Getting to the Heart of the Matter: A Case of Peripartum Cardiomyopathy Leading to Heart Transplantation

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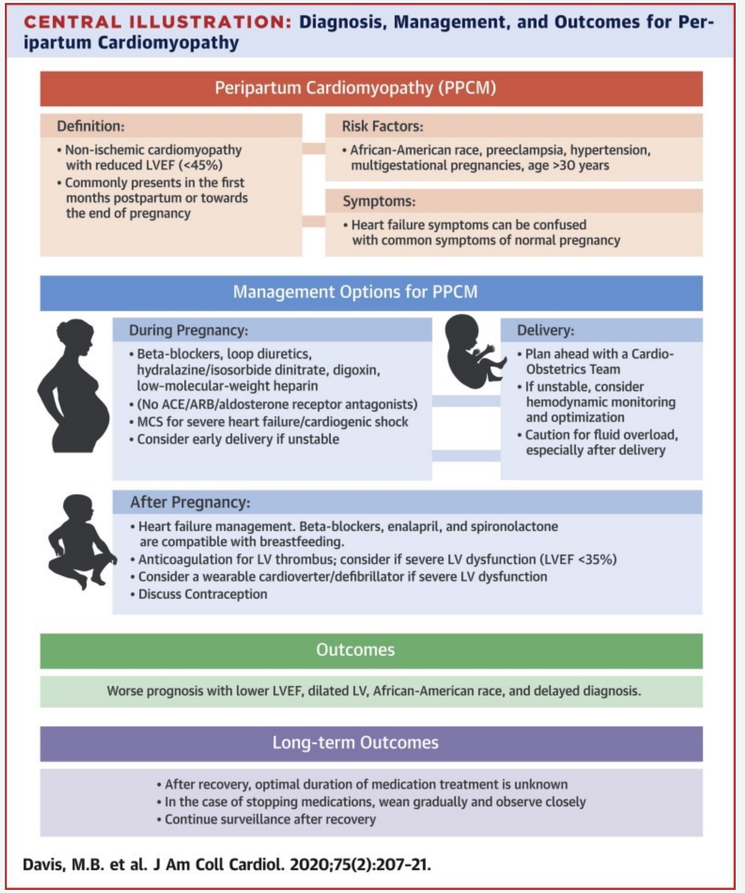
Introduction

- Peripartum Cardiomyopathy (PPCM) is a type of non-ischemic cardiomyopathy with reduced ejection fraction affecting a parturient in late pregnancy or in the first five months postpartum
    - Risk factors include hypertension, preeclampsia, age >30 years, African American race, multigestational pregnancy
- Diagnosis is often difficult and may be delayed, with many symptoms similar to those seen in normal pregnancy
    - Symptoms: dyspnea, orthopnea, chest tightness
    - Physical exam: tachycardia, tachypnea, edema, elevated jugular venous pressure
    - Echocardiography: LVEF <45%, possible LA or biatrial enlargement
    - Laboratory findings: elevated BNP
    - Chest X-ray: pulmonary venous congestion
- Management of PPCM is comparable to that of other forms of heart failure, with severe cases sometimes requiring advanced therapies
    - Mechanical circulatory support
    - Heart transplantation



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Case

- 34 year old female, G1P0, with PMSH anemia, leiomyoma, prior cholecystectomy
- Presented at 37w5d with chest pain, dyspnea, non-productive cough

Initial Work up

- Elevated BNP, Negative troponin, Negative CT PE
- Bedside TTE with severely reduced LVEF (17%) and moderately reduced RV function
- Multidisciplinary team including Obstetric Anesthesia, Cardiothoracic Surgery, Heart Failure Cardiology, OB/GYN assembled

Preoperative Optimization

- Arterial line placed, inotropic support with dobutamine initiated pre-operatively

Emergent Cesarean Delivery

- General anesthesia
- Central access obtained, Swan-Ganz catheter placed
- Epinephrine infusion initiated
- Intra-aortic balloon pump placed
- CCU transfer

Postoperative Course

- PPD1- Worsening biventricular function
- PPD2- VA ECMO initiated with peripheral Impella
- PPD8- Transferred to an affiliated hospital for cardiac transplant evaluation
- PPD9- Developed paraplegia and saddle anesthesia, diagnosed with spinal cord infarction, failed trial of decannulation
- PPD 11- Urgent chest exploration with concern for tamponade

UNOS Status 1 for Transplant on PPD13

- PPD17- Successfully underwent orthotopic heart transplant
- Discharged to spinal cord rehabilitation center

