



Obstetric Anesthesia Considerations in a Heart Transplant Recipient

Hans P. Sviggum, M.D.
Assistant Professor of Anesthesiology
Mayo Clinic, Rochester, Minnesota

Cardiac Problems in Pregnancy
Sunday, February 28, 2016 14:45-14:55pm

Case

40 yo G1P0, 37 wks, BMI 45

Orthotopic allotransplantation 2010

Hypertrophic Cardiomyopathy

Septal myectomy 1996

NYHA IV, EF 15-25%

Pre-pregnancy echo:

EF 66%

Normal RV/LV size and function

No valvular disease

Case – Pregnancy Course

1st trimester

Low tacrolimus levels

Increase in tricuspid regurgitation

Tacrolimus 8 mg twice daily

Azathioprine 25 mg twice daily

2nd trimester

Monthly echocardiograms – no change

Tacrolimus to 17 mg twice daily

3rd trimester

Two admissions for elevated BP

Pre-eclampsia w/o severe features

Tacrolimus to 14 mg three times daily

Case – Cesarean Delivery

Spinal anesthesia

Profound uterine atony

Unresponsive to standard treatments

Resuscitation, Intubation

Estimated Blood Loss – 2000 mL

3 units PRBC → Hgb 8.6

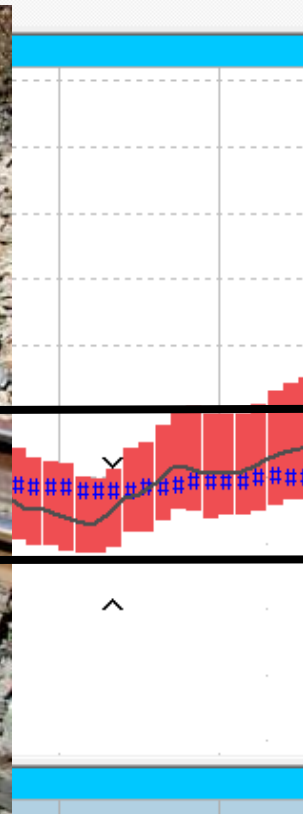
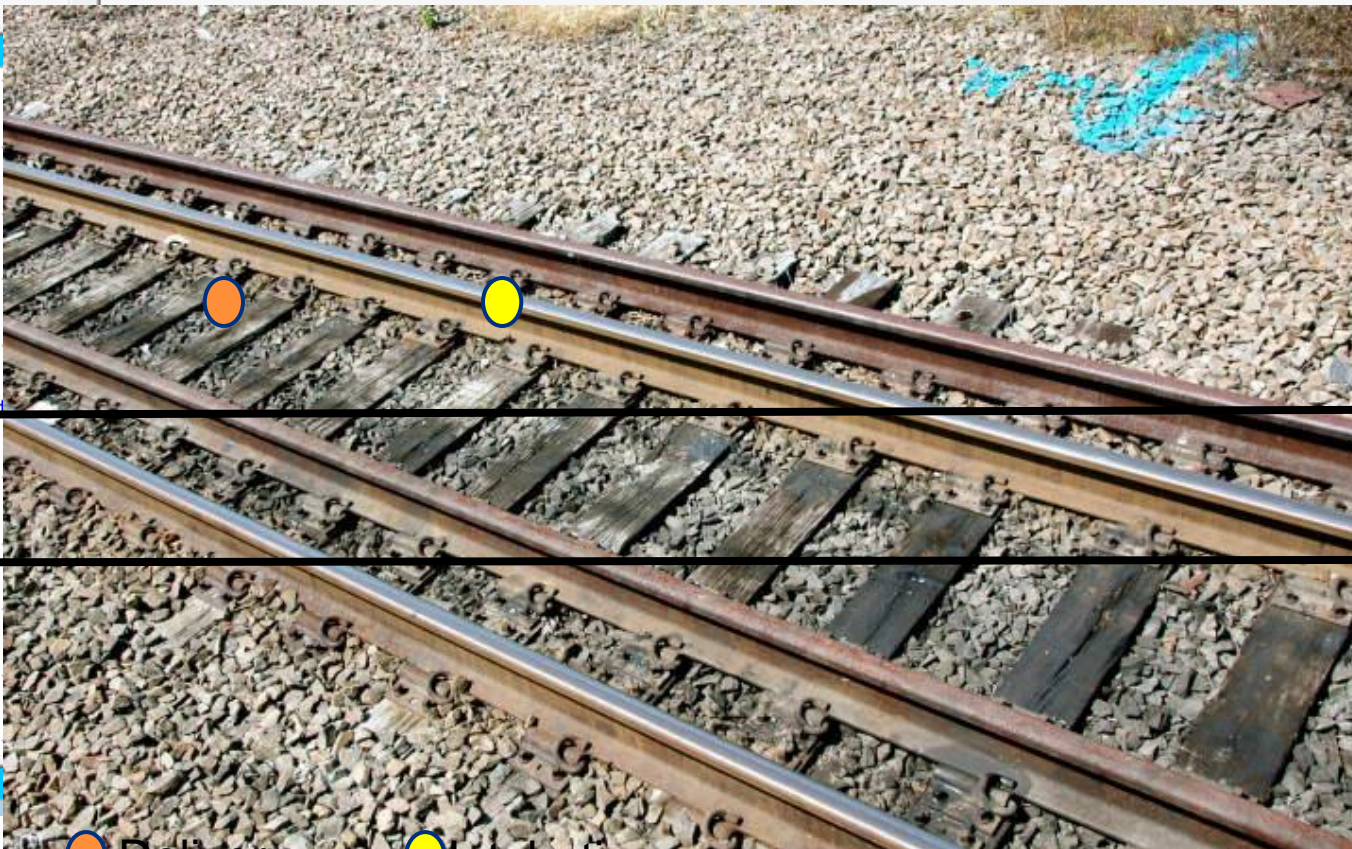
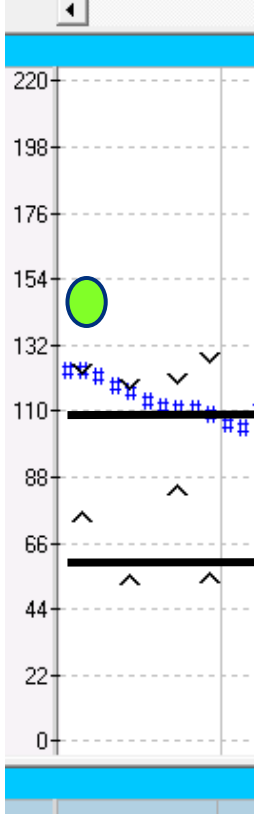
Hysterectomy performed

