

Clinical outcomes after removal of low clival and foramen magnum meningiomas by means of far lateral (transcondylar) approaches.

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Learning Objectives

Low clival and foramen magnum meningiomas

Introduction

Low clival and ventral foramen magnum meningiomas constitute approximately 3-5 % of all meningiomas. Clinical symptoms and surgical techniques for removal of meningiomas of these two localizations are similar therefore they are typically studied together.

Methods

Outcomes of 16 cases were analyzed after removal of low clival and FM meningiomas by means of Far Lateral Approach (FLA) with partial transcondylar resection. The patients were operated in the period from 1998 till 2013. The average follow-up period made 38 months (12 - 78).

All the patients underwent resection of 1/3 of a condyle to the hypoglossal nerve canal. Transposition of vertebral artery was an obligatory stage of the surgery.

The surgery results were assessed according to Glasgow outcome scale (GOS). For assessment of cervicomedullar compressions severity we used EMS scale. Volume of meningioma removal we assessed according to Simpson scale. For assessment of biomechanical stability of craniocervical junction we used White-Panjabi criteria for C0-C2 segment.

Case 1. Foramen magnum meningioma Symptoms: headache, disfunction of IX-XII, hemiparesis

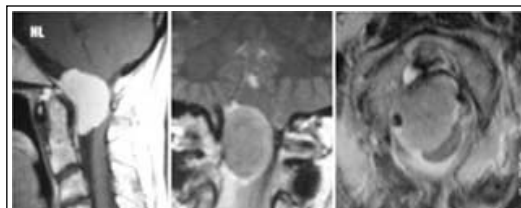


Fig. 1 MRI T1. Foramen magnum meningioma (Anterior lateral localization).

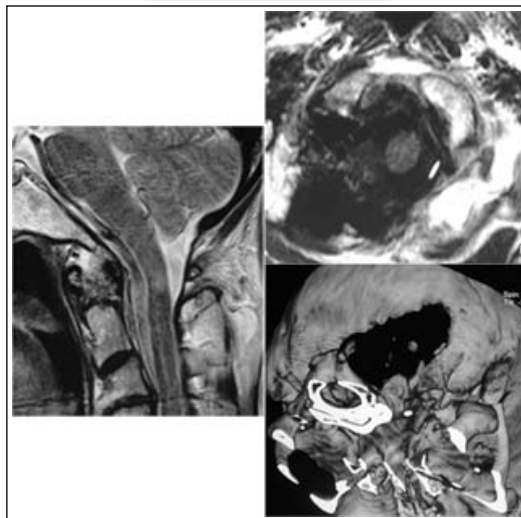
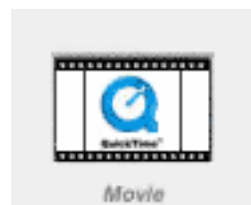


Fig. 2 Post-op. A – MRI T2 sagittal. B – MRI T2 axial. C – 3D CT reconstruction.

Case 1. Low clival meningioma Symptoms: headache, disfunction of IX-XII, tetraparesis

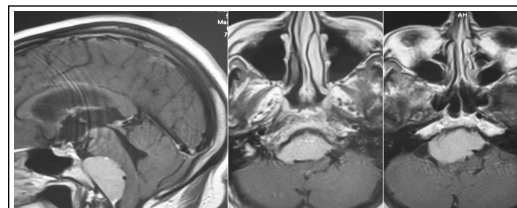


Fig. 1 MRI T1. Low clival meningioma (Anterior lateral localization).

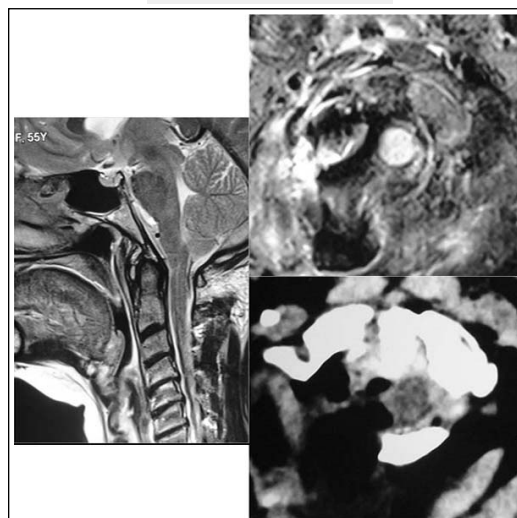
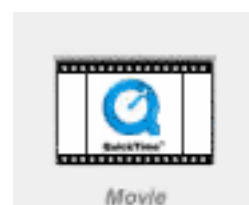


Fig. 2 Post operation control. A – MRI T2 sagittal. B – MRI T2 axial. C – CT axial.

Results

There were 9 (56,3%) cases with low clival meningiomas and 7 (43,7%) cases with ventral FM meningiomas. In 11 (68,7%) cases we used transcondylar approach with vertebral artery transposition, in 5 (31,2 %) cases condylar resection wasn't made. Average follow-up period was 38 months. Degree of tumor resection in 14 (87,5%) cases was Simpson II and in 2 (12,5%) cases it was Simpson III. In 11(68,7%) cases the outcomes were estimated as GOS 5, in 4 (25 %) cases as GOS 4. 1 (6,25%) patient died 4 weeks after the surgery (stem ischemic stroke). Tumor recurrence was observed in 2(12,5%) cases. Hydrocephalus appeared 10 weeks after surgery in 1 (6,25%) case, we applied VP shunt. Low cranial nerves disfunction was identified in 4 (25%) cases. In 3 cases low CN disfunction was fully recovered in 6 months, in 1 case moderate disfunction remained.

Conclusions

FLA transcondylar approaches for low clival and ventral FM meningiomas provide reliable manipulation and visual control of anterior brain stem space. In most cases it is possible to keep craniocervical junction stability, minimizing volume of condylus resection to 50 %. When anatomic integrity of low cranial nerves is retained the average recovery period takes 6-9 months.