status	Parameter	Old Value	New Value
Programmed	Normal Brady Leads LV-Pace	LVRing3>>RV	LVRing2>>Can
Programmed	Normal Brady LV Offset	-20 ms	0 ms
Programmed	Normal Brady LV-Pulse Width	0.4 ms	1.0 ms
Programmed	Normal Brady Maximum Sensed AV Delay	90 ms	110 ms
Programmed	Normal Brady Minimum Sensed AV Delay	90 ms	110 ms
Programmed	VT Detection Interval	353 ms	429 ms
Programmed	VT Detection Rate	170 bpm	140 bpm

Fig C: Changes in CRT-D parameters.

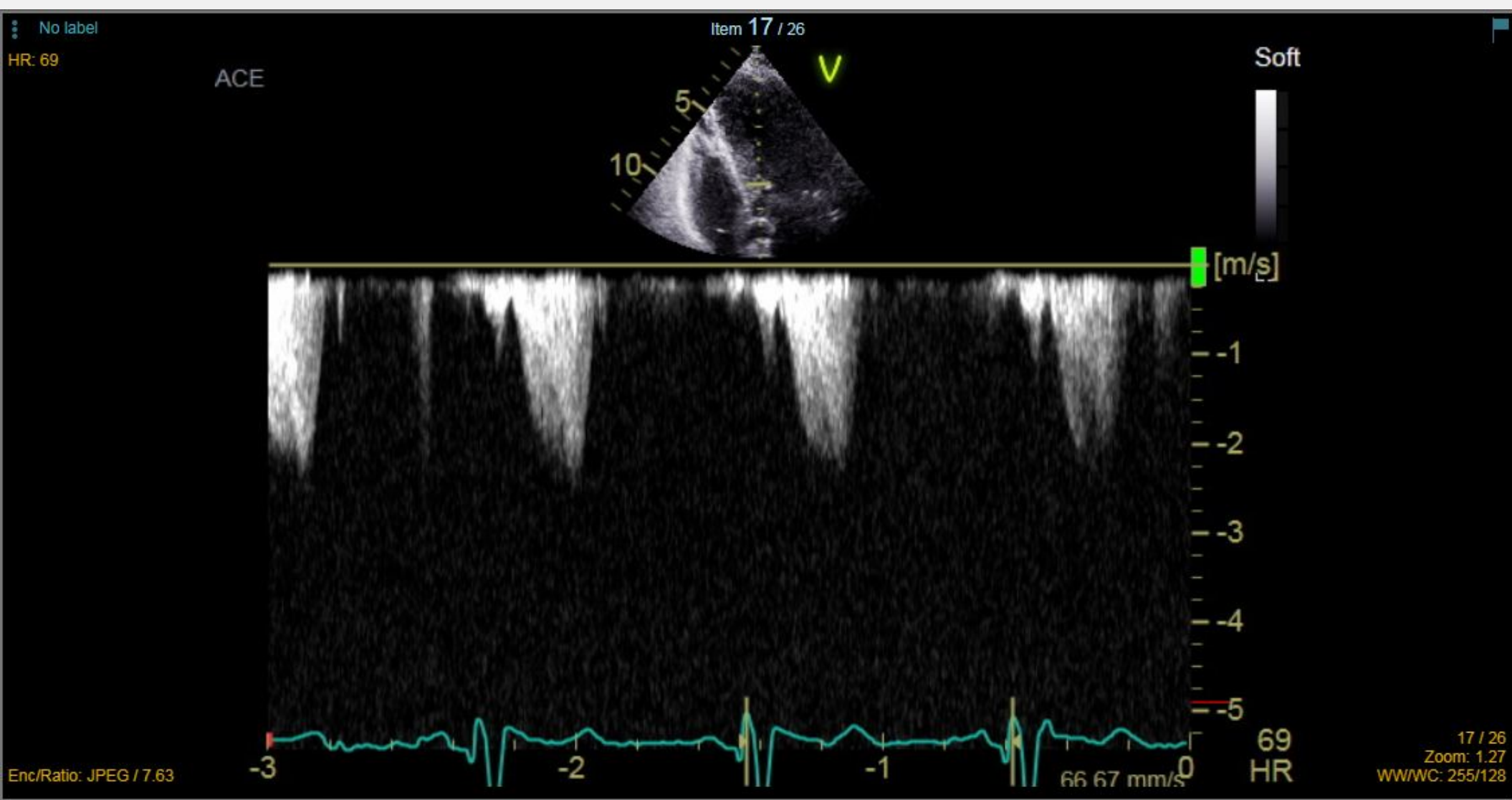


Fig D: LVOT velocity post CRT-D changes.

DISCUSSION: Identification of patients with worsening heart failure symptoms who have a CRT-D is challenging, as it is unexpected to see the reverse outcome from the desired therapeutic benefit of a CRT-D. This case demonstrates previously undocumented complication of CRT-D, and highlights the importance of close follow-up of LV function post-CRT-D implantation.

KEY REFERENCES

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