Anesthetic Management in a Parturient with Symptomatic Chiari-1 Malformation

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Chiari-1 Malformation

- Caudal displacement of cerebellar tonsils \geq 5 mm below foramen magnum •
- Intermittent obstruction of CSF outflow from 4th ventricle leads to elevated intracranial pressure, increased risk for herniation and decreased cerebral perfusion pressure
- Prevalence in US is $\sim 0.5\%$ with a strong female predominance
- Symptoms Headaches, vision changes, cranial nerve disturbances and extremity pain, weakness and sensory deficits •
- Definitive treatment is surgical decompression \bullet

Syringomyelia

- CSF filled cystic structure that forms due to pressure transmitted down the central spinal canal •
- Present in up to 80% of cases of Chiari-1 Malformation \bullet

Implications for Pregnancy

- Increased CSF pressure during pregnancy can lead to worsening symptoms
- Literature limited to mainly case reports
- Concerns regarding mode of delivery and anesthetic method

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Case Presentation

- 36 y/o G7P2224 at 34 weeks gestation presented for a primary cesarean section in the setting of symptomatic Chiari-1 malformation. Her pregnancy was otherwise complicated by asthma, advanced maternal age and tobacco use.
- Chronic right sided numbress and weakness, which worsened during pregnancy and included gait imbalance with falls
- Chronic occipital headaches increased in frequency, especially with coughing/sneezing •
- MRI brain/spine: low lying cerebellar tonsils (1.8 cm descent), crowding of foramen • magnum and large syrinx extending from C2-conus medullaris
- Multidisciplinary discussions with decision for earliest possible safe delivery •

Intra-op Course

- Goal to maintain hemodynamic stability and avoid increases in intracranial pressure •
- Plan for general anesthesia; reassuring airway exam •
- Pre-induction A-line, video laryngoscopy with cervical neutrality, maintenance with TIVA •

Post-op

- Neuro exam remained stable from prior
- She underwent an uneventful suboccipital craniectomy and C1 laminectomy with • duraplasty on postpartum day 2 with discharge home on post-partum day 6
- 2 month follow up: slow improvement in neurologic symptoms

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Syrinx



Learning Points

- Availability of some decision-making tools; however, they are not validated
 - Consider presence of symptoms, depth of tonsillar herniation and presence of syringomyelia
- Importance of multidisciplinary care teams given challenges of managing these complex patients •
- Mode of delivery
 - Concerns that Valsalva, contractions and pain may lead to increased intracranial pressure and possible risk for acute herniation
- Antepartum management
 - If patient is symptomatic, recommend MRI prior to delivery
 - Referral to neurosurgery to consider surgical decompression prior to pregnancy
- Anesthetic considerations
 - Risks and benefits for both general and neuraxial
 - Individualized decision based on patient's clinical presentation and imaging
 - Unclear risk of CSF leak and downward herniation with intentional or accidental dural puncture
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