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Anesthetic Management of A Parturient with a History of Ross Procedure Complicated by Pulmonary Valve Stenosis Undergoing Elective Cesarean-Section

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Introduction

Congenital aortic valvular stenosis in women at childbearing age is not common. The Ross procedure is used as a treatment modality in children and young patients with this condition. It consists of replacing the aortic valve with the patient's own pulmonary valve and has been shown to provide hemodynamic advantages, durability, and an opportunity to avoid anticoagulation use. However, the probability of developing pulmonary homograft stenosis at 10 years is estimated around 30%¹. Considering its rarity, the optimal anesthetic plan for expectant patients with this condition is either inconclusive or controversial.

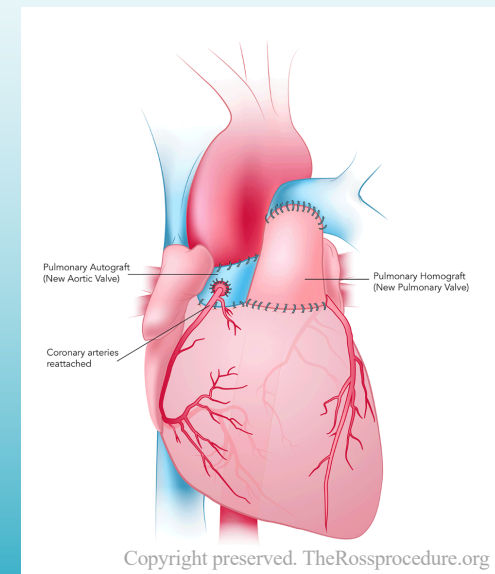


Figure 1 Ross procedure which is a surgical technique that uses your own healthy pulmonary valve (pulmonary autograft), which is a mirror image of a normal aortic valve, to replace your damaged aortic valve

1.HaoZeng Y, Calderone A, Rousseau-Saine N, et al.* "Right Ventricular Outflow Tract Obstruction in Adults: A Systematic Review and Meta-analysis" *CJC Open* Volume 3, Issue 9, September 2021, Pages 1153-1168



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Case Presentation

29-year-old G2P1 parturient at 37 weeks GA who was scheduled for elective cesarean section.

- Past cardiac history: Congenital aortic stenosis
 - Age of 20 months old :balloon valvuloplasty.
 - Age of 26-year:Ross Procedure due to recurrent stenosis.
 - Later: gradual severe pulmonary homograft stenosis.
- Pregnancy:
 - Close follow-up by multidisciplinary team
 - The patient had **NYHA class II** at the moment of delivery.
- Anesthetic plan :
 - Lumbar epidural (L2-L3) slowly titrated to effect over 20 min with 2% Lidocaine with bicarbonate .
 - Pre-induction arterial line for continuous blood pressure monitoring.
 - Phenylephrine infusion was used to maintain adequate hemodynamics.
- The case was uneventful with no requirements for inotropic support. The patient was admitted to the obstetrics ward and was discharged 5-days later

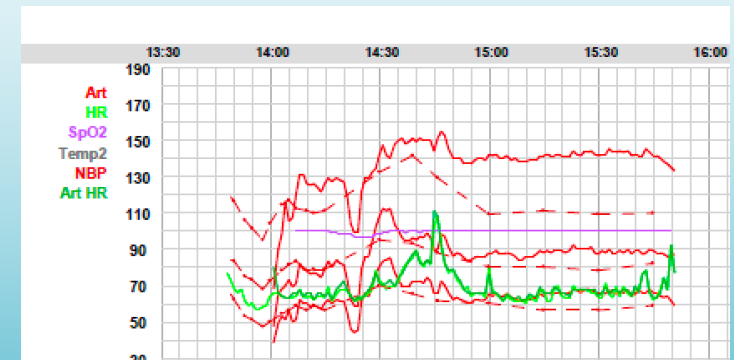


Figure 2: Intraoperative anesthesia-minimal hemodynamics fluctuations under epidural anesthesia during elective c-section in a parturient with a history of Ross procedure with severe pulmonary valve stenosis



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Learning Points

- Some cardiac conditions tend to worsen throughout pregnancy².
- Pulmonary homograft stenosis requires close follow-up during pregnancy and careful anesthetic planning by multidisciplinary team.
- Pulmonary stenosis is considered as mild to moderate risk with risk of maternal death around 1%².
- Our anesthetic goals were to maintain right ventricular preload, right ventricular contractility, left ventricular afterload, and manage any arrhythmias.
- In this case, epidural anesthesia with incremental dosing offered a safe approach for managing a parturient with this condition.

2.Hameed AB, Goodwin TM, Elkayam U. Effect of pulmonary stenosis on pregnancy outcomes – A case-control study. Am Heart J. 2007;154(5):852–4.