

Spare the Difficult IV: Intranasal Dexmedetomidine for Sedation in a 13 Month-old Female with Macrocephaly-Capillary Malformation Syndrome Undergoing Brain MRI

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INTRODUCTION

The unique challenges of providing anesthesia to pediatric patients in the MRI suite demand thoughtful and individualized care, as highlighted in a recent ASA practice advisory (1). We describe the value of intranasal dexmedetomidine (IN DEX) for MRI sedation in a medically complex infant with known difficult IV access.

CASE REPORT

A 14kg ex-32-week 13-month-old female with Macrocephaly-Capillary Malformation (M-CM) presents for surveillance non-contrast brain MRI. She had undergone multiple decompressive craniotomies and ventriculo-peritoneal insertion for obstructive hydrocephalus and severe refractory epilepsy. Records reveal prior routine mask ventilation and video-laryngoscopy despite macroglossia, macrocephaly, and dysmorphic facies. Her common M-CM features of syndactyly, right hemi-macrosomia, and doughy skin (Figure 1) had resulted in a history of difficult IV access leading to surgery cancellation and the emergent use of intraosseus and scalp IV cannulation.

To avoid difficult PIV insertion, deep sedation was induced with PO midazolam 6 mg (0.4 mg/kg) and IN DEX 56 mcg (4 mcg/kg) in MRI zone 3. After 40 minutes, the sedated patient was transferred to zone 4, where MRI-safe standard ASA monitors, capnography, and 1L/min nasal cannula supplemental oxygen were applied (Figure 2). In the event of complication, MRI-safe difficult airway equipment, video laryngoscope, intraosseous drill, in addition to IM and IN rescue drugs for bradycardia, laryngospasm, bronchospasm, seizure and hypotension were available. The scan was completed uneventfully in 30 minutes while the patient maintained unassisted spontaneous ventilation. The patient was discharged home after an uneventful recovery.

DISCUSSION

In contrast to conventional management of pediatric MRI sedation, we chose to achieve natural airway sedation without IV placement due to this patient's history of difficult IV access, both avoiding a potentially prolonged inhalational induction and providing psychological relief to the patient and mother. IN DEX offers natural, non-rapid eye movement sleep with minimal respiratory depression that can obviate the need for airway manipulation and IV insertion and its high efficacy and low complication rate for MRI sedation was recently described (2). The administration of IN DEX in lieu of volatile agents may also confer lower risk of cognitive neurotoxicity and potential neuroprotection in a patient with multiple neurologic comorbidities that have and will continue to necessitate numerous anesthetics (3).



Figure 1 (left): photograph of the 13 month old female with Macrocephaly-Capillary Malformation, which features macrocephaly, hemihypertrophy, doughy skin, syndactyly
Figure 2 (above): photograph of patient in MRI zone 4 with standard monitors and nasal capnography applied.
Photographs used with parental permission.

LESSONS LEARNED

- Anesthesia care for MRI requires an individualized pre-scan planning.
- M-CM can present challenges such as epilepsy and difficult airway/IV placement.
- IN DEX induces sedation with minimal respiratory depression that can obviate the need for airway manipulation, prolonged inhalation induction and IV insertion.
- More studies are needed of IN DEX sedation for radiologic and other low-invasive procedures.

REFERENCES

1. ASA: Practice advisory on anesthetic care for MRI: ASA Task Force on Anesthetic Care for MRI. *Anesthesiology* 2015, 122 (3).
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3. Bilotta F et al. Neurotoxicity of anesthetic drugs: an update. *Curr Opin Anaesthesiol*. 2017