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Feasibility and safety of outpatient brachytherapy in 37 patients with brain tumors using the GliSite Radiation Therapy System.

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Abstract

Temporary, low dose rate brachytherapy to the margins of resected brain tumors, using a balloon catheter system (GliSite Radiation Therapy System) and liquid I-125 radiation source (Iotrex), began in 2002 at the University of Arizona Medical Center. Initially, all patients were treated on an inpatient basis. For patient convenience, we converted to outpatient therapy. In this article we review the exposure data and safety history for the 37 patients treated as outpatients. Proper patient selection and instruction is crucial to having a successful outpatient brachytherapy program. A set of evaluation criteria and patient instructions were developed in compliance with the U.S. Nuclear Regulatory Commission's document NUREG-1556 Volume 9 (Appendix U) and Arizona State Nuclear regulatory guidelines, which specify acceptable exposure rates for outpatient release in this setting. Of the 37 patients monitored, 26 patients were treated for recurrent glioblastoma multiforme (GBM), six for primary GBM, and five for metastatic brain tumors. All 37 patients and their primary caregivers gave signed agreement to follow a specific set of instructions and were released for the duration of brachytherapy (3-7 days). The typical prescription dose was 60 Gy delivered at 0.5 cm from the balloon surface. Afterloaded activities in these patients ranged from 90.9 to 750.0 mCi and measured exposure rates at 1 m from the head were less than 14 mR/h. The mean exposure to the caretaker measured by personal radiation Landauer Luxel + whole body dosimeters for 25 caretakers was found to be 9.6 mR, which was significantly less than the mean calculated exposure of 136.8 mR. For properly selected patients, outpatient brachytherapy is simple and can be performed within established regulatory guidelines.

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MeSH Terms

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