Awake Craniotomy For Eloquent Area Gliomas Using Clinical Monitoring

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Introduction

Awake craniotomy is an important surgical technique for operating tumor in eloquent areas.

Awake surgery can be done with functional monitoring

a) with clinical monitoring

b) with electrophysiological monitoring

It can be combined with anatomical adjuncts such as

a)use of navigation and ultrasound

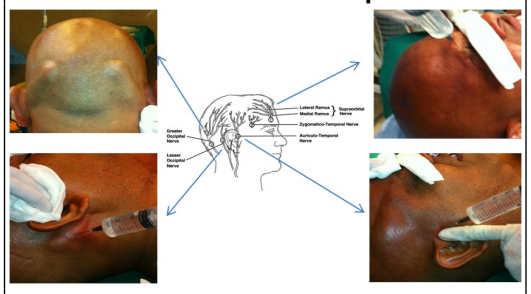
b) flourescence eg ALA dye.

This study was done to examine the morbidity as well as the extent of resection in patients with gliomas undergoing awake craniotomy, using clinical monitoring.

Methods

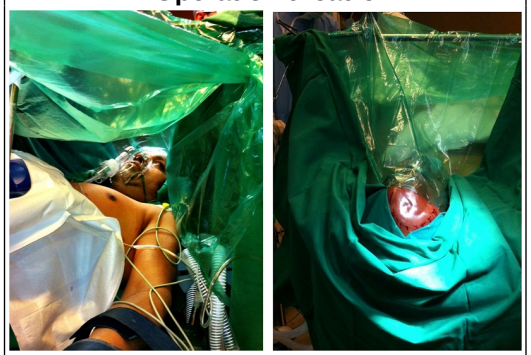
- Retrospective analysis of a prospectively maintained database
- Patient with tumors close to eloquent areas were enrolled
- Functional MRI was obtained whenever feasible
- Surgery was done under scalp block with/without dexmedetomidine
- Patients were monitored for speech and motor deficits
- Electrophysiological monitoring was not used
- Surgeons as well as radiological extent of resection was documented
- Course in wards and condition at discharge was noted

Anesthesia technique



scalp block using lignocaine and bupivacaine

Operation theatre



Patient positioning

Results

- 52 patients : 39 males and 13 females
- Perirolandic was most frequent site(69.5%)
- High grade gliomas were the most common histological group(71.2%)
- Intraoperative ultrasound was used in 84.6% of cases.

Morbidity

- 25 patient (48.1%) had deficits at presentation.
- 20 patients(38.5%) developed new deficits/complications during surgery, with 1 patient requiring conversion to general anesthesia.
- Of the 20 patients who developed deficits , 4 made complete recovery, 10 made partial recovery(19.2%) and 6 patients remained same with deficits(11.5%), at discharge.

Morbidity details

- motor deficits :15 patients
- speech deficits: 3 patients
- seizures : 2 patients

Extent of resection

- Gross total resection was achieved in 52.9% cases(radiological)

Results are comparable with studies quoted below.

Comparative studies

Study	Patients	Electro physiology monitoring	Morbidity (ND-neurodeficit, IO-intra-op, D-at discharge)	Extent of resection
Bernstein et al .JNS 2007	610	YES	ND (14.6%) Seiz. : 4.9%	-
Sawaya et al .Neurosurgery 2009	309	YES	ND 21%(+map) vs 9% (-map)	GTR 64%
Danks et al. J Neurooncol. 2000	157	YES	Transient ND in 33 %	GTR 57 %
Duffau et al JNN Psychiatry 2005 (LGG)	100	NO	17%	GTR 6 %
	122	YES	6.5%	GTR 25.4%
Ari chacko et al CNN 2012	67	YES	24.6%(IO) 13.4% (D.)	-
Present study	52	no	38.5% (IO) 19.2% -improving deficits at D 11.5% -no improvement at D	GTR 52.9%

morbidity and extent of resection

Conclusions

Awake craniotomy with clinical monitoring can be used in suitable patients with tumors in eloquent areas with acceptable morbidity and extent of resection, especially at centers where electrophysiological monitoring is unavailable.

Learning Objectives

- This study higlights that awake craniotomy with clinical monitoring can be used in any small centre without electrophysiological monitoring
- Though the intra-operative morbidity is more, many of the patients recover in due time.