Myelomeningocele (MMC) In Utero Repair. Perioperative Management. Case Report

Figar Gutiérrez A, Adrover A, Deluca D, Alvarez Calzaretta L, Portillo S, Otaño L

Hospital Italiano de Buenos Aires, Buenos Aires, Argentina

Background: MMC is a neural tube defect that affects approximately 5-10 pregnancies per 10,000 in the United States. There is evidence showing that prenatal repair might be a better choice than postnatal repair.¹

Case Report: A 38 years old patient was scheduled for fetal MMC in utero repair. The fetus presented a lumbosacral MMC and Arnold Chiari type II malformation. Magnesium sulfate was administered for fetal neuroprotection. We provided a latex free environment (LFE). Uterine relaxation (UR) was achieved by indomethacin, atosiban, nitroglycerin and sevoflurane. Rapid sequence intubation was performed using fentanyl, propofol and rocuronium. Anesthesia maintenance was achieved by target controlled infusion (TCI) of remifentanyl, sevoflurane and fentanyl. Bispectral Index (BIS) was used to monitor depth of anesthesia. As there is a known risk of pulmonary edema¹, we decided to maintain a goal directed fluid management, using EV1000® to estimate systolic volume variation and cardiac output. Norepinephrine was used to maintain maternal blood pressure. Fentanyl, atropine and vecuronium were administered intramuscularly to the fetus. Fetal heart rate was registered by echocardiography. Surgery was completed without any maternal or fetal complications.

Discussion: There are several important topics that need to be taken into consideration in fetal surgery: preterm neuroprotection, UR, fetal and mother anesthesia and monitoring, LFE and avoiding preterm labor. Sevoflurane has been used in fetal surgery for UR. Since there is an FDA warning regarding impaired brain development in children following exposure to certain anesthetic agents, we decided to use a multimodal strategy for UR in order to reduce exposure to sevoflurane. Remifentanyl and sevoflurane pass through the placenta, however, they do not provide adequate fetal immobilization, therefore additional drugs are needed for fetal anesthesia. Maintaining a LFE seems reasonable in order to prevent MMC patients exposure to latex.

Learning points:

- LFE should be considered to prevent fetus sensitization.
- A multimodal approach for UR reduces fetal exposure to sevoflurane. Atosiban might be a good choice for UR.
- Goal-directed fluid therapy and titration of vasoactive drugs might reduce incidence of pulmonary edema.
- Since MMC prenatal repair has an almost 13% incidence of preterm delivery before 30 weeks, giving magnesium sulphate for fetal neuroprotection should be considered.