

Progressive Vestibular Schwannoma Following Subtotal or Near-Total Resection: Dose-Escalated Versus Standard-Dose Salvage Stereotactic Radiosurgery

Mohamed H. Khattab¹, Alexander Sherry², Anthony J. Cmelak¹, Albert Attia¹

1. Radiation Oncology, Vanderbilt University Medical Center, Nashville, USA 2. School of Medicine, Vanderbilt University, Nashville, USA

Corresponding author: Mohamed H. Khattab, mohamed.khattab@vumc.org

Categories: Radiation Oncology

Keywords: vestibular schwannoma, radiosurgery, dose escalation

How to cite this abstract

Khattab M H, Sherry A, Cmelak A J, et al. (April 02, 2020) Progressive Vestibular Schwannoma Following Subtotal or Near-Total Resection: Dose-Escalated Versus Standard-Dose Salvage Stereotactic Radiosurgery. Cureus 12(4): a516

Abstract

Objectives: Large vestibular schwannoma (VS) presenting with highly symptomatic mass effect and brainstem compression may represent a more biologically aggressive entity than incidentally diagnosed or indolent VS. Progression following subtotal or near-total resection of this subset of VS is common, and local control after salvage stereotactic radiosurgery (SRS) using standard doses of 12-13 Gy is poor. We hypothesized that dose-escalated SRS, corrected for biologically effective dose, would have superior local control of high-grade VS progressing after subtotal or near-total resection compared to standard-dose SRS.

Methods: After IRB approval, we performed a retrospective cohort study of adult patients treated at our institution with linear accelerator-based SRS for progressive VS following subtotal or near-total resection. Dose-escalated SRS was defined by a biologically effective dose exceeding a single-fraction 13 Gy regimen. Study outcomes were local control and neurologic sequelae of SRS. Binary logistic regression and Cox proportional hazards regression evaluated predictors of study outcomes.

Results: A total of 18 patients with progressive disease following subtotal (71%) and near-total (39%) resection of Koos grade IV disease (94%) were enrolled. Seven patients were treated with dose-escalated SRS, and eleven patients were treated with standard-dose SRS. Over a median follow-up of 32 months after SRS, local control was 100% in the dose-escalated cohort and 91% in the standard-dose cohort. Transient and late neurologic sequelae occurred in 28% of patients, the most common being transient facial nerve neuropathy. One patient in the dose-escalated cohort developed a malignant peripheral nerve sheath sarcoma 15 years following SRS. A greater number of toxicities occurred in the dose-escalation cohort though this was not significant ($p=0.1204$).

Conclusions: Dose-escalated SRS appears to offer improved local control of recurrent VS following progression after subtotal or near-total resection, although dose-escalated SRS may be associated with worsened transient neurologic toxicity compared to standard-dose SRS. Future well-powered prospective studies of dose-escalated SRS for progressive VS with macroscopic residual disease following microsurgery are warranted.

Open Access

Abstract

Published 04/02/2020

Copyright

© Copyright 2020

Khattab et al. This is an open access article distributed under the terms of the Creative Commons Attribution License CC-BY 4.0., which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Distributed under

Creative Commons CC-BY 4.0

