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CONSCIOUS SEDATION WITH SCALP BLOCK FOR AWAKE CRANIOTOMY: A RETROSPECTIVE STUDY OF SIX CASES

Dr Abhay Pandey	3rd year resident, Department Of Anaesthesia, B J Medical college Ahmedabad Gujarat.
Dr Shakuntala J Goswami	Professor, Department Of Anaesthesia, B J Medical college Ahmedabad Gujarat.
Dr Varun G Karnam	3rd year resident, Department of anaesthesia B J Medical college Ahmedabad Gujarat.
Dr Dixita Patel	Senior Resident, Department of anaesthesia, B J Medical college Ahmedabad Gujarat.
Dr Thasvija Thambi	3rd year resident Department of anaesthesia, B J Medical college Ahmedabad Gujarat.

ABSTRACT **Background:** Awake craniotomy has been used for surgery for resection of brain tumors located within or near the eloquent areas (sensory, motor, language area). We evaluated safety and efficacy of conscious sedation with scalp block technique for awake craniotomy in six patients. **Method:** Retrospective study of six cases done for awake craniotomy under conscious sedation with scalp block technique. Conscious sedation with inj. Propofol and dexmedetomidine infusion and scalp block with inj. bupivacaine 0.25%. We observed respiratory and hemodynamic parameters, patient cooperation, surgeon satisfaction and perioperative complications. **Result:** All patients had stable respiratory and hemodynamic parameters, were cooperative while mapping. One patient developed slurring of speech and the surgery was abandoned. **Conclusion:** Combination of conscious sedation with scalp block offered hemodynamic stability, no airway complications, early diagnosis of neurological deficit in form of speech, during eloquent area manipulation prevented further damage.

KEYWORDS : Awake craniotomy, Conscious sedation, Scalp Block.

INTRODUCTION

Awake craniotomy is required for neurosurgical procedures when the patient is needed to be awake and cooperative during certain stage of the procedure. It is often employed for tumors, such as primarily gliomas, glioblastomas, brain metastases, located within or close to the eloquent areas (i.e., sensorimotor or language areas) of the brain[1].

The modern awake craniotomy techniques are done in combination with intraoperative neurophysiologic monitoring to identify the eloquent areas of the brain. The cortical mapping during awake craniotomy enables the identification of cortical and subcortical networks for individual patient's neurological functions[1]. Here we evaluated safety and efficacy of conscious sedation with scalp block technique awake craniotomy.

AIMS AND OBJECTIVES

AIM-

Safety and efficacy of conscious sedation with scalp block technique for awake craniotomy.

Primary Objective-

1) Safety and efficacy of conscious sedation with scalp block technique for awake craniotomy.
2) Intraoperative respiratory and hemodynamic stability (Pulse, SBP, DBP, Spo2, ETCO2).
3) Surgeon satisfaction.
4) Patient cooperation during mapping.

Secondary Objective-

1)Perioperative complications.

MATERIALS AND METHODS

Retrospective case series of six patients posted for awake craniotomy included patients having tumors of eloquent (sensory, motor, language) brain cortices done in neurosurgery operation theatre.

All patients had history of headache/vertigo or both, any prior neurologic deficit asked, thorough examination done, routine blood investigations done, ICU cot and blood products were kept ready.

All the patients were counselled about type of anaesthesia level of cooperation expected, potential risks, safety measures, stages of procedure, intraoperative discomfort & a predefined questionnaire was prepared and explained to the patient. IV line was secured and normal saline infusion started. Nasopharyngeal airway was introduced to protect airway, supplement oxygen and to monitor ETCO2. Routine monitoring was done (ECG, NIBP, SPO2, U/O). All patients had stable respiratory and hemodynamic parameters.

Pre-medication-inj. glyco 4mcg/kg iv, inj. emset 0.15mg/kg iv, inj. fentanyl 1ug/kg, inj. Dexamethasone 8 mg iv, inj. valproate 500mg iv and inj. mannitol 1.5g/kg iv. given.

All patients [tablc1] were given scalp block with inj. Bupivacaine 0.25 % 2ml in each nerve bilaterally. Then all patients were given infusions of Inj. dexmedetomidine and propofol (50 mcg of inj. dexmedetomidine in 100 ml NS and 2mg/ml propofol in 100ml NS prepared) which were stopped 15 minutes prior to neurocognitive mapping and patient were asked about predefined questionnaire questions during procedure, all patients cooperated and surgical field was lax and surgeon satisfied with intraoperative management.

