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Stereotactic radiotherapy for atrial fibrillation in three cancer patients

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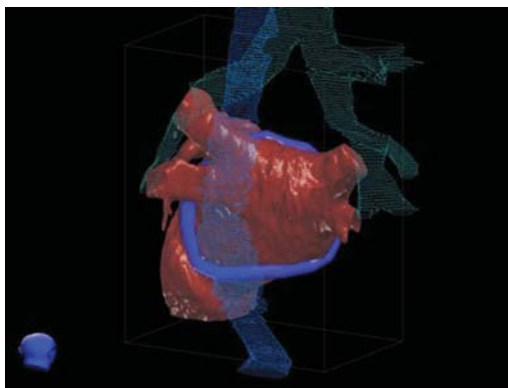
Background: Although catheter ablation is an effective therapy for atrial fibrillation (AF), risks remain and improved efficacy is desired. Stereotactic radiotherapy is a well-established therapy used to noninvasively treat malignancies with precision.

Objective: We sought to evaluate stereotactic arrhythmia radioablation (STAR) as a therapeutic option for treating AF.

Methods: Three cancer patients with drug refractory AF were enrolled. Planning software using 3-D CT of the left atrium was used to design a desired ablation volume encompassing antral circumferential pulmonary vein isolation, a roof line, and a floor line to create a "BOX" lesion set. Target dose to the treatment volume was 25 Gy, with exposure to the esophagus excluded. After planning, patients were treated in the radioablation suite.

Results: STAR was able to deliver the intended radiation dose to target without complication in 3 patients. No acute complications were seen for up to 6 months. One patient with paroxysmal AF died of deterioration of cancer. The autopsy revealed evidence of fibroblasts and fibrogenesis at the regions of atrial tissues targeted with radioablation. Two patients with long-standing persistent AF remained in AF at 6 months. In one patient, atrial electrograms were recorded at the atrial posterior wall from the esophagus before STAR, and it was absent at 3 months after STAR, indicating electrical isolation.

Conclusions: Although STAR may be safe, further evaluation is warranted regarding effectiveness. For longstanding persistent AF, AF may be difficult to terminate only with a BOX lesion set without electrical cardioversion.



BOX isolation created by STAR