Continued care in ICU



Case- Hemodynamics

11:20	11:30	11:40	11:50	12:00	12:10	12:20	12:30	12:40	12:50	13:00	13:10
■	■	■	■	■	■	■	■				



● Spinal ● Delivery ● Intubation

Heart transplant and pregnancy

Avoid pregnancy during 1st post-transplant year

Fertility unaffected by immunosuppressive drugs

Criteria for pregnancy timing

- No rejection in past year
- Adequate and stable graft function
- No acute infections (e.g. CMV)
- Stable dose of immunosuppression



Multidisciplinary team for counseling and care

Costanzo MR, et al. J Heart Lung Transplant 2010;8:914-56

McKay DB, et al. Am J Transplant 2005;5:1592-99



Maternal Concerns

Rejection

Acute rejection *not* increased

Chronic rejection *not* increased

Continue meds for prepregnancy target levels

Infection

13% of pregnancies

Grafts from CMV-positive donor carry biggest risk

Hypertension

30-50% prevalence

Aggressive treatment indicated

Avoid ACE inhibitors and ARBs

Coscia LA, et al. Clin Transpl 2010;65:85

Fetal Risks

Premature delivery

~ 40% < 37 weeks

Low birth weight

~ 40% < 2500 g

Spontaneous abortion?

6-27%, Appears to be similar to non-transplant



Coscia LA, et al. Clin Transpl 2010;65:85

Sibanda N, et al. Transplantation 2007;83:1301

Fetal Risks

Immunosuppressive therapy

Continued throughout pregnancy

Mycophenolate acid (mycophenolate mofetil, MMF)

Fetal loss and congenital malformations

Azathioprine commonly used instead

Maternal benefits > adverse pregnancy outcomes

Use lowest effective dose

Coscia LA, et al. Clin Transpl 2010;65:85

Hoeltzenbein M, et al. Am J Genet A 2012;158A:588

Delivery

Cesarean delivery for obstetric indications

30-57%

“Stress-dose” steroids controversial

Post-partum period critical

Large increase in cardiac output

Drug toxicity more likely

Uterine atony with high tacrolimus dose?

Deshpande NA, et al. Rev Obstet Gynecol 2013;6:116-25

Anesthetic Implications

Denervated heart

Direct acting vasopressors and chronotropic agents

Have epinephrine available

Cardiac Output highly volume dependant

Reversal of neuromuscular blockade safe

Barbara DW, et al. Transplantation 2015; epub ahead of print

Anesthetic Implications

Anesthetic technique does not affect outcome

Regional anesthesia well tolerated

Continuous ECG monitoring

Significant dysrhythmias rare

Invasive monitoring rarely required

Cardiac allograft vasculopathy

Increased incidence of co-morbidities

Hypertension, renal dysfunction

Cheng DCH, Ong DD. Can J Anaesth 1993;40:981-86

Taylor DO, et al. J Heart Lung Transplant 2005;24:945-55

Summary

- Increased maternal and fetal risks
- Avoid pregnancy in year following transplant
- Continue immunosuppression
- Regional anesthesia indicated according to patient wishes
- Use direct acting cardiovascular medications
- Continuous electrocardiographic monitoring



Thank you!

sviggum.hans@mayo.edu