Case study

ANESTHETIC MANAGEMENT OF LEFT CEREBELLOPONTINE ANGLE ACOUSTIC NERVE SCHWANNOMA IN SITTING POSITION WITH INTRAOPERATIVE ELECTROMYOGRAPHIC FACIAL NERVE MONITORING

1. **Abstract**: We managed a case of left CP angle acoustic nerve schwannoma in sitting position with EMG monitoring for facial nerve. A 40 year old, male, ASA II, presented with complaints of difficulty in walking, left sided hearing loss, diminution of vision since 3 years. MRI sugestive of Left CPA acoustic nerve schwannoma. Patient was operated under general anesthesia in sitting position with Mayfield clamp on head without using muscle relaxant as plan was to use EMG monitoring during tumor resection. Anesthesia was maintained with sevoflurane and propofol and no muscle relaxant was used still patient was immobile. Throughout the procedure hemodynamic stability was maintained with injection noradrenaline. Procedure was uneventful with complete excision of tumor and without damaging the facial nerve. Excision of this deep seated tumor in sitting position without using muscle relaxant are very difficult to manage. This surgery was very challenging from anesthesia point of view as sitting position itself increases the risk of complications and avoiding movement of patient with Mayfield clamp without using muscle relaxant was a tough job.

Keywords: Sitting position, EMG Monitoring, No muscle relaxant

Introduction:

The sitting position was introduced in clinical practice by De Marte in 1973[1.] But it has been declining in popularity since 1980's due to high incidence of complications. Sitting position used for resection of tumors in cerebellopontine angle, pineal region, other technically difficult tumors in infratentorial region as well as surgeries of cervical spine. Advantage of this position is provides drainage of CSF and blood, provides easy access to airway and promotes favorable changes in ventilatory mechanics . This position has several life threatening complications such as venous air embolism, postural cardiovascular effects because of general anesthesia,

macroglossia, pneumocephalous, quadriplegia, peripheral nerve injury[2]

Intraoperative electromyographic (EMG) monitoring of the facial nerve during acoustic neuroma resection allows the early detection of surgical stimulation and reduces nerve dysfunction postoperatively[3].Acoustic nerve shwannoma are the most common tumors of the cerebellopontine angle (CPA)[4], accounting for more than 90% of all such tumors with the risk of injuring facial nerve during surgeries.Usage of intraoperative EMG monitoring will definitely reduce the risk of damaging facial nerve, but becomes more challenging for an anaesthetist to maintain motionless patient in sitting position with Mayfield clamp on head of the patient. we managed a case of left CP angle tumor posted for excision in sitting position with emg monitoring in our institute.

Case report:

40 yr old(45kg,155 cm)male brought to the hospital with complaints of difficulty in walking, left sided hearing loss ,diminution of vision since 3 years. MRI was done which revealed a well marginated heterogeneously enhancing extra axial mass lesion in left cp angle cistern s/o acoustic nerve schwannoma.he was posted for excision of the tumour. Thorough preoperative checkup was done. preop HRCT was S/O a solitary pulmonary nodule in left upper lobe s/o infective etiology.All routine workup was done including 2D ECHO which was normal.

