Neuraxial Anesthesia for Cesarean Delivery in a Pregnant Patient with Progressive Aortic Stenosis : A Case Report

- Background
 - Aortic stenosis (AS) presents unique challenges in pregnancy
 •d/t its fixed obstruction to left ventricular outflow.
 - Physiologic changes of pregnancy can worsen AS increased cardiac output, expanded blood volume, and reduced systemic vascular resistance

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- Traditionally, **general anesthesia** has been favored in severe AS for its ability to maintain precise hemodynamic control.
- However, with advances in cardiac imaging and **close multidisciplinary monitoring**, **neuraxial anesthesia** can be considered in selected patients.

• Careful preoperative planning, **serial echocardiography**, and individualized anesthetic strategies are essential to balance maternal safety and fetal well-being.

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Patient Summary

- 32-year-old G0P0 woman, diagnosed with **bicuspid aortic valve** at age 5
- Asymptomatic, no medications prior to pregnancy
- Preconception cardiology clearance: pregnancy deemed safe
- Serial TTE: progression of aortic stenosis from moderate to severe

Perioperative Management

- Planned cesarean delivery at 38+3 weeks gestation
- Radial arterial line placed; intraoperative TTE confirmed stable cardiac function
- Combined spinal-epidural (CSE) anesthesia:
 - Intrathecal bupivacaine 5 mg + fentanyl 10 mcg
 - Epidural catheter inserted (needle-through-needle technique)
 - Norepinephrine infusion (0.02 mcg/kg/min) + 500 mL Plasma-Lyte A
- Initial sensory block at T10
 - Epidural 2% lidocaine 10 mL + fentanyl 90 mcg
 - T5 level reached at 17 minutes \rightarrow surgery started
 - Epidural top-up: 4 mL of 0.5% ropivacaine after delivery

Outcome

- Neonate delivered uneventfully, transferred to NICU
- Norepinephrine tapered off by end of surgery
- Post-op course stable; discharged on POD 4
- At 1 year postpartum: patient remains asymptomatic, TTE shows improved cardiac function

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Discussion

Hemodynamic Changes in Pregnancy

- ↑ Cardiac output, ↑ blood volume, ↓ SVR
- These changes can exacerbate aortic stenosis (AS)

🔷 Anesthesia Strategy

- Sequential CSE used instead of general anesthesia
 - \rightarrow Gradual sympathectomy onset
 - → Minimizes abrupt BP shifts
 - \rightarrow Allows for **controlled titration** of anesthesia

Role of Cardiac Monitoring

- Serial echocardiography (TTE) from preconception to 2nd trimester
 - \rightarrow Guided anesthetic and surgical planning
 - → Enabled **proactive management** of AS progression

Anesthetic Priorities

- Maintain **afterload** to avoid hypotension
- Avoid **tachycardia** (optimize coronary perfusion)
- Ensure **normovolemia** with strict fluid control
- **TTE or POCUS** provided real-time intraoperative cardiac assessment

Multidisciplinary Approach

- Close coordination with cardiology, obstetrics, and anesthesia
- Anesthesiologists played a **central role**
- Continuous monitoring & anticipating physiologic changes → optimized outcomes