Tentorial Meningiomas: Surgical Outcomes and Predictors of Recurrence Tumors Based on Yasargil classification of Tumor Location.

Shyamal C Bir MD PhD; Tanmoy Kumar Maiti Mch; subhas konar; Anil Nanda MD FACS

[Institution]

University Neurosurgery

Introduction

Despite improvements in microsurgical techniques, resection of tentorial meningiomas is a formidable challenge due to involvement of neurovascular structures. The authors reviewed their experience of surgical resection of tentorial meningiomas in different locations and assessed the association between extent of resection and recurrence-free survival (RFS) of patients after meningioma resection.
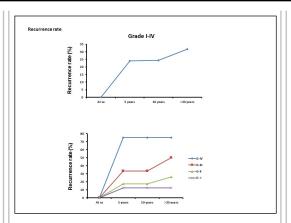
Methods

Clinical and radiological information of 41 patients with tentorial meningiomas who underwent surgery over the past 20 years was retrospectively reviewed. Simpson and Shinshu grading scales were used to evaluate the extent of surgical resection. Statistical analysis was conducted using Kaplan-Meier curves and Cox proportional-hazards regression

Results

In this study, overall recurrence rate was 31.7%. However, the recurrence rate varied based on Yasargil classification (T1-T2: 40%, T3-T8:33%, T4:12%, T5:28%, T6-T7: 40%) of tentorial meningiomas and Simpson grade of resection (Grade I: 12%, II: 26%, III: 50%, IV: 75%). Median recurrence-free survival was significantly higher in the patients with tumor in T4 location (RFS: 247 months, p=0.04) compared to other location (RFS: 149 months). Similarly, median RFS was significantly higher in the patients underwent gross total resection (RFS: 149, p=0.001) compared to who underwent subtotal resection. In Cox regression analysis, patients with tumors in T4 location (p=0.046), gross total resection (p=0.003), WHO grade I (p=0.036) and KPS >70 (p=0.045) were revealed as a significant predictors of RFS.

Conclusions

Patients with T4 meningiomas and undergoing a gross total resection have a low operative morbidity, recurrence rate and improved RFS. Although complete tumor resection is the goal, surgical approach should be tailored to each patient depending on the risks and surgical morbidity and location of tumors in the tentorium.

Recurrence rate — Grade I-IV

Learning Objectives

1.The recurrence rate varied based on Yasargil classification (T1-T2: 40%, T3-T8:33%, T4:12%, T5:28%, T6-T7: 40%) of tentorial meningiomas. Median recurrence-free survival was significantly higher in the patients with tumor in T4 location (RFS: 247 months compared to other locations (RFS: 149 months). In Cox regression analysis, patients with tumors in T4 location, gross total resection WHO grade I and KPS >70 were revealed as a significant predictor of RFS.

Recurrence-free survival based on Yasargil Classification

Recurrence-free survival based on Simpson's grade of resection, WHO grade and KPS score

Table: Extent of resection based on Yasargil classification and Simpson grade of resection

Simpson grade	T1-T2/Group I	T3-T8/ Group II	T4/ Group III	T5/ Group IV	T6-T7/ Group V
I	3	0	2	1	2
II	4	5	4	4	6
III	2	1	0	1	2
IV	2	0	0	1	1
Total	10	6	8	7	10
Recurrence rate	40%	33%	12%	28%	40%
WHO grade					
Grade 1	9 (82%)	5 (83%)	5 (83%)	4 (57%)	9 (82%)
Grade 2	2 (18%)	1 (17%)	1 (17%)	3 (43%)	2 (18%)
Complications	3 (27%)	2 (33%)	2 (25%)	1 (14%)	3 (27%)

Table 6: Cox regression univariate analysis for prognostic factors

Variables	HR	95% CI for HR	P value
WHO Grade (I vs. II)	0.29	0.1-1	0.036
KPS (>70 vs.≤70)	4.34	0.1-0.98	0.045
Age (>65 years vs. ≤ 65years)	1.6	0.48-5.09	0.42
Gender (Female vs. male)	0.38	0.11-1.35	0.13
Ethnicity (Whites vs. Blacks)	0.14	0.71-10.22	0.14
Simpson's grading (I-II vs. III-IV)	6.98	1.95-24.95	0.003
Shinshu grading (I-II vs. III-IV)	6.98	1.94-24.94	0.003
Yasargil classification (Group III vs. others)	4.30	0.11-1.0	0.04