

## CLINICAL PRACTICE

*Clinical Images***Pathologic Ventricular Interdependence  
in Constrictive Pericarditis**

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**A** 23-year-old previously healthy male presented with dyspnea. Clinical examination demonstrated elevated jugular venous pressure, lower extremity edema, abdominal distension, tachycardia (111 bpm), and a narrow pulse pressure (116/94 mmHg) without pulsus paradoxus. Bedside cardiac ultrasound (parasternal short axis) demonstrated pathologic ventricular interdependence with ventricular septal shift toward the left ventricle (LV) on deep inspiration (“D-sign”). Mitral valve inflow velocities were measured and demonstrated a 35% decrease in inflow velocity with deep inspiration.

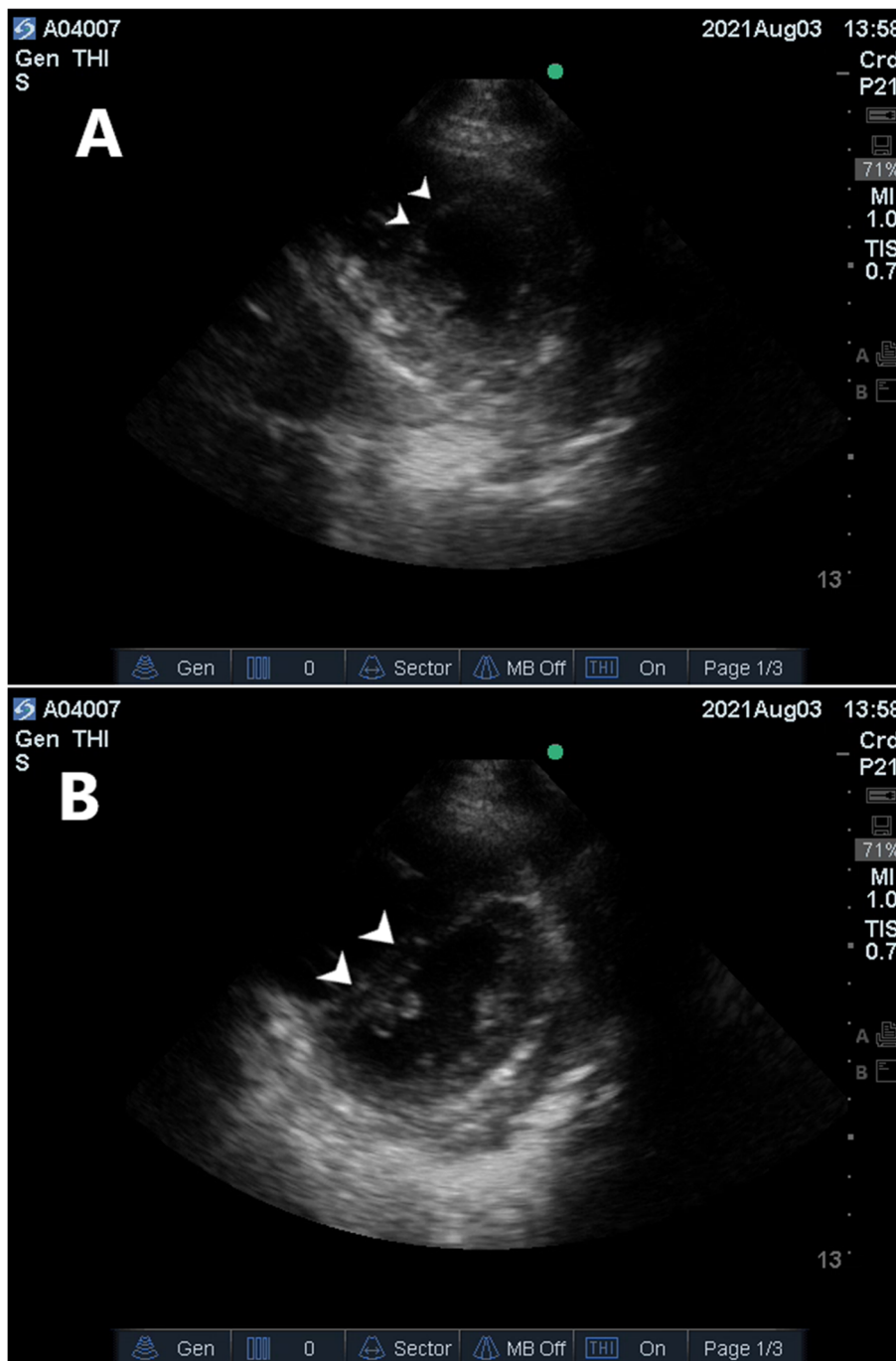
Formal echocardiogram revealed a reduced ejection fraction of 25% with paradoxical septal motion.

Ventricular interdependence is a normal phenomenon but may become pathologic/exaggerated in constrictive states.<sup>1</sup> A rigid pericardium results in fixed cardiac volumes throughout the cardiac cycle and prevents transmission of intrathoracic pressures to the cardiac chambers.<sup>2</sup> In this setting, increased right ventricle (RV) filling along with reduced LV filling during inspiration results in septal flattening and shift of the septum into the LV, which reverses during expiration.<sup>2</sup> Pulsus paradoxus may be absent in up to 80% of patients with constrictive pericarditis, as in our patient.<sup>3</sup> The patient was diagnosed with constrictive pericarditis secondary to disseminated non-pulmonary tuberculosis and treated with heart failure goal directed medical therapy and anti-tuberculosis quadruple therapy. The patient improved significantly and has recovered ejection fraction over the ensuing year.

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**Legend:** The parasternal short axis view is displayed in expiration (A) and inspiration (B). Note the septum (arrows) flattening and shifting toward the left ventricle during inspiration (“D-sign”). Video 1 demonstrates this in real-time

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**Declarations:**

**Conflict of Interest:** The authors declare that they do not have a conflict of interest.

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