

Linear Accelerator Stereotactic Radiosurgery for Treatment of Glomus Jugulare Tumors: Long-Term Follow-up of 39 Patients

Ankur Patel ¹, Joshua Rodriguez-Lopez ², Steven A. Burton ³, John C. Flickinger ^{3, 4, 5}, David Clump ⁶

1. Radiation Oncology, UPMC Hillman Cancer Center, Pittsburgh, USA 2. Radiation Oncology, UPMC 3. Department of Radiation Oncology, UPMC Hillman Cancer Center, Pittsburgh, USA 4. Department of Radiation Oncology, University of Pittsburgh Medical Center, Pittsburgh, USA 5. Department of Neurosurgery, University of Pittsburgh Medical Center 6. Department of Radiation Oncology, University of Pittsburgh Cancer Institute, UPMC

Corresponding author: Ankur Patel, patelak2@upmc.edu

Categories: Radiation Oncology

Keywords: paraganglioma, glomus jugulare, linear accelerator

How to cite this abstract

Patel A, Rodriguez-Lopez J, Burton S A, et al. (April 02, 2020) Linear Accelerator Stereotactic Radiosurgery for Treatment of Glomus Jugulare Tumors: Long-Term Follow-up of 39 Patients. *Cureus* 12(4): a522

Abstract

Objectives: Stereotactic radiosurgery (SRS) can be an effective treatment for patients with glomus jugulare tumors (GJT). However, supporting data come from small retrospective series with short follow-up, and most include patients treated with gamma knife radiosurgery. Herein we report a large series of patients with GJT with extended follow-up after linear accelerator-based SRS.

Methods: An IRB-approved retrospective review was conducted on patients with GJTs treated with linear accelerator-based SRS since 2002. Patients were simulated with custom mask immobilization and tumor volumes and critical structures were delineated by a team consisting of a radiation oncologist, medical physicist, and either a neurosurgeon, neurotologist, or head and neck surgeon. Patients were treated with single or multi-fraction SRS using Cyberknife® or a conventional linear accelerator. Follow-up notes and imaging were reviewed for outcomes, and late toxicities were graded with CTCAE v5.0. Treatment failure was defined as radiographic or clinical progression, or persistent symptoms after SRS requiring intervention.

Results: Forty-five GJTs in 44 patients were treated between 2002 and 2019, with a median age of 59.0 years (interquartile range, [IQR] 46.5-70.5). Most patients were female (81.8%), white (90.9%), and were treated on the Cyberknife® platform (71.1%). Sixteen patients (35.6%) had prior surgery, and 4 patients (8.9%) had prior radiation. The median treatment volume was 9.00 cc (IQR 3.9-15.3 cc). The most common total dose (Gy)/fraction number was 21/3 (n=16, 35.6%), followed by 25/5 (n=7, 15.6%), and 20/1 (n=6, 13.3%) or 18/3 (n=6, 13.3%). The median BED3 and EQD23 was 70.0 Gy (IQR 66.7-89.0 Gy) and 42.0 Gy (IQR 40.0-53.4 Gy), respectively. Thirty-nine patients (86.7%) had at least one MRI/CT after SRS, with a median of 5 scans (IQR 2-8), and were evaluated for outcomes and toxicity. With a median clinical and radiographic follow-up of 76.4 mos. (IQR 30.5-150.7 mos.) and 57.0 mos. (IQR 20.1-106.9 mos.), respectively, 3 failures (7.7%) were noted, for a 6-year progression-free survival of 97.0%. Two patients experienced progression on imaging, and one patient had persistent symptoms after SRS. Regarding salvage treatment, one patient had repeat SRS >10 years after initial SRS, while 2 patients had surgery (one >10 years and one 17 mos. after SRS); all 3 patients remained

Open Access

Abstract

Published 04/02/2020

Copyright

© Copyright 2020

Patel 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

controlled at a median of 33.1 mos. after salvage treatment. Symptom improvement was reported in 65% of patients after SRS. Three patients (7.7%) experienced late toxicities (grade I hearing impairment, grade II hearing impairment, grade II osteonecrosis after resection and SRS).

Conclusions: To our knowledge, this is the largest reported series of patients with GJTs treated with linac-based SRS. With extended clinical and radiographic follow-up, local control was >92% and toxicity was <8%.