

Repeat Cesarean Delivery at 37 weeks Gestation in a Patient with a HeartMate 3 Left Ventricular Assist Device

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Background

Management of parturients with left ventricular assist devices presents unique anesthetic challenges

There have been 12 documented cases of pregnancy in patients supported by an LVAD

- Only 3 deliveries have been reported with the HeartMate 3 (HM3) device
- Here we report the first case of a term delivery and repeat C-section in a parturient with a HM3

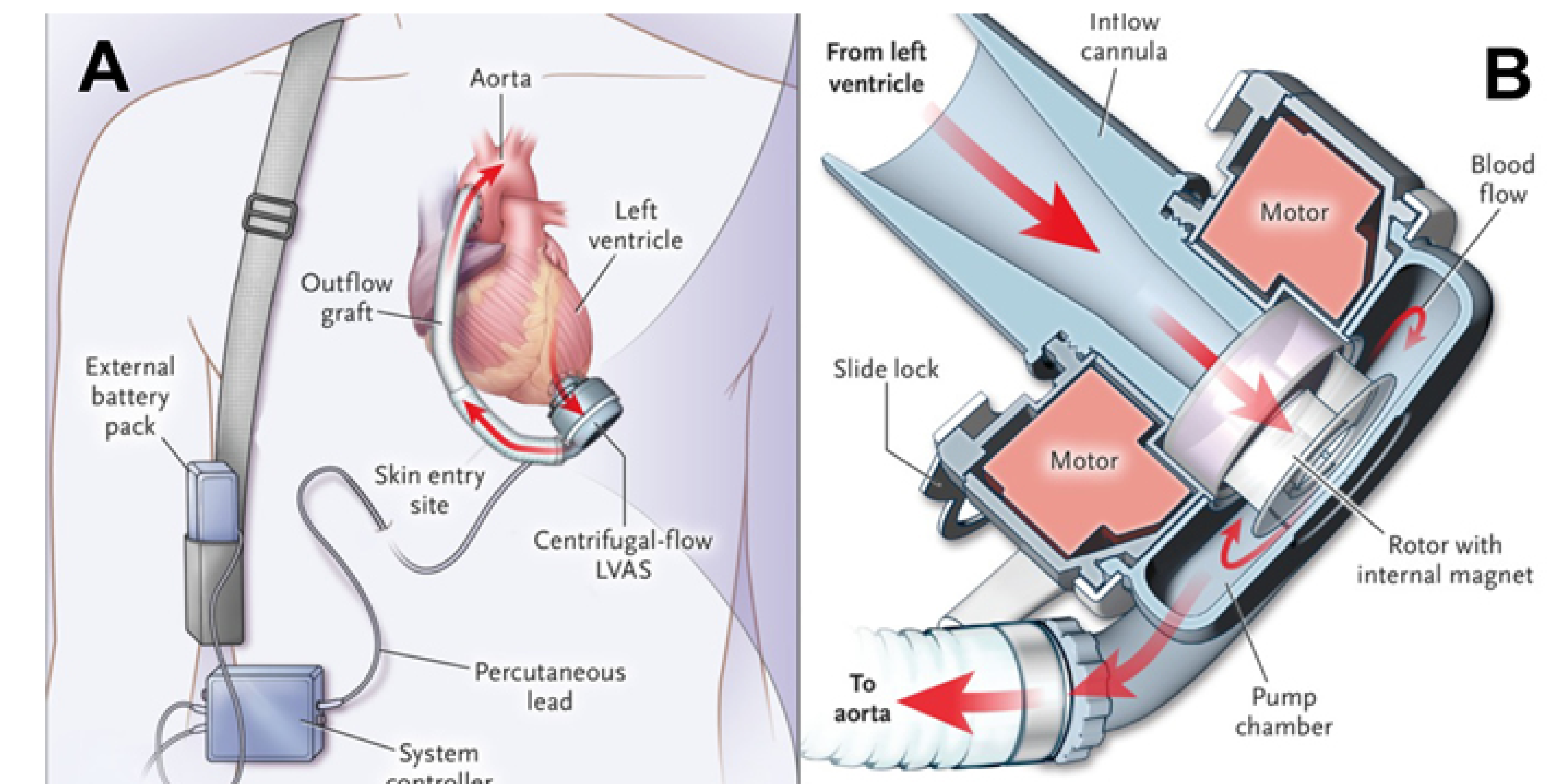
Impact of HeartMate 3

Parturients with HM3 devices are particularly preload sensitive

- RV function and PVR must maintain supply to HM3
- Uterine autotransfusion > RV overload > septal shifting > HM3 suction events > loss of flow

HM3 patients are also sensitive to increases in afterload

- Increases in SVR from labor, intubation, and surgical stimulation may result in HM3 motor failure



