Epidural Anesthesia for C-section in a Full-Term Patient with Type I Arnold-Chiari Malformation

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Case Description: A 30 year old, primigravid, parturient Hispanic female (height 5'3", weight 173 lbs), with known history of type I Arnold Chiari malformation (ACM) and Syringomelia presented with a spontaneous rupture of membrane at 38 weeks gestation. At age 16, patient was diagnosed with type I ACM with MRI significant for descent of the cerebellar tonsils 8 mm on the right and 6 mm on the left below the level of the foramen magnum. A syrinx was also identified extending from C6 to T1. Patient’s condition has been unchanged and remarkably asymptomatic with infrequent migraine-type headaches. She denied headaches with bending or postural changes, incoordination, numbness, weakness, and other focal neurological deficits. Otherwise, the course of the pregnancy was uncomplicated with appropriate prenatal care. Physical exam was unremarkable. Labs: Hgb 14.2, Hct 40.1, WBC 9.9, and Plts 208. Due to the significant descent of the cerebellar tonsils and presence of syrinx in the cervical cord, a discussion between OB/Gyn, neurology, and anesthesiology resulted in a decision to pursue an elective caesarean section to avoid increased intracranial pressure (ICP) due to strong exertion of labor. An epidural was not contraindicated due to the minimally symptomatic nature of the disease, but potential complications were considered. After a discussion with the patient regarding risks, benefits, and informed consent, on the day of the surgery, the epidural was performed using a strict aseptic technique with the patient awake and in a left lateral decubitus position. The L3-L4 level was identified, and a skin wheal was made at the needle entry site. The overlying skin and subcutaneous tissue were appropriately anesthetized. A 3.5 inch, 17 gauge epidural needle was passed at the midline through the skin wheal and advanced in a ventral direction into the lumbar epidural space using the loss of resistance technique. The patient received a total of 20 ml of 2% Lidocaine with an adjunct of Fentanyl (5 Âµm/ml) and epinephrine (5 Âµm/ml). The injection was made incrementally with constant monitoring every 5 mlâ€™s with negative aspiration of CSF or blood. The epidural was well tolerated without any paresthesia or pain. A low transverse caesarean section was performed and a live male infant (Apgar 9/9) was delivered without complications. Patient remained stable during hospital stay and at discharge on post-op day 3.

Discussion:

Type I ACM is a congenital malformation characterized with herniation of cerebellar tonsils below the level of the foramen magnum[1]. In patients with type I ACM, any potential risk of increased ICP must be avoided as it can result in deterioration of neurological function and further herniation of cerebellar tonsils[2]. In such cases, careful consideration is necessary to determine the method of delivery and anesthesia in order to minimalize the risk of potential complications secondary to
changes in CSF pressure. Since uterine contractions and bearing down can result in significant elevations in CSF pressures during a vaginal delivery[3], a C-section was selected as the delivery method in this case. Additionally, a retrospective case series of 12 patients suggests both, regional and general anesthesia, are safe and effective methods in these patients[4]. General anesthesia presents the risk of elevated CSF pressure and changes in ICP due to coughing and bucking, during induction and emergence especially in the setting of a potentially difficult intubation in a patient with a BMI greater than 30. On the other hand, epidural anesthesia presents the potential risk of an accidental dural puncture resulting in a postdural puncture headache or, in more severe cases, craniospinal CSF pressure dissociation leading to risk of further herniation[5]. In this patient, the lack of neurological deficits and signs of increased ICP greatly limit the risk of CSF pressure dissociation and herniation, and therefore the epidural anesthesia was successfully established without complications.

Conclusion:

This case demonstrates the safe use of epidural anesthesia for a C-section in a patient with minimally symptomatic type I ACM and Syringomelia.

References: