Cureus

Mask Maturation and the Effects on Patient Movement and Treatment Times in Stereotactic Radiosurgery

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Abstract
Published 02/11/2022

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Categories: Medical Physics, Radiation Oncology
Keywords: motion restriction, patient positioning, stereotactic radiosurgery

How to cite this abstract
Hintz E, Delacruz B, Chang J, et al. (February 11, 2022) Mask Maturation and the Effects on Patient Movement and Treatment Times in Stereotactic Radiosurgery. Cureus 14(2): a716

Abstract

Objective: To determine if there are differences in movement parameters between patients who underwent successive mask fabrication and stereotactic radiosurgery versus those whose mask was fabricated at least one day prior.

Methods: Treatment records between 9/9/2019 and 6/30/2021 were searched to identify SRS-naïve patients undergoing their initial treatment. Fifty-two patients were identified who underwent same-day mask fabrication and treatment, while 48 waited at least one day between fabrication and treatment. Data, including estimated and actual treatment times and motion mapping event logs, were recorded from each patient. Unpaired t-tests were used for statistical comparison between cohorts.

Results: The cohorts were similar in terms of estimated treatment times. There was no difference seen in the percentage increase in actual treatment time over estimated (17.7% in the same-day vs 13.5% in the different-day cohorts; $p = 0.24$). A significantly greater number of pauses, in which the head drifts out of tolerance, were noted in the same-day versus different-day cohorts (8.4 vs 4.5, respectively; $p < 0.02$). The number of alarms, which prompt over 12 minutes of off-treatment time compared to seven seconds per pause, were similar in each group.

Conclusion: Patients who undergo same-day mask fabrication and treatment do not require significantly longer treatment times but do experience significantly more movement-related treatment pauses. Pauses are generally brief events indicating that patients could easily be "coached back" to within tolerance. Additional studies are necessary to determine if this is related to longer overall on-table time or to an incompletely cured mask.