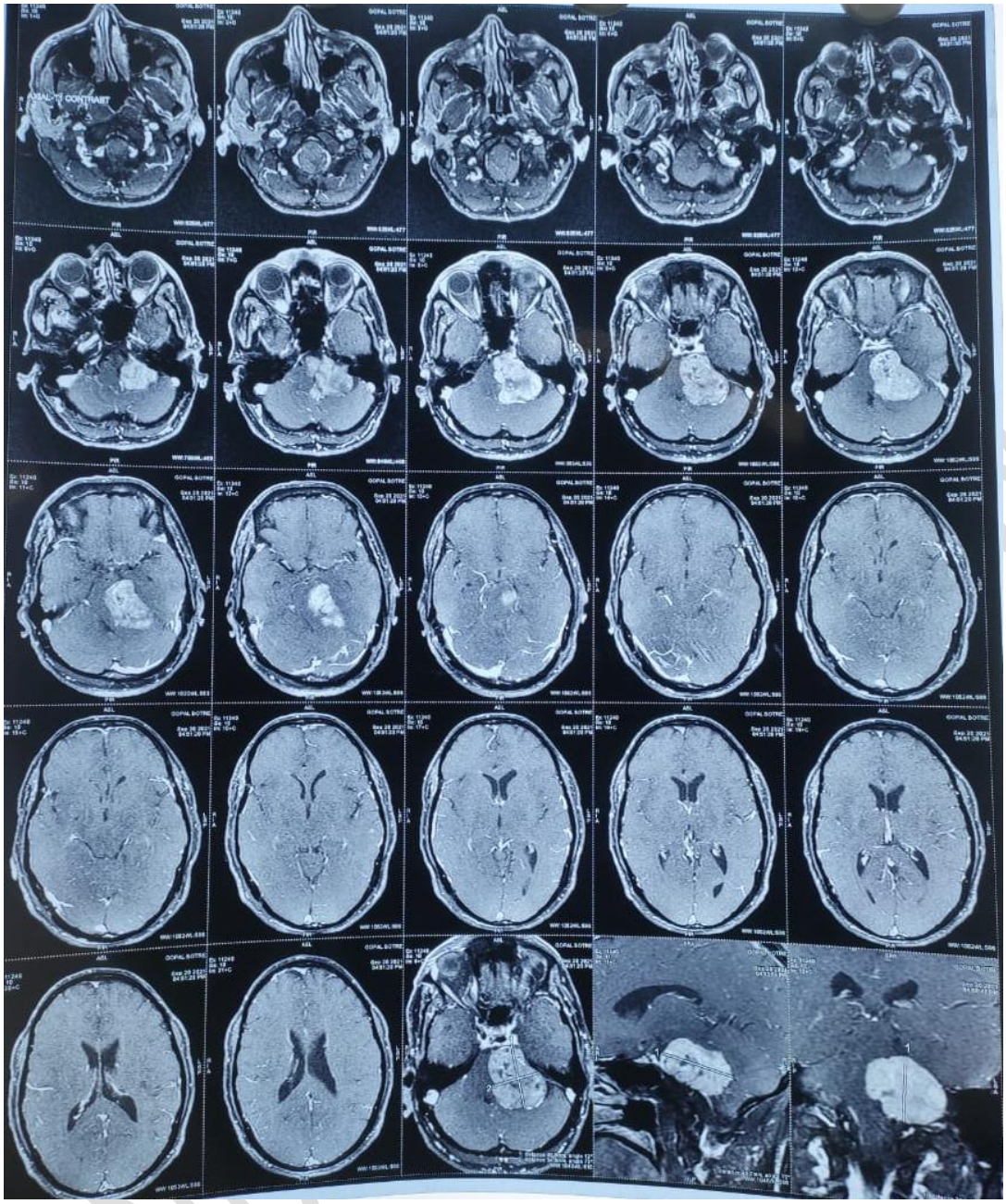
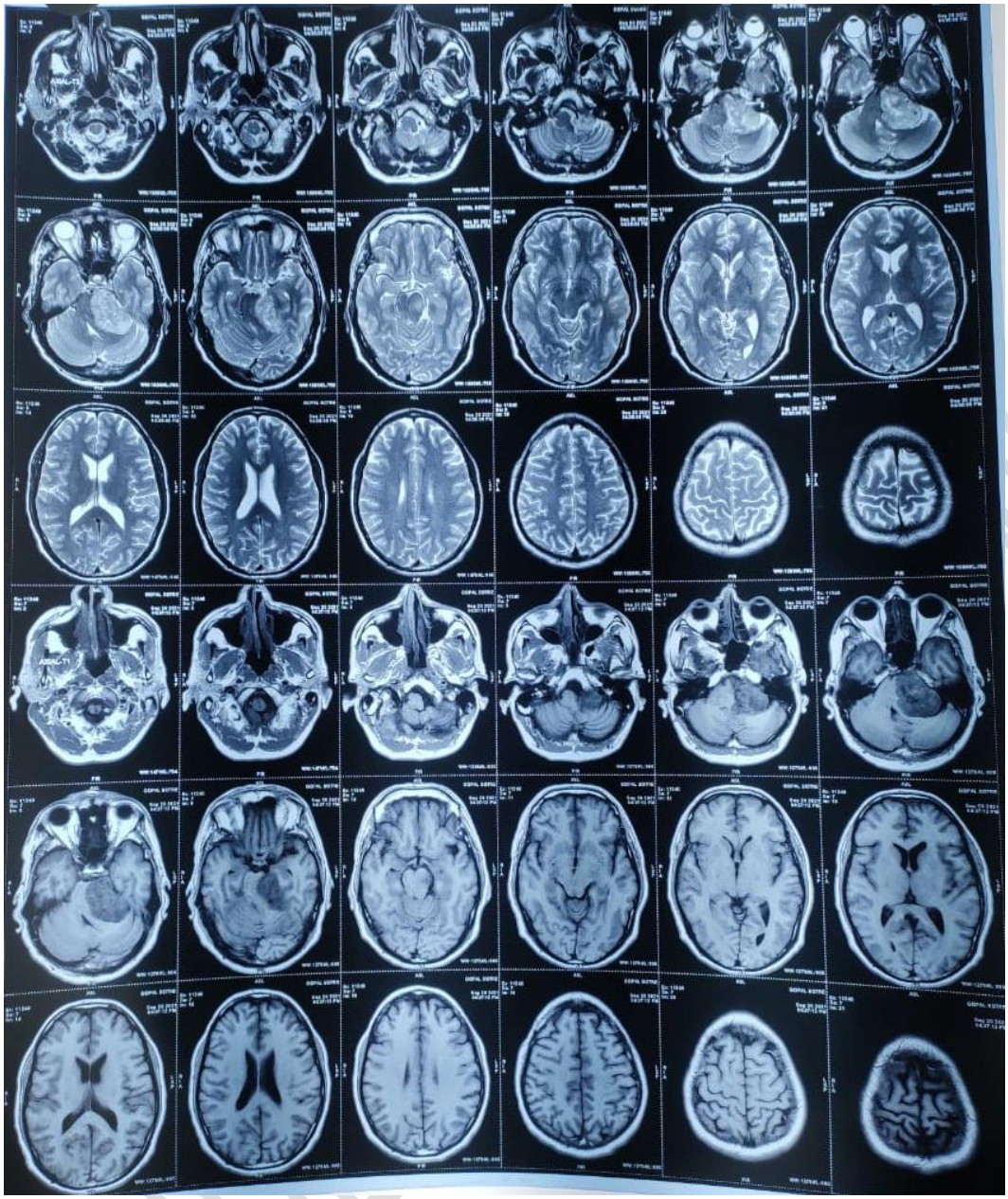


