Strategy of Adult Thalamic Glioma Surgery: Thoughts and Practices based on Thalamic Glioma Classification

Yuxin Quan[1,#], MBBS, Yujia Mao [1,2,#], MBBS, Tao Chang[1], MD, Xiaodong Niu[1], MD, Siliang Chen[1], MD, Yunhui Zeng[1], Xiang Wang[1], MD, Yanhui Liu[1], MD, Yuan Yang[1,*], MD, Qing Mao[1,*], MD

[1]: Department of Neurosurgery, West China Hospital, Sichuan University, Chengdu, China.
[2]: West China School of Medicine, West China Hospital, Sichuan University, Chengdu, Sichuan, China.
[#]: Both authors contribute equally to this work.
[*]: Co-corresponding authors.

Emails of Contributing authors:
quanyuxindandan@outlook.com; yujia.mao.0611@gmail.com; sht2005011086@126.com; allen_niuxd10@163.com; chensil@outlook.com; zengyh2016@163.com; wangxiangtim@gmail.com; yhliu2001@163.com;

Co-corresponding Authors' names and current institution:
Yuan Yang, MD,
Department of Neurosurgery, West China Hospital, Sichuan University,
#37 Guoxue Alley, Wuhou District,
Chengdu, Sichuan Province, China.
Email: yangyuan@wchscu.cn

Qing Mao, MD,
Department of Neurosurgery, West China Hospital, Sichuan University,
#37 Guoxue Alley, Wuhou District,
Chengdu, Sichuan Province, China.
Email: qingmao2000@163.com

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Table S1. Histological Types and WHO Grades Across Different Tumor Zones.

Zone	Histopathological Types				WHO Grading			Total
	GBM	DMG	AA	Others	WHO II	WHO III	WHO IV	
I	4	0	2	0	0	2	4	6
II	21	5	5	3	3	5	26	34
III	17	13	4	4	3	5	30	38
IV	7	2	2	0	0	2	9	11
I + II	2	1	0	1	0	1	3	4
II + III	21	11	4	4	3	5	32	40
III + IV	8	5	1	2	2	1	13	16
Multiple	21	15	7	5	5	7	36	48
Bilateral	1	1	2	0	0	2	2	4

GBM: Glioblastoma Multiforme; **DMG**: Diffuse Midline Glioma; **AA**: Anaplastic Astrocytoma.

Table S2. Distribution of Muscle Strength by Tumor Zone (Preoperative and Postoperative Month 6).

	Preoperative		6 Months After Surgery			
	Grade 4~5	Grade 0~3	Grade 4~5	Grade 0~3	Dead	Unknown
I	4	2	3	0	2	1
II	29	5	18	3	8	5
III	38	0	25	3	8	2
IV	11	0	2	1	7	1
I + II	3	1	2	1	1	0
II + III	39	1	21	1	11	7
III + IV	16	0	6	2	5	3
Multiple	37	11	21	1	22	4
Bilateral	4	0	1	1	1	1

