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Clinical Study

Quality of life after en bloc resection of tumors in the mobile spine

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Abstract

BACKGROUND CONTEXT: Little has been reported regarding the patient-centered quality-of-life (QOL) outcomes after en bloc spondylectomy (ES). Despite lower local recurrence rates, it is unknown whether outcomes justify the surgical morbidity.
PURPOSE: The purpose of this study was to report on patient QOL after ES as measured by validated instruments and to identify factors that may predict better postoperative QOL.
STUDY DESIGN: This is a retrospective case-control study (Level III).
PATIENT SAMPLE: Thirty-five consecutive patients with mobile spine tumors were included. Twenty-seven patients underwent en bloc resection, whereas 8 patients received definitive radiation and no surgery. Minimum follow-up was 6 months (median, 32 months).
OUTCOME MEASURES: The outcome measures were European Quality Group 5-Dimensional Questionnaire (EQ5D), four Patient-Reported Outcome Measurement Information System (PROMIS) short-form metrics, Neck Disability Index, and Oswestry Disability Index (ODI).
METHODS: We performed statistical comparisons between the surgery and radiation groups, of the general US population, and within the study group itself to identify predictors of higher QOL scores.
RESULTS: We identified a significant difference in QOL between the surgery and radiation groups in only one instrument, PROMIS pain interference, with surgery having more pain interference (15.7 vs. 10.1, p=.04). For most metrics, including EQ5D, pain interference, pain behavior, and ODI, scores were around one standard deviation worse than the US population mean. Multivariable linear regression for each instrument demonstrated that preoperative factors such as better performance status, tumor location in the cervical spine, lack of mechanical back or neck pain, and shorter fusion span were independently predictive of better QOL scores. Postoperative factors such as poor performance status, chronic narcotic use, and local recurrence were more dominant than preoperative factors in predicting worse QOL.
CONCLUSIONS: Patients may experience more pain interference after surgery as opposed to definitive radiotherapy, but we did not identify a difference for most metrics. Quality of life in our study group was significantly worse than the general population for most metrics. Cervical tumors, lack of mechanical pain, better baseline performance status, and less extensive surgery predict better QOL after surgery.

Keywords: Spondylectomy; Quality of life; Mobile spine; PROMIS; Malignant; Tumor; En bloc

FDA device/drug status: Not applicable.

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The disclosure key can be found on the Table of Contents and at www.TheSpineJournalOnline.com.

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Introduction

The operative management of primary tumors of the mobile spine has evolved in the past two decades to combine traditional oncologic principles with advances in spine surgery techniques. The most current paradigm for local surgical control of malignant primary tumors of the mobile spine involves an anatomically based approach [1] that allows removal of the tumor en bloc in an attempt to achieve wide surgical margins. The oncologic principles are derived from the work of Enneking et al. [2], and the technical execution was first described by Stener [3]. The technique was popularized and refined by Roy-Camille, Tomita, Fidler, Boriani, and others [1,4–6]. This approach has led to an improvement in oncologic outcomes such as local recurrence and overall survival [7–10]. Furthermore, enthusiasm for this technique has led to expanding indications, and en bloc resection has even been used in the metastatic or benign setting for selected cases [11,12].

However, although oncologically sound and technically possible, en bloc resections of the mobile spine come at a price, and complication rates are high [8,10,13]. Neurologic compromise, deep infection, blood loss, failure of reconstruction, and other events lead to rates of reoperation and morbidity that are not insignificant. In addition, the physiologic insult of the surgery, in combination with common adjuvant treatments such as radiation or chemotherapy, can lead to a prolonged course of recovery that may never approach the preoperative expectations of the patient. The benefits demonstrated by ''hard'' outcome measures such as overall survival or local recurrence are self-evident. However, a patient-centered evaluation of outcomes such as postoperative pain, anxiety, depression, and other quality-of-life (QOL) metrics are vital to the informed consent for these procedures.

Our understanding of patient QOL after spine surgery is improving [14–25], but relatively little has been published on QOL after en bloc resection of spine tumors [26–28]. In this study, we seek to augment the current understanding of QOL after en bloc resection of malignant spine tumors by comparing our en bloc surgery group with an internal control group who had similar disease and comorbidity status but received definitive radiation alone without major surgery. We also compare our surgical cohort QOL scores with previously reported scores in the general and spine surgery populations. Finally, we seek to identify preoperative and postoperative patients, disease, or treatment-related risk factors that predict higher QOL scores after surgery.

EVIDENCE & METHODS

Context
Advocating that little is known regarding patient quality of life following en-bloc spondylectomy, the authors utilized a number of patient-centered functional outcome measures, including PROMIS, in their evaluation of 35 patients treated for tumors of the mobile spine.

Contribution
This study included 27 patients treated with en-bloc spondylectomy and eight treated using radiotherapy alone. Those who underwent spondylectomy had a significant difference in quality of life in only one measure, pain interference. Quality of life was significantly worse for most patients as compared to metrics for the general population. The authors postulate a number of patient factors that might be indicative of improved quality of life following treatment for mobile spine tumors.

Implications
The results presented here may be of value in managing patient expectations and prognosticating perioperative outcomes following treatment for mobile spine tumors. The relatively small sample is a major limitation in allowing for more extensive generalization. Other limiting factors include a heterogeneous patient population with different indications for intervention and the fact that treatment was rendered at a tertiary academic health center with substantial experience in treating mobile spine tumors. In addition, given the number of variables considered in this analysis (in light of the small sample) the potential is high for some of the factors identified to be significant solely due to chance. Larger, prospective studies that include patients treated at multiple centers across the U.S. could potentially develop more useful data with a capacity for broader translation.

—The Editors

Methods

Study design

We performed a retrospective analysis of patients with spinal tumors treated at our tertiary center from 2000 to 2013. Inclusion criteria were a neoplastic diagnosis in the mobile spine treated with en bloc surgical resection plus the completion of one or more QOL survey instruments during the posttreatment follow-up period. Exclusion criteria were planned intralesional surgery, failure to complete QOL instruments, or tumor location in the sacrum or skull base. In addition to the surgical study group (n=27), we identified a group that underwent definitive radiotherapy instead of open en bloc surgery as the index treatment (n=8). This group fulfilled all other inclusion criteria and none of the exclusion criteria. The maximum surgical exposure allowed in this comparison group was open biopsy. We measured patient demographics and comorbidities, disease characteristics, treatment characteristics, and complication profiles.