

Abstract

This dissertation is a set of 5 studies focused on skull base meningiomas. The anatomical study explored the dislocation of the outer and inner arachnoid membranes by the skull base meningiomas. The findings can be applied during surgical resection to predict the presence or absence of the arachnoid dissection plane and the adherence of critical neurovascular structures. The Czech multicentric study documented overall survival 98.1 %, morbidity 13.2 %, and mortality 1.3 %. Predictive factors of histological grade, the extent of resection, clinical outcomes, risk of recurrence and progression were analyzed. Petroclival meningiomas originating within the interpeduncular and prepontine cisterns were the most surgically challenging. Our prospective study focused on the examination of olfaction in olfactory groove meningiomas. The predictors of olfaction preservation were intact olfaction, lower volume and unilateral surgical approach. Olfaction examination is essential to choose surgical strategy and evaluate functional outcome. In a retrospective study of Simpson grade IV resections, adjuvant stereotactic radiosurgery was associated with longer progression-free survival, time-to-progression, and overall survival. Due to the high percentage of progressions (50 %) and the long overall survival (10 years 79 %), we recommend considering adjuvant stereotactic radiosurgery of meningioma residues. Primary stereotactic radiosurgery of the posterior fossa meningiomas ensured progression-free survival at 1, 2, and 3 years 98, 98, and 94 %. Higher volume was the only significant predictor of progression. Clinical improvement was probable in the range of biologically effective dose 56-61 Gy. In this dissertation, we have contributed to the existing knowledge about the technical aspects, predictive factors, and functional results of microsurgical resection of the skull base meningiomas. Subsequently, we documented the importance of stereotactic radiosurgery as a complementary and primary therapeutic modality.

Keywords:

Arachnoid, meningioma, skull base, stereotactic radiosurgery, surgical resection