

2017

Burks et al. reviewed clinical data on all patients undergoing glioma surgery performed by the senior author during a 4-year period at the University of [Oklahoma](#) Health Sciences Center. Forty patients were identified who underwent surgery for [butterfly gliomas](#). Each patient was designated as having undergone surgery either with or without the use of awake subcortical mapping and preservation of the [cingulum](#). Data recorded on these patients included the incidence of abulia/akinetic [mutism](#). In the context of the study findings, the authors conducted a detailed anatomical study of the cingulum and its role within the DMN using postmortem fiber tract dissections of 10 cerebral hemispheres and in vivo diffusion tractography of 10 healthy subjects.

Forty patients with butterfly gliomas were treated, 25 (62%) with standard surgical methods and 15 (38%) with awake subcortical mapping and preservation of the cingulum. One patient (1/15, 7%) experienced postoperative abulia following surgery with the cingulum-sparing technique. Greater than 90% resection was achieved in 13/15 (87%) of these patients.

This study presents evidence that anterior butterfly gliomas can be safely removed using a novel, attention-task based, awake brain surgery technique that focuses on preserving the anatomical connectivity of the cingulum and relevant aspects of the [cingulate gyrus](#) ¹⁾.

2014

[Adult](#) patients who underwent surgery for a newly diagnosed primary Glioblastoma at an academic tertiary-care institution between 2007 and 2012 were retrospectively reviewed and tumors were volumetrically measured. Of the 336 patients with newly diagnosed Glioblastoma who were operated on, 48 (14 %) presented with bGlioblastoma, where 29 (60 %) and 19 (40 %) underwent surgical resection and biopsy, respectively. In multivariate analysis, a bGlioblastoma was independently associated with poorer survival [HR (95 % CI) 1.848 (1.250-2.685), $p < 0.003$]. In [matched pair analysis](#), patients who underwent surgical resection had improved median survival than biopsy patients (7.0 vs. 3.5 months, $p = 0.03$). In multivariate analysis, increasing percent resection [HR (95 % CI) 0.987 (0.977-0.997), $p = 0.01$], radiation [HR (95 % CI) 0.431 (0.225-0.812), $p = 0.009$], and temozolomide [HR (95 % CI) 0.413 (0.212-0.784), $p = 0.007$] were each independently associated with prolonged survival among patients with bGlioblastoma. This present study shows that while patients with bGlioblastoma have poorer prognoses compared to non-bGlioblastoma, these patients can also benefit from aggressive treatments including debulking surgery, maximal safe surgical resection, temozolomide chemotherapy, and radiation therapy ²⁾.

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2011

Median age was 59 years; 52 % were female; median preoperative Karnofsky performance score (KPS) was 80. Twelve patients underwent biopsy and eleven underwent surgical decompression. The median tumor volume for the biopsy group was 60.6 cm(3) and for the surgically decompressed group 40.5 cm(3). In the biopsy group, five patients received adjuvant therapy but one died prior to its completion; two died prior to the initiation of adjuvant therapy and five were lost to follow up. In the surgical decompression group, seven patients received adjuvant therapy, one died prior to the initiation of adjuvant therapy, two were treated with palliative measures only, and one was lost to follow up. Kaplan-Meier estimates of overall median post surgical-survival of the whole group was 180 days, the biopsy group 48 days, and the surgically decompressed group 265 days ($p = 0.14$). Our results show that there was a higher median survival in the surgically decompressed group; but a direct correlation could not be established, and that the median KPS did not improve in either group after treatment. A larger multicenter review is required to quantitatively assess the factors, including tumor biomarkers that are associated with patient outcome ⁴⁾.

1)

Burks JD, Bonney PA, Conner AK, Glenn CA, Briggs RG, Battiste JD, McCoy T, O'Donoghue DL, Wu DH, Sughrue ME. A method for safely resecting anterior butterfly gliomas: the surgical anatomy of the default mode network and the relevance of its preservation. *J Neurosurg.* 2017 Jun;126(6):1795-1811. doi: 10.3171/2016.5.JNS153006. Epub 2016 Sep 16. PubMed PMID: 27636183.

2)

Chaichana KL, Jusue-Torres I, Lemos AM, Gokaslan A, Cabrera-Aldana EE, Ashary A, Olivi A, Quinones-Hinojosa A. The butterfly effect on glioblastoma: is volumetric extent of resection more effective than biopsy for these tumors? *J Neurooncol.* 2014 Sep 6. [Epub ahead of print] PubMed PMID: 25193022.

3)

Chaichana KL, Jusue-Torres I, Lemos AM, Gokaslan A, Cabrera-Aldana EE, Ashary A, Olivi A, Quinones-Hinojosa A. The butterfly effect on glioblastoma: is volumetric extent of resection more effective than biopsy for these tumors? *J Neurooncol.* 2014 Dec;120(3):625-34. doi: 10.1007/s11060-014-1597-9. Epub 2014 Sep 6. PubMed PMID: 25193022; PubMed Central PMCID: PMC4313925.

4)

Dziurzynski K, Blas-Boria D, Suki D, Cahill DP, Prabhu SS, Puduvalli V, Levine N. Butterfly glioblastomas: a retrospective review and qualitative assessment of outcomes. *J Neurooncol.* 2012 Sep;109(3):555-63. doi: 10.1007/s11060-012-0926-0. Epub 2012 Jul 18. PubMed PMID: 22806339; PubMed Central PMCID: PMC3992290.

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