OptiVol: an incidental pregnancy test

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Case description
A 33-year-old woman with hypertrophic obstructive cardiomyopathy, presented for management of her implantable cardioverter defibrillator (ICD; Medtronic Virtuoso DR) after the OptiVol alarm was detected via remote monitoring. Device interrogation showed OptiVol fluid index over the threshold, normal device parameters and no arrhythmia. She was asymptomatic without worsening outflow tract obstruction. Incidentally, she had been pregnant for 2 months. With close follow-up, the delivery was normal.

The Figure displays the weight, OptiVol fluid index, and thoracic impedance over 12 months. Blood volume expansion starts ~1 month into pregnancy coinciding with decreasing thoracic impedance and increasing OptiVol index (1). This continues until the 7–8th month. When this signal returns to the baseline (3), there is no further increase in plasma volume although it remains elevated until the end of pregnancy. The OptiVol index resets to zero when the daily impedance rises above the reference impedance line calculated over an average of 4 preceding daily measurements. At 2 months, the OptiVol index resets to zero (2) with the cross in the impedance measurements possibly due to hyperemesis during first trimester pregnancy.

In this case, pregnancy associated volume increase causes abnormal intrathoracic impedances in the absence of heart failure, which could delude the OptiVol algorithm.