

AWAKE CRANIOTOMY USING INITIAL SLEEP WITH LARYNGEAL MASK AIRWAY IN DEPRESSED AGITATED PATIENT

- A Case Report -

KHALID M AL SHUAIBI*

Abstract

Depressed patients with brain tumors are often not referred to awake craniotomy because of concern of uncooperation which may increase the risk of perioperative complications. This report describes an interesting case of Awake Craniotomy for frontal lobe glioma in 41 year old woman undergoing language and motor mapping intra-operatively. As she was fearful and apprehensive and was on antidepressant therapy to control depression the author adapted general anesthesia with laryngeal mask airway during initial stage of skull pinning and craniotomy procedures. Then patient reverted to awake state to continue the intended neurosurgical procedure. Patient tolerated the situation satisfactory and was cooperative till the finish without any event.

Key words: craniotomy; awake. LMA. Parietal tumor.

Introduction

Intra-operative mapping, of targeted areas of brain resection, is an integral part of modern neurosurgery. Intraoperative stimulation of near speech and motor regions may prevent unnecessary nervous tissue damage. while using neuro navigation and intraoperative MRI (iMRI) allowing maximum resection of the tumor. This procedure requires an awake, cooperative patient to assess motor and verbal responses. Sometimes patient may be not cooperative during this procedure due to psychological profile or extreme fear from the notion of being awake during initial surgical intervention while the skull is fixed and then opened. This report describes the author's experience with awake craniotomy in a middle aged woman having anxiety and treated for depression, using initial sleep and maintaining the airway by laryngeal mask airway initially then awake technique before testing and to the end of the surgery.

* MD, Pain Medicine Fellow.

Consultant of Anesthesiology, Pain Medicine & Chairman of Anesthesia, Department of Anesthesia, King Fahad Medical City, Riyadh, Kingdom Saudi Arabia. E-mail: kmalshuaibi@kfmc.med.sa

Case Report

A 42 year old female (weight:59 kg. Hight:168 cm) presented to the Neuroscience Department at King Fahad Medical City (KFMC), complaining of progressively, increasing headaches of 18 months duration. She was placed on anticonvulsant therapy: valproic. Clinical history revealed reports of depression since a long time related to overwhelming psychosocial problems at home. Clinical examinations were unremarkable. Awake craniotomy was planned including intra-operative mapping for language and motor function. In the BrainSuite® Lab, intravenous line was started and sedation using both midazolam 1-2 mg iv. and fentanyl 25-50 µg iv. Standard anesthetic monitoring was initiated (ECG, NIBP and pulse oximetry). A right radial arterial line was inserted, under local anesthesia, for continuous blood pressure measurement and serial blood gases monitoring.

A nasal cannula was placed in position. Scalp Block was established, with the use of 80 ml of 0.125% bupivacaine and 5 µg.ml⁻¹ of adrenaline, by the surgeon. The patient was positioned in supine position and her head was rotated to the left side. A four-pin frame failed to fix after many trials due to irritable patient. We gave 20-30 mg propofol bolus with 25-50 µg fentanyl and still the patient was uncooperative during the pins application. Anesthesia was induced with propofol 2 mg.kg⁻¹ and fentanyl 50 µg. iv. Laryngeal Mask Airway (LMA) size 3 was inserted easily and after demonstration of proper deep anesthesia. Airway and spontaneous breathing was maintained using 4 L.min⁻¹ of 50% O₂ in air. Anesthesia was maintained with combined continuous infusions of propofol 1% 20-30 ml.h⁻¹ and fentanyl 25 ug.h⁻¹. Patient then brought to the BrainSuite® Lab. for pre-operative MRI and Neuronavigation. MRI- compatible monitoring was included i/ e. ECG, IBP, Capnography, Temperature and Pulse Oximetry.

Patient; urinary bladder was catheterized and mannitol 0.5 mg.kg⁻¹ was given in addition to Dexamethazone 8 mg iv.

Surgery started and after the dura is opened the propofol and fentanyl was gradually decreased and later stopped. The patient became awake smoothly. LMA was removed without complications. Oxygenation was maintained with a nasal cannula. The patient

became completely awake, able to talk within 10 minutes following the removal of LMA. The surgery was commenced again while the patient was fully awake with proper intra-operative motor and language assessments. The course of the surgery went uneventful. Hemodynamic variables were thoroughly stable. There were no desaturation or airway obstruction. Another MRI study was done while patient was completely awake. After surgery patient was transferred to SICU with a good clinical condition.

Discussion

BrainSuite Lab is newly established at KFMC. Two years have passed and various difficult neurosurgical surgery operation with great success. Awake craniotomy was done to benefit from intraoperative MRI and navigation facilities¹.

Awake craniotomy for seizure foci resection is currently popular since a complete resolution of seizures foci without increasing neurological deficit²⁻⁴.

This requires “asleep, awake, asleep” anesthesia technique to keep an awake, comfortable patient who cooperates with intraoperative testing.

Drugs are used to manage this state. They are selected according to their short half-lives and ease of titration. Using such drugs concurrently can cause powerful respiratory depression. Our selection of the prescribed regimen in accordance of reported success in literature^{2,5}. Neuroanesthesia team should be vigilant for such events like: hypoventilation, apnea, and chest wall rigidity.

Several options are available for airway management during awake craniotomy including endotracheal intubation, LMA, nasal airway and non intubation technique preserving natural airway.

Adverse events during awake craniotomy can include nausea, intraoperative anxiety, seizures, and brain engorgement^{6,7}. Nausea and/or vomiting may result in significant morbidity. We chose to reduce this risk, by administering ranitidine, ondansetron, metoclopramide, dexamethasone, and glycopyrrolate.

Appropriate patient selection is critical to success. In this case it was not an ideal patient for the technique but detailed pre-operative explanation of the anesthesia plan was important for operators

to go ahead. Despite uncontrollable anxiety and the concurrent state of depression we expected that incorporation could still occur. Our efforts focus on reassure the patient followed by supplements of sedo-analgesics regimen and we explained, to the patient, that general anesthesia is possible for short period and there would be no pain when she will be waken up for testing. Intraoperative urgent intubation is technically difficult and slow to secure. The anesthesiologist in expectation of intraoperative seizures. Although, it did not happened in this case, the plan for its control swiftly should be in mind i.e. surgeon's application of ice water irrigation and discontinuation of stimulation, anticonvulsants intravenously and if respiratory instability occur, intubation and controlled ventilation.

In conclusion, a careful approach in handling psychological patient may tolerate the current analgesia and anesthesia techniques during awake craniotomy, this case may open the field to operate on moderately disturbed patient and have more exposure rather keeping awake craniotomy for fully co-operative patient. Anesthesiologist should be malleable in his plan to the immediate needs of his patient.

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Fig. 1

Briansuite[®] settings: surgeon looking to mural screens showing integrated iMRI an imaging with microscopic operating field screen



Fig. 2

MRI vault: the patient is draped and protected by head coil before iMRI session



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