



Noninvasive Hemodynamic Monitoring in a Non-Compliant High-Risk Parturient with a History of Recurrent Postpartum Cardiomyopathy

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Introduction

Peripartum cardiomyopathy (PPCM) is a form of idiopathic heart failure affecting women in late pregnancy or postpartum. The incidence is reportedly between 1 in 849 to 1 in 4350 live births with a mortality of approximately 10% in two years. Morbidity and mortality in subsequent pregnancies is increased if left ventricular dysfunction persists.

Case Presentation

- A 35-year-old G13P5075 at 36 weeks gestation
- Past medical history: PPCM with persistently reduced left ventricular ejection fraction (LVEF) of 30-35%, hypertension, paroxysmal atrial fibrillation, episodic NSVT, CHF, morbid obesity, gestational diabetes, PTSD, and anxiety.
- LVEF over peripartum time period including postpartum is summarized in Figure 1A.
- Heart failure exacerbation 2 months prior requiring cardiac ICU hospitalization
- Scheduled elective induction of labor
- Presentation: asymptomatic and compliant with maintenance beta-blocker and hydralazine therapy.
- Notably patient has a history of low health literacy, noncompliance, and decline of recommended AICD placement and anticoagulation.

Figures

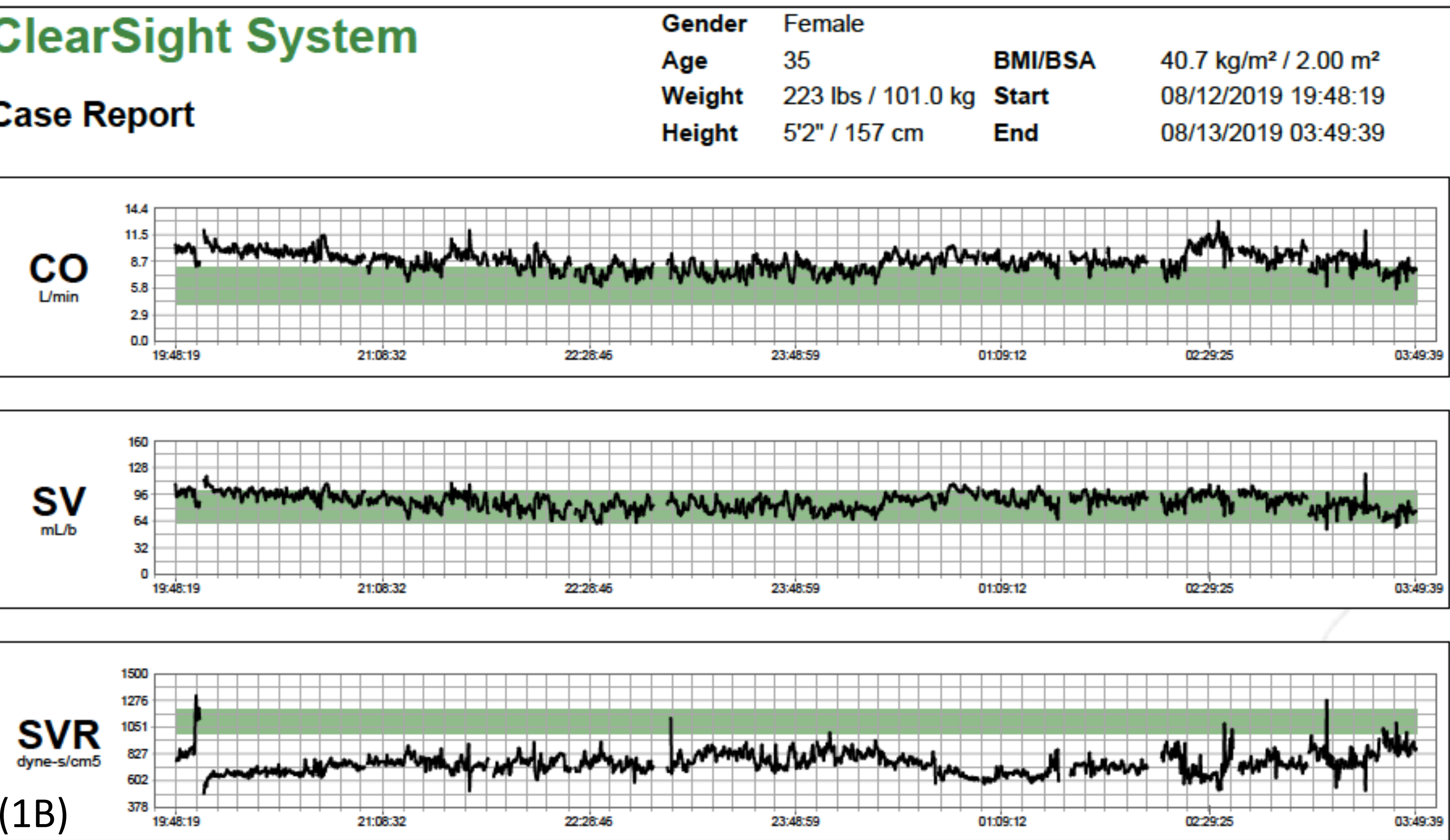
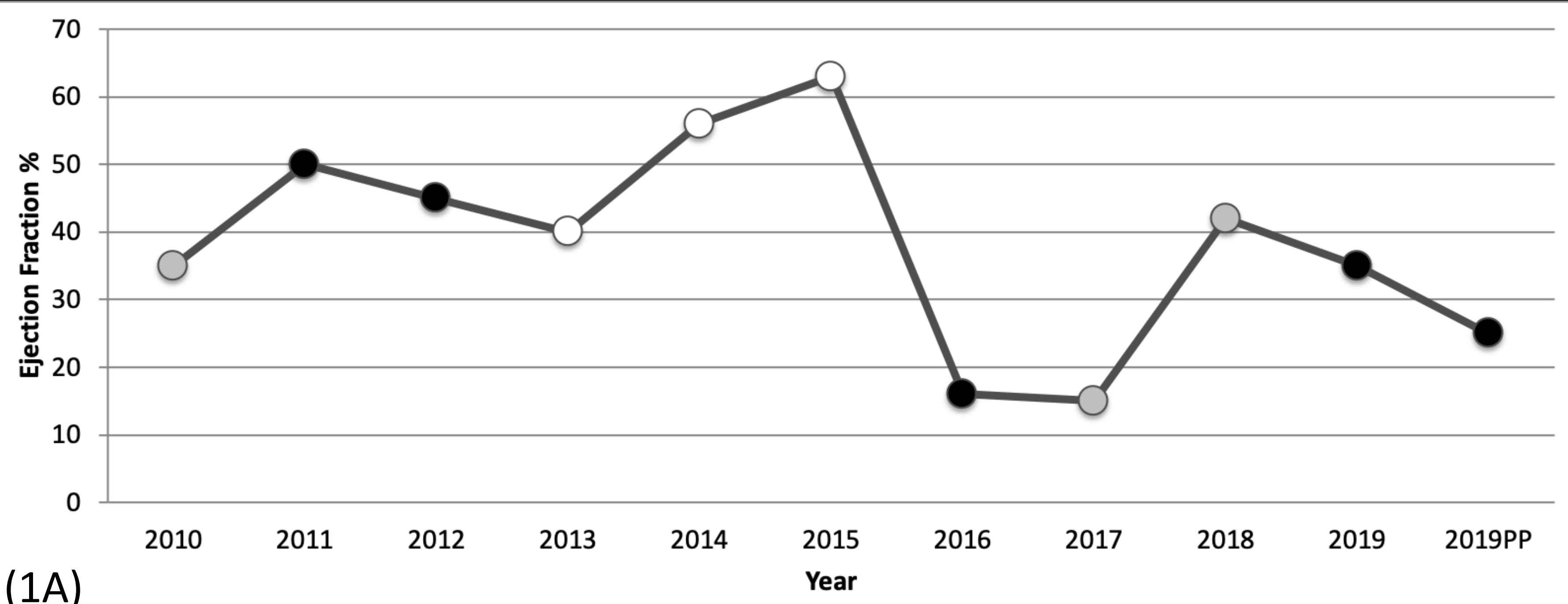


