Awake surgery for glioma systematic reviews

- Intracranial meningioma with intratumoral hemorrhage: A systematic review of associated features and outcomes
- A Journey into the Complexity of Temporo-Insular Gliomas: Case Report and Literature Review
- Congress of Neurological Surgeons systematic review and evidence-based guidelines for the role of surgery in the management of patients with diffuse low grade glioma: update
- Awake Craniotomy for Eloquent Brain Arteriovenous Malformations: A Systematic Review and Individual Patient Data Meta-Analysis
- The impact of intraoperative mapping during re-resection in recurrent gliomas: a systematic review
- "False friends" in Language Subcortical Mapping: A Systematic Literature Review
- Challenges and Opportunities in Awake Craniotomy for Brain Tumor Surgery in Low- and Lower-Middle-Income Countries: A Narrative Review and Perspective
- An update on tests used for intraoperative monitoring of cognition during awake craniotomy

Bocanegra-Becerra et al. performed a systematic review of the literature about awake surgery for glioma resection during pregnancy. A total of six patients with a median age of 30.5 years (interquartile range: 40-27) were analyzed. Awake surgery was performed in the third trimester in 50% of patients (median time: 24.5 weeks) without reported intraoperative complications. Conscious sedation was achieved by remifentanil and propofol infusion in 67% of cases, and intraoperative fetal heart monitoring was utilized in 83% of cases. Most studies revealed good clinical maternal-fetal outcomes at follow-up; however, long-term safety effects remain undetermined and warrant further research. In conclusion, awake surgery for glioma resection under a multidisciplinary approach can be a reasonable treatment option for select patients during pregnancy [1)]

A systematic review focuses on the effects of repeated surgery in awake conditions on the quality of life of adults with diffuse glioma through three parameters: return to work, presence of postoperative neurocognitive disorders, and occurrence of epileptic seizures. A systematic review of the last 20 years was performed according to the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) standards. Summarized data from selected studies were processed quantitatively, using a meta-analysis process, with the Review Manager 5.4 software. Five databases (PubMed, Web of Science, Science Direct, Dimensions, and Embase) were used. Fifteen articles were selected for qualitative analysis and 11 for meta-analysis. One hundred and fifty-one patients (85%) returned to active socio-professional life after repeated surgery, and 78 (41%) presented neurocognitive disorders in the immediate postoperative period, only 3% (n = 4) of them suffering from permanent disorders. One hundred and forty-nine (78%) participants were free of epileptic seizures after repeated surgery. This systematic review of the literature highlights the benefit of repeated surgery on the quality of life of patients with adult diffuse glioma [2)]

A systematic review to better understand stress, anxiety, and depression in AC patients.

PubMed, Scopus and Web of Science databases were searched from January 1, 2000, to April 20, 2022, in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guideline.

Four hundred forty-seven records were identified that fit our inclusion and exclusion criteria for screening. Overall, 24 articles consisting of 1450 patients from 13 countries were included. Sixteen studies (66.7%) were prospective, whereas 8 articles (33.3%) were retrospective. Studies evaluated stress, anxiety, and depression during different phases of AC. Twenty-two studies (91.7%) were conducted on adults, and 2 studies were on pediatrics (8.3 %). Glioma was the most common AC treatment with 615 patients (42.4%). Awake-awake-awake and asleep-awake-asleep were the most common protocols, each used in 4 studies, respectively (16.7%). Anxiety was the most common psychological outcome evaluated in 19 studies (79.2%). The visual analog scale and self-developed questionnaire by the authors (each n = 5, 20.8%) were the most frequent tools used. Twenty-three studies (95.8%) concluded that AC does not increase stress, anxiety, and/or depression in AC patients. One study (4.2%) identified younger age associated with panic attacks.

In experienced hands, AC does not cause an increase in stress, anxiety, and depression; however, the psychiatric impact of AC should not be underestimated [3)]

A systematic review was conducted in which 102 studies were included, reporting on speech and language errors and the corresponding brain locations during awake craniotomy with DES in adult glioma patients up until 6 July 2020. The current findings provide a crude overview of language localization. Even though subcortical areas are in general less often investigated intraoperatively, 40% out of all errors were reported at the subcortical level and almost 60% at the cortical level. Rudimentary localization patterns for different error types were observed and compared to the dual-stream model of language processing and the DuLIP model. While most patterns were similar compared to the models, additional locations were identified for articulation/motor speech, phonology, reading, and writing. Based on these patterns, we propose an updated DuLIP model. This model can be applied for a more adequate “location-to-function” language task selection to assess different linguistic functions during awake craniotomy, to possibly improve intraoperative language monitoring. This could result in a better postoperative language outcome in the future [4)]

A review yielded 7 studies, with a total of 25 multilingual brain tumor patients who underwent awake brain mapping. The age ranged from 25 to 62 years. Majority were female (56.5%). Most (52%) were trilingual, while 20% were quadrilingual and 28% were pentalingual. All tumors were left-sided, mostly in the frontal lobe. These were predominantly gliomas. Extent of resection was gross total in 61%. The brain mapping findings were heterogeneous. Some authors reported a greater number of cortical sites for the first language compared to others. Others found that the first and second languages shared cortical sites whereas the third and subsequent languages were located in distant sites. The peri-Sylvian area was also found to be involved in language that was learned at an earlier age. Subsequent languages thus involved more distant sites. A larger number of cortical areas were also activated for languages that were learned later in life. In terms of language disturbance and recovery, there were mixed results.