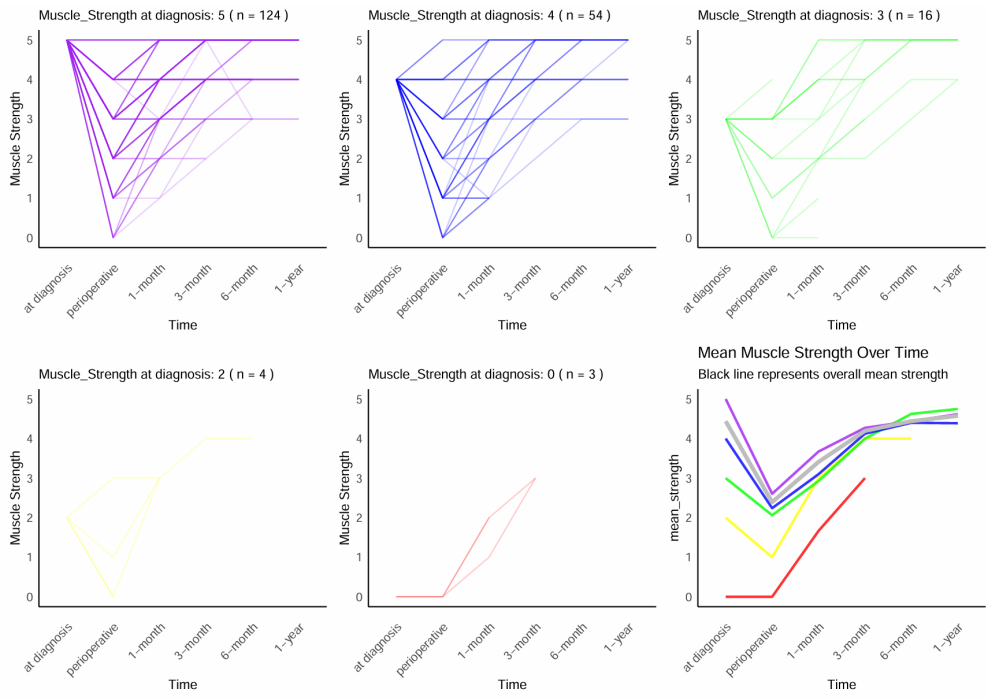

Figure S1. Time Course of Muscle Strength in Patients. Each line represents the longitudinal muscle strength trajectory of an individual patient, with color gradient intensity indicating the frequency of patients exhibiting similar trends; darker gradients correspond to higher patient numbers within specific trajectory patterns. **Perioperative**: Muscle strength during the perioperative period. **1-month**: Muscle strength at 1 month after surgery. **3-month**: Muscle strength at 3 months after surgery. **6-month**: Muscle strength at 6 months after surgery. **1-year**: Muscle strength at 1year after surgery.

