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ANAESTHETIC MANAGEMENT IN A LOW GRADE GLIOMA TUMOUR INVOLVING THE LEFT PARIETAL REGION POSTED FOR AWAKE CRANIOTOMY-A CASE REPORT

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ABSTRACT

INTRODUCTION: Awake craniotomy means the craniotomy where a patient remains awake during whole or part of the surgery.It is performed for intraoperative functional cortical mapping and intraoperative electrocorticography for localisation of epileptic foci.

CASE REPORT: A 14 years old male patient weighing 35kgs having low grade left parietal lobe glioma posted for awake craniotomy.Patient was managed with propofol and dexmedetomidine infusion and scalp block.Goals of anaesthesia are to provide optimal psychological care and ensuring minimal discomfort to the patient without using drugs or techniques which make functional monitoring possible.

CONCLUSION: Appropriate selection of patients and titrated use of sedatives,analgesic and anaesthetic agents are key to success.

RESULTS: Patient was hemodynamically stable and cooperative throughout the surgery.Perioperative period was uneventful.

KEYWORDS : Awake craniotomy, scalp block with sedation ,Left parietal lobe glioma.

INTRODUCTION

"Awake craniotomy" means the craniotomy where a patient remains awake during whole or part of the surgery. There are two reasons for performing neurosurgery with patient being awake first for procedures that involves intraoperative functional cortical mapping and second during intraoperative electrocorticography for localization of epileptic foci; Craniotomy under local anaesthesia minimizes the impact of anesthetics on these kind of recordings. One of the procedure is Tailored resection of a glioma in the motor or Broca's area which can be performed to preserve patient's function like speech. Its success highly depends on the careful patient selection and the experience of the surgical and anaesthesia team.

CASE REPORT

We have managed a case of 14years old male patient weighing 35kgs having low grade left parietal lobe glioma who was posted for awake craniotomy in neurosurgery operation theatre. Patient was presented with complain of vertigo and headache since 12 months. There was no h/o blurred vision, speech defect, vomiting, seizures or confusion and also no h/o any medical or surgical illness. Patient was conservatively managed with Inj valproate 250mg IV BD and Inj dexamethasone 4mg IV TDS for 5 days. On examination patient was conscious following verbal command with HR-98/min and regular, BP-122/72 mm of Hg. Airway and spine were Normal, systemic examination was normal including CNS examination with adequate motor, tone and power in all four limbs. All Routine blood investigations including ECG/CXR were normal except MRI BRAIN WITH SPECTROSCOPY which showed enhancing neoplastic lesion in left parietal lobe likely low grade glioma of 33*36*83mm size**.**

On the day before surgery, patient was well motivated and psychologically prepared. Solid Rapport was built between anaesthetist and patient about intraoperative communication. Patient's relatives were explained about procedure and anaesthetic risk. On the day of surgery, Patient was taken to operation theatre with 22G IV line secured. All the monitors were attached like ECG, NIBP,$ETCO_2$ and pulse oximetry. Patient was premedicated with Inj. glycopyrrolate 0.4ug/kg i.v; Inj. ondasetron 0.15mg/kg; Inj. valproate 1g iv to prevent epileptic foci.

Patient was sedated with Inj. fentanyl 40ug IV and Propofol and dexmedetomidine infusion. Propofol-dexmedetomidine drip was prepared as follows: Inj. Propofol 50mg and Inj Dexmedetomidine 25µg in 50 ml of 5% dextrose in dosifix.25 ml of infusion given within 15 mins before giving scalp block. Neurosurgeon was asked to perform scalp block with Inj bupivacaine 0.5% 10ml and Inj lignoadrenaline 1.5% 10ml and saline 20ml as showed in figure(1).The child was placed in a slight reverse Trendelenburg position to reduce the preoperative blood loss and to decrease intracranial pressure.

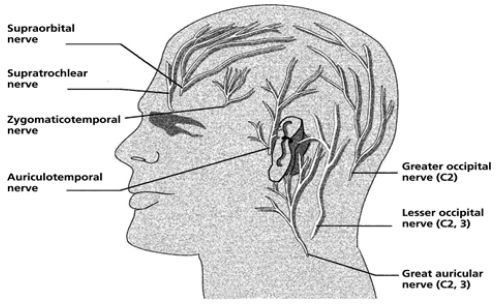
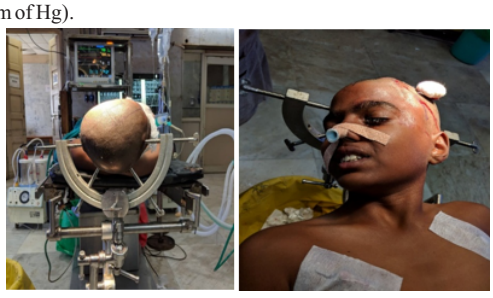


Figure (1):Nerves blocked in scalp block

Then slowly the drip was continued throughout the surgery and stopped only before brain mapping. Nasopharyngeal airway no:7 inserted and connected to Bain's circuit with o2 flow rate @ 4L/min. Oxygenation was maintained throughout the procedure which can help us to supplement nitrous oxide and sevoflurane, if needed and also protects airway compromise. Careful monitoring of the respiration was done with bag movement of bain's circuit and ETCO2 (Range-17-22 mm of Hg).



