

Long-term outcomes of total spondylectomy for giant cell tumor of the mobile spine

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INTRODUCTION:

In cases of giant cell tumor (GCTs), curettage-based surgery can lead to a high rate of local recurrence. To prevent local recurrence of spinal GCTs, we routinely perform total en bloc spondylectomy (TES). When TES is not anatomically feasible (e.g., in patients with prior surgery or patients with cervical spine tumors), we perform total piecemeal spondylectomy, ensuring adequate tumor margins. In this case series, we report the long-term outcomes of total excision for spinal GCTs over a period of approximately ten years and examine cases with local recurrence.

METHODS:

The data of 34 spinal GCTs patients who were treated surgically at our institution between 1994 and 2022 were retrospectively reviewed. Data collected included sex, age, tumor level, surgical classification of spinal tumor (SCST), history of prior surgery, preoperative denosumab treatment, surgical procedure (TES or total piecemeal spondylectomy), and time to recurrence. To detect local tumor recurrence, all patients were examined using computed tomography every 6 months for the first 2 years postoperatively, and annually thereafter. The recurrence-free survival was estimated using the Kaplan-Meier method, and recurrence-free survival rates were calculated at 2, 5 and 10 years postoperatively.

RESULTS:

The study population included 9 men and 25 women, with a mean age of 33.8 years (range, 15-51 years) at the time of surgery. Tumor location was cervical in 5 patients, at the thoracic in 14, and lumbar in 15. Nine patients (26.5%) had undergone prior surgery at the other institutions. TES was performed in 18 patients, and total piecemeal spondylectomy in 16 patients. Preoperative denosumab treatment was performed for 9 patients. The mean follow-up duration was 118.9 months (range, 24-252 months). Local tumor recurrences occurred in 3 patients (recurrence rate: 8.8%) at 12, 48, and 72 months after surgery, respectively. The estimated recurrence-free survival was 223.1 months. The recurrence-free survival rates were 97.1% at 2 years, 93.3% at 5 years, and 88.9% at 10 years postoperatively. All three recurrences in patients who underwent total piecemeal spondylectomy. These tumors were classified as SCST type was 6 (tumor involves adjacent vertebrae), and none of these patients had received preoperative denosumab. Among the 9 patients with a history of prior surgery, 7 underwent total piecemeal spondylectomy, and 1 experienced recurrence. In all 5 cervical cases, total piecemeal spondylectomy was performed, with no recurrences observed.

DISCUSSION AND CONCLUSION:

In cases of spinal GCTs, TES provided excellent local control with no recurrences observed during an average follow-up of 10 years. Total piecemeal spondylectomy also yielded favorable outcomes in most cases. Even in patients with prior surgeries or anatomically challenging cases such as in cervical spine, total excision with adequate tumor margins should be pursued wherever feasible.