

BACKGROUND

Normal His-Purkinje Conduction

Symmetrical, Rapid Activation

RV Apical Pacing (LBBB-like dyssynchrony)

Asymmetrical, Slow Muscle-to-Muscle Conduction

Core Definition: Pacing-Induced Cardiomyopathy (PICM) is an iatrogenic heart failure syndrome characterized by an LVEF reduction of $\geq 10\%$ (dropping below 50%) due to chronic, high-burden RV pacing.

Mechanism: Bypassing the native His-Purkinje system creates profound interventricular and intraventricular dyssynchrony, increasing end-systolic volume, wall stress, and myocardial fibrosis.

12%

of pacemaker recipients develop PICM

2-3x

↑ risk of death / HF hospitalization
Risk highest within the first 6 months of pacemaker implantation

⚠️ PREGNANCY RISK

- EF < 45% → elevated maternal risk
- ~16% mortality in subsequent pregnancies with LV dysfunction

Clinical Case

PATIENT PROFILE

Age: 23 years old

Obstetric: G2P1001, 38+5 wks

Indication: Decreased fetal movement → IOL

Cardiac Dx: Congenital CHB (Mobitz I)

Pacemaker: Dual-chamber (implanted 2017, re-implanted 2023)

PM Status: PACEMAKER-DEPENDENT

Echo: EF 45%, paradoxical septal motion

MONITORING & SAFETY

- ✓ Continuous telemetry
- ✓ Peripheral IV access
- ✓ Strict intake/output monitoring
- ✓ External defibrillation pads
- ✓ **Magnet AVAILABLE — NOT applied**
- ✓ Fetal monitoring throughout
- ✓ MDT: OB Anesthesia, MFM, Cardiology, EP

ANESTHETIC TECHNIQUE

Technique: Dural Puncture Epidural (DPE)

Initial infusion:

0.0625% bupivacaine
+ fentanyl 2 mcg/mL

Breakthrough pain:

10 mL 0.25% bupivacaine bolus

No neuraxial opioid adjuncts required

No hemodynamic compromise observed

Teaching Points

THE PICM PARADOX

Unlike DCM or PPCM, the cardiomyopathy is iatrogenic from RV pacing — yet the device cannot be discontinued in pacemaker-dependent patients. Management targets loading conditions, not device removal and this case illustrates a relatively rare instance of peripartum management in patients with PICM.

NEURAXIAL CHOICE: DPE

The choice of dural puncture epidural (DPE) over standard epidural or CSE optimizes both analgesia quality and hemodynamic stability in cardiac patients. DPE offers faster onset and superior sacral coverage, while avoiding the dense sympathectomy of CSE/spinal. In ↓EF, preserving preload and SVR is essential.

EMI & MAGNET STRATEGY

Vaginal delivery without electrocautery = minimal EMI risk. Magnet should be available but NOT routinely applied — magnet mode (asynchronous) can be deleterious. Reprogramming reserved for planned cesarean w/ monopolar cautery.

TEMPORARY PACING

Prophylactic transvenous pacing was not indicated in this hemodynamically stable, device-functional patient. Transcutaneous pads + defibrillation capability suffice as backup.

MULTIDISCIPLINARY PLANNING

This case demonstrates that successful pregnancy is achievable in young women with cardiomyopathy and reduced ejection fraction, but requires expert multidisciplinary care and carries significant maternal risk. Together, OB/Gyn, anesthesia, cardiology, and electrophysiology coordination resulted in seamless care for this patient.