

A Case of Tricuspid Stenosis presenting for Cesarean delivery

Tyler King MD and Carrie Polin MD

Background: Tricuspid Stenosis

- Tricuspid stenosis is a very rare cardiac lesion and accounts for 1% of valvular heart disease.
- Often broken into three large categories:
 - Acquired, Congenital, Iatrogenic
- A mean pressure gradient greater than 5 mmHg is considered severe
- A compensatory increase in right atrial pressure maintains flow across the stenotic valve, but often leads to hepatomegaly, jugular venous distention, and peripheral edema.
- On auscultation, tricuspid stenosis is often inaudible but may produce a soft opening snap and a mid-diastolic rumble with presystolic accentuation.
 - The murmur becomes louder and longer with maneuvers that increase venous return (exercise, inspiration, leg-raising), but softer and shorter with maneuvers that decrease venous return (standing, Valsalva maneuver).
- Treatment includes diuretics and sodium/fluid restrictions
- Few case reports mention tricuspid stenosis in pregnancy due to the low incidence.

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Case: TS in Pregnancy

- 34-year-old female, G3P2 at 35.1 weeks presenting for a scheduled Cesarean Section.
- PMH: endocarditis with bioprosthetic valve replacement four years prior.
- Hospitalized at 19 weeks for exertional chest pain, shortness of breath, and increased lower extremity edema.
- TTE at that visit showed moderate to severe tricuspid stenosis with RVSP at 19.2 mmHg and peak velocity at 164 cm/s.
- On the day of scheduled C-section, a repeat echo showed a mean gradient of 6mmHg and a peak velocity of 168 cm/s.
- Anesthetic plan was determined, with the help of cardiology, and included a combined spinal and epidural, with a reduced dose of intrathecal bupivacaine to decrease the risk of sudden hemodynamic changes. An arterial Line was placed pre-operatively.
 - 6mg of hyperbaric bupivacaine, 0.15 mg morphine, and 15 mcg fentanyl were used for the spinal dose.
- Pt sent to ICU post-delivery for overnight monitoring
- On follow up:
 - A repeat echo 1mo post delivery showed moderate to severe tricuspid stenosis.
 - Pt was still having cardiac symptoms two months after delivery.
- CT surgery is currently evaluating for a redo valve surgery due to continued dyspnea on exertion, orthopnea, palpitations, and lower extremity edema.

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Discussion

- Cardiovascular disease has emerged as one of the leading causes of maternal morbidity and mortality in the United States.
- A vaginal delivery is preferred for most women with valvular heart disease.
- To minimize the drop in systemic vascular resistance, a combined spinal and epidural was performed. A low spinal dose and slowly titrating the epidural lead to very little variation in blood pressure.
- References
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WHO Risk Class I <i>No detectable increased risk of maternal mortality and no or mild increase in morbidity.</i>	- Uncomplicated, small or mild - Pulmonary stenosis - Patent ductus arteriosus - Mitral valve prolapse - Successfully repaired simple lesions (atrial or ventricular septal defect, patent ductus arteriosus, anomalous pulmonary venous drainage). - Atrial or ventricular ectopic beats, isolated
WHO Risk Class II (If otherwise well and uncomplicated) <i>Small increased risk of maternal mortality or moderate increase in morbidity.</i>	- Unoperated atrial or ventricular septal defect - Repaired tetralogy of Fallot - Most arrhythmias
WHO Risk Class II or III (Depending on individual) <i>Risk as indicated in Class II (above) or Class III (below).</i>	- Mild left ventricular impairment - Hypertrophic cardiomyopathy - Native or tissue valvular heart disease not considered WHO I or IV - Marfan syndrome without aortic dilatation - Aorta <45 mm in aortic disease associated with bicuspid aortic valve - Repaired Coarctation
WHO Risk Class III <i>Significantly increased risk of maternal mortality or severe morbidity. Expert counseling required. If pregnancy is decided upon, intensive specialist cardiac and obstetric monitoring needed throughout pregnancy, childbirth and the puerperium.</i>	- Mechanical valve - Systemic right ventricle - Fontan circulation - Cyanotic heart disease (unrepaired) - Other complex congenital heart disease - Aortic dilatation 40-45 mm in Marfan Syndrome - Aortic dilatation 45-50 mm in aortic disease associated with bicuspid aortic valve
WHO Risk Class IV (Pregnancy contraindicated) <i>Extremely high risk of maternal mortality or severe morbidity; pregnancy contraindicated. If pregnancy occurs termination should be discussed. If pregnancy continues, care as for class III.</i>	- Pulmonary arterial hypertension of any cause - Severe systemic ventricular dysfunction (LVEF <30%, NYHA III-IV)* - Previous peripartum cardiomyopathy with any residual impairment of left ventricular function - Severe symptomatic mitral or aortic stenosis - Marfan syndrome with aorta dilated >45 mm - Aortic dilation >50 mm in aortic disease associated