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CASE REPORT

Anaesthetic Management of Supratentorial Tumor Craniotomy Using Awake-Throughout Approach

Faraz Shafiq[1], Fahad Salim[1], Ather Enam[2], Jai Parkash[1] and Mohammad Faheem[2]

ABSTRACT

The authors are reporting an anaesthetic management of patient presenting with left parietal lobe space occupying lesion and scheduled for Awake-craniotomy. Awake-throughout approach using scalp block was planned. Among techniques reported for keeping patient awake during the surgery, this one is really underutilized. The successful conduct requires thorough preoperative assessment and psychological preparation. We used powerpoint presentation as a preoperative teaching tool. The anatomical landmark technique was used to institute scalp block, where individual nerves were targeted bilaterally. Patient remained stable throughout and participated actively in intraoperative neurological monitoring. Postoperative period showed remarkable recovery, better pain control, and shorter length of stay in hospital.

Key Words: *Anaesthesia. Supratentorial neoplasms. Scalp. Awake-craniotomy.*

INTRODUCTION

Awake-craniotomy is a technique reserved for resection of supratentorial tumours near eloquent cortex.[1] The approach reported to be useful for maximum safe resection and minimizing postoperative neurological deficit.[2] Various anaesthesia techniques have been reported for this, which include either asleep-awake-asleep or asleep-awake approach.[3] The choices vary depending upon available resources, anaesthetic agents, equipment, and comfort level of a particular team. The concept of awake-throughout (AT) approach is really underutilized and absolutely new to our part of the world. Successful conduct requires analgesia in the form of scalp block, while patient remains awake through out the surgery. This requires extensive counseling and psycological preparation preoperatively.

It is the first successful case employing this technique ever done in Pakistan. However, the authors are expecting long-term benefits of the technique in improving outcome and overall reduction in the cost of care in Pakistan.

CASE REPORT

The patient was a 53-year male weighing 90 Kg, not known to have any comorbid condition. He presented to the neurosurgical clinic with complains of headache, blurring of vision along with gait abnormalities since three months. MRI brain revealed left parieto-occipital space occupying lesion measuring 52 X 25 X 54 mm in AP, transverse and cranio-caudal dimensions, respectively (Figure 1a). MRI tractography showed significant surrounding perilesional edema, mass effect and midline shift of 4 mm towards the contralateral side. Fibres from left-sided forceps major were displaced medially. Main cortico-spinal tract was intact and anterior to lesion (Figure 1b). The neurosurgeon decided that awake-craniotomy would be the best option for resection of this tumor. Routine preoperative assessment was done. The patient was taught in detail about need of keeping him awake, what are the expectations, the method of scalp block, and his role in intraoperative care plan. Realistic counseling about possible discomforts like surgical positioning or dural pain was also done. Patient was also counseled about associated side effects. Powerpoint presentation was used which included the necessary information about indications, contraindications, pictorial information related to scalp block, theatre setup and surgical positioning.

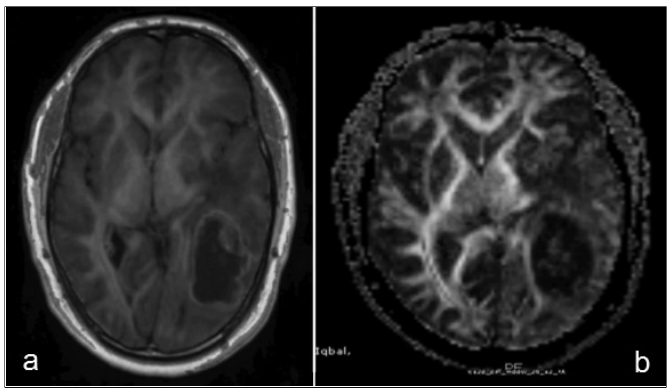

Figure 1: (a) MRI brain indicates the location of tumor, **(b)** MRI tractography showing involvement of tracts.

Routine monitoring, which included noninvasive blood pressure, electrocardiogram, and pulse oximetry were

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Table I: Volume of LA mixture used for scalp block.

Nerves Infiltrated (bilaterally)	Volume (ml)		Anatomical landmark
	Right	Left	
Supra-orbital / supra-trochlear	3	3	Supraorbital notch
Auriculo-temporal	4	4	Auriculo-temporal groove in front of tragus
Zygomatico-temporal	3	3	Lateral edge of orbit on temporalis muscle
Greater-auricular	2	2	2 cm posterior to the auricle at the level of tragus
Greater-occipital / lesser-occipital	8	8	2-3 cm lateral to inion on superior nuchal line

Dose Calculation: Ropivicaine (0.5%) 2-3 mg/Kg.
Preparation: Ropivicaine 0.5%=40 ml, mixed with Dexamethasone 8 mg and 0.2 ml of Adrenalin (1:1000).

applied. Injection Ropivicaine 0.5% (40 ml=200 mg) with 0.2 ml of adrenalin (1:1000) was used for scalp block. Dexamethasone 8 mg was used as an additive to local anaesthesia (LA) regime. Supraorbital (SO), Supra-trochlear (ST), Auriculotemporal (AT), Zygomaticotemporal (ZT), Greater auricular (GA), Greater occipital (GO) and Lesser occipital (LO) nerves were blocked bilaterally using anatomical landmarks. The LA solution was infiltrated in increments as mentioned in Table I. Dedicated syringes having fixed volume were used separately for individual nerves. Additional LA was also given on Mayfield pins side. After evaluating the quality of block, patient was positioned laterally and pins were applied. Patient did not show any discomfort and remained pain-free throughout. However, mild to moderate pain was noticed because of dural traction during deep resection. This was very well managed with boluses of fentanyl (10 micrograms). Patient showed active involvement in intraoperative neurological monitoring, which was done to assess his contralateral motor and sensory functions. Higher mental functions were also evaluated during resection phase by asking questions related to memory.