Table 1- Case Details Of All Six Patients Included In Our Study

	CASE 1	CASE2	CASE3	CASE4	CASE5	CASE 6
AGE/SEX	14y/M	62y/M	35y/F	61y/M	32y/M	37y/M
DIAGNOSIS	Left parietal lobe glioma	High grade glioma	Hemorrhagic glioma	High grade glioma Insular glioma	Insular glioma	Fronto parietal and insular cortex glioma
INTRAOP COMPLICATIONS	None	None	None	None	None	Slurring of speech, surgery abandoned
POST OP OUTCOME	Uneventful	Uneventful	Uneventful	Uneventful	Uneventful	Patient recovered on second postop day

We evaluated conscious sedation with scalp block technique's safety and efficacy for awake craniotomy, intraoperative respiratory and hemodynamic stability (Pulse, SBP, DBP, SPO2, ETCO2), surgeon satisfaction[3], patient cooperation during mapping, perioperative complications.

DISCUSSION

Mainly used anaesthetic techniques for Awake craniotomy include the asleep-awake-asleep (SAS) technique, conscious sedation and the recent introduced awake-awake-awake (AAA) method and scalp block. Hypertension, seizures and signs of raised ICP were not observed in our series.

Nowadays, there is growing trend among neurosurgeons for preference of awake craniotomy, our institute also began this since last few years, where conscious sedation with scalp block is technique of choice for awake craniotomy. Limitation of this series is small sample size.

Asleep-awake-asleep

This technique involves induction of general anaesthesia and control of the airway with either a supraglottic device or intubation. During neurocognitive testing and intra-operative mapping, the anaesthetic drugs are either reduced or stopped and the airway device is removed, when the patient regain upper airway reflexes, surgeon allowed for resection. Once resection of the lesion is complete, general anaesthesia can be re-introduced[3].

The advantages of this technique include the ability to control ventilation, prevent airway obstruction and hypoventilation.

Disadvantage of this technique is cumbersome procedure during different stages of transition from complete general anaesthesia to complete awake state which at times lead to haemodynamic instability and irritability during mapping.

Scalp Block

Patient tolerance of an awake craniotomy relies on effective analgesia of the surgical field by scalp block and also provides haemodynamic stability and decreases the stress response to painful stimuli [Figure1].

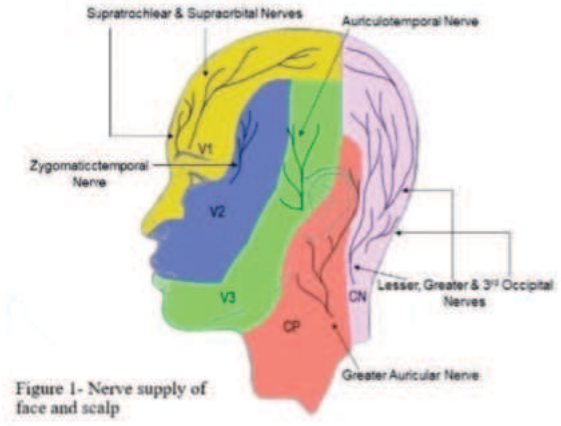

Figure 1 *Nerve supply of scalp and face*
https://resources.wfsahq.org/wp-content/uploads/480_image_1.jpg

Awake-awake-awake Technique

Conscious sedation technique provides purposeful patient response to tactile or verbal stimulation while preserving spontaneous ventilation with airway secured by nasal cannula, simple O2 mask, nasal airway[2].Airway obstruction remains a major problem during awake craniotomy with this technique. Navdeep Sokhal, Girija prasad rath et al observed airway related complications (desaturation 7.4%, airway obstruction 4%) which require O2 supplementation /mask ventilation[7]. But in our study use of nasal airway prior to procedure prevented airway obstruction, helped to monitor ETCO2 and respiration and also supplementation of oxygen.

None of our patients developed nausea and vomiting due to use of inj. emset and dexamethasone and propofol as sedative. One of our patients developed slurring of speech and recovered on second post operative day.

Dexmedetomidine[4] is a selective alpha 2 adrenoreceptor agonist. It provides adequate sedation and analgesia without significant respiratory depression.

Patients undergoing awake craniotomy frequently have postoperative nausea and vomiting so using propofol which is an antiemetic and anticonvulsant is better for conscious sedation.

CONCLUSION

Combination of conscious sedation with scalp block offered hemodynamic stability, no airway complications, early diagnosis of neurological deficit in form of speech, during eloquent area manipulation prevented further damage.

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