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Spinal meningioma surgery: A single center experience in the change of time

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Abstract

Objective: Spinal meningiomas are well known, most frequently intradural, extramedullar tumors, representing 25% of all intradural spinal tumors. The purpose of this study was to compare the outcome of surgically treated patients suffering from spinal meningioma in two different time intervals with special emphasis on postoperative functional outcome. Methodology: Patients with spinal meningiomas who were admitted in our department between 1990 and 2020 were enrolled in the study. The cohort was divided into two groups (historic cohort [HC] from 1990 to 2010 and current cohort [CC] from 2010 to 2020). Patients' clinical data, surgical and radiological reports were retrospectively analyzed up to 5 years. Preoperative and postoperative neurological function was assessed using the modified McCormick Scale (mMCS). The Charlson Comorbidity Index (CCI) was used to evaluate the effect of comorbidities on the preoperative status and postoperative outcome. Findings: In total, 300 patients were included. A younger age of the surgically treated patients was observed in the CC. Indeed, there were twice as many patients from the CC who were younger than 50 years of age than patients from the HC having the same age. The most common tumor location was the thoracic spine. A symptom duration until surgery <12 months was statistically significantly associated with an earlier improvement in the mMCS (p=0.045). In the CC, the symptom duration until surgery was shorter and patients' neurological function at first and last follow-ups was statistically significantly better than in the HC (p<0.001, p<0.001; respectively). Conclusion & Significance: Our longstanding experience with spinal meningioma patients suggests that the impact of surgical management and postoperative rehabilitation on patients' long-term neurological outcome had reached important milestones during the last decades. Indeed, thanks to an earlier diagnostic, spinal meningioma patients could be surgically treated earlier, which significantly prompted patients' postoperative neurological recovery.

	Outcome at first follow-up	Outcome at last follow-up
Mann-Whitney U Test	P	P
Age	0.012*	0.010*
CCI	0.116	0.894
Symptom duration	0.501	0.303
Cochran-Armitage Test for trend		
Expansion of the lesion (1/2/>2 Seg.)	0.915	0.084
Level of the spine (C/Th/L)	0.756	0.355
Grade of resection	0.841	0.901
Chi-Square Test		
Sex	0.368	1.000
Location (ventral vs. dorsal)	0.028*	0.241
Surgical approach (Laminectomy vs. Laminoplasty)	0.103	0.548
Tumor adhesion	0.525	1.000
Postoperative complications	0.646	1.000
Operation period (HC vs. CC)	0.060	0.499

Multivariate analysis *Binomial logistic regression*

	Outcome at first follow-up			Outcome at last follow-up		
Predictors	Exp.(B)	P	95% CI	Exp.(B)	P	95% CI
Age	1.060	0.053	0.999-1.124	1.336	0.083	0.963-1.853
Location (ventral vs. dorsal)	6.076	0.025*	1.254-29.452	--	--	--
Operation period (HC vs. CC)	3.963	0.089	0.811-19.369	--	--	--
Expansion of the lesion (1/2/>2 Seg.)	--	--	--	4.085	0.265	0.345-47.661

*: significant p-value (<0.05)

Table 1: Univariate analyses and multivariate binomial logistic regression regarding outcome at first and last follow-up

Recent Publications

1. Baro V, Moiraghi A, Carlucci V, Paun L, et al: Spinal Meningiomas: Influence of Cord Compression and Radiological Features on Preoperative Functional Status and Outcome. Cancers (Basel) 13, 2021.
2. Gottfried GW, Quinones-Hinojosa A, Kan P, Schmidt MH: Spinal meningiomas: surgical management and outcome. Neurosurg Focus 14:e2, 2003.
3. Manzano G, Green BA, Vanni S, Levi AD: Contemporary management of adult intramedullary spinal tumors-pathology and neurological outcomes related to surgical resection. Spinal Cord 46:540-546, 2008.
4. Yoon SH CC, Jahng TA Surgical Outcome of Spinal Canal Meningiomas. J Korean Neurosurg Soc 42:300–304, 2007.
5. Aaron A, Cody A, Bernd W, William E, Spinal meningiomas in patients younger than 50 years of age: a 21-year experience. J Neurosurg (Spine 3) 98:258–263, 2003.



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