Long Term Follow Up

- Follow up TTE 2 months postoperatively demonstrated LVEF 65% with mildly reduced RV function

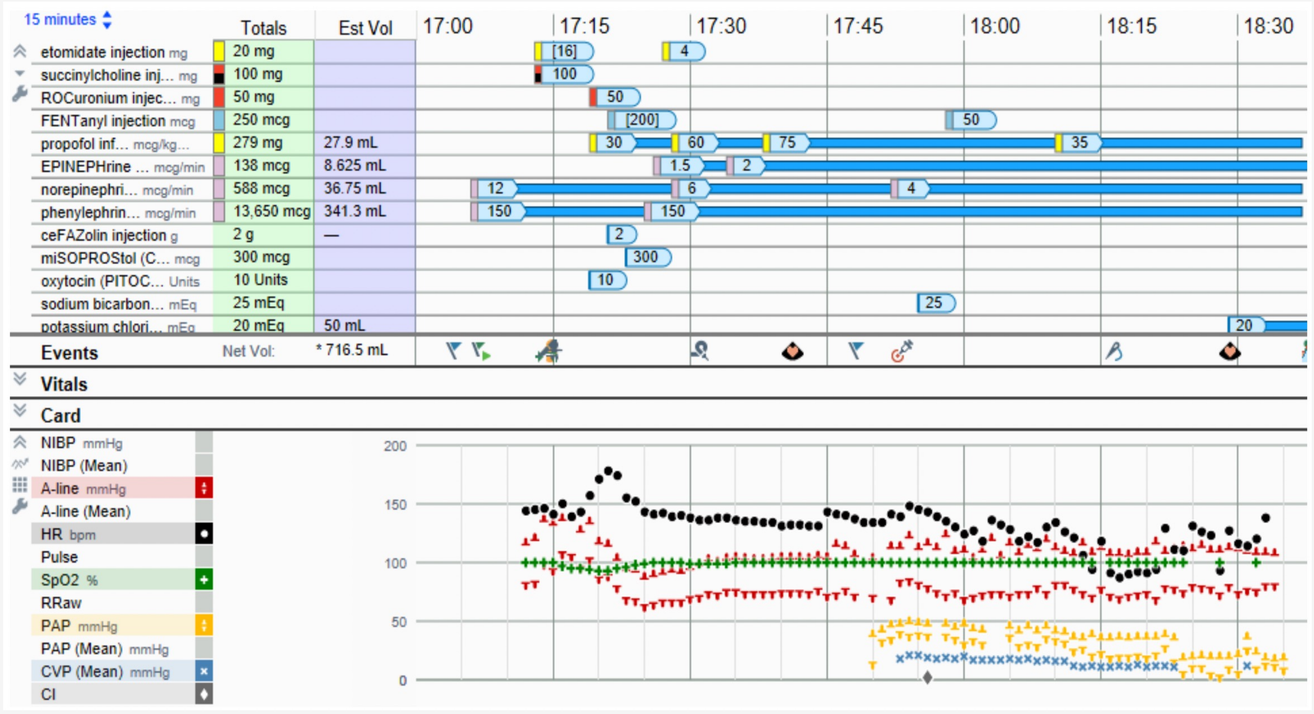

Figure 1. Peripartum Vital Signs and Medication Timeline

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Discussion

- Vaginal delivery is preferred in cases of PPCM, but both neuraxial and general anesthesia can be safely performed when cesarean delivery is required
    - Focus on strict hemodynamic control with careful cardiac monitoring
- Period immediately following delivery can be particularly tenuous with acute increases in venous return increasing risk of fluid overload
- Acutely decompensated patients should be managed by specialized multidisciplinary teams
    - Treatment may include vasodilators, diuretics, and inotropic support
    - Mechanical circulatory support with an intra-aortic balloon pump, VA ECMO, or ventricular assist devices should be considered early in refractory cases
- Approximately 10% of PPCM patients require heart transplantation
    - Data suggest higher rates of graft failure and lower age-adjusted survival compared to non-PPCM patients
- Long-term follow up is required, though questions remain about optimal duration of medication treatment after recovery

References:
1- Davis M.B., et al. Peripartum Cardiomyopathy: JACC State-of-the-Art Review. J Am Coll Cardiol. 2020 Jan 21;75(2):207-221.
2- Kwon, J., et al. Heart Transplantation for Peripartum Cardiomyopathy: Outcomes Over 3 Decades. Ann Thorac Surg. 2022 Sept; 114(3):650-658.
3- Ramachandran R, et al. Anesthetic management of patients with peripartum cardiomyopathy. J Obstet Anaesth Crit Care. 2011; 1:5-12.

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