Figure(2):Trendelenburg Position of the patient in sugita head fixator.

During the surgery, patient's speech was assessed by oral questionnaire and patients's communication was excellent during the mapping procedure and the patient was allowed to awaken fully by stopping all infusions prior to neurological testing. Patient was hemodynamically stable throughout the procedure. Total propofol given throughout the surgery was 50mg and dexmedetomidine 25ug.Inj diclofenac 70mg i.v was given for post-operative analgesia. Surgery lasted for 2 hours 30 minutes.

DISCUSSION.

The challenge of anaesthetic management in awake craniotomy is to have the patient comfortable enough to remain immobile throughout

the procedure and yet sufficiently alert and cooperative to comply with neurological testing during the surgery[2].Three major intraoperative anaesthetic challenges includes (1)provision of a rapid and smooth transition of the anaesthetic depth according to the different surgical stages.(2) maintenance of stable cerebral hemodynamic and cardiopulmonary function(3)crisis management for an awake patient with an open cranium[1] Most common complications of awake craniotomy occur due to over anaesthesia or under sedation. Over sedation may lead to apnoea, hypercapnia and cerebral swelling, whereas under sedation may result to agitation, arterial hypertension and tachycardia. We also have to maintain the common anaesthetic goals for all neurosurgical patients, such as the avoidance of hypercapnia and hypoxemia adequate cerebral perfusion pressure and brain relaxation. [1]

Most important things to consider are to Maintain patent airway , assist ventilation as and when needed and cardiovascular stability. Immediate management includes decreasing sedation, jaw thurst or use of an airway adjunct. Nasopharyngeal airway can be used early to relieve airway obstruction. Therefore, We in our case inserted nasopharyngeal airway after proper sedation of patient with propofol-dexmedetomidine infusion to support airway compromise. Skucas and Artru studied the complications in over 300 patients who had awake craniotomy for epilepsy surgery, and found that 5 patients(1.5%) had oxygen saturation of less than 90%[1].

Many references describe various techniques of awake craniotomy includes local anaesthesia (scalp block), conscious sedation, asleep-awake- asleep technique. In the asleep-awake-asleep technique involves the induction of general anaesthesia (m/c using proseal LMA or endotracheal intubation) with airway control during the craniotomy, head pinning and closure. With a secured airway, deep anaesthesia can be achieved without compromising the patient's safety. Excellent operating conditions can also be achieved with control of ventilation. The patient is fully awakened for intraoperative neurological evaluation as general anaesthesia is discontinued for the period of functional cortical mapping [1]. In this technique we have to remove LMA or extubate ET tube intraoperatively and the surgical position is such that we may face difficulty in securing the airway again [2]. This technique is suitable for patients who are not able to tolerate craniotomy with sedation alone, especially the longer procedure.

We used conscious sedation technique with local anaesthesia in which the patient remains sedated with spontaneous breathing throughout the procedure, and the sedatives and analgesic were titrated based on the surgical stages. The main causes of failure in awake craniotomy are the onset of seizures and the loss of patient's cooperation due to severe somnolence, restlessness or the development of mixed dysphasia[2]. Most seizures occurred during brain mapping or tumour resection, correlating with periods of cortical stimulation, so we have used Inj valproate intravenously in premedication to prevent intraoperative seizures. Failed awake craniotomies are associated with a lower incidence of gross total resections, increased postoperative speech deterioration and a longer hospital stay.

We have used the combination of propofol and dexmedetomidine to minimizes the disinhibition and to ensure speedy awakening. Jee jain See and Thomas Wk Lew at el had reported that Haemodynamic instability are more common in awake craniotomy than craniotomy under general anaesthesia.Also Hypertension was commonly reported during application of head fixator[1].So to prevent hypertension before the time of head fixator, we gave Inj Fentanyl intravenously and started propofol-dexmedetomidine drip to achieve proper sedation. Additional analgesia and sedation may be required to manage intraoperative hypertension.

Dexmedetomidine is a selective a2 adrenoceptor agonist. It has been shown to provide sedation and analgesia without significant respiratory depression. It also reduces the intraoperative and postoperative anaesthesia requirement [5].Patients undergoing awake craniotomy frequently experience nausea and vomiting[1].So that the use of propofol,which is an effective antiemetic and anticonvulsant properties and the avoidance of high doses of opioids were contributory factors. Propofol only anaesthesia with spontaneously breathing patients has been described as safe. Propofol sedation can lead to agitation and restlessness and it is advisable to use only mild levels of sedation to allow the patient to voluntarily supress such restlessness[2].

CONCLUSION

Preoperative psychological preparation of the patient with communication regarding the procedure, best scalp block by neurosurgeon, best choice of sedative and analgesic drugs , vigilant airway management skill and experienced anaesthesia and surgical team are the keys to successful outcome in awake craniotomy.

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