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Surgical Outcome of Spinal Cord Tumor in Childhood

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Introduction

The objective of this study was to examine the long-term surgical outcomes of spinal cord tumor in childhood using a prospective multicenter database.

Methods

Of 48,822 surgical cases in our database, 1,025 (2.1%) involved patients under 20 years old. Among these, 45 cases (0.09%: male 28, female 17, mean age 11.1 years, mean follow-up: 5.1 years) were spinal cord tumors with clinical records, plain radiographs, and MRI. The patient characteristics, symptoms at onset, tumor resection, surgical procedure, postoperative radiotherapy and chemotherapy, surgical outcome and kyphotic change at final follow-up were examined. Statistical analysis was performed by unpaired t-test and Fisher exact test.

Results

Intradural extramedullary, intramedullary, and extradural tumors accounted for 50%, 33%, and 17% of the 45 cases, respectively (Fig.1). A thoracic spine tumor was most common (40%). The common pathological diagnoses were ependymoma (n=7), neurinoma (n=6), and neurofibroma (n=6), including high-grade malignant spinal tumor. The most common symptom at onset was pain (51%), followed by motor palsy (34%), gait disturbance (18%), and bladder disturbance (15%)(Fig.2). In 35% of the cases, pain was the only preoperative symptom. Total resection was achieved in 60% and subtotal resection in 22% of cases, and radiotherapy and chemotherapy were performed postoperatively in 18% and 14%, respectively. The recurrence rate was 24%, and these cases were treated with additional surgery and chemotherapy. Postoperative improvement of symptoms occurred in 36 cases (80%), but there were four deaths due to a malignant tumor. Progression of spinal kyphosis (>5°) occurred in 18 cases (40%), with an average of 10.7° (Fig.3). Postoperative kyphosis was significantly related to postoperative therapy (p=0.013), but not to the number of laminectomy levels.

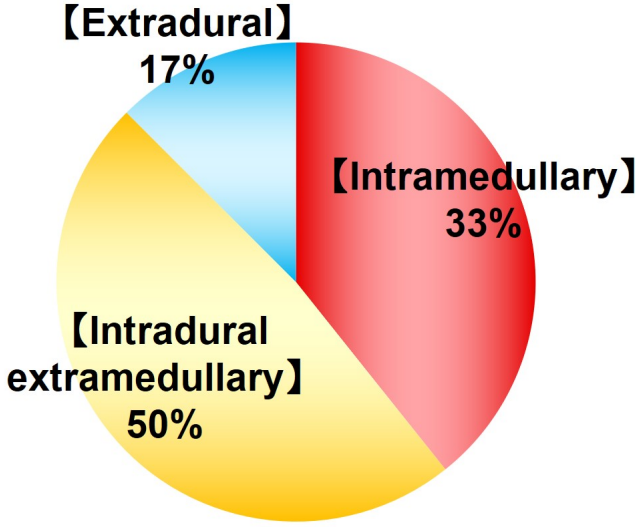
Learning Objectives

Surgical cases of spinal cord tumor in childhood with mean follow-up of 5.1 years were examined in a multicenter prospective database of clinical records and MRI findings. The main symptom at onset was pain without neurological deficit. Postoperative radiotherapy may be effective, but kyphotic change is a concern in children.

References

1.Hsu W, Jallo GI. Pediatric spinal tumors. Handb Clin Neurol. 2013;112:959-65. Review.

Fig.1 The location of spinal tumor



Conclusions

In spinal tumor in childhood, the main symptom at onset was pain without neurological deficit. Hsu et al has also reported that pediatric spinal cord tumors most often present with pain followed by motor regression, gait disturbance, sphincter dysfunction or sensory loss, torticollis, and kyphoscoliosis (ref.1). Postoperative radiotherapy may be effective, but postoperative kyphotic changes are a concern in these patients.

Fig.2 The symptom at onset

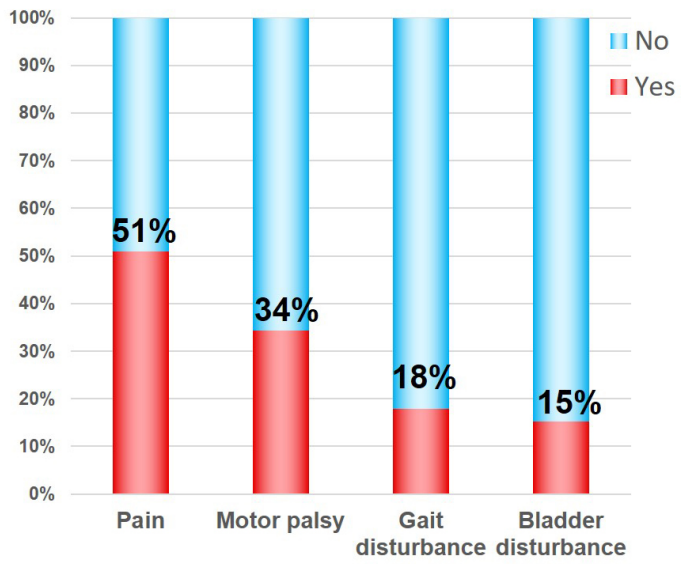


Fig.3 Progression of spinal kyphosis after surgery