

Introduction

Fractionated CyberKnife radiosurgery (CKRS) treatment for acoustic neuromas may reduce the risk of long-term radiation toxicity to nearby critical structures compared to that of single fraction radiosurgery. However, tumor control rates and clinical outcomes after CKRS for acoustic neuromas are not well described.

Methods

We retrospectively reviewed consecutive acoustic neuroma patients treated with CKRS over an 8-year study period using prospectively maintained clinical and radiographic data. Treatment failure, defined as the need for additional surgical intervention, was evaluated using Kaplan-Meier analysis.

Results

For 119 evaluable patients, median values were 49 months (range 6-133 months) of follow-up, 1.6 cm3 (range 0.02-17 cm3) tumor volume, and 18 Gy (range 13-25 Gy) prescription dose delivered in 3 fractions (range 1-5 fractions). Thirty-five (59%) of 59 patients with pre-radiosurgery serviceable hearing (American Academy of Otolaryngology–Head and Neck Surgery class A or B) maintained serviceable hearing at last audio follow-up (median 21 months). Two (2%) of 111 patients with facial nerve function House-Brackmann (HB) =3 progressed to HB >3 after radiosurgery. Koos grade IV was predictive of radiographic tumor growth after radiosurgery compared to grades I-III (p=0.02). Treatment failure occurred in 9 (8%) of 119 patients; median time to failure was 29 months (range 4-70 months). The actuarial rates of tumor control at 1, 3, 5, and 7 years were 96%, 94%, 88%, and 88%, respectively.

Conclusions

CKRS affords effective tumor control for acoustic neuromas with an acceptable rate of hearing preservation. Further studies are needed to compare CKRS to single fraction radiosurgery for acoustic neuromas.

Learning Objectives

1. Describe the increased prevalence of radiosurgery in the management of acoustic neuroma patients.
2. Describe the tumor control, hearing preservation, facial nerve dysfunction, and trigeminal nerve dysfunction rates following CyberKnife radiosurgery for acoustic neuromas.

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