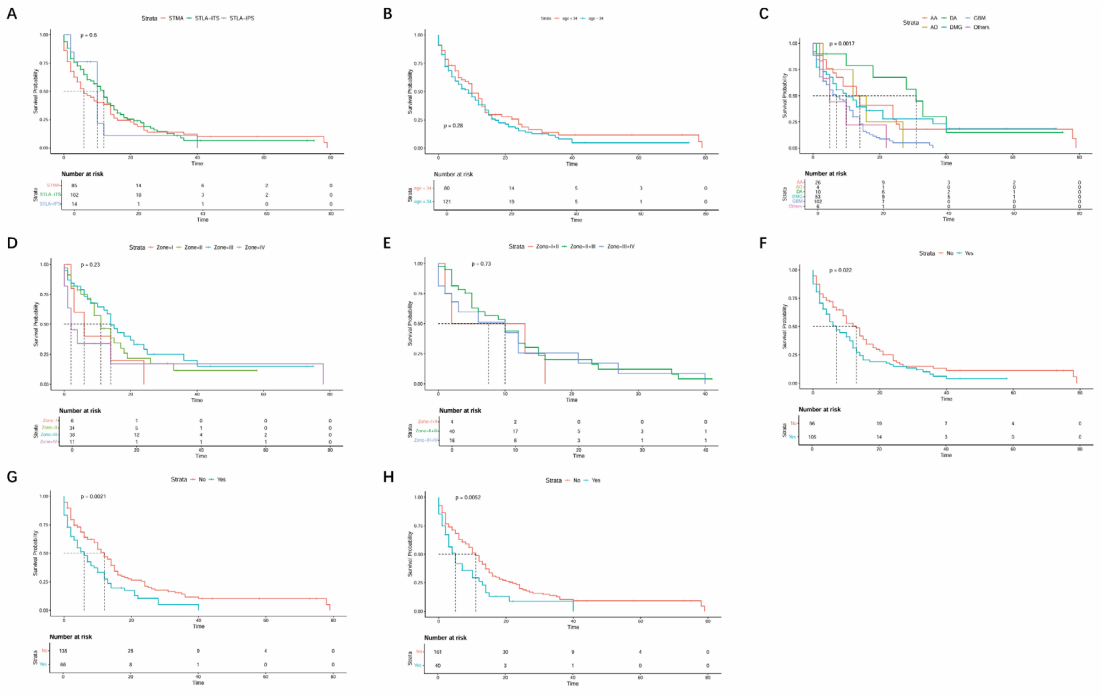

Figure S2. Survival Curves. The results demonstrated that the histopathological types of tumors, the presence of preoperative and postoperative hydrocephalus, and the extension of tumors beyond the thalamus were significantly associated with survival time. However, there was no observed correlation between the surgical approach and survival time. Additionally, when tumors invaded the same number of zones, no difference in survival time was noted between the different zones. **(A)** Survival Analysis of Tumors by Surgical Approach. (**B**) Survival Analysis of Tumors Age of Patients. (**C**) Survival Analysis of Tumors by Histopathological Types. **AA**: Anaplastic Astrocytoma; **OA**: Oligoastrocytoma; **GBM**: Glioblastoma Multiforme; **DMG**: Diffuse Midline Glioma; **AO**: Oligodendroglioma. (**D**) Survival Analysis of Tumors Invading One Zone by Tumor Location. (**E**) Survival Analysis of Tumors Invading Two Zones by Tumor Location. (**F**) Survival Analysis of Tumors by Thalamic Invasion. Yes: Tumors have extended beyond the thalamus. (**G**) Survival Analysis of Patients by Preoperative Hydrocephalus Status. Yes: Patients with preoperative hydrocephalus. No: Patients without preoperative hydrocephalus. (**H**) Survival Analysis of Patients by Postoperative Hydrocephalus Status. Yes: Patients with postoperative hydrocephalus. No: Patients without postoperative hydrocephalus.

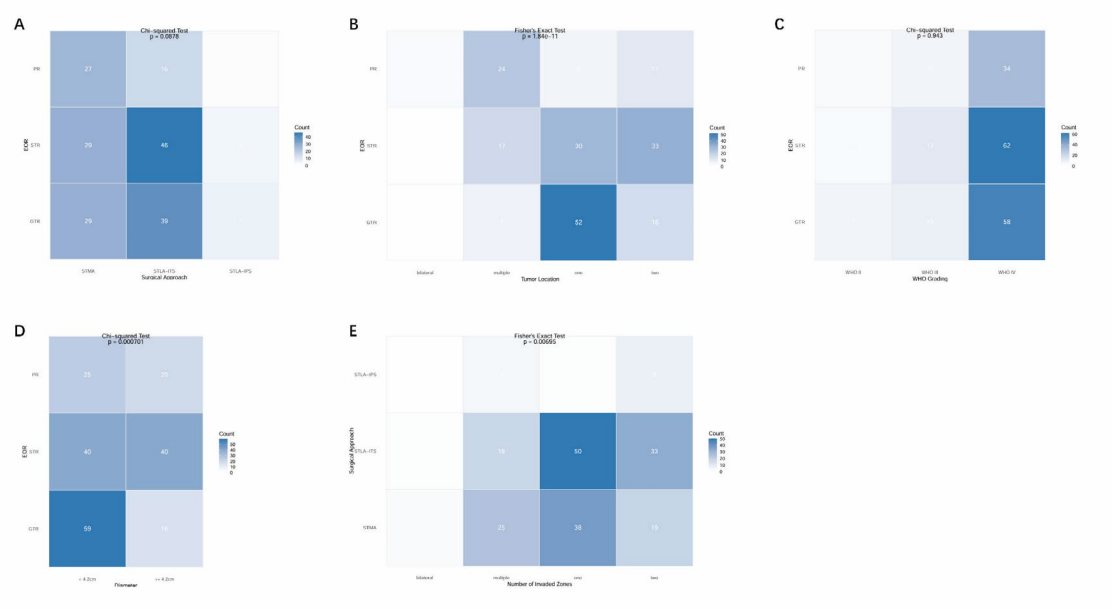

Figure S3. Contingency Table of Surgical Features for All Patients. While WHO tumor grade demonstrated no significant association with EOR, EOR was significantly correlated with both the number of invaded zones and tumor size. A higher number of invaded zones and smaller tumor size predicted greater resection completeness. Although the number of invaded zones influenced surgical approach selection (likely due to anatomical constraints imposed by invasion patterns), no direct correlation was observed between surgical approach and EOR. (**A**) Contingency Table of Surgical Resection Rate by Surgical Approach. (**B**) Contingency Table of Surgical Resection Rate by the Number of Zones Tumor Invading. (**C**) Contingency Table of Surgical Resection Rate by WHO Grading. (**D**) Contingency Table of Surgical Resection Rate by Diameter. (**E**) Contingency Table of Surgical Approach by the Number of Zones Tumor Invading.