Figure 1A: LVEF over peripartum time period and in association with PPCM. Black indicator: full pregnancy and delivery. White indicator: no pregnancy. Gray indicator: pregnancy and abortion. 2019PP is postpartum. Figure 1B: trends of CO, SV, and SVR peripartum via ClearSight System, delivery at 2:38am.

Plan

- Cardiology, obstetrics, and anesthesiology planned for assisted second stage vaginal delivery with early epidural placement, continuous telemetry, and arterial line monitoring.
- Upon arrival, a labor epidural was placed to decrease catecholamine surge with the pain of contractions, but the patient refused arterial line placement.
- We utilized the ClearSight system (Edwards Lifesciences) as a noninvasive monitor with advanced hemodynamic parameters.
- A 2960g male infant with Apgar of 9 & 9 at 1 & 5 minutes, respectively, was delivered via vacuum assistance.
- Postpartum, she had an uneventful recovery in the cardiac ICU despite persistent LV dysfunction.

Summary

Major adverse events of PPCM include cardiogenic shock, cardiac arrest, and mortality. Hence, it is imperative to monitor maternal hemodynamic changes during labor and immediately postpartum as cardiac output (CO) peaks. Postpartum fluid overload from relief of vena cava obstruction and increasing systemic vascular resistance (SVR) can be detrimental in this patient population.¹ The ClearSight system utilizes a photometric volume clamp that generates an arterial pulse wave (APW) as well as providing stroke volume (SV), CO and SVR. Although validated in the cardiac surgical population, the CO and SV values overestimated in the ClearSight device during the third trimester of pregnancy when compared to transthoracic echocardiography² Despite these limitations, the device provided significant hemodynamic trends (Figure 1B) during labor and immediately postpartum. The ClearSight system allowed hemodynamic monitoring in a noncompliant, at-risk parturient who refused the use of invasive blood pressure monitoring.

References

- Duclos, G. et al. *Int J Obstet Anesth.* 2018 Nov 36:85-95
- Kolte, D. et al. *J. Am. Heart Assoc.* 2014 Jun 4;3(3)