Stereotactic Radiosurgery (SRS) for Spinal Tumors: A Single Institution Experience

J Richelcyn Baclay 1, Angela Gaerlan 2, Ibet Sih 2, Julius Cezar Rojales 2, Kat Cortez 2, Nonette Cupino 2, Miriam Calaguas 2, ROY TORCUATOR 2


Corresponding author: J Richelcyn Baclay, jrichelcyn@gmail.com

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Abstract

Objectives: Although stereotactic radiosurgery (SRS) for spinal tumors has shown promising results, it has been used sparingly. This study aims to establish the temporal profile; the number of patients who had pain relief after spine SRS; to characterize toxicity experienced by patients after SRS; and to determine the rates of neurologic progression and/or clinical improvements of patients who underwent spine SRS.

Methods: From August 2012- April 2015, 24 patients who underwent spine SRS in this institution were retrospectively reviewed. Pain outcome was measured using the Numerical Rating Pain Scale. Neurologic examination was done by the attending neurosurgeon and the radiation oncologist. Acute effects were scored according to the Common Terminology Criteria for Adverse Events (CTCAE) v4. The mean age of patients was 58 ± 16.06 years. Radiation was delivered via intensity modulated radiation therapy (IMRT) and prescribed to cover at least 80% of the planning treatment volume (PTV), with organs-at-risk doses kept to tolerance level. Patients were treated to a median dose of 16Gy (range 12-25Gy), given in 1-5 fractions.

Results: Spine SRS was performed in a total of 30 spinal tumors from 24 patients (7 primary spinal tumors, 23 metastatic). The most common origins of the metastatic lesions were prostate (4/23), renal cell (2/23), lung (2/23), and breast (2/23) cancers. The most common treated primary spinal tumor was schwannoma (4/7). A total of 4, 20, 1, and 5 lesions were treated in the cervical, thoracic, lumbosacral, and lumbar spine, respectively. None of the patients received previous irradiation to the spine. Pain was present in 18 of the patients pre-SRS. Thirty-eight percent presented with complete pain relief one day after the treatment, and increased to 83%, one month after SRS. The treatment was well tolerated with none of the patients experiencing acute toxicities such as nausea, vomiting, and headache. Only one patient experienced pain flare two days after the treatment, which resolved with steroids. One patient developed vertebral compression fracture two months after treatment, and was managed subsequently. Of the 10 patients who had motor deficits pre-SRS, 3 had complete recovery of motor function, while 7 had partial improvement.

Conclusions: SRS for spinal tumors is well-tolerated, safe, and effective treatment option. The results of our institution appear comparable to other institution reports investigating outcomes of spine SRS.