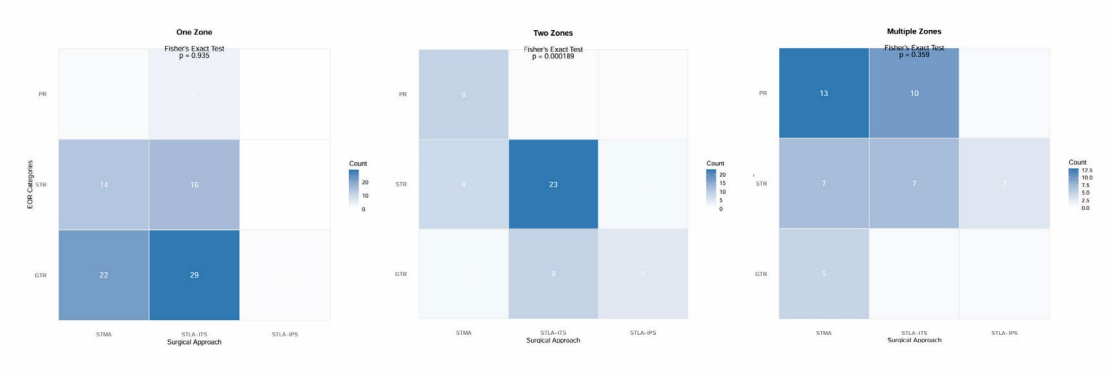

Figure S4. Contingency Table of Tumor Resection Completeness and Surgical Modality Stratified by Number of Invasive Regions. A significant association between the surgical approach and EOR was identified in tumors invading two zones ($p < 0.001$), whereas no such correlation was observed in tumors involving single or multiple (≥3) zones. Contingency table analysis was omitted for bilateral thalamic tumors due to uniformly partial resections across all cases.

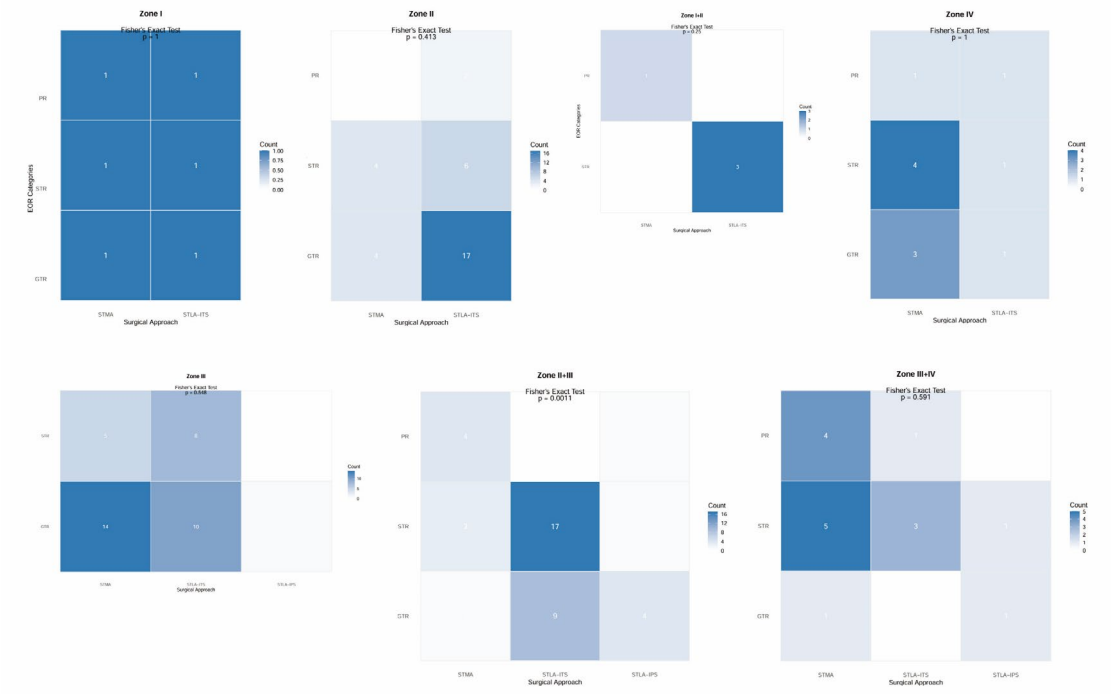

Figure S5. Contingency Table of Tumor Resection Completeness and Surgical Modality Stratified by Tumor Location. A significant association between surgical approach and extent of resection was observed exclusively in tumors localized to Zones II+III ($p = 0.0011$), whereas no such association was detected in other tumor locations.