# [N-76] Anesthetic Management of a Pediatric Awake Craniotomy with Intraoperative Magnetic Resonance Imaging

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Introduction: Awake craniotomy using electrophysiologic mapping (EPM) has been shown to improve the safety margin of resection of lesions affecting the eloquent cortex. The advent of intraoperative magnetic resonance imaging (iMRI) offers the opportunity for aggressive resection of tumors and when combined with awake craniotomy, confers the prospect of more complete tumor removal (1). However, there are substantial risks associated with iMRI especially when operating in the presence of a high strength magnetic field. A combination of personnel education, use of MR compatible equipment, and appropriate patient selection are paramount to successful utilization of this technology. This combined surgical approach has been described for adults using both pure sedation and asleep-awake-asleep anesthetic techniques(2). In the pediatric population, sedation and asleep-awake-asleep techniques for awake craniotomy have been published (3); however, an anesthetic approach to awake craniotomy with iMRI has not been reported. We describe a case report that combines both these techniques in a pediatric patient using pure sedation.
Case description: A 16yr-old female with history of intractable seizures secondary to a frontal lobe lesion presented for craniotomy. The preoperative fMRI and SPECT scan showed the lesion to be affecting the motor homunculus for face and tongue thus necessitating an awake craniotomy. This was scheduled in the iMRI suite with 1.5T movable iMRI device. After thorough preoperative assessment to ascertain patient suitability a decision was made to perform the craniotomy using intravenous sedation and a scalp block. After achieving intravenous access the patient's vitals were monitored using the MRI compatible monitor and sedation was achieved with infusions of a combination of propofol and remifentanil and spontaneous ventilation was maintained with supplemental oxygen via nasal cannula. A scalp block was performed by the surgeons whilst under deep sedation prior to placing the patient's head in pins. The level of sedation was then lightened for the awake EPM and then sedation was deepened for tumor resection. After tumor resection, in preparation for the iMRI, the scalp was loosely approximated and the head was covered in special clear drapes to maintain sterility and allow adequate airway access. Prior to the deployment of the magnet all ferromagnetic materials were accounted for and placed outside the 5 gauss line or removed from the room. The 11 hour surgery was well-tolerated under sedation with complete resection of the lesion without the need for airway support.
Conclusion: This report illustrates a pure sedation technique in a pediatric patient for an awake craniotomy in an intraoperative MRI suite. It demonstrates a novel approach that eliminates the hazards of inducing and emerging from general anesthesia while in a Mayfield frame in a surgical approach for which there is no literature to guide anesthetic selection in the pediatric population.

References:
1. Tuominen J, et al. Acta Neurochir 2013; 155:1805–1812.
2. Parney IF, et al. World Neurosurg 2010 (73); 5:547-551.
3. Hagberg CA et al. J Clin Anesth 2004; 16:43 – 47.

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