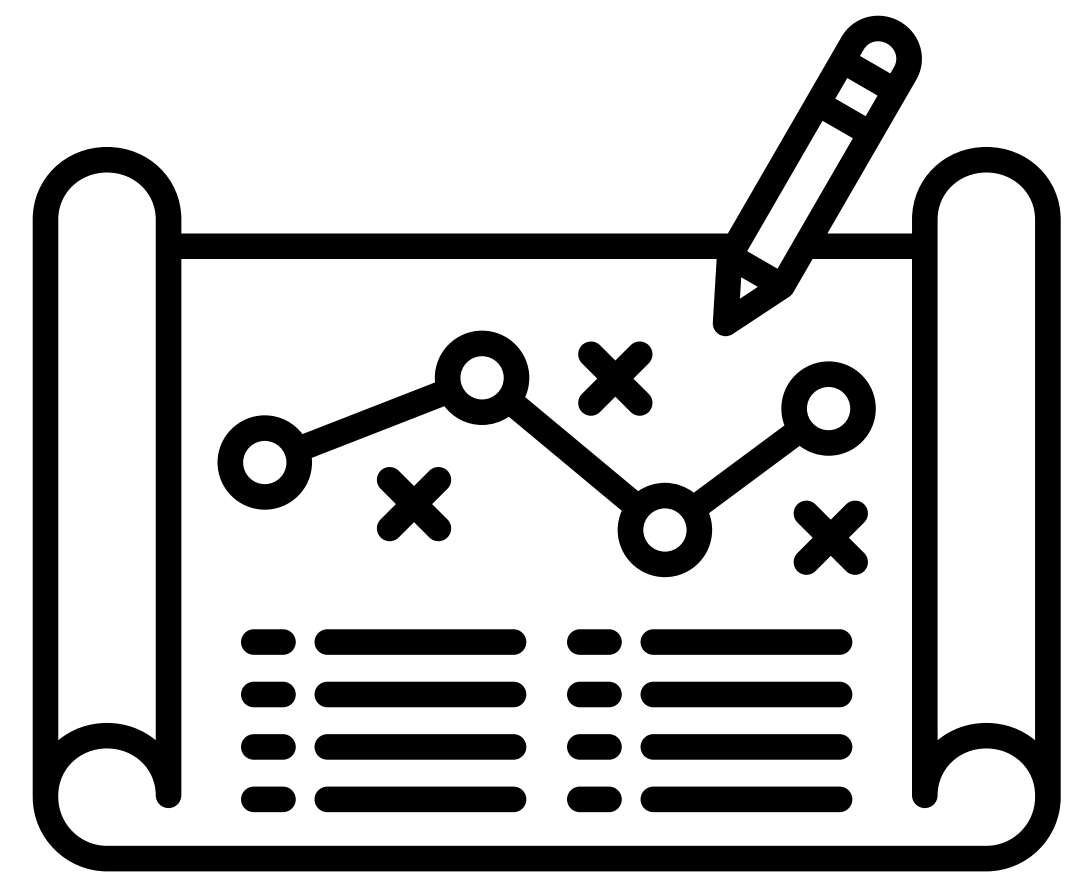
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Peripartum Management

A 37-year-old G3P1011 at 37 weeks gestation with a HeartMate 3 (HM3) LVAD presents for scheduled repeat cesarean section

Preoperative Planning

- Case managed since 9 weeks EGA via a coordinated team including MFM, cardiology, cardiac surgery, obstetric anesthesia & cardiac anesthesia
- Preoperative PFA-100 testing confirmed platelet dysfunction (ADP/PFA 121s, EPI/PFA 228s)
- Decision made to proceed with general endotracheal anesthesia with intraoperative TEE monitoring



Delivery and Postpartum Care

- Radial arterial line and right IJ central venous catheters were placed preoperatively, followed by controlled induction using propofol
- Following intubation, TEE was performed and milrinone was started at 0.25 mcg/kg/min
- Incision-to-delivery time was 2 minutes with infant APGAR scores of 9 and 9
- BP dropped to 76/61 shortly after delivery; TEE demonstrated maintained RV function with minimal septal shifting, suggesting mismatch between RV accommodation and transient SVR reduction
- Epinephrine infusion was started, along with slow oxytocin infusion
- Desmopressin and tranexamic acid were administered
- Final QBL = 900 mL
- Patient extubated in the OR and discharged on postpartum day 2

Pre-Incision TEE

- Mildly dilated RV
- No RVH
- Mildly decreased global RV function

Post-Delivery TEE

- Moderately dilated RV with normal RV function
- HM3 inflow cannula well positioned

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Take Home Learning Points



Anesthetic Choice

- Multidisciplinary navigation with frequent adjustment of LVAD parameters permitted a term delivery
- The presence of acquired von Willebrand and ability to utilize TEE for real time surveillance favored the use of general endotracheal anesthesia
- Additional concerns included full term infant and need for repeat cesarean, which increased risk of additional bleeding and prolonged operative time

Intraoperative Management

- Milrinone and epinephrine provided inotropic support and pulmonary vasodilation, reducing the chance of RV failure
- TEE showed a stable intraventricular septum and good RV function, preventing the common mistake of "fluid loading" an already volume-stressed heart, which could have triggered secondary RV failure in this patient
- Desmopressin and tranexamic acid were utilized to minimize bleeding

Postpartum Considerations

- Uterine tone was managed with a slow, titrated Oxytocin infusion. Non-pharmacologic tools for controlling bleeding (e.g., intrauterine balloon) were available
- Methylergonovine and Carboprost were avoided due to potential increase in pulmonary and systemic vascular resistance, which could impact RV and HM3 function

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