Fig.1 Preoperative MRI Scan



Patient was shifted to OT.All ASAmonitors were attached,18G Intracath was secured I.V. fluid NS started.Patient was preoxygenated with 100% oxygen at 5lit/min of oxygen and premedicated with inj. lidocaine 2% 1.5mg/kg. Induction done with Inj. thiopentone 5 mg/kg Inj. fentanyl 2mcg/kg ,after that ventilation was confirmed with bag and mask and musle relaxant Inj. vecuronium 0.1mg/kg was given.Patient was ventilated for 3 minutes and intubated with ET tube size 8 mm. After confirming the air entry is equal on both sides, ET tube was fixed. Left radial artery was cannulated for direct arterial pressure monitoring and arterial blood gas analysis intra operatively. Triple lumen central line was cannulated in right subclavian vein. Anesthesia was maintained with sevoflurane(MAC 0.8 -0.9)and oxygen and

air(40%-60%).The bladder was catheterised for urine output monitoring. after the continuous observation of CVP,arterial pressure and peak pressures patient was slowly given sitting position without disturbing the hemodynamic parameters.Knees were kept at the level of heart and shoulders were strapped to operating table from behind to avoid drooping. Over flexion of neck was avoided. Pillows were placed below thighs and legs on both sides and pressure points were padded properly.A Mayfied frame was used ,which was clamped to the side rails of the operating table to make the head and trunk immobile with respect to each other. Before fixing the frame to the scalp inj.fentanyl 1 mcg/ kg was given. After final positioning Arterial line tranceducer was zeroed at the level of middle ear. Intraoperatively analgesic was maintained with fentanyl 1mcg/kg/hr.

