OBJECTIVE: Benign and malignant tumors of the spine significantly impair the function and quality of life of many patients. Standard treatment options, including conventional radiotherapy and surgery, are often limited by anatomic constraints and previous treatment. Image-guided stereotactic radiosurgery using the CyberKnife system (Accuray, Inc., Sunnyvale, CA) is a novel approach in the multidisciplinary management of spinal tumors. The aim of this study was to evaluate the effects of CyberKnife stereotactic radiosurgery on pain and quality-of-life outcomes of patients with spinal tumors.

METHODS: We conducted a prospective study of 200 patients with benign or malignant spinal tumors treated at Georgetown University Hospital between March 2002 and September 2006. Patients were treated by means of multisession stereotactic radiosurgery using the CyberKnife as initial treatment, postoperative treatment, or retreatment. Pain scores were assessed by the Visual Analog Scale, quality of life was assessed by the SF-12 survey, and neurological examinations were conducted after treatment.

RESULTS: Mean pain scores decreased significantly from 40.1 to 28.6 after treatment (P < 0.001) and continued to decrease over the entire 4-year follow-up period (P < 0.05). SF-12 Physical Component scores demonstrated no significant change throughout the follow-up period. Mental Component scores were significantly higher after treatment (P < 0.01), representing a quality-of-life improvement. Early side effects of radiosurgery were mild and self-limited, and no late radiation toxicity was observed.

CONCLUSION: CyberKnife stereotactic radiosurgery is a safe and effective modality in the treatment of patients with spinal tumors. CyberKnife offers durable pain relief and maintenance of quality of life with a very favorable side effect profile.

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