Remifentanil for Fetal Immobilization and Analgesia during The EXIT Procedure performed Under Combined Spinal-Epidural Anesthesia

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Abstract Body: Neuraxial anesthesia for EXITs have been previously described. However this technique does not directly provide fetal anesthesia or analgesia, and additional agents might be needed for this purpose. The use of remifentanil to achieve those goals has not been previously described. We report 3 cases of the EXIT procedure performed under neuraxial anesthesia where the maternal administration of remifentanil was used successfully to provide fetal immobilization and analgesia.

Case 1: An EXIT procedure was performed for a fetus with a large fetal goiter. Following the placement of a combined spinal epidural (CSE) a phenylephrine infusion at 50 mcg/min was initiated. Ten minutes later a remifentanil infusion was initiated at 0.15 mcg/kg/min. Oxygen 2L/min was administered via nasal cannula. Maternal sedation levels and respiratory rate were closely monitored. One minute before uterine incision a 50 mcg IV bolus of nitroglycerin was administered and an infusion of 50 mcg/min started. The fetal head was delivered and intubation was successful on the second attempt. The duration on placental bypass was 5 minutes with no need for additional relaxation or analgesia. The remifentanil infusion was discontinued following delivery.

Case 2: An EXIT procedure was performed for fetal arthrogryposis. Following the placement of the CSE a phenylephrine infusion was initiated. An infusion of remifentanil at 0.1 mcg/kg/min was started and titrated up to 0.15 mcg/kg/min before skin incision. Oxygen 2L/min was administered by nasal cannula. Intravenous nitroglycerin was used to achieve uterine relaxation. The fetal head was delivered and intubation was accomplished on the first attempt. The time from delivery of the fetal head to intubation was 3 minutes. Arterial cord gases were as follows: pH 7.25, pCO2 60 mmHg, pO2 25 mmHg.

Case 3: An EXIT procedure with a planned tracheostomy was performed for fetal arthrogryposis with temporomandibular joint involvement. A remifentanil infusion was started following the placement of a CSE at 0.1 mcg/kg/min and titrated up to 0.2 mcg/kg/min before skin incision. Intravenous nitroglycerin was administered for uterine relaxation. Following the delivery of the fetal head a tracheostomy was performed by the pediatric ENT team. The fetus was maintained on placental circulation for 20 minutes and remained immobile with no need for additional fetal muscle relaxation or analgesia during this period.

Discussion: Remifentanil undergoes extensive placental transfer and has been used to provide fetal immobilization and anesthesia for in utero fetal interventions. Its use as an adjunct to neuraxial anesthesia for the EXIT provided excellent fetal immobilization and obviated the need to administer other analgesics or muscle relaxants. It also facilitated the longest reported EXIT performed under regional anesthesia. No clinically significant maternal sedation or respiratory depression was observed in any of these cases.