

CESAREAN DELIVERY IN A PARTURIENT WITH SEVERE MS, PH, AND VSD: A CASE REPORT

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- Cardiovascular disease (CVD) is a leading cause of maternal morbidity and mortality
- Rates of pregnancy among individuals with acquired and congenital CVD are rising
 - Advanced maternal age
 - Survival of congenital heart patients into adulthood
 - Increasing prevalence of cardiovascular comorbidities
- Mitral stenosis (MS) is particularly hazardous, with mortality rates as high as 3% in high-income countries
 - Severe MS (mitral valve area (MAV) < 1cm²) combined with pulmonary hypertension (PH) carries a maternal mortality rate of up to 15%
- Additional cardiac pathologies (i.e., VSD) further complicate hemodynamic management throughout the peripartum course, requiring a multidisciplinary team, sufficient evaluation in the antepartum period, and a hemodynamic “balancing act”

2018 ESC Guidelines for the Management of Cardiovascular Diseases during Pregnancy. *European Heart Journal*. 2018;39(34):3165-3241.

Pregnancy Outcomes in Women With Rheumatic Mitral Valve Disease. *Circulation*. 2018;137(8):806-816.

Cardiovascular Considerations in Caring for Pregnant Patients: A Scientific Statement From the American Heart Association. *Circulation*. 2020;141(23).

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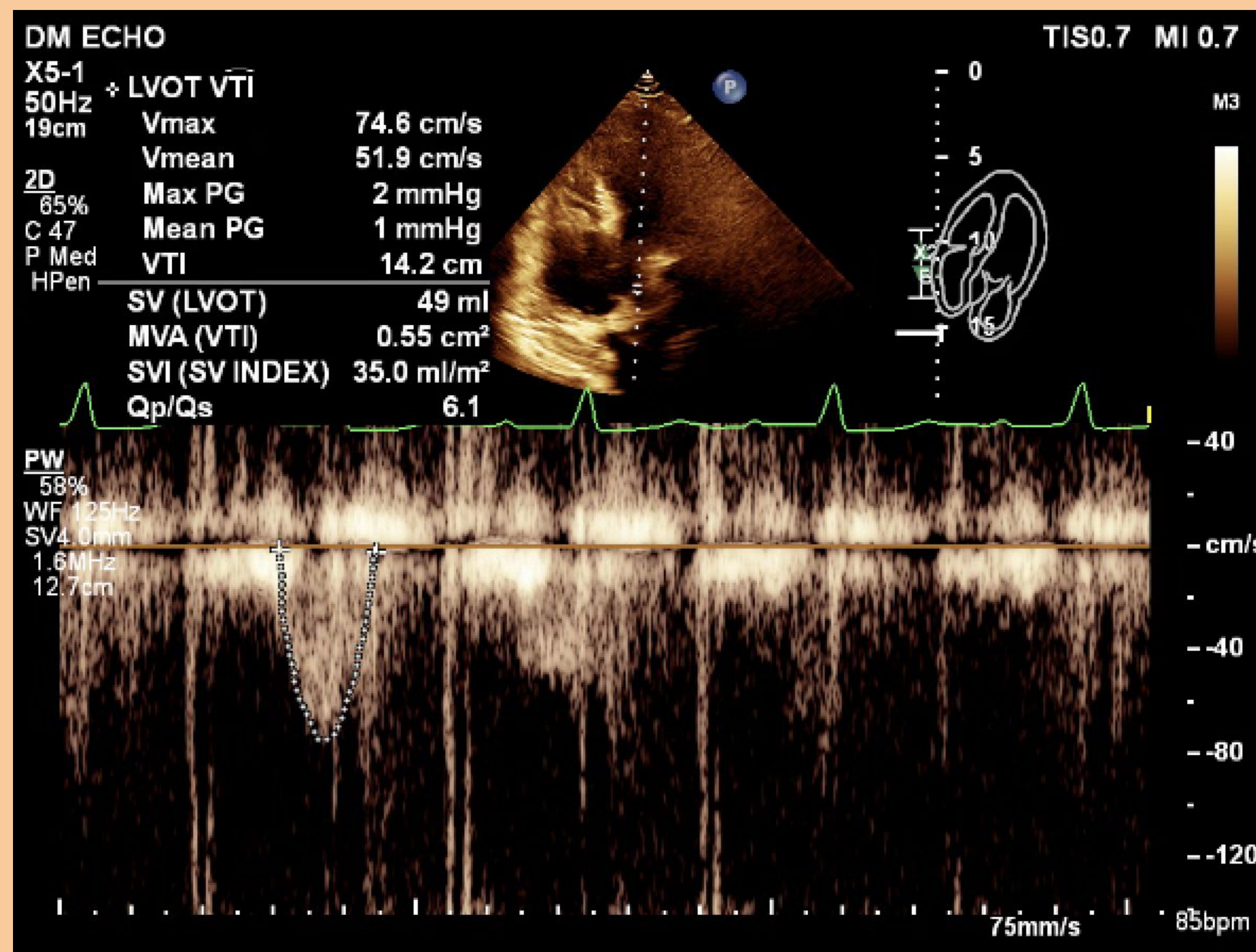
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The Case

Pathophysiology

32-year-old G4P2 at 36w3d

- Critical Rheumatic MS (MVA: 0.56 cm²)
- Severe PH (PASP 71 mmHg)
- Pulmonic Stenosis + VSD



**Fixed Cardiac Output
+
Risk of Decompensation**

Hemodynamic Goals

- ✓ ↓ Heart Rate → Optimize Diastolic Filling
- ✓ Maintain Systemic Vascular Resistance
- ✓ Avoid ↑ Pulmonary Vascular Resistance
- ✓ Prevent Right → Left Shunt

Key Risks

Tachycardia → ↓ Filling → Pulmonary Edema

↓ SVR → Shunt Reversal → Collapse



Technique + Monitoring

Titrated CSE @ L4-L5

Spinal

- Bupivacaine 0.75% (1 mL)
- Fentanyl 15 mcg
- Morphine 150 mcg
- Epinephrine 100 mcg

Monitoring

- FloTrac (continuous SV, CO, SVR)
- PA Catheter (PA pressure)

Rescue Plan

- Pre-placed ECMO sheaths
- Femoral vessel access prepared
- Rapid MCS in case of collapse

Why Not GA?

- Avoid sympathetic surge
- Avoid PPV → Preserve RV Preload
- Allow controlled titration

OUTCOME: Successful cesarean — healthy infant — no intraoperative complications — post-op ICU monitoring

Teaching Points

- Pregnant patients present unique challenges related to cardiovascular physiology and perioperative hemodynamics.
- In patients with aberrant structural physiology, careful consideration must be given to optimize a variety of cardiac parameters.
- With severe mitral stenosis, ensuring adequate diastolic filling can be accomplished via tight heart rate control.
- In pulmonary hypertension and ventricular septal defect, avoiding systemic hypotension is important to prevent shunt reversal and cardiovascular collapse.
- Neuraxial analgesia via a combined spinal-epidural can be utilized to avoid the sympathetic surge associated with laryngoscopy, intubation, and positive pressure ventilation, while a low-dose incremental technique allows for gradual anesthetic titration and helps prevent abrupt sympathectomy.
- Preparation with pre-placed ECMO sheaths and postoperative monitoring in a heart failure ICU are proactive measures to ensure maternal and fetal safety during and after cesarean section.

