

Factors Associated with the Surgical Outcome of Intramedullary Cavernous Hemangioma of the Spinal

Cord

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Introduction

No study of intramedullary cavernous hemangioma of the spinal cord has evaluated the surgical results and spinal cord monitoring findings in patients who had motor paresis that was recovered before surgery. [Objective] To investigate the clinical course of motor paresis and ambulatory ability before and after surgery, to evaluate how preoperative spontaneous recovery impact on the intraoperative monitoring findings and the extent of tumor resection.

Methods

The subjects were 44 patients (20 male and 22 female, average age of 38 years) with intramedullary cavernous hemangioma of the spinal cord who underwent surgery. The mean follow-up period was 10 years. The pre- and postoperative motor paresis, the extent of tumor resection, pre- and postoperative ambulatory ability, intraoperative spinal cord monitoring findings and the recurrent tumor were evaluated. Patients with preoperative motor paresis were treated with intravenous administration of steroids and rest before surgery.

Results

An acute motor paresis at onset was found in 22 patients (50%). All 22 of these patients recovered from the motor paresis immediately before surgery. 13 patients (30%) had aggravation in intraoperative spinal cord monitoring (Table 1). In the motor paresis at onset group, the amplitude of intraoperative spinal cord monitoring decreased easily in spite of spontaneous recovery from paresis before surgery (Figure 1, 9% in no paresis group vs 50% in motor paresis group, p<0.01). Total resection was completed in 40 patients and subtotal and partial resection in 2 respectively. However, 2 patients that underwent partial resection developed rebleeding and worsened symptoms, and one of those patients underwent reoperation and recovered his ambulatory ability. The total resection rate was not different in the two groups. The percent of total resection was high among the patients with good preoperative ambulatory ability (Table 2). Postoperative stable ambulatory ability was achieved among the patients with good preoperative ambulatory ability (Figure 2).

Discussion

Patients with preoperative motor paresis have severe damage to the spinal cord and require more careful spinal cord monitoring and surgical procedures for total resection, even if the patients recovered the muscle strength immediately before surgery. It is assumed that the severely damaged spinal cord had reduced plasticity, even though the patients appeared to recover muscle strength, consequently, had a greater tendency to be damaged during surgery. Steiger et al. reported that the postoperative course is unsatisfactory in the group of the patients with a long history of symptoms and preoperative severe deficit [1]. Total resection is recommended while patients have good ambulatory ability, because rebleeding from residual hemangioma occurred in 9-18%[2], and 50% of patients with residual hemangioma experienced rebleeding in this study.

References

Steiger HJ,et al. (2010)
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 Neurosurgery 45:30-32.

Conclusion

Patients with preoperative motor paresis have severe damage to the spinal cord and require more careful spinal cord monitoring and surgical procedures for total resection, even if the patients recovered the muscle strength immediately before surgery. Patients with mild symptoms and good preoperative ambulatory ability should undergo surgery for total resection to achieve good postoperative ambulatory ability and good surgical results.

Learning Objectives

to investigate the clinical course of motor paresis and ambulatory ability before and after surgery, to evaluate how preoperative spontaneous recovery impact on the intraoperative monitoring findings and good surgical outcome.

Changes in spinal cord monitoring during surgery using the compound muscle action potential (CMAP) in 13



Relationship between preoperative ambulatory ability and extent of tumor resection

resection	resection	resection	(%)
24 (cases)		1	96%
12	2		86%
2		1	67%
2			100%
	resection 24 (cases) 12 2 2 2	resection resection 24 (cases) 12 2 2 2 2 2	resection resection resection 24 (cases) 1 12 2 2 1 2 1 1 2 2 1 2 1 1

Table 2





