



# Management of a Pregnant Congenital Heart Disease Patient for Emergent Cardiopulmonary Bypass Procedure

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## INTRODUCTION

As congenital heart patients survive into adulthood, some of them will experience pregnancy. With its physiological changes, pregnancy can stress the delicate homeostasis in these patients. Patients who develop heart failure or infections may require cardiopulmonary bypass (CPB), which has an estimated fetal mortality of 16-33%. Caring for the congenital cardiac patient and her fetus requires thoughtful consideration of physiologic goals.

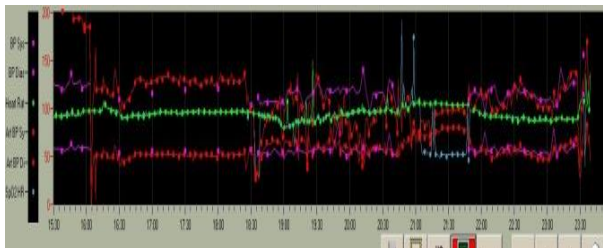
## CASE SUMMARY

30 yo primigravid F with history of congenital aortic stenosis, status post valvuloplasty as an infant, a Ross procedure at age 5, and transcatheter pulmonary (Melody) valve placement at age 23, presented with cough, fatigue, dyspnea on exertion, fever and chills for several weeks. Fetus was 10w EGA.

Echocardiography revealed a 1 x 1 cm vegetation and peak gradient of 65-70 mmHg across her Melody valve. Inpatient IV antibiotics were initiated, but after 10 days of therapy, vegetation size increased to 2.3 x 1.5cm and extended to proximal PA with septic pulmonary emboli. Urgent surgery was planned for RV-PA conduit replacement with CPB. Fetus was 12w EGA.

Preoperatively, vital signs were stable, a III/VI systolic ejection murmur was present, lungs were clear and fetal heart tones were present in 170s. General anesthesia was induced with midazolam, fentanyl, propofol and cisatracurium. Anesthesia was maintained with isoflurane and morphine infusion and an ET tube, arterial/central venous lines and TEE probe were placed.

## OPERATIVE MANAGEMENT



In order to maintain adequate maternal and placental oxygen delivery, physiologic goals were:

- Maintain target MAP > 70 mmHg using phenylephrine infusion prior to CPB and maintaining CI 3.0-3.5 on CPB
- Maintain normocarbida to avoid placental vasoconstriction
- Preserve arterial pulsatility
- Maintain normothermia prior to and during CPB
- Avoid hemodilution by maintaining hematocrit >30%

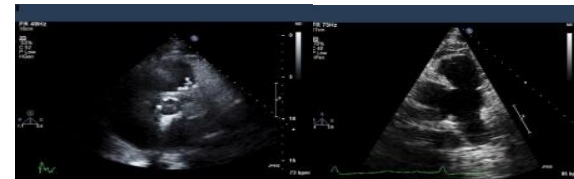
After 69 minutes of CPB, a norepinephrine infusion was initiated but weaned quickly following recovery of intrinsic cardiac function.

Patient was extubated in the operating room and transferred to the cardiac ICU where postop FHT were confirmed.

Following uneventful recovery, she was discharged on POD #6.

Three months postoperatively, obstetric records note normal fetal development at 25w EGA.

## TEE IMAGES



Preop Melody valve vegetation

Postop RV-PA conduit & branch PA

## CONCLUSION

- Congenital heart disease represents up to 75% of heart disease in pregnancy.
- When maternal condition necessitates CPB, fetal mortality is significant.
- Knowledge of the pharmacologic effects of the medications utilized as well as the physiologic effects of the hemodynamic changes to placental blood flow which occur during CPB, may enable providers to ameliorate factors which may adversely affect fetal oxygen delivery during these cases.

## REFERENCES

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