Awake Craniotomy Versus Craniotomy Under General Anesthesia for Supratentorial Glioblastoma in Eloquent Areas: A Retrospective Controlled-Matched Study

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What are the findings?

- Awake craniotomy (AC) for resecting glioblastomas leads to a higher extent of resection
- Awake craniotomy is associated with less neurological morbidity in glioblastoma surgery
- Awake craniotomy does not statistically improve overall survival in glioblastoma resections

How might it impact on clinical practice?

- AC increases extent of resection but decreases neurological morbidity in glioblastoma resections in eloquent areas
- AC can make these resections both more succesful and safe

Methods

- Two cohorts selected from a database: AC/GA
- Glioblastoma resections in a 10-year time span
- Inclusion: isolated, eloquent, grade IV, supratentorial, KPS >70, elective, no crossover
- Allocation according to neurosurgeon's expertise
- Neuronavigation was used, no other adjuncts
- Matching: AC was 1:3 matched with GA for prognostics: age, gender, KPS, tumor volume and -location, adjuvant treatment
- After matching: 37 AC and 111 GA

Introduction

- Complete resection of glioblastomas is impossible
- Traditionally, gross-total resection yields improved survival with the risk of higher morbidity
- AC is used for resections in eloquent areas primarily in low-grade glioma surgery
- Purpose: to determine whether AC increases the extent of resection and decreases neurological morbidity in glioblastoma surgery as compared to general anesthesia (GA)

Table 1: Postoperative complications after matching

Variable	Levels	n	$\bar{x}$	s	$\tilde{x}$	IQR
Comp_E_min	general anesthesia	111	0.22	0.46	0	0
	awake	37	0.24	0.64	0	0
$p = 0.71$	all	148	0.22	0.51	0	0
Comp_E_maj	general anesthesia	111	0.25	0.48	0	0
	awake	37	0.19	0.40	0	0
$p = 0.54$	all	148	0.24	0.46	0	0
Comp_L_min	general anesthesia	111	0.15	0.39	0	0
	awake	37	0.03	0.16	0	0
$p = 0.05$	all	148	0.12	0.35	0	0
Comp_L_maj	general anesthesia	111	0.12	0.32	0	0
	awake	37	0.05	0.23	0	0
$p = 0.27$	all	148	0.10	0.30	0	0

Figure 1: Box plot of extent of resection in both groups

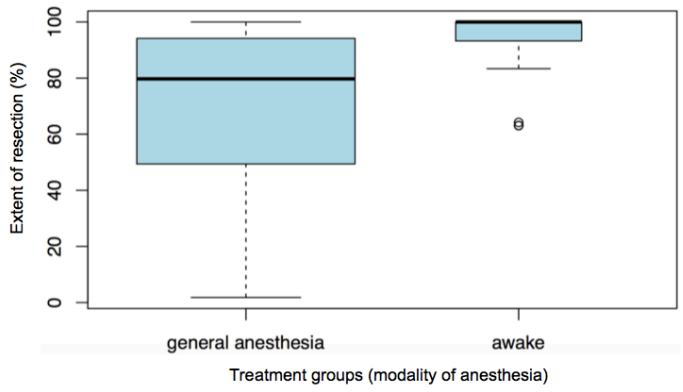
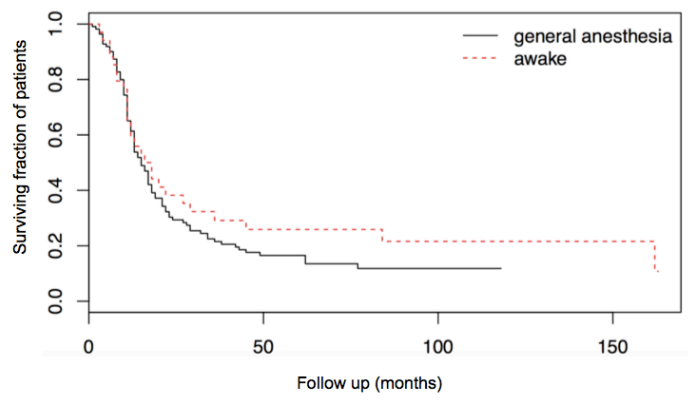


Figure 2: Kaplan-Meier curve for overall postoperative survival of both groups



Results

- After matching: no significant differences baseline
- Significantly higher extent of resection in the AC group: mean extent 94.89% (SD=10.57) vs 70.30% (SD 28.37) in the GA group, p<0.0001
- Significantly less late minor posteropative complications in the AC group: 0.03 (SD=0.16) vs GA group: 0.15 (SD=0.39), p=0.05
- Overall postoperative survival did not statistically differ between groups

Conclusions

- AC significantly improves extent of resection
- AC is associated with less late minor postoperative complications
- In patients with glioblastoma near eloquent areas, implementation of AC in standard care should be considered

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