Awake craniotomy anesthesia: A comparison between the Monitored Anesthesia Care (MAC) versus the Asleep-Awake-Asleep (AAA) technique

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Introduction
Awake craniotomy (AC) with intraoperative brain mapping, allows for maximum tumor resection while monitoring neurological function. Used for lesions involving the eloquent areas of the brain, such as Broca’s, Wernicke’s, or the primary motor area. Common techniques - monitored anesthesia care (MAC), using an unprotected airway, or the asleep-awake-asleep (AAA) technique, using a partially or totally protected airway. Comparative analysis between the MAC and AAA technique in a consecutive series of patients undergoing the removal of an eloquent brain lesion is being presented.

Method
Approved by the appropriate Institutional Review Board (IRB), requirement for written informed consent was waived by the IRB. A prospective data collection and subsequent retrospective data analysis was conducted on eighty one patients who underwent an awake craniotomy for an eloquent brain lesion over a 9 year period. Fifty patients underwent anesthesia with the monitored anesthesia care (MAC) technique and thirty one patients underwent the asleep-awake-asleep (AAA) technique by a single surgeon and a team of anesthesiologist Method Monitored anesthesia care technique No set protocol for sedation Different medications for MAC based on the comfort level of anesthesiologist, requirements of the patient and whether the scalp block is working well Propofol IV bolus for nasopharyngeal tube insertion Nose sprayed with phenylephrine and the posterior pharynx was sprayed with lidocaine, nasopharyngeal airway coated with 5% lidocaine ointment was inserted into the more patent nostril, which is connected to the anesthesia circuit for oxygenation Asleep-Awake technique For the AAA technique, propofol was used for induction followed by laryngeal mask airway placement (LMA). An anesthesia circuit was attached to the LMA, and the anesthesia was maintained with sevoflurane anesthesia until the patient was spontaneously ventilating and asleep. Scalp Block: A complete scalp block of the supraorbital, supratrochlear, auriculotemporal, zygomatico-temporal, greater occipital, lesser occipital and greater auricular nerves was performed by the neurosurgeon or anesthesiologist (Figure 1) Infiltrative block is performed at the pinning site and also the incision site After craniotomy local anesthesia was infiltrated around the nerves supplying the duramater by the surgeons Bupivacaine or Ropivacaine 0.5% with 1:200,000 epinephrine is usually used

Results
Similar preoperative patient characteristics in the two groups (Table 1). Operative time shorter in the MAC group(283.5 mins.) versus the AAA(313.3 mins., p=0.038), by about 30 minute
Hypertension most common intraoperative complication (MAC: 8% vs AAA: 9.7%, p=0.794). Intraoperative seizures incident 4% in the MAC group and 3.2% in the AAA group (p=0.858). Awake cases conversion to general anesthesia in none of the MAC group and 3.2% of the AAA cohort (p=0.201). No cases were aborted in either cohort (Table 2). Mean hospital stay was 3.98 and 3.84 days in the MAC and AAA group, respectively (p=0.833). (Table 3).