The total resection time was approximately two hours. Patient was shifted to post-anaesthesia care unit (PACU) with stable vitals and then to special care unit (SCU). Intravenous acetaminophen and tramadol were prescribed for postoperative pain. Patient remained fairly stable throughout the recovery period and discharged to ward bed after 24 hours. Postoperative MRI revealed mild postoperative changes including the residual pneumocranium. The biopsy of lesion showed it to be Glioblastoma multiforme garde IV. Patient was called on telephone after three months to evaluate his satisfaction about the technique, for which he gave a score of 8 out of 10 on verbal rating scale.

DISCUSSION

Anaesthesia for awake-craniotomy includes various strategies ranging from conscious sedation during resection phase to deep anaesthesia when no neurological monitoring is required. The success of any technique is directly linked to patient selection and expertise of the team. Anesthesiologist plays a key role in the patient's psychological preparation. Along with routine preoperative assessment, it is important to evaluate patient's willingness and motivation. Identification of contraindications like inability to lie still, persistent cough, obstructive sleep apnea or history of any psychiatric disorder is important.[4] The counseling should be realistic,[5] where patients' needs to be reassured that they are going to be looked after by expert team. However, it is also very important to tell them about possible discomforts as pain during the manipulation of dura matter. The authors used power-point presentation as a preoperative counseling tool in this patient. It included the images related to actual theatre setup, practical conduct of scalp block and positioning. This proved to be very useful in terms of psychological preparation, reducing anxiety level and overall understanding of patient.

The analgesia provided by scalp block was the mainstay, where individual nerves were targeted based on their anatomical location, for which ropivicaine (0.5%) with adrenalin (1:1000) was used. As the infiltration required higher volume, it is logical to use ropivicaine because of its low cardiotoxicity. Dexamethasone was added to enhance the quality of block, considering its effect on attenuation of type C fibers.[6] Studies have shown that the addition of dexamethasone enhances the quality and prolongs the duration of regional block.[7] During the resection phase, the patient remained fairly stable and pain-free. However, at times he reported moderate discomfort during deep resection of tumor. It was very well managed with increments of fentanyl. A close collaboration is required between the anesthesiologist and surgeon during the resection time. As this is a critical time to evaluate the neurological, functions, depending upon the location of tumor, it might be either the assessment of motor/sensory or higher mental functions. Anesthesiologist should also anticipate intraoperative complications like nausea, vomiting or seizure, and the need to induce general anaesthesia in emergency.[8] It is our routine to give anti-seizure prophylaxis preoperatively to all supratentorial craniotomies. Similarly antiemetic prophylaxis is a part of modern anaesthesia practice and considered as a standard of care. Analgesia provided by scalp block needs to be bridged in postoperative period, for which paracetamol and tramadol are acceptable options. This patient remained pain-free and showed better recovery profiles in immediate postoperative period. He was shifted much earlier to SCU, and similarly from SCU to ward bed in comparison to patients having general anaesthesia.

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REFERENCES

1. Sahjpaul RL. Awake craniotomy: Controversies, indications and techniques in the surgical treatment of temporal lobe epilepsy. *Can J Neurol Sci* 2000; **27** (Suppl 1):S55-63.
2. Lobo FA, Wagemakers M, Absalom AR. Anaesthesia for awake craniotomy. *Br J Anaesth* 2016; **116**:740-4.
3. Burnand C, Sebastian J. Survey of anaesthesia for awake craniotomy. *J Neurosurg Anesthesiol* 2012; **24**:249.
4. Erickson KM, Cole DJ. Anesthetic considerations for awake craniotomy for epilepsy and functional neurosurgery. *Anesthesiol Clin* 2012; **30**:241-68.
5. Chui J. Anesthesia for awake craniotomy: An update. *Rev Colomb Anestesiol* 2015; **43**:22-8.
6. Williams BA, Murinson BB, Grable BR, Orebaugh SL. Future considerations for pharmacologic adjuvants in single-injection peripheral nerve blocks for patients with diabetes mellitus. *Reg Anesth Pain Med* 2009; **34**:445-57.
7. Tandoc MN, Fan L, Kolesnikov S, Kruglov A, Nader ND. Adjuvant dexamethasone with bupivacaine prolongs the duration of interscalene block: a prospective randomized trial. *J Anesth* 2011; **25**:704-9.
8. Olsen KS. The asleep-awake technique using propofol-remifentanil anaesthesia for awake craniotomy for cerebral tumours. *Eur J Anaesthesiol* 2008; **25**:662-9.