Conclusion: Cortical mapping in multilingual brain tumor patients showed heterogeneity in terms of the location and number of language areas in the face of pathology. These findings may influence neurosurgical and oncological management of tumors in the speech area but emphasize the need to tailor surgical approaches and intraoperative testing to the patient [5)].

To determine the benefit of awake craniotomy for language, motor, and neurological functions, as well as other clinical outcomes, Bu et al. searched Medline, Embase, the Cochrane Library, and the Chinese Biomedical Literature Database up to December 2019. Gray literature was also searched. They included randomized and non-randomized controlled studies comparing awake craniotomy versus general anesthetic resection and reporting the language and neurological outcomes. Ten studies with 833 patients were included in the meta-analysis. The pooled risk ratio (RR) suggested no significant differences in language and neurological outcomes between the general anesthesia group and the awake craniotomy group without Electrostimulation. Awake craniotomy with Electrostimulation, however, was associated with improved late language and neurological outcomes (≥ 3 months) versus general anesthesia with pooled RR of 0.44 (95% CI = 0.20-0.96) and 0.49 (95% CI = 0.30-0.79), respectively. Awake craniotomy with Electrostimulation was also associated with a better extent of resection with the pooled RR of 0.81 (95%CI = 0.71-0.92) and shorter hospital stay duration with the pooled weighted mean difference (WMD) of - 1.14 (95%CI = - 1.80 to - 0.48). This meta-analysis suggested that the application of awake craniotomy with Electrostimulation during glioma resection is associated with lower risks of long-term neurological and language deficits and higher extent of tumor resection, as well as shorter hospital stay duration [6].

Test

What was the median age of patients analyzed in the systematic review of awake surgery for glioma resection during pregnancy?

a) 25 years

b) 30.5 years

c) 35 years

d) 40 years

In the same review, what percentage of patients underwent awake surgery in the third trimester of pregnancy?

a) 25%

b) 50%

c) 67%

d) 83%

Which medications were used to achieve conscious sedation in 67% of the cases during awake surgery?

a) Remifentanil and propofol

b) Morphine and ketamine

c) Diazepam and midazolam

d) Aspirin and ibuprofen

What is the main conclusion of the systematic review of awake surgery for glioma resection during pregnancy?

a) Awake surgery is not a suitable option during pregnancy.

b) Awake surgery is safe during pregnancy with no maternal-fetal complications.

c) The long-term effects of awake surgery during pregnancy are well-determined.

d) Awake surgery should only be performed in the first trimester of pregnancy.

What parameters were evaluated in the systematic review regarding repeated surgery in awake conditions for diffuse glioma patients?

a) Blood pressure, heart rate, and oxygen saturation

b) Return to work, neurocognitive disorders, and epileptic seizures

c) Tumor size, location, and histology

d) Surgical complications, anesthesia duration, and hospital stay

How many patients returned to active socio-professional life after repeated surgery in the systematic review on repeated awake surgeries?

a) 15%

b) 41%

c) 78%

d) 85%

According to the systematic review on stress, anxiety, and depression in AC patients, what percentage of studies concluded that awake craniotomy does not increase stress, anxiety, and/or depression?

a) 10%

b) 33.3%

c) 66.7%

d) 95.8%

What was the most common psychological outcome evaluated in the studies included in the review on stress, anxiety, and depression in AC patients?

a) Mood swings

b) Neurocognitive disorders

c) Anxiety

d) Memory loss

In the systematic review on speech and language errors during awake craniotomy with DES, what percentage of errors were reported at the subcortical level?

a) 10%

b) 20%

c) 40%

d) 60%

According to the meta-analysis mentioned in the last paragraph, what is the main benefit associated with awake craniotomy with Electrostimulation during glioma resection?

a) Faster recovery of motor skills

b) Reduced surgical complications

c) Lower risk of long-term neurological and language deficits

d) Shorter anesthesia duration

Answers:

b) 30.5 years b) 50% a) Remifentanil and propofol b) Awake surgery is safe during pregnancy with no maternal-fetal complications. b) Return to work, neurocognitive disorders, and epileptic seizures b) 41% d) 95.8% c) Anxiety c) 40% c) Lower risk of long-term neurological and language deficits

1)
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