Fig 2: Intra operative vitals

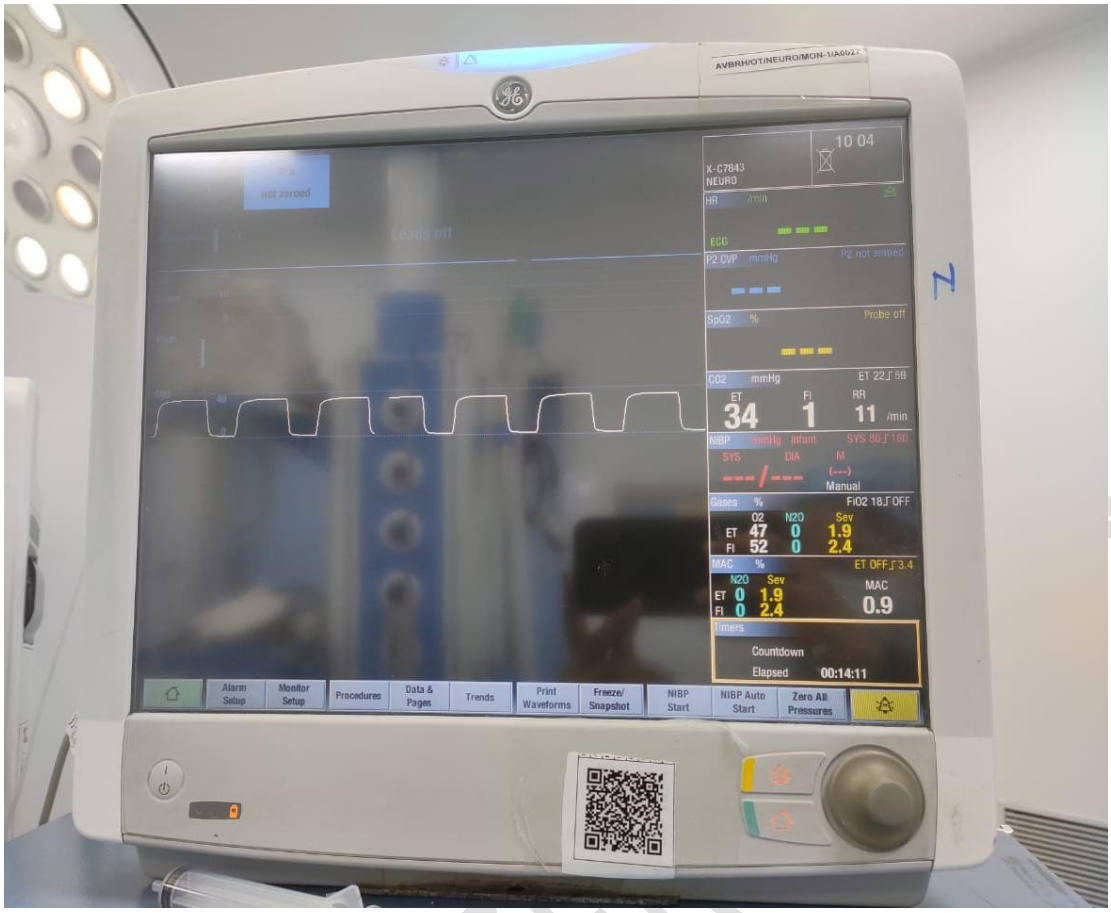


Fig 3: Intraopeartive EtCO2 monitoring

Fig 4: intraoperative noradrenaline and propofol infusions

As the surgeon planned for facial nerve monitoring patient was maintained on inj.propofol infusion at0.1-0.2 mg/kg/hr and Sevoflurane MAC was kept at 0.5 to 0.6.inj noradrenaline infusion was started at 4 ml/hr to maintain MAP between70mmHg to 90 mmHg . All vital parameters were maintained stable through out the procedure. Serial arterial blood gases monitoring was done. No episodes of air embolism through out the surgery which is the most devastating complication in sitting position.

The surgery was completed in 11 hours without any complications.patient was shifted to ICU with ET tube insitu. He was put on inj.midaz 5mg/hr with inj. fentanyl 1mcg/kg boluses every 2 hrly for the night and extubated on the next day after stopping sedation. Patient was fully conscious and oriented, obeying commands,GCS was E4V5M6, And no facial palsy was present.

Discussion: CPA tumors are mostly benign, slow-growing tumors with low potential for malignancy (~1%)[1]. Between 5 and 10% of all intracranial tumors are located in the cerebellopontine angle[5]. The most common tumors at the CPA are vestibular schwannoma, meningioma, and epidermoid tumors[6]. Vestibular schwannoma accounts for 75 to 85% of all CPA tumors; Schwannomas are the primary lesion of cranial nerves involving trigeminal, facial, glossopharyngeal, vagus, and sometimes even accessory cranial nerve[7]. The diagnosis of CPA tumors is made based on history, physical examination, audiometric and radiological evaluation. Magnetic resonance image (MRI) is the gold standard for the diagnosis of CPA tumors. Treatment options for CPA tumors include observation, radiation therapy, or microsurgery[8].In patients undergoing acoustic neuroma resection, Intraoperative EMG monitoring of the facial nerve has resulted in improved preservation of facial nerve function postoperatively1. The anaesthetic management of these patients should not only provide an immobile patient but also preserve an optimal environment for facial EMG monitoring.The advantage of sitting position are improves surgical access to the posterior fossa by facilitating gravity assisted drainage of blood and CSF[9] and decreasing ICP,It improves surgical orientation, access to the midline structures and decreases the amount of surgical retraction needed to gain access to deeper structures, but this position has many disadvantages like Venous air embolism accounting for 25%-75%, cardiovascular instability, Macroglossia, quadriplegia, pneomocephalous[10]. Patients in the sitting position must be returned to the supine position rapidly for resuscitative measures in case of an acute cardiovascular collapse. From the surgical aspect, the sitting position gives good surgical access to the operative

site[11], improves venous drainage, gives a better view of facial area for monitoring evoked responses from cranial nerve stimulation and allows for better ventilation. Conversely, the sitting position can present complications such as air emboli, postural hypotension and serious cardiac arrhythmias due to surgical stimulation of cranial nerves and brainstem. Precordial Doppler or transesophageal echocardiography monitoring improves the detection of small venous air embolism enabling its early treatment and diminishing its consequences[12].

CONCLUSION : we have successfully managed a case of acoustic nerve schwannoma excision,in sitting position with propofol infusion with facial nerve EMG monitoring.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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