The Successful Use of a Remifentanil Infusion with Ultrasonography to Achieve Fetal Immobility for Fetal MRI

Abstract Type: Case Report/Case Series
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Remifentanil infusions offer superior fetal movement suppression for diagnostic quality magnetic resonance image (MRI) while the parturient benefits from mild sedation. General anesthesia provides fetal movement suppression, but subjects the parturient to all the risks and complications of general anesthesia in an MRI scanner. When comparing the visual analog scores (VAS) of fetal movement of diazepam to remifentanil using ultrasound, remifentanil was far superior in lowering the VAS in a shorter period of time (1). Ultrasound observation of the fetus gives the anesthesiologist the unique ability to accurately titrate remifentanil infusions and quantify movement suppression in a patient that cannot otherwise be monitored.

We present three cases of diagnostic quality fetal MRIs performed by administering a titrated infusion of remifentanil and real-time monitoring of fetal movement suppression with ultrasound. The ultrasound equipment used was a General Electric (GE) Logiq E machine with 4 MHz and 8 MHz curved probes. Each patient received a 0.1mcg/kg/min intravenous infusion of remifentanil while standard American Society of Anesthesiology monitors were used with supplemental oxygen. Ultrasound monitoring was recorded before and during the remifentanil infusion as fetal immobility was observed approximately ten minutes after the start of the infusion. Ultrasound monitoring was resumed once the patient left the MRI scanner and the remifentanil infusion was stopped. Fetal movement returned to baseline approximately ten minutes after stopping the infusion. The first patient was 36-year-old female at 21 weeks gestation that had previous failed MRI’s secondary to fetal movement during the scan. The fetal MRI was ordered to evaluate a suspected fetal brain tumor. Diagnostic quality fetal MRI was imperative to determine fetal prognosis and well being. The second patient was a 30-year-old female status-post fetoscopic surgery to correct twin-to-twin transfusion syndrome. The MRI was ordered to evaluate fetal neurologic development and well being. The third patient was a 25-year-old female at 28 weeks gestation requiring a fetal MRI to evaluate possible fetal bladder outlet syndrome. In all three cases, fetal immobility was achieved with an intravenous remifentanil infusion. Fetal MRI images were all of diagnostic quality allowing the radiologist a more accurate evaluation.